

Melania-Gabriela Ciot
(Editor)

The European Green Deal and the Quest for Sustainability

Challenges and Perspectives

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MELANIA-GABRIELA CIOT

Editor

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FOREWORD

Professor Dr. Melania-Gabriela CIOT

When I started thinking about writing this word, the first article I read was on euractiv.ro platform that morning was titled *Luna iunie a fost cea mai caldă înregistrată vreodată în Europa de Vest/June was the warmest month ever recorded in Western Europe*. I perceived this coincidence as a sign – perhaps a positive one – related to the research topic that has been preoccupying me for some time. Yesterday, I was following the discourse of President Macron in the Palace of Westminster, addressing the Parliament, and the second global priority enounced was climate policy, also viewed as a foundation for future collaborations and cooperations among states. Indeed, the effects of climate change and the fight against it could be a point of building cooperation and alliances, serving as a precious tool in foreign policies. Climate diplomacy is expanding into new spaces and places and is being used more frequently. In contrast, science diplomacy plays a significant role in developing common projects and research, making global preoccupations a platform for building networks of specialists who can find solutions for decision-makers.

However, one of the most challenging tasks in fighting against climate change is increasing awareness of the imminence of its effects and the climate crisis we are leaving behind. The Jean Monnet Chair that I am coordinating, *Green Deal and European Negotiations*, has an important component in the organisation of events aiming to gather specialists in the field of climate and approach the topics from various perspectives, such as international relations and European studies, political sciences, history, economic sciences, law, philosophy, etc. In this way, a fresh perspective, social and humanistic, is introduced that can improve previous solutions and disseminate knowledge among scholars, especially young researchers.

The present volume represents the result of the second conference organised within the framework of the Jean Monnet Chair *Green Deal and European Negotiations* by the Doctoral School of *International Relations and European Studies* at Babeş-Bolyai University (Faculty of European Studies). The participants were primarily PhD students who presented their papers in three sessions: *Politics and Governance for Green Europe*, *Innovation and Technology for Sustainable Development*, and *The Social and Economic Dimensions of Green Transition*. The doctoral students belong to the most prestigious universities in Romania, as Alexandru Ioan Cuza University in Iaşi (from 2 doctoral Schools - Doctoral School of Philosophy and Social-Political Sciences, Doctoral School of Economics and Business Administration), Academy for Economic Studies from Bucharest, and Babeş-Bolyai University (from 6 doctoral school as Doctoral School of International Relations and Security Studies, Doctoral School of Political, Administrative and Communication Sciences, Doctoral School of Philosophy, Doctoral School

of Economic Sciences and Business Administration, Doctoral School of International Relations and European Studies). 40 PhD students participated with papers. The conference featured special international guests from the Azerbaijan University of Languages, whose presence underscores the global relevance of the discussions, given that the last Conference of Parties (2024) was held in Baku. From all the papers presented at the conference, 14 were selected for the present volume.

The volume *The European Green Deal and the Quest for Sustainability. Challenges and Perspectives*. brings together a series of studies that reflect the complexity and ambitions of the European Union's green transition, exploring from multiple perspectives how the European Green Deal is projected into the EU's internal and external policies. The opening chapter, "European Strategies for a Green Future," provides an overview of institutional strategies aimed at achieving climate neutrality, followed by an analysis of the role of innovation and technology in facilitating this transition. The paper on *Populism and Green Rhetoric* draws attention to how environmental discourse is politically instrumentalised, and the empirical analysis of the predictors of sustainable development in the European space makes an essential contribution to understanding the mechanisms through which green policies can be calibrated more effectively on a scientific basis.

In addition to the European analytical dimension, the volume also integrates relevant case studies that illustrate national differences in the implementation of the Green Deal: Finland is presented as a pioneer in integrating green objectives into public policies, while Greece offers an interesting example of institutional reconstruction towards ecological governance. There is no shortage of foreign policy perspectives, such as the strategic energy relationship between the EU and Africa or the tense economic negotiations between the European Union and Indonesia, which shed light on the geopolitical challenges generated by the new sustainability standards. In this context, the study of Russia's innovative eco-urban system and the analysis of the role of digitalization in sustainable development complete the thematic palette, highlighting the diversity of actors and instruments involved in the ecological transition.

Finally, the volume pays special attention to the ethical, educational and cultural dimensions of sustainability. Articles dedicated to the European governance of artificial intelligence and its integration into education — including through the lens of the Romania 2030 initiative — highlight the role of technology as a dual catalyst for both economic development and social transformation. The philosophical reflection proposed by Umberto Galimberti on biocentric ethics and the analysis of the official discourse during the 1989 Revolution provides a valuable counterpoint, reminding us that sustainability is not only a matter of public policies and innovation, but also one of collective memory, cultural vision, and moral conscience.

As coordinating editor, this collection not only offers a rigorous mapping of the challenges posed by the Green Deal but also invites critical reflection on the sustainable future of the European Union.

Cluj-Napoca,
July 8, 2025

Professor Dr. Melania-Gabriela Ciot

EUROPEAN STRATEGIES FOR A GREEN FUTURE: THE ROLE OF INNOVATION FOR A GREEN FUTURE

Cătălina-Mihaela LUPU¹

Abstract: *This study explores how the EU is using advanced technologies to create a green, sustainable and resilient society, in an attempt to provide future generations with an equally high quality of life, with access to resources. Through a qualitative methodological approach, including case studies and policy analyses, this study identifies key drivers and obstacles in the transition to a circular economy, highlighting the need for stronger multilateral collaboration and targeted policy interventions to accelerate the adoption of CE principles across industries. The 2030 Agenda for Sustainable Development is a crucial global framework for addressing major world issues, such as poverty, hunger, climate change and social inequalities. Economic diplomacy is an essential tool for implementing this Agenda because it focuses on promoting the economic interests of states in the context of international relations, and its objectives are global and require cooperation and coordination between states to be achieved. Economic diplomacy thus facilitates dialogue and collaboration between states to identify common solutions and promote concerted action towards sustainable development. On the other hand, the circular economy offers an innovative economic model that maximizes resource efficiency and minimizes waste, thus directly contributing to the SDGs such as responsible consumption and production (SDG 12), sustainable economic growth (SDG 8) and resilient infrastructure (SDG 9), etc. By promoting the circular economy, economic diplomacy can facilitate the transfer of green technologies, investments in sustainable infrastructure and international partnerships, all of which are crucial for a global transition towards a sustainable development model. Thus, the circular economy becomes a strategic tool for integrating sustainability goals into international economic policy.*

Keywords: *circular economy, sustainability, multilateral collaboration, innovation, technology.*

Introduction

The new circular paradigm that we face today can easily support sustainability in the European Union and foster economic growth. The traditional linear economic model of "take-make-dispose" has always been the easiest way of doing things, but due to increasing

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environmental and economic challenges, there was a need and a pressure for change. Waste generation, pollution, and resource depletion were the most significant topics in the last year, even if we are talking about government, NGO, academics, or the private sector. The circular economy has brought us new concepts such as sharing, reusing and recycling that aim to redefine global and national growth. Promoting these principles is defining a new way of doing things. Our planet is so far the only one that can be lived on, so we need to think of a way to preserve and use it in the most sustainable way possible. By extending the life cycle of products, the circular economy helps protect the environment, reduce dependence on raw materials, create new jobs, and save consumers money (European Commission, 2020). The Sustainable Development Goals (SDGs) of the United Nations, outlined in the 2030 Agenda, are deeply connected to the principles of the circular economy and, therefore, prioritising CE in our national strategies could be one of the most effective ways to build a better world by 2030. This article highlights the opportunities and challenges that the circular economy offers or faces throughout its implementation in all significant sectors and how economic diplomacy can help awareness and global adoption of the principles of the circular economy. The primary keys of the research are: (1) to identify the obstacles that circular economy strategies are facing in alignment with the 2030 Agenda, (2) to highlight the role of economic diplomacy in the transition to the circular economy, with a strong focus on international treaties, partnerships, and European standards, and (3) to propose concrete policy recommendations to improve regulatory consistency, private sector engagement, and technological innovation in CE transitions. By tackling these topics, this research improves understanding of the interaction between economic, political, and environmental elements in the transition to a sustainable world.

Even though we are aware of this, the situation is nevertheless worsened by the very large amount of waste that people and institutions are producing. Although numerous measures have been implemented to encourage recycling, waste generation is constantly increasing worldwide. In the EU, almost 5 billion tonnes of waste are generated per capita, annually. This has a major impact on the environment and public health and involves high management costs. The global population consumes more than 100 billion tonnes of materials each year, with more than 90% of all materials extracted and used ending up as waste. This reinforces the main idea of the article, namely the transition to a circular economy that offers everyone a sustainable way of life. By promoting sustainable practices and strategies, improving resource efficiency, and reducing environmental impact, we provide a comprehensive framework to achieve the SDGs (EIB, 2023).

The main purpose of this paper is to examine the real potential of the circular economy to stimulate sustainable development, while addressing key global challenges, and to highlight the critical role of economic diplomacy in facilitating the transition to green technologies, investments in sustainable infrastructure, and the establishment of international partnerships. All these factors have a real impact on the global transition to a sustainable development model, and the best combination will lead to a new and better world. By analysing the challenges and opportunities that are associated with the implementation of circular economy strategies, we will be able to create a theoretical basis that unconditionally

supports this new economic model. Throughout the study, I will present the barriers already existing, as well as the innovative solutions that have managed to transform economic sectors so far.

Analysing from a scientific point of view, the study also adopts an interdisciplinary approach by combining public policy analysis, case studies, and quantitative methods to outline a comprehensive overview of the circular economy and how it can truly contribute to the achievement of the SDGs. The results of the study will integrate perfectly into the mainstream of knowledge, not only by providing a robust theoretical and applied framework, relevant to all policymakers, academia, and the private sector, but also by developing new relevant, effective, and scalable strategies, which will bring us even closer to this transformative concept and its successful implementation.

The 2030 Agenda was created out of the current crisis and is designed to mark the world's greatest challenges, including all conflicts, poverty, and climate change. The achievement of all the SDGs has become a must for all countries and requires so much detail, planning, and actions. It is also essential and crucial to cooperate with the principal actors in the international scene, even though we talk about business or diplomatic spheres; sustainability leadership must redress the gaps and find the best solutions to implement circular economy, to promote sustainability and sustainable growth (European Parliament, 2023). Diplomacy can be easily named the heart of global action toward the 2030 Agenda and it can help promote awareness, improve market factors and regulatory environment, grow international partnerships, and underline opportunities. A great deal can be accomplished by leveraging the opportunities offered through sustainable investment, international trade, public-private partnerships, soft power, cross-border education, artificial intelligence, and digital transformation. Diplomacy has been created to support peace and prosperity between people and states, and now its role is to provide a bridge between them and the planet. Its importance extends to all 17 SDGs, and the central idea behind diplomacy is global partnership. All forms of diplomacy, from economic or cultural to corporate or climate, can contribute effectively to the global initiatives undertaken under the 2030 Agenda. We have seen what it means to not find a common path to follow and to act unilaterally, thinking only about your own wealth as a country.

Reaching the EU climate-neutrality objective in 2050 is very ambitious, especially for the member states of Central-East Europe. All states will face the challenges of transformational changes, but a good preparation of their administrative capacity will be a consistent support. For achieving this goal, an interesting model of analysis was elaborated by the Romanian government, which takes into consideration three levels and dimensions: strategic (with executive and legislative dimensions), administrative (national and regional dimensions) and outcomes (assessed from a well-being lens and public opinion surveys). The model will be applied at the European and national levels (Romania), using qualitative research strategies and methods. Following the adoption of the 2030 Agenda for Sustainable Development in 2015, Romania has constantly advanced its commitment to a comprehensive and responsible implementation of the Agenda and its 17 Sustainable Development Goals (SDGs) by strengthening the institutional framework for sustainable development. In 2017, the

Romanian government established the Department for Sustainable Development (DSD) as part of its operational framework, focusing primarily on the implementation of the 2030 Agenda and its 17 SDGs. The adaptation of the 2030 Agenda to our national particularities is fully expressed in the 2030 Romanian Sustainable Development Strategy, which was approved in 2018 and the Romanian Circular Economy Strategy, adopted in September 2022. Working in the circular economy means working in most of the SDGs.

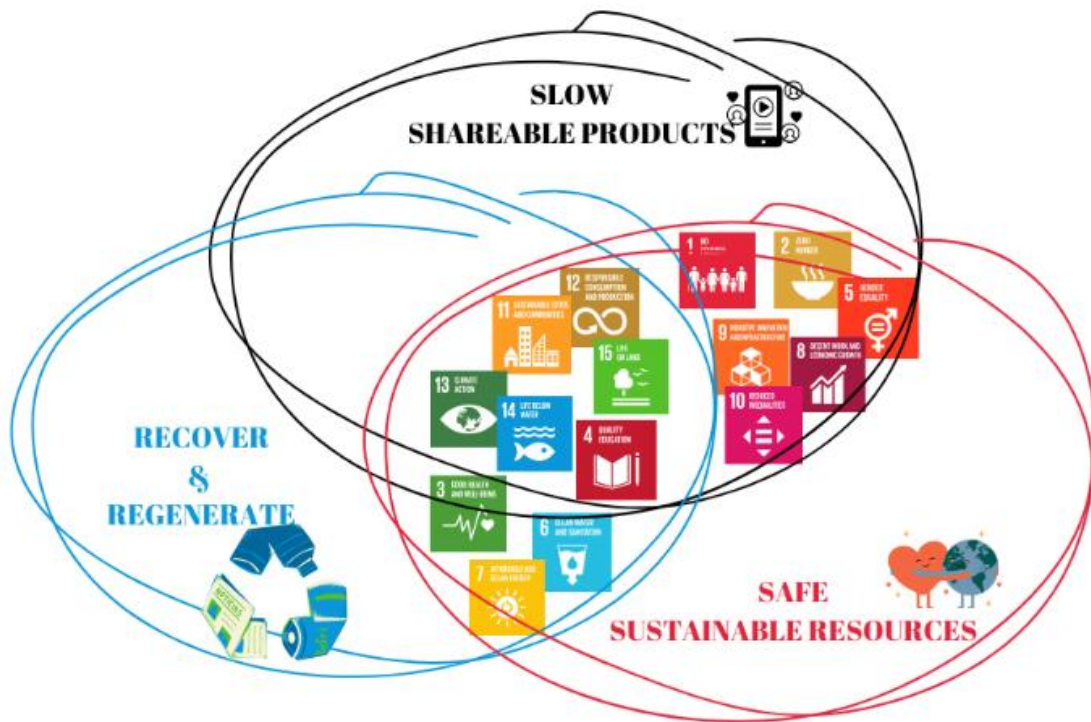


Figure 1. The way circular economy supports 15 of the 17 SDGs (source: author's own creation)

There is more to consider. By working with the 15 Sustainable Development Goals included in Figure 1, we directly support the application of the principles of the circular economy, which, in turn, promotes the use of resources in a sustainable way, with the goal of significantly reducing waste. In this context, SDG 16 and SDG 17, which aim to promote peace, justice and strong institutions, as well as global partnerships for sustainable development, are essential in their proper implementation, supporting collaboration and effective governance, two fundamental aspects when we bring into discussion the effective implementation of the circular economy at large scale. Companies and government bodies are beginning to understand that the circular economy serves as a perfect tool for sustainable design. This text tackles the issue of "decoupling," which involves disconnecting resource consumption from environmental damage, waste, pollution, and emissions while still striving to enhance life quality for everyone. Companies also benefit because it reduces risks, provides new revenue and service opportunities, and boosts brand image. By encouraging local, regenerative, and circular production systems, we strengthen the relationships between suppliers, producers, and consumers. We must transition from the existing model of "increasing profit" through lower costs to a more sustainable way.

The Role of Circular Economy in Sustainable Development

The circular economy is gaining recognition as an essential approach to accomplishing the Sustainable Development Goals (SDGs), especially those focused on responsible consumption and production (SDG 12), climate action (SDG 13), and sustainable cities and communities (SDG 11). By integrating the practices that define the circular economy, we can reduce our environmental impact and improve resource efficiency, while promoting inclusive economic growth. The ability of the circular economy to decouple economic growth from resource consumption is the basis of this theory, stating that the population's need for raw material extraction decreases considerably, reducing the consequences on the environment. The products obtained from recycling have a great potential to regenerate nature, offering both the consumer and the producer the satisfaction they expect. Knowing that there is the ability to reuse products and materials that offer the same expectations and meet the needs of each consumer, people perceive the circular economy from a different point of view and understand that we are talking not only about high costs and a difficult implementation, but about a future that will contribute to our standard of living. Although we hear so often about the circular economy and we have all understood that there is a real potential to stimulate sustainable development through it, today it still faces numerous challenges. Consumer interest and awareness are not high enough to support such a transition, and the absence of government action contributes to this phenomenon even more; a joint action of the administrative apparatus is needed to increase the importance of the circular economy.

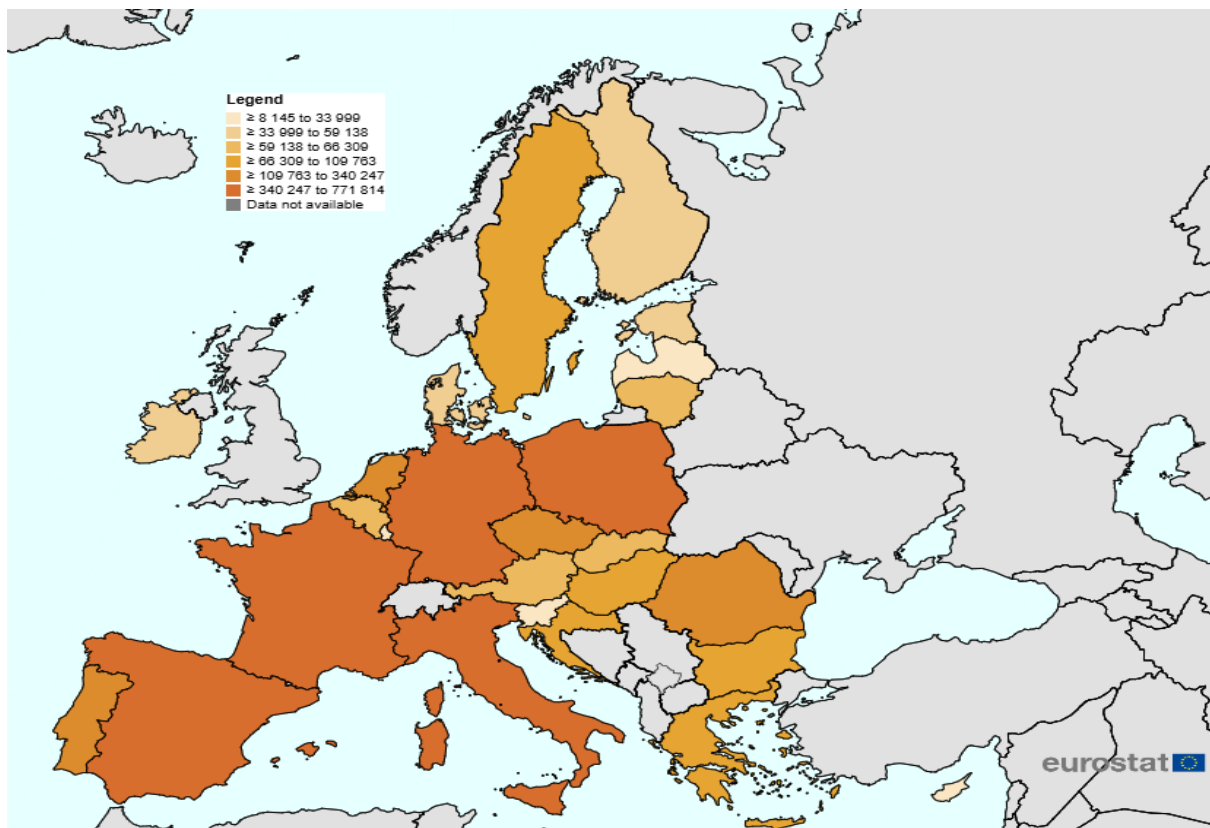


Figure 2. Persons employed in circular economy sectors

(source: https://ec.europa.eu/eurostat/databrowser/view/cei_cie011/default/table?lang=en)

Romania is not among the top 3 countries with the most employees in this field, but observing the distribution, it ranks immediately after Poland, occupying the 6th place in the EU. As previously mentioned, Romania has set national plans that it closely follows to ensure that our country enjoys sustainable development, improving the standard of living for its citizens. Prioritising sustainable production is crucial in this new paradigm.

Economic Diplomacy and Circular Economy

Economic diplomacy substantially supports the advancement of circular economy goals by facilitating international collaboration, thereby aligning regulatory frameworks and attracting increasing investment in sustainable technologies. Economic diplomacy is becoming a key element in supporting circular practices globally, as nations progressively recognize the environmental and economic benefits of the circular economy. The EU plans to strengthen international collaboration on circular economy policies by creating initiatives like the European Green Deal, therefore supporting the adoption of circular practices beyond its own borders. Furthermore, economic diplomacy also comprises efforts to involve multinational corporations and investors in promoting sustainable business models and green investments. Their presence in this framework is progressively significant. Recent research emphasizes the considerable potential of diplomatic initiatives in facilitating the global transition to a circular economy by sharing know-how, aligning national policies with international sustainability objectives and building strategic alliances (Ranta et al., 2018).

The Transition to a Smart Europe

The European Union is certainly a leader in the global movement towards sustainability and digital progress, recognising and supporting at every opportunity the need to respond to climate issues, but also to the rapid depletion of resources and urbanisation. To ensure that all these objectives are achieved and closely pursued, the EU has developed a series of specific strategies regarding green initiatives, digital innovation and big data, but also economic transformation through the circular economy. All these efforts have been designed not only to reduce the short, medium and long-term effects on the environment but also to permanently boost Europe's competitiveness in all developing sectors, promoting an inclusive and resilient economy.

Table 1. The major EU strategies influencing the future of a Smart Europe
(source: author's own research)

Strategy	Objective	Key Actions
The European Green Deal	Achieve climate neutrality by 2050	Reduce greenhouse gas emissions, invest in renewable energy, promote sustainable mobility, enhance biodiversity protection.
The European Digital Strategy	Foster innovation in digital technologies and smart infrastructure	Support AI development, expand 5G connectivity, implement smart city technologies, enhance cybersecurity.

Strategy	Objective	Key Actions
The Circular Economy Action Plan	Promote recycling, reuse, and waste reduction	Improve waste management systems, develop sustainable product policies, encourage eco-design and resource efficiency.
The EU Smart Mobility Strategy	Develop sustainable, intelligent, and accessible transport	Expand electric vehicle charging networks, invest in high-speed rail, integrate AI in traffic management, promote alternative fuels.
The EU Energy Strategy	Ensure clean, affordable, and secure energy	Increase renewable energy capacity, modernize electricity grids, improve energy efficiency in buildings, promote hydrogen and other clean fuels.
The Sustainable Finance Strategy	Align financial markets with green and digital transitions	Introduce EU Taxonomy for sustainable investments, promote green bonds, mobilize private and public funds for climate action.
The EU Industrial Strategy	Support Europe's green and digital transformation in industry	Develop clean manufacturing processes, boost digitalization in production, enhance supply chain resilience.

Circular Economy in the European Union: A Pioneer in Policy and Implementation

The European Union has gained more and more importance and is now one of the main actors on the global stage. By advocating circular economy practices within its Circular Economy Action Plan in 2015 and follow by the revised version, EU has established more and more ambitious objectives for the transition to a sustainable economy, based on resource-efficiency (European Commission, 2023). The whole framework is focused on policies and directives regarding waste reduction, recycling rates and promoting eco-design principles that are more attractive for the consumers. Sweden is serving as one of the best examples because of its recycling efficiency. As of 2023, the recycling rate for household waste has remarkably boost up to 99%, with a substantial amount being transformed into energy (Swedish Environmental Protection Agency, 2023). Now, with such a big percentage of green energy, we can only attribute the success to the circular practices. A similar example is the Netherlands who has positioned itself as a leader in the circular construction sector. There are proofs that, when you embrace the circular economy, you can develop your country and have a significant economic growth. Amsterdam has presented a circular strategy for urban development that included principles of modular construction and resource recovery. By following its national strategy, in 2022, the public infrastructure projects were using at least 50% recycled materials, revealing the scalability of CE in urban planning (City of Amsterdam, 2022). As we can see, a strong policy framework can spread the implementation of circular practices across various sectors.

When we are talking about circular material use rate, we can strongly affirm that The Netherlands surpasses all others EU states. Its position as the leading country is without doubt because it's dedication to recycling, resource efficiency and also high implementation of circular principles. Closely behind we can see Italy, Malta and Belgium who are showcasing high circular material use rates and who possess strong system and frameworks for recycling and including raw material into their economies. Countries as France, Austria, Germany and

Czechia, even though we might think that are on top positions, we can truly see there are some issues and there is a need for improvement. The fact that you are a developed country, a big government or a strong company is not assuring you the success. The most important aspect is your national strategy and the way you are including the green principles in all the activities. At the bottom of the ranking, we can see Romania, Ireland, Finland, and Portugal who have the lowest rates within the UE. There's a pressing need for new actions and as we now until now, each country has its national strategy plan and it's dedicated to the Agenda 2030 and the EU neutrality objectives.

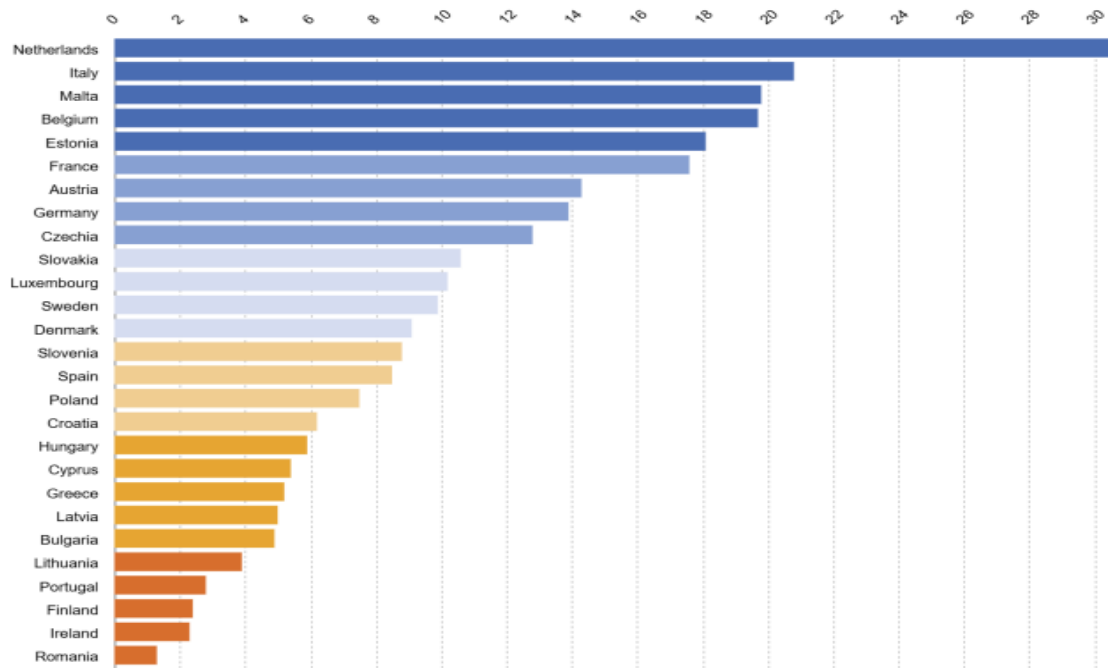


Figure 3. Circular material use rate in EU, 2023

(source:https://ec.europa.eu/eurostat/databrowser/view/cei_srm030/default/table?lang=en)

The circularity path is not as simple as it seems, being a long-term endeavour. Romania has started its journey on this path, but it's just the beginning. It's important to understand that the socio-economic capital cannot be ignored against the effects of human activities on the environment. To try to protect the natural ecosystem, minimize the loss, and restrict high emissions, the circular economy must prioritize the actual structure and the real potential of natural capital. To be sure that we can face all the challenges and threatens, Romania needs a strategic direction and a long-term vision. The Sustainable Development Department of the Romanian Government has published the national strategy and all the actions that were taken until now and we can affirm that Romania has achieved certain economic advancements in the last ten years and it's still trying to implementing different directions to follow. Our national strategy is still linked to the waste management, which is notably underdeveloped, and there is a lack of understanding and learning in this field. According to data from the Circular Economy Monitoring Framework, Romania is among the EU countries that exhibit the least favourable results in terms of resource productivity, the ratio of waste generation to GDP,

waste treatment practices, and the integration of recycled materials into the economy. As we know, not only on circularity terms, there is a clear gap between the Northern and Western European nations and Eastern and Southern countries, which usually are left behind. This gap may reflect differences in economic development, the implementation of policies, and the public's awareness of the circular economy. The solution to align their capabilities is by creating partnerships and treaties, by sharing the best practices that can be used by everyone. Some countries are doing this through conferences like 2030 Agenda Stakeholder, Beyond 2030 Agenda, Summit of the Future, Pact for the Future and progress reports. There is a need to ensure peace, unlock greater financing and fiscal space for developing countries and secure a more equitable, representative, and effective international financial system and also to unlock transformative progress across the goals by doubling down on key transitions. The transformation is more stimulated by the accelerations of climate change (20% accelerations in the next years), the historic level of losses and damages (80% comes from the climate factor) and technology (big data, AI). We must understand what went wrong, what is missing from our evaluation toolbox, what has changes, which are the imminent danger zones and how to implement a consolidated methodology.

Table 2. Examples of Smart Cities in Europe (source: author's own research)

City	Key Sustainability Initiatives	Technological Innovations	Impact
Copenhagen, Denmark	Aims for carbon neutrality by 2025; promotes cycling as the main mode of transport; implements smart district heating.	Smart energy systems using excess heat from industries; wind and solar energy integration; intelligent traffic management to reduce congestion.	60% of residents use bicycles daily; significant reduction in CO ₂ emissions; improved air quality.
Amsterdam, Netherlands	Pioneer in the circular economy; promotes sustainable urban planning with renewable energy and waste reduction strategies.	Smart waste management with AI-powered recycling; self-sufficient energy districts; IoT-based water management to optimize consumption.	Reduced waste production; increased energy efficiency in residential areas; enhanced water conservation.
Barcelona, Spain	Focuses on green mobility and digital urban services; integrates smart technologies to optimize city operations.	AI-powered traffic systems; air pollution sensors adjusting traffic in real-time; smart public transport networks with digitalized services.	Decreased traffic congestion; improved air quality; enhanced efficiency in public services.
Vienna, Austria	Prioritizes energy-efficient housing and smart mobility; leads in renewable energy adoption.	Passive housing projects with geothermal heating; smart grids for efficient energy distribution; autonomous electric buses.	Reduced energy consumption in buildings; improved sustainability in public transportation.
Stockholm, Sweden	Combines digitalization and sustainability to lower carbon emissions and improve urban living.	Smart grids optimizing electricity use; district cooling and heating systems powered by renewable energy; real-time environmental monitoring.	Lowered carbon footprint; efficient urban energy use; enhanced resilience to climate change.

Conclusions

It is more than obvious that no single organization or state can tackle all these challenges on its own; understanding that multilateral cooperation and the integration of all the CE approaches is the key, we can easily focus on the most impactful areas and make a difference. Adopting a circular economy can create high levels of value in resources and products while minimizing waste production.

If we start to emphasize the 3Rs that we know (reduce, reuse and redistribute) in governmental policies and initiatives, and by encouraging collaborations between the public and private sectors we can enhance the use of natural resources and make considerable progress toward sustainability. I believe that the results of this study are providing a significant contribution to the specialized literature by analysing circular economy strategies across sectors and regions. Thus, the study brings added value not only by identifying the barriers and opportunities encountered but also by offering solutions applicable in various economic and geographical contexts. The development of effective public policies and sustainable strategies, both in the public and private sectors, will provide an analytical framework and support the implementation of the circular economy on a large scale. Relying on case studies, effective or not, and on the available empirical data, we can increase the implementation of the circular economy, integrating the results into the global debate.

Obviously, the research also has certain limitations. Being a subject that has gained importance in the last years, most of the information regarding the effective implementation of circular strategies is not yet public. Public data is not updated to date (2023-2024), and identifying them is often difficult, as official sources do not have sufficient information to share. Another limitation of the paper is the generalizability of the conclusions, making it extremely difficult to identify the applicability of the results. These may vary depending on the sector, industry, region, economy, political system. It is important that each practice (good or bad) is adapted to national needs and restructured to fit the characteristics of the country. Being a constantly changing field, policies and regulations in the circular economy can influence the efficiency of the proposed strategies, requiring a constant study of the market. Despite all the limitations mentioned, the present study provides a solid basis for future research and can contribute to the development of innovative solutions to facilitate the transition to a sustainable economic model. Environmental diplomacy provides the framework for institutional cooperation among nations. Combating climate change is imperative for the future of Europe and the world because it can have devastating effects on economies, including the loss of agricultural production, destruction of infrastructure, and increased costs for adaptation and reconstruction. Establishing a fair and sustainable economy from a climate perspective is an increasingly shared goal among nations and is frequently discussed.

However, these goals can only be realized through international cooperation, including bilateral and multilateral collaborations. Unilateralism is not a viable solution in such cases, and a strictly national approach cannot bring significant benefits. The number of actors in world affairs has increased enormously, the types of actors have changed significantly,

interactions between them have become more complex, and the international public policy agenda has evolved in response to changing circumstances, leading to a greater need for adaptation and collaboration.

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POPULISM AND THE 'GREEN RHETORIC': A STUDY OF PUBLIC PERCEPTIONS

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Abstract: *The environment is impacted by many degradation drivers, ranging from pollution and inadequate waste management to illegal logging, water contamination, and the excessive use of pesticides. International organisations are formulating sector-specific policies to mitigate these adverse effects, focusing on their economic implications. The Green Transition is one such process, involving a major paradigm shift in environmental conservation. Concrete actions take place across several dimensions, from energy from renewable sources to individual behaviours that reflect respect for the environment. As they imply a new dynamic in production–consumption activities, populist leaders are also exploiting this theme discursively, reaffirming the perceived lack of autonomy of states in generating policies. This article aims to provide a comparative perspective on social perceptions of the Green Transition in Romania and populist narratives on the same topic.*

Keywords: *green transition, environment, populism, rhetoric, anti-elitism*

Introduction

Today, the environment is an essential aspect of human security, industrial development, and trade. Its steady degradation has been caused by a wide range of factors, from a lack of regulation and enforcement to low levels of environmental literacy and economic interests. The emergence of non-governmental organizations in the sector has put significant pressure on decision-makers regarding conservation and protection policies. Discussions about joint and coherent action have not been limited to the state level. International organizations have drawn attention to the management of shared objectives, and the European Union has held a series of working forums announcing sectoral objectives and policies. This paper aims to complement scholarly studies that address the discursive aspects of populism in relation to the green transition. The reference period is January 2023 to January 2025, a time span that is not extensively explored in the literature. The thesis aims to analyse

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Romanian citizens' perceptions of what the green transition means and how they are influenced by populist rhetoric. To carry out the analysis, we conducted 20 semi-structured interviews and used deductive thematic analysis to extract the main themes from the Simion Plan 2024: Rebuilding Romania. The document represents the proposed government program of the AUR party, structured around themes of social interest. The research question we aim to answer is: "How have Romanians' perceptions of the green transition evolved in a political climate energized by populist rhetoric?".

Theoretical framework

Defining concepts

This section is devoted to theoretical elements. We systematically define the key concepts (populism, green transition, perceptions), review the literature, and outline the directions of analysis within the analytical framework.

Populism

Political processes in democracies are not just about voting. With the statement "democracy is more than elections"², researchers have set out to analyse patterns of activities involved in the praxis of politics. Relevant examples include the generation and implementation of decisions, the representation of minority social groups at the leadership level³, and the prioritization of bottom-up policies. Depending on the political culture, the issues at stake, and the willingness of citizens to engage in public life, some issues of common interest may be treated superficially on the agenda of decision-makers. Populists take these topics of interest and bring them to the forefront, generating strong emotions such as frustration, indignation, and discontent. In emerging democracies, the perceived distance between citizens and political leaders can be reflected in limited interactions. Populists exploit the lack of strong communication levers between these actors to amplify scepticism about the ruling class and its work. Inherently, these politicians wish to challenge the electoral representation of society by the current political class against the backdrop of the contrast between voters and elected representatives.⁴

Measuring the quality of democracy has been and is a comparative process, due to different historical backgrounds. This process has proven to be a difficult one to operationalize because of the different terminological templates that scholars apply in assessing democracies.⁵ In former communist states, the formations and process stages sedimented in

² Gerardo L. Munck, "What Is Democracy? A Reconceptualization of the Quality of Democracy," *Democratization* 23, no. 1 (January 2, 2016): 1, <https://doi.org/10.1080/13510347.2014.918104>.

³ Munck, "What Is Democracy? A Reconceptualization of the Quality of Democracy", 1.

⁴ Nadia Urbinati, "Political Theory of Populism," *Annual Review of Political Science* 22, no. 1 (May 11, 2019): 113, <https://doi.org/10.1146/annurev-polisci-050317-070753>.

⁵ Munck, "What Is Democracy? A Reconceptualization of the Quality of Democracy", 4.

political and institutional life (path dependency specific to historical institutionalism⁶) may inhibit the development and integration of a more engaged citizen's view of recurrent issues. By utilizing this context, populists can address both the subject of institutional inefficiency (which complicates the citizen's life) and the critique of policies of institutional progress that influence the identity of communities. The chameleonic particularity of populism derives precisely from the adaptability of strategies to versatile social contexts.⁷ The lack of a scientific consensus on the definition of the concept of 'populism' makes it necessary to turn to the explanations provided by specialized dictionaries. According to *The Blackwell Dictionary of Political Science*, populism is associated with two forms of manifestation: social mobilization and political leadership.⁸ The dictionary's explanation combines three important particularities involved in understanding populism: direct democracy, people, and nationalism.⁹

(...) Populism also distrusts distant legislators and tends to believe in DIRECT DEMOCRACY. Populist politicians can often be found leading populist movements. Elsewhere they are the sort of political leader whose gestures and use of symbols is meant to proclaim identification with the PEOPLE. Appeals to NATIONALISM and attacks on those regarded as unpatriotic may characterize their pronouncements.¹⁰

Populism is considered in the literature as a multidimensional concept, contested and used with a double meaning (associated with political parties respectively radical social movements).¹¹ The context in which the term "populism" is used is important for shaping the meaning and identifying the actors who translate their own visions into practice. The exclusive use of the concept around political leadership may limit the analysis of collective thinking and action. A number of authors have identified radical social movements (e.g., "Occupy Wall Street") as a significant source of mobilization against elites and their decisions.¹² The literature in this spectrum emphasizes the relationship between bottom-up and top-down populism in a bidirectional way: '(...) party system populism occasionally emerges as a corollary of its bottom-up incarnation (...)'.¹³ However, not every social movement has populist implications in the desires it advocates. The representativeness of the interests of society as a whole (not of a stratum or social group) and the reform of the political system are the main characteristics identified among populist movements.¹⁴ Negative emotions of dissatisfaction with the political

⁶ Ian Greener, "The Potential of Path Dependence in Political Studies," *Politics* 25, no. 1 (February 2005): 62, <https://doi.org/10.1111/j.1467-9256.2005.00230.x>.

⁷ Gijs Schumacher and Kees van Kersbergen, "Do Mainstream Parties Adapt to the Welfare Chauvinism of Populist Parties?," *Party Politics* 22, no. 3 (May 2016): 300, <https://doi.org/10.1177/1354068814549345>.

⁸ Frank Bealey, *The Blackwell Dictionary of Political Science: A User's Guide to Its Terms*, 1. publ (Oxford: Blackwell, 1999), 262.

⁹ Bealey, "The Blackwell dictionary of political science: a user's guide to its terms", 262.

¹⁰ Bealey, "The Blackwell dictionary of political science: a user's guide to its terms", 262.

¹¹ Cas Mudde and Rovira Kaltwasser, *Populism and Political Leadership* (Oxford University Press, 2013), 1.

¹² Mudde and Kaltwasser, "Populism and Political Leadership", 1.

¹³ Paris Aslanidis, *Populism and Social Movements*, ed. Cristóbal Rovira Kaltwasser et al., vol. 1 (Oxford University Press, 2017), 2.

¹⁴ Aslanidis, "Populism and Social Movements", 3.

class are the starting point for social mobilization.¹⁵ They are used by party leaders who want to change an existing political order in favour of their own reform agenda, but also by individuals who are part of social movements.

Aiming at the "juxtaposition between people and the elite"¹⁶, populism can be defined as a political movement that maximizes the identity particularities of a society in order to seize political power. Populism's adaptability to contexts is also reflected in the moment of seizing the leadership of a state. According to the literature, both the legitimization of one-party dictatorships and " (...) the possibility of a seizure of power by a populist leader through normal voting procedures"¹⁷ are feasible scenarios that circumscribe populist practices. Many scholarly studies analyse the construction of populist discourses before and after the seizure of political power. If in the pre-election period, the focus falls on mobilization and identification of the leader with social issues, all boosted by anti-elitism, gaining power may influence the reporting. A definition of populism reflected in leadership style gives us a strategic dimension to the term:

"populism is best defined as a political strategy through which a personalistic leader seeks or exercises government power based on direct, unmediated, uninstitutionalized support from large numbers of mostly unorganized followers"¹⁸

Populist leaders manage, through constant and well-targeted speeches, to mobilize social groups conducive to their election and support. The term 'populism' is not only applied in political science or the praxis of political leadership. The media contextualizes certain events to validate the discursive tendencies of leaders or practitioners and their relations with society. Through the elasticity of the concept in use, several grievances are labelled to be populist.¹⁹ Some scholars even note a "migration" of the meaning of terms from political science theory into the language of the press, an often-superficial application, lacking substance and semantic analysis. We can associate populism with what "Giovanni Sartori once called 'conceptual overstretching'".²⁰ The multiple definitions, the versatile contexts, but also the historical particularities that can shape populist tendencies are elements that provide scholars with differentiated frameworks of analysis.

¹⁵ Aslanidis, "Populism and Social Movements", 3.

¹⁶ Manuel Anselmi, *Populism: An Introduction*, trans. Laura Fano Morrissey, Key Ideas (London New York, NY: Routledge, 2018), 42.

¹⁷ Cristóbal Rovira Kaltwasser, "How to Define Populism?: Reflections on a Contested Concept and Its (Mis) Use in the Social Sciences," in *Populism and the Crisis of Democracy* (Routledge, 2018), 62.

¹⁸ Weyland in Daniel Rueda, "Is Populism a Political Strategy? A Critique of an Enduring Approach," *Political Studies* 69, no. 2 (May 2021): 168, <https://doi.org/10.1177/0032321720962355>.

¹⁹ B. Guy Peters and Jon Pierre, "A Typology of Populism: Understanding the Different Forms of Populism and Their Implications," *Democratization* 27, no. 6 (August 17, 2020): 928, <https://doi.org/10.1080/13510347.2020.1751615>.

²⁰ Michael Shafir, "From Historical to 'Dialectical' Populism: The Case of Post-Communist Romania," *Canadian Slavonic Papers* 50, no. 3-4 (September 2008): 427, <http://dx.doi.org/10.1080/00085006.2008.11092591>.

Green Transition

An umbrella term for a wide range of implications, the green transition is a process through which international organizations, state actors, and citizens join efforts to protect the environment and its resources. Sectoral approaches to the green transition are identified in the literature according to different sectors. An example of this is portrayed by the industrial area, whereby "to sustain a shift to cleaner and more energy-efficient production processes through clever policy mixes involving elements of push and pull."²¹

While clearly involving change, the rhetorical dynamics generated around the green transition have been associated by researchers with a re-dimensioning of interests in the policy arena. The approach implies a high level of complementarity between the resilience of progressively deployed green technologies across sectors, but also "capabilities on the part of policymakers to craft appropriate policies in the face of uncertainties and information asymmetries".²² A simple diffusion of rules from the supranational level is not sufficient to give the Green Transition empirical applicability.

Returning to the conceptual value of the "green transition", it is important for readers to keep in mind its multidimensional character due to the diversified reference levels. For this reason, there is no consensus among researchers on a unanimously accepted definition. Sub-elements such as green economy or green industry generate more precise technical details. In this research context, the green transition is understood as a main desideratum of the European Union, designed in the framework of the European Ecological Pact. The document aims at transforming the existing production-consumption relationship into a sustainable one to "achieve climate neutrality by 2050".²³

Because it concerns the relationship between what we produce and what we consume, the green transition must also be seen from an educational perspective. The wishes and changes undertaken through the legislative work of the Council of the European Union are made transparent, providing citizens with versatile information tools. The implications of the term 'transition' do not stop at programmatic information on 'green' changes. European citizens are shaping their skills for what we call "green jobs"²⁴ by being directly involved in the cyclical process involved in the circular economy, waste management, or the moral component of their own procurement. To summarize, the green transition is a process that aims to change the way we produce and consume various goods to manage non-renewable resources efficiently and directly protect the environment.

²¹ René Kemp and Babette Never, "Green Transition, Industrial Policy, and Economic Development", *Oxford Review of Economic Policy* 33, no. 1 (January 1, 2017): 66, <https://doi.org/10.1093/oxrep/grw037>.

²² Kemp, Never, "Green Transition, Industrial Policy, and Economic Development", 68.

²³ "European Green Deal," Consilium, accessed April 2, 2025, <https://www.consilium.europa.eu/en/policies/european-green-deal/>.

²⁴ Patricia Urban et al., "Jobs for the Green Transition," *CEPS In-Depth Analysis*, 2023, 1.

Perceptions

Associated with 'mental images', 'understanding' or 'awareness'²⁵, perceptions are a useful tool in the social and political sciences for scaling phenomena. They have the capacity to reveal a certain level of knowledge of individuals about events, situations, or behaviours. There are numerous studies in the literature that deal definitively with this concept. Perceptions are useful in clinical and experimental studies as well as in the social sciences and humanities, where practitioners wish to test hypotheses from an applied understanding of attitudes.

From an etymological point of view, perception comes from Latin (*perceptio*, *percipio*), associating the process of connection between mind and senses.²⁶ Defining unique and individualized experiences²⁷, perceptions have over time diversified their meanings due to the emergence of fields that use them²⁸. One of the simplest explanations ("perception equals sensations plus images"²⁹), greatly restricts the term to avoid a vague characteristic. In this paper, we will use the meanings proposed by the *Longman Dictionary of Contemporary English* associated with the term "perception":

a) the way you think about something and your idea of what it is like; b) the way that you notice things with your senses of sight, hearing, etc.; c) the natural ability to understand or notice things quickly.³⁰

In conclusion, perceptions are broad and layered processes through which individuals select, organize and interpret reference subjects (behaviours, objects, persons, etc.).³¹

Literature review

Populists prioritize existing social problems in their discourse, transforming them into sources of antagonism between the "people" and the "elites". In the specialized literature, we identify several studies that deal with the green transition in populist rhetoric, as well as the dilemmatic solutions related to it.³² The macro characteristics of this phenomenon are also reflected in the spectrum of the environmental component. Discourses aim at a polarization

²⁵ Susan M. McDonald, "Perception: A Concept Analysis," *International Journal of Nursing Terminologies and Classifications*, November 11, 2011, 2.

²⁶ OU Qiong, "A Brief Introduction to Perception," *Studies in Literature and Language* 15, no. 4 (2017): 18, <https://doi.org/10.3968/10055>.

²⁷ McDonald, "Perception: A Concept Analysis", 3.

²⁸ Julian Hochberg, "Perception: Toward the Recovery of a Definition.," *Psychological Review* 63, no. 6 (November 1956): 400, <https://psycnet.apa.org/doi/10.1037/h0046193>.

²⁹ Hochberg, "Perception: Toward the Recovery of a Definition.," 400.

³⁰ Longman Dictionary of Contemporary English, "Perception," Perception, accessed April 2, 2025, <https://www.ldoceonline.com/dictionary/perception>.

³¹ Qiong, "A Brief Introduction to Perception", 18.

³² Helenor Tormis, Katarina Pettersson, and Inari Sakki, "'Like We Definitely Have to Go Greener, But...': Analysing Affective–Discursive Practices in Populist Environmental Discourse," *British Journal of Social Psychology* 63, no. 3 (July 2024): 1340, <http://dx.doi.org/10.1111/bjso.12733>.

between the understanding of climate issues and sectoral policies driven by supranational entities. More specifically, they are used to reinforce the idea of loss of sovereignty and decision-making autonomy, but also to render the related economic implications unsustainable.

The framing of climate issues in populist rhetoric is directly associated with the negative vision of elites.³³ Policies in this area of interest are often associated with a 'cosmopolitan agenda' whereby the interests of ordinary citizens are not represented.³⁴ Thus, a discourse that produces polarization and feelings of injustice in society is doubled in its impact by the great distance between leaders and voters. Negative perceptions crystallized against mainstream parties or leaders are not the only desires of populists. As we also visualize in scholarly writings, these constant efforts are aimed at the inherent gain of power: "Right-wing populist parties can efficiently use these negative implications that climate policies have for the people in their environmental discourse (Küppers, 2022; Vihma et al., 2021) to mobilize voters."³⁵ One of the main rationales that place some populist leaders on the periphery of supporting the green transition is 'resource nationalism'.³⁶ This assumes a domestic production-consumption dynamic exclusively dedicated to the people of reference.

Populists and environmental issues present a dynamic and versatile relationship. In this paper, we will focus our attention on the substantive elements proposed by the Alliance for the Unity of Romanians party, as well as on the indicated perceptions of citizens on this issue. The comparative nature of the study aims to emphasize the level of adaptability of the AUR regarding the topicality of environmental issues.

Analytical framework

During the paper, I will focus on two major issues related to the sustainability and applicability of environmental policies generated by the green transition. On the one hand, I capitalize on the populist rhetoric on the topic to observe the main discourse themes. The second direction, dedicated to perceptions, aims to visualize the Romanian citizens' reporting of the implications of the green transformations at the individual level. In the figure below you can find an outline of the research directions and their interaction.

³³Tormis, Pettersson, Sakki, "'Like We Definitely Have to Go Greener, But...': Analysing Affective–Discursive Practices in Populist Environmental Discourse, 1341.

³⁴ Tormis, Pettersson, Sakki, "'Like We Definitely Have to Go Greener, But...': Analysing Affective–Discursive Practices in Populist Environmental Discourse, 1341.

³⁵ Tormis, Pettersson, Sakki, "'Like We Definitely Have to Go Greener, But...': Analysing Affective–Discursive Practices in Populist Environmental Discourse, 1341.

³⁶ Andrew Ofstehage, Wendy Welford, and Saturnino M. Borras, "Contemporary Populism and the Environment," *Annual Review of Environment and Resources* 47, no. 1 (October 17, 2022): 675, <https://doi.org/10.1146/annurev-environ-012220-124635>.

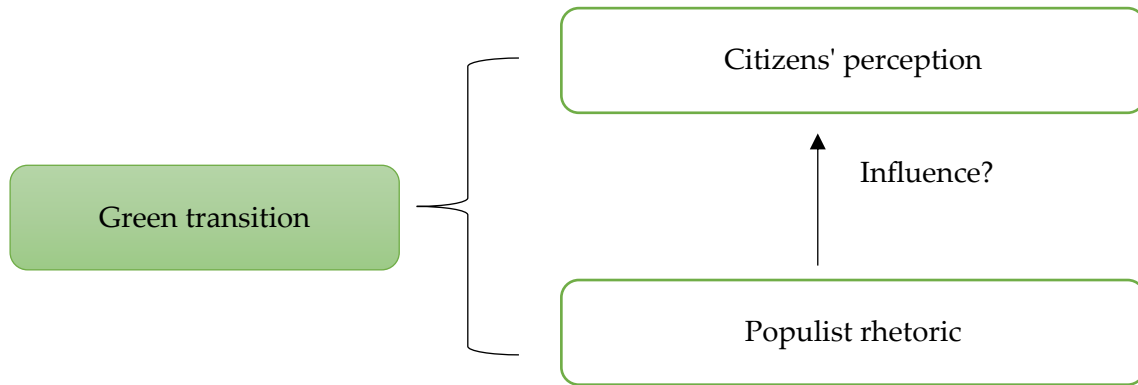


Figure 1: Analytical framework

Source: Author's own elaboration based on literature review.

Methodology

Case selection

The literature identifies different case selection procedures, ranging from the typical ("typical examples of some cross-case relationship"³⁷), to various, extreme, or crucial. The list can be continued with reference typologies. This paper uses Romania as a representative case for the intensification of populist discourse in recent years. The tradition of such rhetoric can also be identified in the case of the PPDD (People's Party - Dan Diaconescu), the PRM (Great Romania Party), and today among the AUR (Alliance for the Unity of Romanians), S.O.S. Romania, and POT (Young People's Party). The thesis will revolve around the approach of AUR, a rapidly evolving party in the Romanian political climate.

In their speeches, but also in their electoral promises, populist leaders appeal to a series of crises or identity issues to sharpen the perceived distance between citizens and the ruling elites. In Romania, during the period covered for this paper (January 2023-January 2025), political analysts, as well as media outlets, have conducted numerous analyses of the electoral success of the AUR party and its consequences for the polarized political environment³⁸. The process of labelling the AUR party as "populist" highlights the contrast between two directions of understanding: the official one, assumed at the party level, and the one accepted by scholars.

In the literature, the AUR party is often associated with the far right or radical right. The fluctuating positions of the leaders do not allow for a stable categorization on this topic. In the 2020 electoral campaign (for the parliamentary elections), the AUR focused its narratives on several dimensions that broadly evoke the idea of national identity: the clearing of forests by foreign companies, the loss of "national dignity", and the minimization of the importance of traditions and customs. Add to all this the corrupt elite, portrayed as the main cause of this

³⁷ John Gerring, "Case Selection for Case-Study Analysis: Qualitative and Quantitative Techniques," in *The Oxford Handbook of Political Methodology*, ed. Janet M. Box-Steffensmeier, Henry E. Brady, and David Collier, 1st ed. (Oxford University Press, 2009), 4.

³⁸ Mihaela Ilie, "The rise of a nationalist-populist party in Romania – the Alliance for the Union of Romanians (AUR)," *Srpska politička misao* 78, no. 4/2022 (November 8, 2022): 145, <http://dx.doi.org/10.22182/spm.7842022.9>.

deterioration.³⁹ The implications of the green transition are also a benchmark in this rhetoric. The next section, dealing with data collection, will identify the main analytic documents that will be used to highlight populist environmental rhetoric.

Data collection

The paper is circumscribed to the qualitative nature of the research. To be able to test the possible influence of populist discourses on citizens' perceptions of the green transition we collect data from two sources: online documents and semi-structured interviews.

Time-consuming, with detailed work on the part of the interviewer, semi-structured interviews seek to maximize the honesty of respondents on various topics.⁴⁰ Unlike the structured interview, which is much more rigorous in terms of interviewer-interviewee interaction, this typology shows autonomy in investigating relevant ideas that may arise during the questioning period.⁴¹ In the literature, we find a preference for researchers to use this method of data collection, alone or in complementarity with other instruments:

Semi-structured interviews are the preferred data collection method when the researcher's goal is to better understand the participant's unique perspective rather than a generalized understanding of a phenomenon.⁴²

Semi-structured interviews give us a detailed insight into respondents' perceptions of the green transition. The basic criterion for the selection of participants in this study was diversity. Versatile experiences and knowledge, backgrounds, or even educational levels are all detailed in the annex table at the end of the paper. The 20 respondents were informed about the use of their answers in the current scientific endeavour.

The analysis of populist discourses within the proposed research topic is carried out by selecting online documents. To express an official party position, we chose the document entitled "Simion Plan 2024: Rebuilding Romania". This document represents the proposal of the government program of the AUR party and is structured by chapters that reveal issues such as taxes, wealth, industry, family, or environment.

Data analysis method

Both types of data are analysed in the paper by means of deductive thematic analysis. The advantages of implementing a deductive data analysis process are manifold. In addition to flexibility and adaptability to the research topic, some experts note the promotion of "the advancement of science by allowing previously published literature, whether empirical or

³⁹ Elisa Orofino and William Allchorn, eds., *Routledge Handbook of Non-Violent Extremism: Groups, Perspectives and New Debates* (Abingdon, Oxon ; New York, NY: Routledge, 2023), 262–63.

⁴⁰ William C. Adams, "Conducting Semi-Structured Interviews," in *Handbook of Practical Program Evaluation*, ed. Kathryn E. Newcomer, Harry P. Hatry, and Joseph S. Wholey, 1st ed. (Wiley, 2015), 493.

⁴¹ Omolola A Adeoye-Olatunde and Nicole L Olenik, "Research and Scholarly Methods: Semi-structured Interviews," *Journal of the American College of Clinical Pharmacy* 4, no. 10 (2021): 1360, <https://doi.org/10.1002/jac5.1441>.

⁴² Adeoye-Olatunde, Olenik, "Research and Scholarly Methods: Semi-structured Interviews" 1360.

non-empirical, to be (re-)examined, leading to greater support, refinement, or refutation of the ideas being studied".⁴³ Below, in Table 1, you can find an example of the deductive coding process in relation to the analysed online document.

Table 1: Example of data coding

Theme	Codes	Sentences that match codes
Green transition	Respect for nature	„OUT OF RESPECT FOR CREATION, THE ENVIRONMENT MUST BE PROTECTED.” (Partidul, AUR, <i>Planul Simion 2024. Reconstruim România</i> , Athos 33, p.55) „Defending the environment as part of Creation / Protect Delta, Sea and Mountain.”(Partidul, AUR, <i>Planul Simion 2024. Reconstruim România</i> , Athos 33, p.259) „We in AUR are the only party that sees the environment as part of Creation, in close connection with human life and not in conflict with it.” (p.274)
	Green energy	„ There is the hypothesis that the ‘green energy’ currently being promoted is an ‘unnatural stake’, being linked to various transnational interests.(...) Romania must not become the victim of a foreign ideology, but must act in its own interest.” (Partidul, AUR, <i>Planul Simion 2024. Reconstruim România</i> , Athos 33, p.55) „ With the implementation of the new energy policies, based on ‘green energy’, the negative influences on the national transport energy system have emerged.” (Partidul, AUR, <i>Planul Simion 2024. Reconstruim România</i> , Athos 33, p.58)
	Sustainable development	„For strategic economic reasons - sustainable development of agriculture and for reasons of environmental protection (amelioration of climatic excesses such as droughts), promoting afforestation of degraded (unproductive) agricultural land in lowland areas would be a strategic direction of sound forestry policy in Romania.” (p.280)

Source: Author’s own elaboration based on collected data; translation from Romanian

Analysis

This section aims at a systematic analysis of the components stated in the analytical framework. We interpret the data resulting from the semi-structured interviews to identify how citizens report their knowledge and the implications of the green transition. We also provide some interpretations of the main themes in the populist rhetoric reflected in the proposed government program.

Perceptions of the Green Transition

The Green Transition is, as we have concluded from the literature, an umbrella term for several processes that national and supranational (but not only) entities are undertaking to conserve the environment and its resources. Building on this, we identified several meanings of the concept among respondents. Some 45% of respondents see the green transition as "a way for authorities to exert tighter control over waste and its reuse". In essence, respondents

⁴³ Stephen T. Fife and Jacob D. Gossner, “Deductive Qualitative Analysis: Evaluating, Expanding, and Refining Theory,” *International Journal of Qualitative Methods* 23 (January 2024): 1, <https://doi.org/10.1177/16094069241244856>.

are making a direct reference to the positive aspects of the circular economy for manufacturing industries, citizens, and the environment. But the green transition was also explained through other types of arguments. Some subjects explained the green transition through the driving interests of supranational entities such as the European Union. They reasoned that this succession of processes generates greater pressure on the financial security of individuals, generating additional costs. The examples they gave referred to the banning of diesel engines in the coming years, all so that "the European Union can achieve its pollution interests".

Through the formulation of the interview questions, the aim was to understand the meanings that citizens give to the green transition, as well as to assess how politicians instrumentalize this issue. The paper confirms the conclusions of researchers Wagner, Brigevidh and Kroqi regarding the insufficient knowledge of the valences of the term "populism", in accordance with the sample size. Respondents associated the structure 'populist leaders' with 'popular leaders', using examples such as the President of Romania, the Prime Minister, or even representatives of certain institutions. These public figures are associated in the answers with poor communication of what the green transition really means in terms of change. Subjects also suggested some positive aspects of the financial compensation that the European Union is promoting. A significant proportion of them consider the green energy transition to be one of the priority elements, with grants for photovoltaic systems encouraging energy self-sufficiency, even if only partially.

In conclusion, perceptions of the green transition among Romanian citizens are relatively diffuse. While some respondents defined this change in terms of environmental education, clean energy production, or pollution abatement, others emphasized the transnational character of policies. Complementary to these issues, we identify a particular pain point associated with political elites, namely a lack of clarity in communication.

"Green" populist rhetoric

The analysed document, "Plan Simion 2024: Rebuilding Romania", deals with environmental issues and the implications of the green transition on social welfare. The application of the deductive coding process revealed a high dose of scepticism and pessimism regarding European green measures. Structures such as "OUT OF RESPECT FOR CREATION, THE ENVIRONMENT MUST BE PROTECTED", "European funds allocated for environmental protection programs will be urgently redirected from bicycle path projects to rail infrastructure", "The GOLD Party considers it essential to adopt and firmly enforce legislation that includes environmental protection in economic and social decision-making in line with national interests.", reveal distinct discursive themes. On the one hand, the environment is linked in importance to religious elements. The invocation of demiurgic authority reveals that the party is acting in accordance with religious precepts, being a guarantor of Creation. The appeal to emotion and divinity can be interpreted in an electoral manner. In the 2011 census,

"Orthodox believers represent 86.5% of the population"⁴⁴. This indicates a large electoral base to which the AUR party is targeting, regardless of the level of religious practice.

The AUR party's government program is structured by chapters, one of which is specifically dedicated to the environment (chapter xv). Visualized as an integrated part of the national identity, the environment is constructed as a point of reference for external interests managed by the ecologists: "We consider that the imposition of the so-called "Green Deal" is part of a dictate (...)" (Simion Plan 2024: Rebuilding Romania, p.273). The Brussels elites are framed through the prism of their economic interests in Romania, and national elites are not missing from the narrative thread. They are associated with a 'criminal group' that threatens the existence of biodiversity such as the Danube Delta through incompetent management.

The proliferation of the party's role as a "saviour" is often mentioned in structures such as "AUR develops and promotes actions to protect local civilization and culture", "The AUR Party has already assumed that we are foresting Romania!" or "We will take drastic measures to stop illegal logging". Considering all the highlighted elements, we conclude that the AUR party is in a continuous process of influencing public perceptions regarding the green transition. The European source of policies is associated with cosmopolitan interests and references to the domestic political class validate the anti-elite discourse. In complementarity, the AUR party's solutions focus on a mix of environment, identity, and conservation, all to maximize nationalist, belonging feelings.

Conclusions

This paper explored the topic of the green transition in the rhetorical agenda of populist parties, using Romania as a case study. With the 20 interviews conducted, we operationalized the social dimension, assessing the perceptions of Romanian citizens regarding their understanding of the concept. We aimed to create a link between populist rhetoric and proposals, respectively, the subjects' views on the environment and change. The results show that the interviewees associate the term "populist" with "being popular" but use common themes in their understanding of transition with populist leaders: antagonism towards elites, lack of autonomy of the political class with respect to generating "autochthonous" policies in this sector.

The research is limited to a small number of interviewees, which may be an impediment to generalizing the results. Future studies could supplement this number, as well as the area of analysis of populist parties (including other political parties such as S.O.S. Romania or the Young People's Party).

⁴⁴ U. S. Mission Romania, "România: Raportul internațional privind libertatea religioasă în anul 2020," Ambasada SUA în România, June 2, 2021, <https://ro.usembassy.gov/ro/romania-ra-portul-international-privind-libertatea-religioasa-in-anul-2020/>.

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Annex 1: Overview of the respondents

<i>Interviewed</i>	Age	Sex	Area of origin	Studies completed
R1	34	male	rural	Higher Education
R2	55	female	rural	Higher Education
R3	58	male	urban	Higher Education
R4	48	male	rural	Higher Education
R5	28	female	urban	Higher Education
R6	29	male	urban	Higher Education
R7	65	male	urban	Higher Education
R8	54	female	urban	Higher Education
R9	26	male	urban	Higher Education
R10	21	female	rural	Higher Education
R11	25	female	rural	High school
R12	28	female	urban	High school
R13	36	male	rural	Higher Education
R14	35	male	urban	High school
R15	25	male	urban	High school
R16	22	male	urban	High school
R17	23	female	urban	Higher Education
R18	22	male	rural	High school
R19	28	female	urban	High school
R20	25	female	rural	High school

Annex 2: Interview questions

1. How important are public policies to protect the environment to you?
2. Do you believe that citizens have coherent information about these policies?
3. What do you understand by "green transition" and how relevant do you consider it to be for Romanian politicians today?
4. Have you noticed speeches of politicians addressing the green transition?
5. To what extent do you think these discourses influence public opinion in Romania?
6. Starting from the populist approaches that have been circulated in the press lately, how do you perceive their positioning in relation to environmental policies? Do you consider that they influence public opinion?
7. How do you see Romania's alignment with European policies on the green transition?
8. Do you consider that this alignment is beneficial for the country, or do you think that it should be better adapted to the national context?

EMPIRICAL ANALYSIS OF SUSTAINABLE DEVELOPMENT AND KEY PREDICTORS IN THE EU'S GREEN TRANSITION

Cristian Romeo SPĂȚARU¹, Cristian Constantin POPESCU²

Abstract: *The European Green Pact is a key strategic framework for the transition to a sustainable economy, aimed at reducing negative environmental impacts and increasing the resilience of European economies. According to the Global Agenda 2030, we can no longer think of sustainable development in the absence of a clean environment. This study aims to provide an overview of the specialized literature and, in its applied section, to analyze, on the one hand, the socio-economic impact of environmental determinants in the green transition process, and on the other hand, to empirically examine the relationship between the Sustainable Development Index and a series of predictors with ecological impact. The methodology is based on quantitative analysis using multiple regression and comparative methods, covering the period from 2005 to 2022 for EU member states.*

The dependent variable is the Sustainable Development Index (SDGI), expressed as the total score for the 17 Sustainable Development Goals (ranging from 0 to 100), while the independent variables used include: net CO₂ emissions (or equivalent) in tons per capita, the share of renewable energy in total energy consumption, municipal waste (in kg) generated per capita, the circular material use rate (%), the rate of premature mortality due to exposure to fine particulate matter (PM<2.5μm), forest area (%), and revenues from the exploitation of natural resources (% of GDP). The tested hypothesis of dependence was H1: "Environmental factors influence sustainable development." The methodology aimed to validate a dependency relationship between the Sustainable Development Index and environmental predictors.

The results largely confirm hypothesis H1, showing that reducing pollution and promoting renewable energy sources are essential for improving the Sustainable Development Index in the context of the European Green Deal. Moreover, the analysis highlights the complex relationships between environmental factors and sustainable development, offering valuable insights for improving future public policies aimed at achieving the goals of the New Green Deal.

This paper contributes to the specialized literature by demonstrating the strong relationship between sustainable development and environmental determinants, and by emphasizing the social and economic benefits generated by ecological factors.

Keywords: sustainable development, key-predictors, EU's green transition

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Introduction

In the context of climate challenges and the need for a transition to a sustainable economy, the European Green Deal represents a fundamental strategic framework for enhancing the ecological dimension and increasing the resilience of the economies of the Member States. This ambitious plan aims to achieve climate neutrality by 2050 through a complex set of policies that include the reduction of greenhouse gas emissions, the expansion of renewable energy use, green transportation, strengthening the circular economy, protecting biodiversity, the mechanism for a fair green transition, and more.

Consequently, identifying the factors that influence the process of sustainable development is essential for the effective implementation of public policy measures. Previous studies have highlighted the role of pollution, excessive consumption of non-renewable resources, and ecosystem quality in determining the sustainable development index. However, the subject of the relationship between sustainable progress and its determinants is far from exhausted, especially regarding the specific indicators of the Green Deal.

Therefore, this paper aims to investigate these aspects through a quantitative approach, analysing the relationship between the Sustainable Development Index and a series of relevant environmental predictors. Thus, the study contributes to understanding the impact of ecological factors on sustainable development, including the associated socio-economic benefits. Although this paper does not aim to formulate public policies, it offers valuable insights for identifying underperforming areas and improving the implementation of current environmental regulations. At the same time, the results may contribute to the development of future public policies aligned with the objectives of the European Green Deal, thereby facilitating a more efficient transition toward a sustainable development model.

While the main purpose of this study is to highlight the connections between sustainable development and environmental predictors, we emphasize that sustainability should not be viewed solely through the lens of the ecological dimension. The Sustainable Development Index (SDGI), chosen as the dependent variable in our analysis, is a three-dimensional index that reflects the balance between the economy, society, and the environment. Consequently, quality of life, economic prosperity, and social equity are other essential dimensions that require constant monitoring and constitute relevant topics for future research.

Without intending to generate any terminological controversy, we also clarify that the terms “durability” and “sustainability” used throughout this article are considered synonymous by the authors.

1. Literature review

1.1. About the European Green Compact

According to the European Commission (2019), the European Green Pact is the European Union's strategy to make Europe the first climate-neutral continent by 2050.

To achieve climate neutrality, concrete objectives and measures have been set:

- *Reduce net greenhouse gas emissions to zero by 2050 with an intermediate emission reduction threshold of at least 55% by 2030 (compared to 1990 levels);*

- *Transition to clean energy* - Expanding renewable energy use, improving energy efficiency, and phasing out fossil fuels;
- *Industry sustainability* - Promoting the circular economy, green production, and reducing industrial pollution;
- *Protecting biodiversity* - Restoring ecosystems, growing protected areas, and promoting sustainable agriculture;
- *Green transport* - Developing electric mobility, expanding rail eco-networks, and reducing air and sea pollution;
- *Green finance* - Encouraging sustainable investment and ensuring companies' transparency on climate risks;
- *Just transition mechanism* - Supporting regions and vulnerable workers as a result of the green transition.

For the foregoing, in Figure 1, we find the relevant schematic representation of the European Green Deal with its objectives.

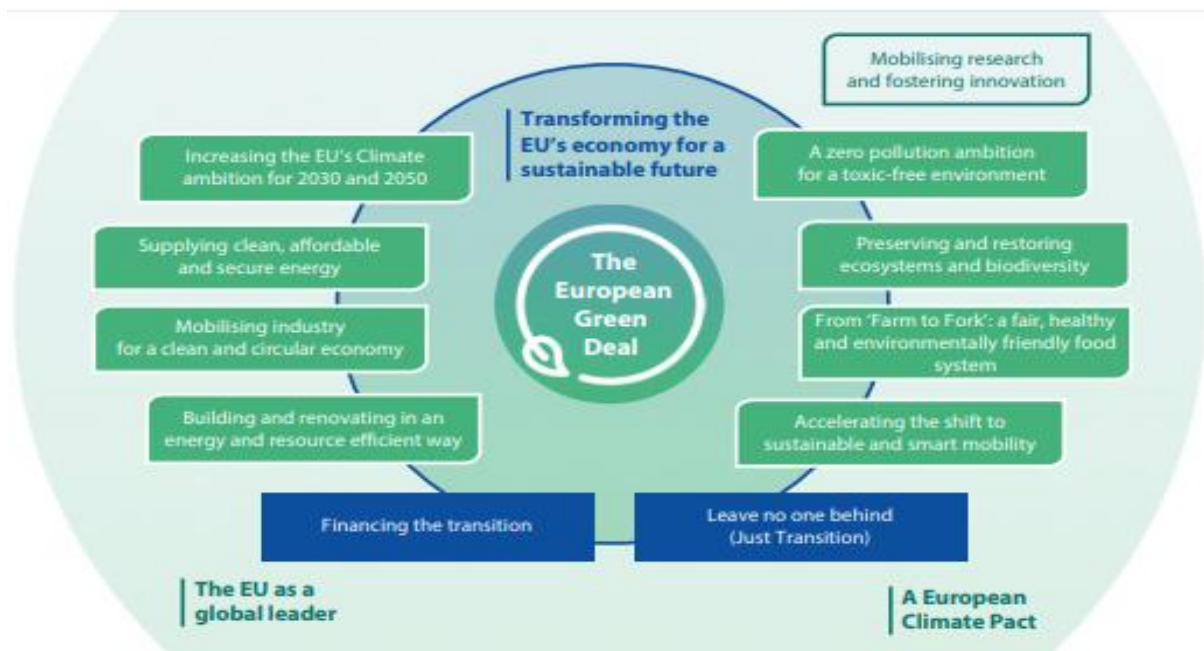


Figure 1. European Green Pact source: European Commission

The new European Green Pact and its direct impact on 12 of the 17 Sustainable Development Goals set out as priorities of the European Commission, we summarise it schematically in Figure 2 below:



Figure 2. European Green Deal and sustainable development goals
Source: European Commission

The European Green Deal is a major initiative launched by the European Commission in December 2019, aiming to address climate change and ensure a “just and inclusive” transition to a post-carbon economy. It seeks to achieve carbon neutrality by 2050 and to improve citizens’ health and well-being by reducing ecological risks and impacts (Pianta & Lucchese, 2020; Samper et al., 2021; Haines & Scheelbeek, 2020).

The new European Green Deal is one of many sustainable development initiatives promoted by international organizations, particularly the United Nations, through the 2030 Agenda (Adamowicz, 2022).

Reducing greenhouse gas emissions and air pollution has a positive impact on both health and the environment. Effective implementation of measures in sectors such as energy, transport, and food could prevent millions of premature deaths globally, including within the European Union. At the same time, promoting sustainable mobility and expanding green spaces in urban areas could generate significant health benefits (Haines & Scheelbeek, 2020).

1.2. The impact of the Green Pact on the economy and the environment

The impact of the European Green Deal on the sustainable economy is significant, with the main aim of transforming the European Union into a competitive, resource-efficient economy with a future zero emissions target by 2050.

“The green economy is one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities (UNEP, 2011)”.

The principles of the green economy formulated by the United Nations Department of Economic and Social Affairs (UNDESA) are presented in the table below:

Table 1. Principles of the Green Economy

Type	Principles
Economic	Recognizes natural capital and values • Integrated in economic development and growth models • Internalizes externalities • Promotes resource and energy efficiency • Creates decent work and jobs data
Environmental	Protects biodiversity and ecosystems • Invest in and sustains natural capital • Recognizes and respects planetary boundaries and ecological limits • Advances international environmental sustainability goals
Social	Delivers poverty reduction, well-being, livelihoods, social protection and access to essential services • Is socially inclusive, democratic, participatory, accountable, transparent, and stable • Is equitable, fair and just—between and within countries and between generations

Source: UNDESA

The Europe 2020 Strategy, launched in 2010 as the EU's ten-year plan, aimed to promote a model of smart, sustainable, and inclusive growth, laying the foundation for new policies such as the European Green Deal, along with its subsequent plans—the new Circular Economy Action Plan and the Industrial Strategy. As for the new Europe 2030 Strategy, the focus shifts explicitly to the green economy, which is addressed as an essential pillar of the transition towards sustainable, inclusive, and resilient growth, in line with the objectives of the European Green Deal (European Commission).

On another note, the Green Deal promotes a circular economy by encouraging material recycling and the sustainable management of resources and energy efficiency, integrating technological innovation and policy reforms to support a competitive and climate-neutral economy (Bonoli et al., 2021; Stefanis et al., 2024).

In turn, the relationship between renewable energy use and economic growth is highly complex; however, most studies suggest that the adoption and expansion of renewable energy consumption has a positive long-term impact on economic growth, while also benefiting the environment. On the one hand, increasing the consumption of renewable energy addresses energy security; on the other, it positively affects economic growth and global competitiveness, making it a key objective of the Green Deal (Armeanu et al., 2017; Singh et al., 2019; Simionescu et al., 2020; Shahbaz et al., 2020; Wang et al., 2021).

Furthermore, Wang (2021) argues that economic and financial development influences renewable energy consumption, with different effects in the short and long term. For example, in China, economic growth stimulates the use of renewable energy, while financial development may have a negative long-term impact. The study by Ahmed & Shimada (2019) shows that in emerging and developing economies, renewable energy consumption is associated with significant long-term economic growth. It has also been observed that the influence of renewable energy on economic growth is more pronounced in emerging economies than in developed ones—an idea also supported by Adams et al. (2018). In certain cases, a bidirectional causal relationship between renewable energy consumption and long-term economic growth has been highlighted (Saad et al., 2017).

Moreover, the effect of renewable energy consumption on economic growth can be non-linear, varying according to factors such as non-renewable energy intensity and the level of urbanization (Wang & Wang, 2020). Renewable energy plays a crucial role in reducing carbon emissions and is a key factor in balancing economic and environmental dimensions. In this context, a bidirectional relationship between economic expansion and renewable energy consumption stands out, emphasizing the interdependence between sustainable development and the energy transition (Saidi & Omri, 2020; Taşkin et al., 2020).

Research highlights the need to implement policies that promote renewable energy consumption, thereby facilitating the transition to a sustainable and prosperous economy (Chu et al., 2023; Khan et al., 2020). Additionally, Assi et al. (2021) observed a negative correlation between environmental pollution levels and renewable energy consumption, underscoring the importance of effective policies to support renewable energy projects. These measures are essential for ensuring long-term economic and environmental sustainability. An econometric environmental study conducted for the BRICS countries over the period 2000–2021 shows that

higher per capita green energy consumption, adequate environmental policies, and entrepreneurial activities have a significant impact on ecological sustainability (Udemba et al., 2024).

1.3. Challenges and criticism

Challenges and criticisms of the Green Deal are also present and refer to: the lack of a clear vision for a fair post-carbon economy, insufficient resources allocated to achieving the Green Deal's objectives, limited implementation tools, and the need for broader green industrial policies that jointly address environmental sustainability, structural changes, and economic equity across Europe (Pianta & Lucchese, 2020; Ossewaarde & Ossewaarde-Lowtoot, 2020).

According to Schunz (2020), the Green Deal represents a paradigm shift in the EU's sustainability discourse, placing environmental protection at the core of economic policy.

Furthermore, tensions exist between green growth and degrowth narratives. The "new pact" to which the European Commission refers might become genuinely transformative only if oligarchical power structures are challenged—specifically, if the ecological transition is not led by the very actors who were dominant in the environmentally destructive brown growth model (Ossewaarde & Ossewaarde-Lowtoot, 2020).

On the other hand, Samper et al. (2021), from a neo-Gramscian perspective, argue that the European Green Deal is seen as an attempt to maintain the dominance of neoliberal ideas in Europe's climate policy. According to this view, such dominance could limit democratic debate and make it more difficult for critical or alternative views on how to address the climate crisis to be heard and considered. The neo-Gramscian perspective draws on the philosophical and political thought of Italian Marxist Antonio Gramsci, who explained how dominant groups maintain their power in society not only through coercion but also through cultural and ideological influence.

In another vein, Mastini et al. (2021) argued that the Green New Deal and degrowth represent two major approaches to mitigating climate change. The Green New Deal supports restructuring the energy system through public investments, viewing economic growth as essential for the green transition. In contrast, degrowth advocates argue that reducing energy consumption is necessary to limit greenhouse gas emissions. Both perspectives emphasize the need for public investment in the energy transition, industrial policies for decarbonization, and expanded social protection. Despite their differences, a synthesis of the two approaches could lead to a "Green New Deal without growth."

Unlike the EU context—and since the environment knows no borders—it is worth mentioning Levidow's (2022) study, which notes that the Green New Deal agendas in the U.S. and the UK were pressured to adopt decarbonization technologies promoted by high-emission industries and supported by their unions. These measures served both as justification for investing in questionable solutions and as a pretext for delaying their implementation, or both.

2. Methodology

Research methods used

- 1) *systematization of the relevant literature* (described in section 2);
- 2) *deductive-conceptual analysis* based on the method of argumentation and logical demonstration for confirmation of socio-economic benefits following the green transition;
- 3) *Quantitative approach* based on statistical data, methods, and techniques, with a view to testing the dependency hypothesis H1: "Environmental factors influence sustainable development."

The quantitative analysis consists of:

- Multiple regression to determine the meaning of relations and links between environmental factors and SDGIs in EU countries.
- Performing comparative analysis (analysis between countries).

Data used: Eurostat, EEA, World Bank, FAO, Sustainable development index

Period analysed: 2005-2022 (to observe the trends)

Number of observations: 28 (27 EU member states plus EU average)

Definition of variables under study

If we aim to analyze the impact of environmental factors or determinants on sustainable development, the Sustainable Development Goals Index (SDGI) is the most appropriate variable to operationalize, which is why we define it as the dependent variable. This index reflects the balance between economic development, social progress, and ecological sustainability. It is used to measure countries' progress in achieving the Sustainable Development Goals and includes over 100 indicators, depending on data availability. Countries are ranked by their overall score. The overall score measures total progress towards achieving all 17 SDGs. The score can be interpreted as a percentage of SDG achievement. A score of 100 indicates that all SDGs have been achieved (Lafortune et al., 2025).

At the same time, the Sustainable Development Goals Index (SDGI) measures human development adjusted for environmental impact, unlike the other two indicators – GDP and the Human Development Index (HDI) – which exclude the influence of CO₂. The data for the Sustainable Development Goals Index were collected from the official website of the SDG Transformation Center. Table 2 below presents the set of independent variables, along with the necessary explanations.

Table 2. Selected independent variables and their impact on sustainable development

Independent Variable	What measure?	Relevance for green transition	Data sources
1. Net emissions of CO ₂ equivalent(*) per capita (annually in tonnes) - built by the authors based on the EEA data for the indicator 'kt CO ₂ eq'	Measure the environmental impact of economic activities by the number of inhabitants in a country /region	Reducing emissions is essential for climate neutrality	EEA, Eurostat https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer
2. Share of renewable energy in total energy consumption, %	The degree of transition to green energy	Countries with a higher share of renewable energy have a higher SDGI	Eurostat https://ec.europa.eu/eurostat/databrowser/view/NRG_IND_REN/default/table?lang=en
3. Annual municipal waste, kg per capita	Environmental impact and sustainability of consumption	High waste generation affects sustainability by indicating excessive consumption, inefficient waste management, plus pollution	Eurostat https://ec.europa.eu/eurostat/databrowser/view/cei_pc031/default/table?lang=en
4. Rate of circular use of materials, %	Measure the percentage of recycled and reintegrated materials in the economy from the total material consumption	It is a key indicator in assessing progress towards a circular and sustainable economy	Eurostat https://ec.europa.eu/eurostat/databrowser/view/ENV_AC_CUR/default/table?lang=en
5. Premature deaths caused by exposure to fine particulate matter (PM _{2.5}), mean annual exposure (micrograms per cubic meter)	Number of premature deaths due to health pollution caused by long-term exposure to PM _{2.5}	Reducing pollution improves quality of life and contributes to strengthening sustainable development	World Bank https://data.worldbank.org/indicator/EN.ATM.PM25.MC.M3
6. Forest area (% of total land)	CO ₂ absorption capacity and biodiversity protection	A large forest area improves the index of sustainable development	World Bank, FAO https://data.worldbank.org/indicator/AG.LND.FRST.ZS
7. Total natural resources rents (% of GDP)	The total income from natural resources is the sum of revenues from oil, natural gas, coal, minerals, and forests.	The income generated by non-renewable resources (fossil and mineral fuels), as well as from the overexploitation of forests, indicates the depletion of a country's natural capital stock. For a sustainable economy, the indicator should be moderate and declining in the long run	World Bank https://data.worldbank.org/indicator/NY.GDP.TOTL.RT.ZS
(*)'Total net emissions with international transport (EEA)': Total greenhouse gas (GHG) emissions including LULUCF, international aviation, and international navigation.			

Source: authors' elaboration, Feb 2025

Defining the model

The basic model can be expressed through the following multiple regression equation:

$$SDGI_i = \beta_0 + \beta_1 tCO2_i + \beta_2 Renew_Energy_i + \beta_3 Waste_i + \beta_4 deaths_PM2.5_i + \beta_5 forest_i + \beta_6 CMR_i + \beta_7 ResourcesRents_i + \epsilon_i \quad (1)$$

Where:

the **dependent variable** is: *SDGI* = Sustainable Development Index (overall score: [0;100])

and the **independent variables (predictors)** are listed below, under the corresponding acronym:

- *tCO2* = Net emissions of CO₂ (or equivalent) per capita (annually in tonnes)
- *%Renew_Energ* = Share of renewable energy in total energy consumed
- *Waste_cap* = Annual municipal waste per capita (kg)
- *deaths_PM2.5* = Particle level PM_{≤2.5} (micrograms per cubic meter)
- *%forest* = share of forest area in total land
- *%CMR (Circular material use rate)* = share of recoveries / recyclings from total used materials
- *ResourcesRents* = natural resources rent (% of GDP)

β_0 = intercept (constant), $\beta_1 \div \beta_7$ = coefficients of regression

ϵ = Residual error

Preparation of data

For the management of missing data, we used two approaches: using predictive linear regression models for data imputation, respectively, as the case may be, performing the arithmetic mean of neighboring values, for certain missing values inside the data field (as was the case with the *Waste_cap* indicator).

Since the *SDGI* dependent variable has values in the range [0, 100], we have normalised the data of all independent variables for better comparability using the same reference range [0, 100].

Below is the min-max method formula applied in this case:

$$X' = \frac{X - X_{min}}{X_{max} - X_{min}}(b - a) + a \quad (2)$$

Where:

X' = scaled value, X = original value, X_{min} and X_{max} are the minimum and maximum values in the dataset, and a and b are the desired limits (between 0 and 100, in our case)

The data preparation work on indicators consisted of the following operations:

- We built the *tCO2* indicator per capita starting from the 'kt CO2 eq' indicator (source: EEA). The values thus obtained were normalized, on occasion, when the positive values of some negative values were carried out at the same time.
- For the *%Renew_Energ* indicator, we performed the normalization of the data;
- For the *deaths_PM2.5* indicator, we performed the normalization of the data;
- For the *%Forest* indicator, we have normalised the data;
- For the *%CMR* indicator - for the prediction of missing values by countries in the 2004-2009 interval, we applied the technique of linear regression at the first stage, then the results obtained were correlated with the results of the known weighted averages of the EU, through a simple arithmetic based on percentage calculation. Finally, we normalized the data.
- For the *Waste_cap* indicator: the management of missing data in the data field required a double approach, we performed the average of the neighbors, and for 3 missing values from the last year (2022) we applied the linear regression technique on the interval, and then the obtained values were refined by weighting so that the known value of the EU average is respected. The last step was to normalize the data.
- For the *ResourcesRents* indicator - for estimating the missing values of the whole year 2022, we made the prediction using by linear regression technique. We calculated the weighted EU average based on the known GDP value of 2022 (in constant prices 2015, US\$). The normalization of data followed.

Statistical methods and techniques applied in empirical analysis

a) Correlation analysis

Correlation analysis is a statistical technique that allows for to measurement of the degree of interdependence between the studied variables. This helps to determine whether two variables are related and whether this association is statistically significant (it is important to note that if two variables are correlated, this does not automatically involve a causal relationship). To assess the intensity of the relationships between variables, we used Pearson correlation coefficients (theoretical range: 0 - 1, preferred range: 0.50 - 0.95).

b) Regression analysis (multiple, in our case)

Regression analysis studies the link between a dependent variable and one or more independent variables. The most important results of the regression analysis are the coefficients *R*, *R Square* (R^2), and the level of significance (*Sig.*).

- The regression coefficient *R* shows how much the dependent variable changes following a change of a unit of one of the independent variables.
- The coefficient of determination R^2 is essential, as it indicates the percentage of variation of the dependent variable explained by the influence of independent variables.

- Statistical significance (*Sig.*) is ideal at values below 0.05, indicating a level of confidence of over 95% for the results obtained. In current practice, values of up to 0.1 are also accepted, which means a level of confidence of over 90%.

c) *Variance analysis (ANOVA)* - in our case, Multifactorial ANOVA; it is a statistical method used to compare averages of three or more groups and to determine whether there are significant differences between them. It allows the separation of total variation into explainable and unexplained components (error) and helps to study the impact of explanatory factors on the dependent variable. Certifies statistical significance.

d) *Factorial analysis*

The factorial analysis was performed using the *Kaiser-Meyer-Olkin statistical test (KMO)* to evaluate the internal consistency of the selected variables. In theory, the KMO value should be between 0.5 and 1, indicating adequate sampling.

3. Presentation of results and discussion

In Table 3, in order to demonstrate the socio-economic benefits of environmental factors in the context of the 2030 Agenda and the New European Green Pact, we proposed an analysis based on deductive reasoning, applying the method of argumentation and logical demonstration.

In Tables 4÷9, we present the quantitative analysis results for the chosen sample - years 2005, 2009, 2013, 2017, 2020, and 2022, including correlation and regression analyses, variance analysis (ANOVA), and factorial analysis (KMO).

For comparisons, we also included in the analysis some of the years marked by crises: 2009 (financial crisis 2008+), 2020 (pandemic crisis 2020+), 2022 (energy crisis 2022+).

The corresponding dispersion diagrams are found in Figures 3÷8.

We will make comments on the results of the statistical processing at the end of this section.

Table 3. Socio-economic benefits of environmental factors

Argument and evidence supporting the positive socio-economic impact of environmental determinants on sustainable development within the framework of the Green Transition (European Green Deal).	
PREMISES	Details of the premises:
<i>Premise 1:</i>	The need for a transition to a sustainable development model (Climate change, due in part to the linear economy based on excessive resource consumption and pollution, is no longer a viable long-term solution).
<i>Premise 2:</i>	The interdependence between the environment, society, and economy (Sustainable economic development cannot exist without a healthy environment, and protecting the environment is beneficial to health and can stimulate economic growth through the emergence of new industries and jobs, with socially beneficial effects).
<i>Premise 3:</i>	Green policy and regulation (the new European Green Pact provides the legislative and financial framework to support innovation and the transition to climate neutrality).

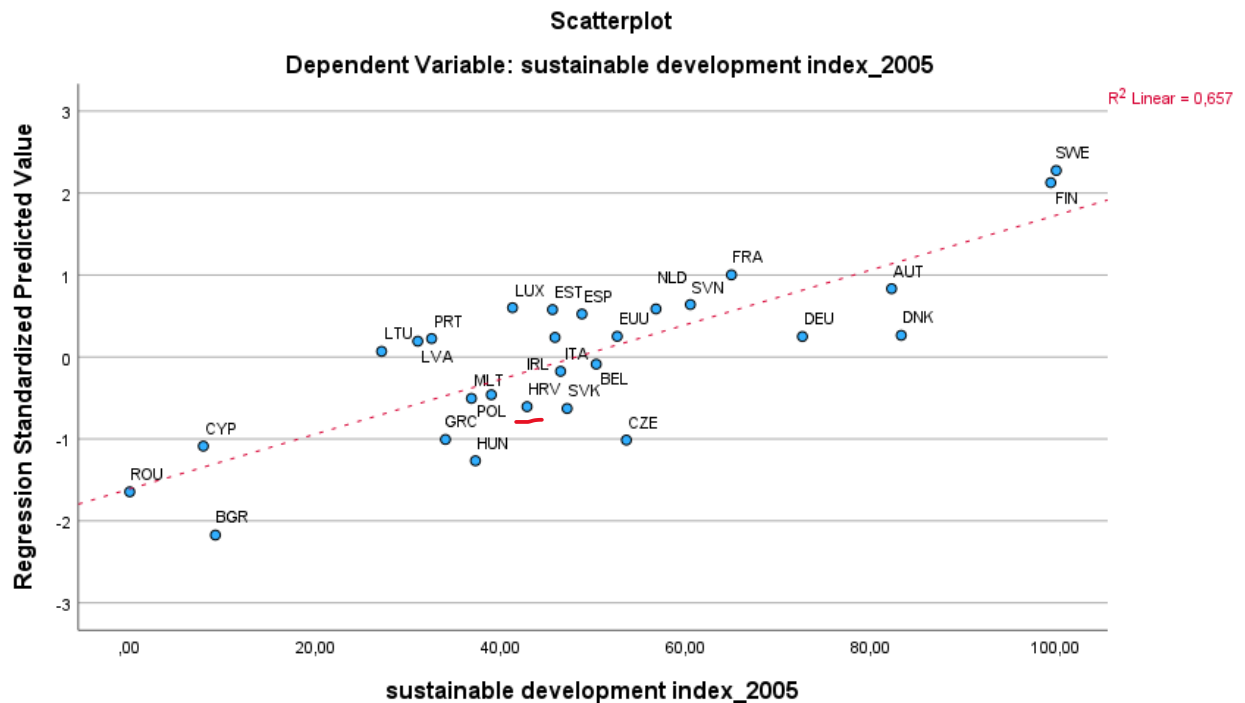
ARGUMENT	Explanations /LOGICAL DEMONSTRATION:
1) The need for green transition	The necessity of the green transition can be explained through three dimensions: ecological, economic, and social. Referring to the ecological dimension, global temperature increases and the intensification of extreme weather events caused by pollution, along with the overexploitation of natural resources, have devastating effects and require decisive action. Economic impact: The regulations of the Green Deal create new opportunities for green innovation and the development of new industries. Additionally, increased competitiveness is achieved through the use of renewable resources, specific measures to improve energy efficiency, responsible use of natural resources, and cost savings promoted by the circular economy (reuse, recycling, and regeneration of materials). The social impact of a clean environment includes improved health and quality of life, as well as new green jobs.
2) Reducing dependence on fossil fuels	Environmental determinant - renewable energy (solar, wind, hydro). Investing in renewable energy reduces dependence on conventional energy sources by ensuring energy security, contributing to the reduction of pollution, and creating green jobs.
3) Reduction of energy costs	Environmental determinant - energy efficiency. Lower energy consumption (ecological transport, heat-compressed buildings) leads to financial savings and better accessibility of resources for citizens and companies. Reducing energy bills in the long run helps to increase the competitiveness of companies.
4.) Improve public health	Environmental determinants - air, water, and soil quality. A healthy environment through measures to reduce pollution will lead to lower costs of medical treatments, decrease absenteeism, and increase labor productivity.
5) Reducing waste and resource dependence	Environmental determinant - waste management and circular economy. The aim is to recycle and reuse materials, reducing waste through efficient management, minimizing waste, stimulating green innovation, and reducing dependence on finite resources.
6) Reduction of pollution through CO₂ absorption	Environmental determinant - forest surface. CO ₂ emissions or equivalent intensify climate change with negative health consequences and economic recovery costs. Forests absorb CO ₂ naturally, improving air quality and reducing pollution, and thus limiting the negative effects of climate change.
7) Protecting biodiversity and ecosystems	The protected ecological areas and the conservation of natural resources ensure the increase of the tourism potential of the area, thus supporting the local economy. And in general, low-pollution areas are more attractive to investors.
8) Opportunity	In order to achieve climate neutrality and for sustainable development, the Green Pact offers mechanisms (Right transition) and economic, social, and environmental opportunities not to be missed.
CONCLUSIONS:	
Countries that adopt effective policies to reduce emissions, increase the share of renewable energy, reforestation, waste management, and recycling, and improve air, water, and soil quality, will have: ✓ Healthier population → impact: reducing health costs; ✓ More resilient economies → impact: sustainable economic growth and new jobs (green); ✓ Increased investment attractiveness → impact: boosting and increasing investment, as green regions are more economically attractive (and not just for tourism); ✓ A higher standard of living → impact: increasing the human development index and quality of life. As such, the socio-economic impact of environmental determinants is conducive to sustainable development, contributing to its improvement of sustainable development.	

Source: authors' elaboration, Feb 2025

Table 4. Methods /statistical techniques applied in variable analysis_year 2005

Correlations 2005		SDGI_2005	tCO2_cap_2005	%_Renew_2005	%_CMR_2005	%_forest_2005	resources_rents_2005	waste_cap_2005	deaths_PM2.5_2005
Sustainable Development Index (SDGI)_2005	Pearson Correlation	1	,052	,396*	,349	,435*	-,211	,143	-,705**
	Sig. (2-tailed)		,791	,037	,068	,021	,281	,467	<,001
	N	28	28	28	28	28	28	28	28
Model Summary (dependent variable)		R	R Square		Adjusted R Square		Std. Error of the Estimate		
1		,811predictors	,657		,538		16,506722469405638		
ANOVA ^a Model		Sum of Squares		df	Mean Square		F	Sig.	
1	Regression	10461,300		7	1494,471		5,485	,001 ^b	
	Residual	5449,438		20	272,472				
	Total	15910,738		27					
a. Dependent Variable: sustainable development index_2005									
b. Predictors: (Constant), premature deaths_PM2.5_2005, %_energy_renew_2005, natural resources_rents_%GDP_2005, municipal waste_kg_capita_2005, %_circular material use_2004, %_forest_2005, tCO2 or echiv._capita_2005									
KMO and Bartlett's Test_2005									
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.						,608			
Bartlett's Test of Sphericity			Approx. Chi-Square			108,161			
			df			28			
			Sig.			<,001			

Source: authors' elaboration, Feb 2025

**Figure 3.** Diagram of dispersion. Sustainable development index vs. environmental predictors_2005

Source: authors' elaboration

Table 5. Methods /statistical techniques applied in variable analysis_year 2009

Correlations 2009		SDGI_2009	tCO2_cap_2009	%_Renew_energ_2009	%_CMR_2009	%_forest_2009	resources_rents_2009	waste_cap_2009	deaths_PM2.5_2009
Sustainable Development Index (SDGI)_2009	Pearson Correlation	1	-,030	,442*	,344	,447*	-,116	,070	-,621**
	Sig. (2-tailed)		,878	,018	,073	,017	,557	,722	<,001
	N	28	28	28	28	28	28	28	28
Model Summary (Dependent Variable)		R		R Square		Adjusted R Square		Std. Error of the Estimate	
1		,771predictors		,595		,453		18,38174	
ANOVA ^a Model		Sum of Squares		df		Mean Square		F	Sig.
1	Regression	9925,145		7		1417,878		4,196	,005 ^b
	Residual	6757,770		20		337,889			
	Total	16682,915		27					
a. Dependent Variable: sustainable development index_2009									
b. Predictors: (Constant), premature deaths_PM2.5_2009, natural resources rents_%GDP_2009, tCO2 or echiv._capita_2009, %_circular material use_2009, municipal waste_kg capita_2009, %_forest_2009, %_Renewable energy_2009									
KMO and Bartlett's Test_2009									
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.						,560			
Bartlett's Test of Sphericity			Approx. Chi-Square			102,036			
			df			28			
			Sig.			<,001			

Source: authors' elaboration, Feb 2025

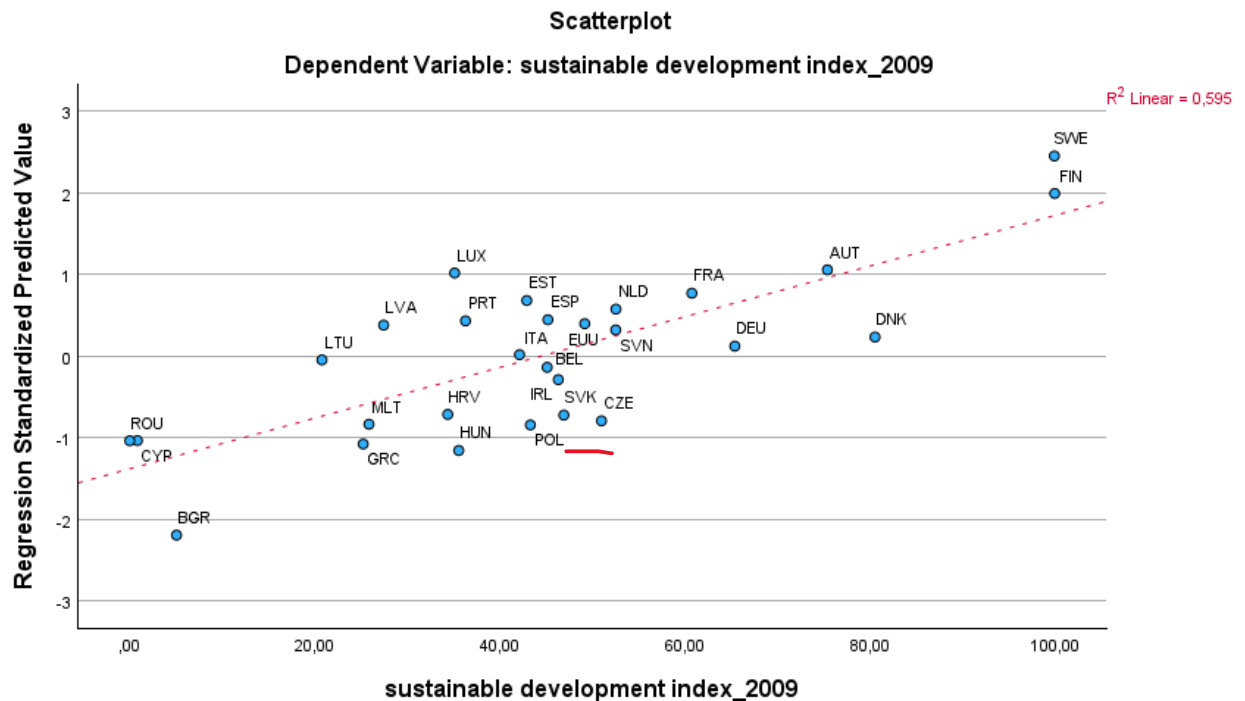


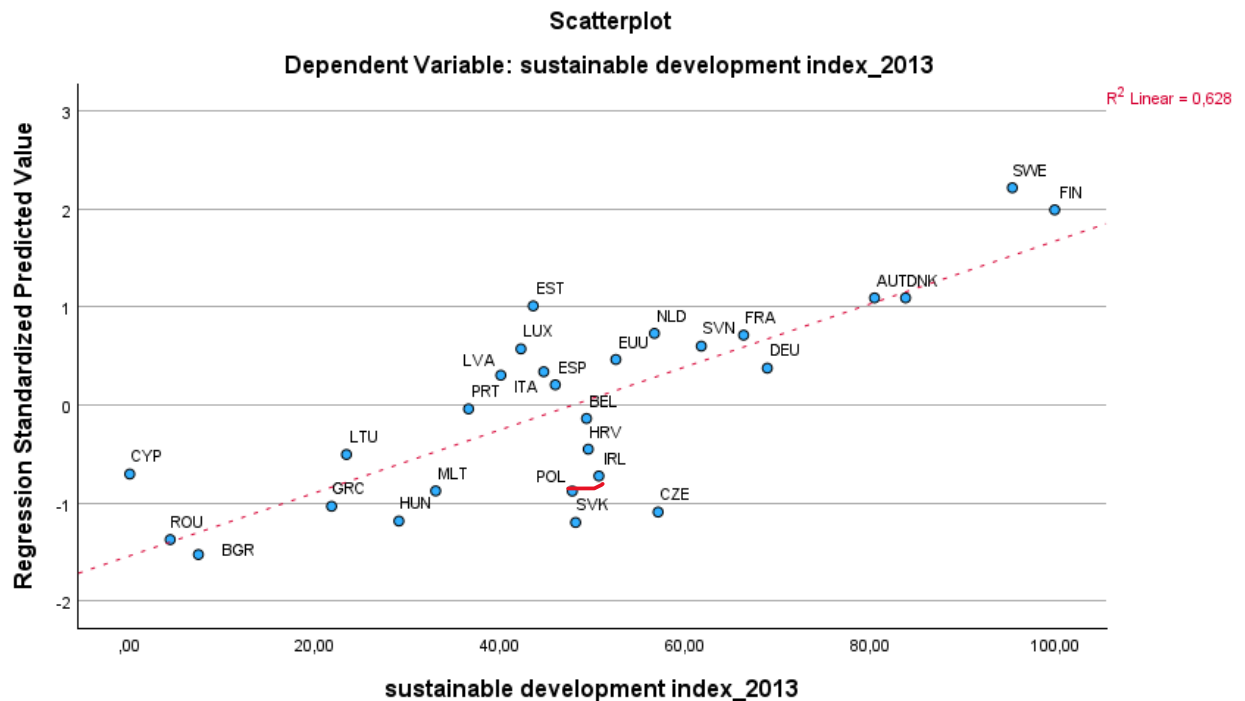
Figure 4. Diagram of dispersion. Sustainable development index *vs.* environmental predictors_2009

Source: authors' elaboration

Table 6. Methods /statistical techniques applied in variable analysis_year 2013

Correlations 2013		SDGI_2013	tCO2 cap_2013	%_Renew_2013	%_CMR_2013	%_forest_2013	resources rents_2013	waste_cap_2013	deaths_PM2.5_2013
Sustainable Development Index (SDGI)_2013	Pearson Correlation	1	,044	,433*	,362	,436*	-,055	,272	-,569**
	Sig.(2-tailed)		,826	,021	,058	,020	,780	,161	,002
	N	28	28	28	28	28	28	28	28
Model Summary (Dependent Variable)		R	R Square		Adjusted R Square		Std. Error of the Estimate		
1		,792predictors	,628		,498		17,48860		
ANOVA ^a Model		Sum of Squares		df	Mean Square		F	Sig.	
1	Regression	10318,802		7	1474,115		4,820	,003 ^b	
	Residual	6117,021		20	305,851				
	Total	16435,823		27					
a. Dependent Variable: sustainable development index_2013									
b. Predictors: (Constant), premature deaths_PM2.5_2013, %_forest_2013, %_circular material use_2013, natural resources rents_%GDP_2013, tCO2 or echiv_capita_2013, municipal waste_kg capita_2013, %_Renewable energy_2013									
KMO and Bartlett's Test_2013									
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.					,501				
Bartlett's Test of Sphericity		Approx. Chi-Square			95,879				
		df			28				
		Sig.			<,001				

Source: authors' elaboration, Feb 2025

**Figure 5.** Diagram of dispersion. Sustainable development index vs. environmental predictors_2013

Source: authors' elaboration

Table 7. Methods /statistical techniques applied in variable analysis_year 2017

		SDGI_2017	tCO2 cap_2017	%_Renew_energ_2017	%_CMR_2017	%_forest_2017	resouces_rents_2017	waste_cap_2017	deaths_PM2.5_2017
Correlations 2017									
Sustainable Development Index (SDGI)_2017	Pearson Correlation	1	,041	,463*	,369	,402*	,045	,228	-,606**
	Sig.(2-tailed)		,837	,013	,053	,034	,821	,243	<,001
	N	28	28	28	28	28	28	28	28
Model Summary									
(Dependent Variable)		R	R Square		Adjusted R Square		Std. Error of the Estimate		
1		,798predictors	,636		,509		17,07590		
ANOVA ^a Model		Sum of Squares		df	Mean Square		F	Sig.	
1	Regression	10192,273		7	1456,039		4,994	,002 ^b	
	Residual	5831,724		20	291,586				
	Total	16023,997		27					
a. Dependent Variable: sustainable development index_2017									
b. Predictors: (Constant), premature deaths_PM2.5_2017, natural resouces_rents_%GDP_2017, %_circular material use_2017, %_forest_2017, tCO2 or echiv_capita_2017, municipal waste_kg_capita_2017, %_Renewable energy_2017									
KMO and Bartlett's Test _2017									
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.						,555			
Bartlett's Test of Sphericity		Approx. Chi-Square				86,221			
		df				28			
		Sig.				<,001			

Source: authors' elaboration, Feb 2025

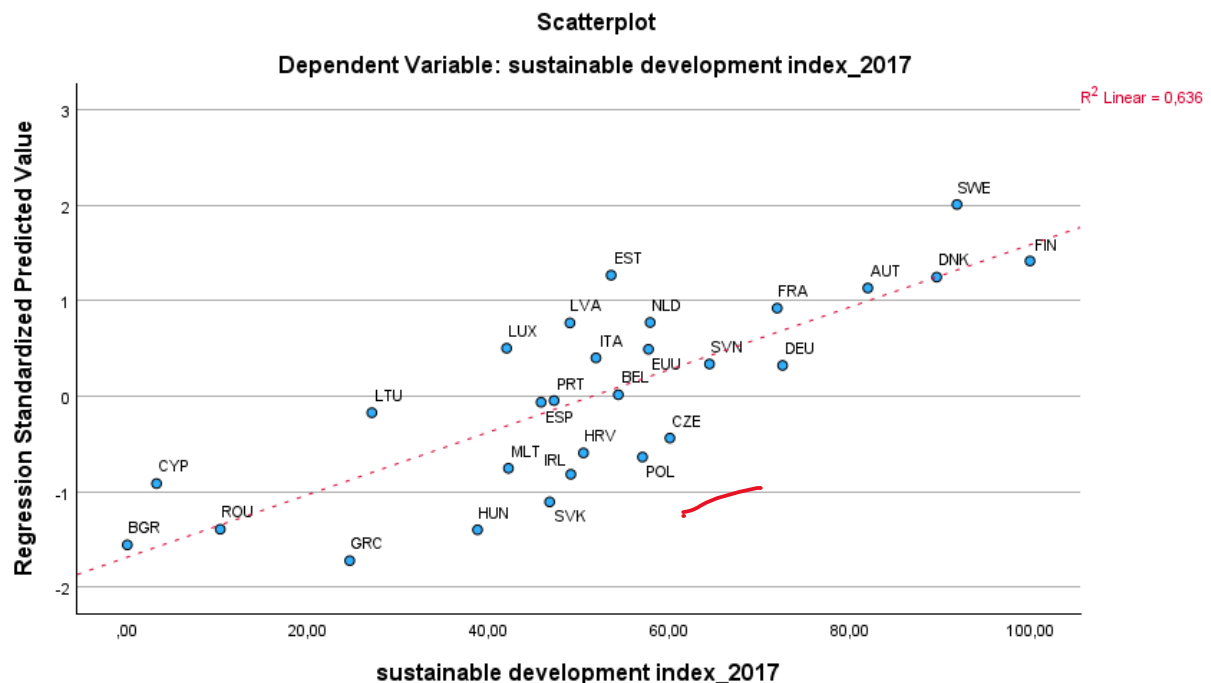


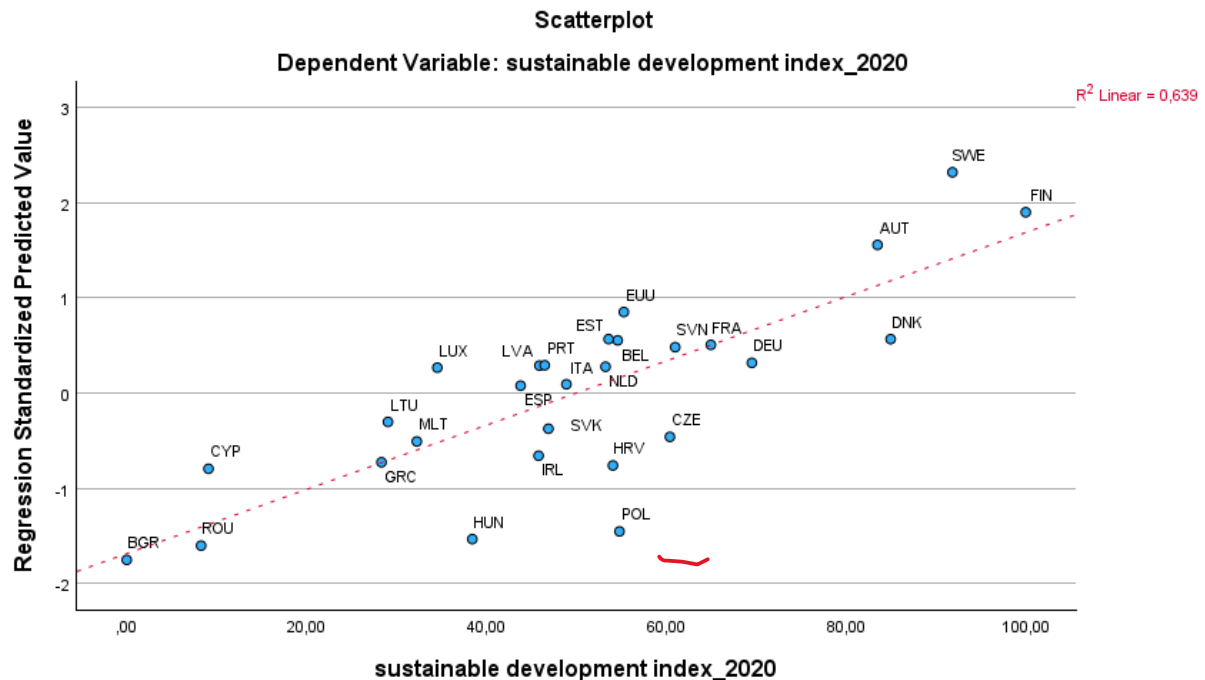
Figure 6. Diagram of dispersion. Sustainable development index *vs.* environmental predictors_2017

Source: authors' elaboration

Table 8. Methods /statistical techniques applied in variable analysis_year 2020

Correlations 2020		SDGI_2020	tCO2_cap_2020	%_Renew_energ_2020	%_CMR_2020	%_forest_2020	resources_rents_2020	waste_cap_2020	deaths_PM2.5_2020
Sustainable Development Index (SDGI)_2020	Pearson Correlation	1	-,038	,510**	,221	,452*	-,055	,338	-,603**
	Sig.(2-tailed)		,848	,006	,258	,016	,781	,078	<,001
	N	28	28	28	28	28	28	28	28
Model Summary (DependentVariable)		R	R Square		Adjusted R Square		Std. Error of the Estimate		
1		,799predictors	,639		,513		16,53871		
ANOVA ^a Model		Sum of Squares		df	Mean Square		F	Sig.	
1	Regression	9679,962		7	1382,852		5,056	,002 ^b	
	Residual	5470,577		20	273,529				
	Total	15150,539		27					
a. Dependent Variable: sustainable development index_2020									
b. Predictors: (Constant), premature deaths_PM2.5_2020, natural resources rents_%GDP_2020, %_circular material use_2020, tCO2 or echiv._capita_2020, %_forest_2020, municipal waste_kg capita_2020, %_Renewable energy_2020									
KMO and Bartlett's Test_2020									
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.						,641			
Bartlett's Test of Sphericity		98,788				98,788			
		df				28			
		Sig.				<,001			

Source: authors' elaboration, Feb 2025

Figure 7. Diagram of dispersion. Sustainable development index *vs.* environmental predictors_2020

Source: authors' elaboration

Table 9. Methods /statistical techniques applied in variable analysis_year 2022

Correlations 2022		SDGI_2022	tCO2_cap_2022	%_Renew_energ_2022	%_CMR_2022	%_forest_2022	resources_rents_2022	waste_cap_2022	deaths_PM2.5_2022
sustainable development index(SDGI)_2022	Pearson Correlation	1	-,028	,529**	,223	,406*	,089	,236	-,607**
	Sig.(2-tailed)		,887	,004	,254	,032	,653	,226	<,001
	N	28	28	28	28	28	28	28	28
Model Summary (Dependent Variable)		R	R Square		Adjusted R Square		Std. Error of the Estimate		
1		,771predictors	,594		17,94347				
ANOVA ^a Model		Sum of Squares		Df	Mean Square		F	Sig.	
1	Regression	9411,472		7	1344,496		4,176	,006 ^b	
	Residual	6439,364		20	321,968				
	Total	15850,835		27					
a. Dependent Variable: sustainable development index_2022									
b. Predictors: (Constant), premature deaths_PM2.5_2022, %_forest_2022, natural resources rents_%GDP_2022, %_circular material use_2022, tCO2 or echiv_capita_2022, municipal waste_kg capita_2022, %_Renewable energy_2022									
KMO and Bartlett's Test_2022									
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.						,542			
Bartlett's Test of Sphericity			Approx. Chi-Square			83,470			
			Df			28			
			Sig.			<,001			

Source: authors' elaboration, Feb 2025

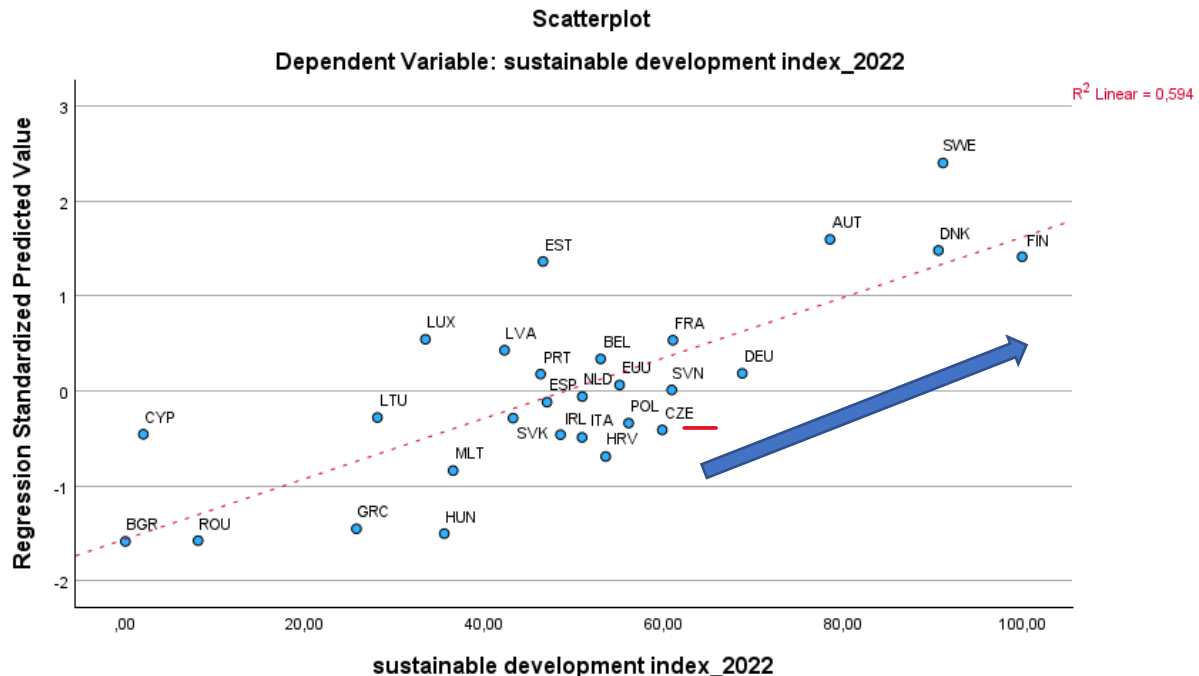


Figure 8. Diagram of dispersion. Sustainable development index *vs.* environmental predictors_2022

Source: authors' elaboration

Analyzing the data of the processing sample, consisting of 2005, 2009, 2013, 2017, 2020, and 2022 (Tables 4÷9 and Figures 3÷8), we can make the following comments:

- *Correlations results:* Correlation results that are statistically validated by the level of significance (Sig. < 0.01** or < 0.05*) indicates dpdv theoretical weak and medium links between pairs of variables of interest (values vary between 34.9 - 70.5% in 2005, between 34.4 - 62.1% in 2009, between 36.2 - 56.9% in 2013, between 36.9 - 60.6% in 2017, between 33.8 - 60.3% in 2020, between 40.6 - 60.7% in 2022) – see situations with correlations in Tab. 4-9; The more convincing bi-variable correlations that manifest in all 6 years of the processed sample are: SDGI - deaths_ PM2.5, SDGI - %_Renew_energy and SDGI - % forest. Except for the last 2 years analyzed (2020 and 2022), marked by the pandemic crisis and the energy crisis, we can also observe the correlation of SDGI - %CMR, in a percentage of 34 - 37%.
- *Regression results:*
 - Regression analysis (coefficient R) shows us for all 6 years analyzed, strong links between the dependent variable and the mix of independent variables analyzed (>75%), which in practice translates into a very good result, which validates the working hypothesis (MIN: 77.1 %, MAX: 81.1%);
 - The R² coefficient in the regression analysis reveals that a significant part of the sustainable development index is explained by the independent variables, in a proportion of 60.8% (2005), 56% (2009), 62.8 (2013), 63.6% (2017), 63.9% (2020) and 59.4% (2022) - see the Summary Model in Tab. 4÷9;
 - Variance analysis: In our case, the multifactorial ANOVA indicates excellent levels of statistical significance (Sig.< 0.01) for the 6-year processing, confirming the linear relationship between the variables (see ANOVA Model - Tables 4÷9).
- *Factorial analysis:* The KMO test shows an acceptable internal consistency of the factors analysed (60.8% in 2005, 56% in 2009, 50.1% in 2013, 55.5% in 2017, 64.1% in 2020 and 54.2% in 2022), which means that the solution obtained is reliable (see Tab. 4÷9).
- *Scatterplots,* with the dependent variable on the X-axis and the standardized regression rate based on the other independent variables on the Y-axis, provide a visual representation of how EU member states are grouped relative to the linear regression trendline (R²), marked on the graph with a red dashed line. The countries positioned at the top of the chart hold leading positions. During the analyzed years, Poland recorded the most notable improvement in the SDGI relative to the influencing predictors, surpassing the EU average. Significant disparities are also observed among EU member states in terms of their SDGI levels relative to the seven environmental predictors. The Nordic countries are at the top of the ranking, followed by Austria, Germany, and France; Bulgaria, Cyprus, and Romania are at the bottom (observe the scatterplots in Figs 3÷8).
- The fact that not all predictors have been confirmed can be partially attributed to model limitations, both in terms of several factors included and the size of the sample analyzed (N=28). It is important to note that the *Sustainable Development Index (SDGI)*

is composed of over 100 indicators, but in this analysis, only 7 of them were selected, which were used as explanatory variables in the model.

4. Conclusions

As regards the European Union, we can note from the literature that the European Green Pact is a major opportunity for improving the health of the population and the environment, but it faces challenges related to available resources and political and economic tensions. Its success will depend on the EU's ability to overcome these obstacles and implement effective policies to ensure a just and sustainable transition, while taking into account the balance between economic development, social progress, and environmental sustainability.

In the applied section of the paper, two distinct analyses were carried out:

1. *Deductive-conceptual analysis*

This analysis started from three fundamental premises considered true:

- o the need for a transition to a sustainable development model;
- o interdependence between environment, society, and economy;
- o Regulations in the New European Green Pact.

Based on these premises, a set of rational arguments was formulated and explained, leading to the expected conclusion: countries that implement effective environmental protection policies—such as reducing emissions, increasing the share of renewable energy, reforestation, waste management and recycling, and improving air, water, and soil quality—will benefit from significant socio-economic advantages while ensuring sustainable development. Consequently, these countries will stand out through a higher value of the Sustainable Development Goals Index (SDGI).

The socio-economic implications associated with the green transition, detailed in Table 3, include:

- o improving the human development index and quality of life;
- o creating new green jobs;
- o reducing long-term health and energy bills;
- o stimulation of eco-tourism;
- o promoting sustainable economic growth.

2. *Empirical analysis*

This analysis was conducted to test the H1 working hypothesis: "Environmental factors influence sustainable development."

The results obtained, presented in Section 4, confirmed the scientific validity of the research hypothesis, demonstrating that a good part of the environmental factors analyzed positively influence the process of sustainable development.

Thus, according to the analyzed data, countries that exhibit:

- a high share of renewable energy,
- extensive forest areas,

- and a low number of premature deaths caused by air pollution (specifically PM2.5) consistently show higher values of the SDGI. These results, although expected, provide empirical confirmation of the favorable relationship between environmental determinants and sustainable development.

The study has significant relevance to the green transition as it scientifically validates the connections between certain environmental factors and socioeconomic progress, thus providing a solid scientific basis for further research. The results obtained can also be a valuable benchmark for optimizing existing environmental policies or, where appropriate, for developing future sustainability strategies and policies, aiming at reducing disparities between member states and, consequently, improving the performance of countries with a low SDGI index.

Limitations of the study

With regard to the limitations of the study, future research could include, among other things, extending the analysis by integrating a greater number of indicators and/or countries. New research questions or hypotheses could also be formulated to allow the study to deepen, with an increased focus on the social and economic dimensions of sustainable development, in line with the green transition and the New Green Pact regulations.

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FINLAND- PIONEER IN THE IMPLEMENTATION OF THE EUROPEAN GREEN DEAL

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Abstract: Finland has emerged as a key pioneer in implementing the European Union Green Deal, particularly through its innovative approaches in education, culture and the economy. The Finnish education system prioritizes sustainability, with environmental topics integrated into curricula from early education to higher levels. Schools and Universities actively engage students in green initiatives, fostering eco-consciousness and empowering the next generation to contribute to the green transition. Culturally, Finland has long celebrated sustainability, with its art, design, and media reflecting themes of environmental preservation and ecological balance. Economically, Finland has leveraged its green policies to drive innovation, focusing on clean technologies and renewable energy, aligning with the EU's climate neutrality goals. The Finnish government supports green entrepreneurship through incentives, which has spurred economic growth in eco-friendly industries. Thus, Finland exemplifies a holistic approach to the Green Deal, blending education, culture and economic policies, doubled by a professional communication agenda, to create a sustainable future.

Keywords: Environmental policies, Finnish Green Deal Challenges, Education, Culture and Art for a sustainable future, Finland's Circular Economy, Renewable sources, Eco- efficient Europe, Green Business Models.

Introduction

Education and culture play crucial roles in Finland's implementation of the EU Green Deal, as they shape both individual and societal attitudes toward sustainability. Finland's education system fosters environmental awareness from an early age, integrating sustainability into curricula at all levels. This enables future generations to understand the importance of green policies and empowers them to innovate and adopt eco-friendly practices. Moreover, Finland encourages hands-on learning experiences, such as waste reduction and renewable energy projects, allowing students to directly engage with sustainability (Finnish National Agency for Education, 2020).

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The Opportunity for Finland has taken significant steps in implementing the EU Green Deal through various key initiatives. Here are three main examples to include in the presentation. The first one: Renewable Energy Transition. Finland has rapidly expanded its use of renewable energy, aiming to be carbon-neutral by 2035. The country has invested heavily in wind and solar energy, and in 2020, over 40% of Finland's electricity came from renewable sources, contributing to EU-wide decarbonization efforts. The second one: Circular Economy. Finland is a leader in the promotion of a circular economy. The Finnish government supports initiatives to reduce waste, increase recycling, and create sustainable products. The country's Circular Economy Strategy focuses on extending product lifecycles, reducing material consumption, and fostering eco-efficient business models. The third example is a Sustainable Forest Management. As a country with vast forest resources, Finland has prioritized sustainable forest management practices. The Finnish Forest Act regulates the responsible use of forests, ensuring biodiversity protection and carbon sequestration while supporting the bioeconomy, aligning with the EU's climate goals.

The solutions of the study are taking as results education policies, culture and arts, social literature, music, architecture, that can supplement a great Green Deal economic aspiration where metaphorical stories and stages aren't merely the goal of learning about Green Deal challenges, but in fact, Finnish traditions and cultural values, such as respect for nature, support sustainable living practices. Finnish art, design, and media reflect environmental themes, promoting awareness and inspiring broader societal shifts toward sustainability. By intertwining education and culture with environmental policy, Finland ensures that the Green Deal is not only a political or economic strategy but also a shared societal mission for a sustainable future with a huge financial impact.

Finland's European Green Deal on economy

According to the government programme, Finland aims to become CO₂ neutral by 2035 and, shortly thereafter, to become CO₂ negative. In addition, Finland wants to be the first society in the world to do without fossil fuels completely. To achieve these goals, Finland is making significant efforts to promote renewable energy and reform the energy sector towards a more flexible, market-based system that can fully utilize the potential of new technologies and cross-sectoral solutions. With its innovative and dynamic business environment, outstanding know-how and flat hierarchies, Finland offers excellent framework conditions to achieve this goal.

Finland has emerged as a key pioneer in implementing the European Union Green Deal, particularly through its innovative approaches in education, culture and the economy. The Finnish education system prioritizes sustainability, with environmental topics integrated into curricula from early education to higher levels. Schools actively engage students in green initiatives, fostering eco-consciousness and empowering the next generation to contribute to the green transition. Culturally, Finland has long celebrated sustainability, with its art, design, and media reflecting themes of environmental preservation and ecological balance. Economically, Finland has leveraged its green policies to drive innovation, focusing on clean

technologies and renewable energy, aligning with the EU's climate neutrality goals. The Finnish government supports green entrepreneurship through incentives, which has spurred economic growth in eco-friendly industries. Thus, Finland exemplifies a holistic approach to the Green Deal, blending education, culture, and economic policies to create a sustainable future.

There is a strong political commitment to a Strategic Green Deal (Heikkilä, L., & Mikkola, H., 2020). The steering instruments of the Finnish Government now include a new commitment to a Strategic Green Deal. The Strategic Green Deal contains five areas of change and it extends until 2035. The most powerful planning engine is The Strategic Circular Economy Green Deal which supplements the existing commitments and provides the opportunity to introduce a 'roadmap' for longer-term cooperation. All parties, who have made a commitment to Green Deal, shared a commitment to the Strategic Circular Economy Green Deal. The most efficient National Finnish Green Politics are: Plastic Carrier Bag Agreement, The Green Deal climate agreement between the automotive sector and the State, Green Deal on the development of national waste oil management, Green Deal for the non-road mobile machinery sector, Green Deal on sustainable demolition, on plastics in construction and the treatment of urban waste water, or the popular sustainable procurements made even in early childhood education.

Wind energy sector

To achieve these goals, Finland is making significant efforts to promote renewable energy and reform the energy sector towards a more flexible, market-based system that can fully exploit the potential of new technologies and cross-sectoral solutions. With its innovative and dynamic business environment, outstanding know-how and flat hierarchies, Finland offers excellent framework conditions to achieve this goal. An impressive example is the success story of the Finnish wind sector. Although wind power has only been commercially used here for two decades, it has quickly become the most competitive form of electricity generation, and Finnish wind farms are now regularly deployed without any government support. Instead of relying on public subsidies, stable revenues are secured through long-term power supply contracts with energy companies or industrial customers, for whom sustainability and climate protection are becoming increasingly important.

Finland was set to launch offshore *Wind Auction*, envisaging up to 500 turbines, in 2023. The aim was also to keep mariners informed and work closely with them whilst we build the Dogger Bank wind farm. This will minimise disruption and ensure that everyone is able to operate and go about their business safely. Finland is a great example of how the Green Deal policies must communicate with the population, so every citizen must be well informed about the benefits of Green Deal programmes. A two-year study commissioned by the Finnish government that has examined the effects of low-frequency sound emissions – infrasound. Although, according to researchers, in many countries there have been many voices attributing these infrasound to symptoms ranging from headaches to tinnitus and cardiovascular problems, scientists say that the results of the new research “do not support

the hypothesis that infrasound (...) cause discomfort" (Panu Maijala, Anu Turunen, Ilmari Kurki, Lari Vainio&Co, 2020),

The researchers relied on interviews, sound recordings and laboratory tests to study the possible effects of these sounds on the health of people living less than 20 kilometers away from these generators. If we compare this study with Romania, maybe we will see in the Black Sea wind farms in a few years. Romanian deputies have voted on a law that, starting this year, will grant concessions to areas in the open sea for the installation of floating turbines. Last year, BSOG and its partners at Midia Gas Development (MGD) unveiled plans to use the existing MGD infrastructure to connect up to 3 GW of offshore wind energy to the national grid. 3 GW would practically double Romania's onshore capacity and a consistent effort by Transelectrica to ensure that the grid can receive this additional amount of energy. But if there are no communication strategies to the citizens, we will probably encounter some divergent opinions of the local marine NGOs that will slow down the Romanian Government efforts.

In Finland, wind turbines have ensured the country's total energy consumption, even during periods of maximum demand. Renewable energy sources are proving their efficiency in Finland. Electricity in Finland is free for consumers, thanks to wind turbines. According to Nord Pool, the Nordic Power Exchange, on Monday, February 17, 2020, it made state electricity history, becoming free for the first time in Finland's history. "The price of electricity has gone negative and amounted to minus 20 eurocents per megawatt-hour (MWh)," the press release from Nord Pool, the Nordic Power Exchange. (Eamon Akil Farhat, Lars Paulsson, 2024)

Battery program in Finland

An important element in the energy sector reform is energy storage. Here too, Finland is striving to be a pioneer. The "Battery from Finland" initiative aims to establish Finland as the world's leading provider of sustainable solutions across the entire battery life cycle, from raw material extraction and processing to battery recycling. "Power-to-X" solutions, such as green hydrogen, which is generated using renewable energy and can be used as a fuel in transport or as a raw material in industry, also have considerable future potential. These technologies allow for the reduction of greenhouse gas emissions also in those sectors that have traditionally been considered difficult to decarbonize. In addition, the possibility of long-term storage can make an important contribution to increasing the flexibility of the energy system. These include tax exemptions for offshore wind farms, the elimination of double taxation for storage solutions, making electricity markets more flexible and creating incentives for the use of new technologies in grid expansion.

Green rail transport. Electrified roads

A global forerunner in electrified transport. The Finnish government has pledged to halve emissions from domestic traffic by 2030 and eliminate emissions by 2045 (compared to 2005 levels). Electrified road transport is key to this goal. Over 90% of Finnish traffic emissions come from road traffic, of which 40% come from heavy goods vehicles. To achieve the planned emission reduction, every third kilometer driven on Finnish roads by 2030 must be electrically

powered. Replacing old cars with electric cars, implementing sustainable public transport, increasing the use of renewable fuels and digitising road infrastructure are all ongoing in Finland.

VR is testing the first of 60 low- emission Stadler diesel locomotives in 2022. “The new diesel locomotives will be used primarily in freight traffic, and their efficiency is twice as high as our old locomotives. Today, the train is by far the lowest- emission mode of transport, and its particulate emissions are significantly lower than those of our old diesel fleet. Nitrogen oxide emissions, for example, are 80% lower,” says Ilkka Heiskanen, Senior Vice President, Operations and Safety Train, VR Group. (VR Press Releases, 2022) Diesel locomotives are still needed, as only slightly more than half of the Finnish railway network has been electrified.

Green air and naval transport. Airports. Ports

“Net zero carbon emissions is an ambitious climate target, and we are proud to have achieved it at four of our airports,” says Mikko Viinikainen, Finavia’s vice president for sustainability and environment. “By switching to exclusively using renewable energy, we have reduced our carbon emissions by 98% in ten years at Ivalo, Kittilä, Kuusamo and Rovaniemi airports. Our operations at all of our 20 airports have been carbon neutral since 2019.” Finavia’s goal is for all of its airports to achieve net zero emissions by the end of 2025. Net zero emissions at Ivalo, Kittilä, Kuusamo and Rovaniemi airports have been certified in the international Airport Carbon Accreditation (ACA) programme, which Finavia has been part of since 2011. (ACI, Airport Carbon Accreditation Programme, 2024)

President Alexander Stubb at the UN Climate Change Conference stated that climate funding also needs to be increased and targeted where the need is greatest. “Finland, as part of the EU, remains committed to supporting developing countries in their climate action. We want to mobilise funding for countries which need it the most.” According to President Stubb, The Finnish must take more responsibility for future generations.

To succeed, they need: 1) national and international targets and legislation, 2) increased public and private funding, and 3) technological innovations.. “And yes, all three are needed together. You cannot regulate or pay yourself out of the climate crises. Regulation sets the target. Finance creates the conditions for innovative technologies. Countries with growing influence should be included in global decision-making, Finland as well. (Embassy of Finland, Jakarta, Press releases, 2025)

EU's Green Deal and Finnish ecological education. Positive civic culture and art

Education and culture play crucial roles in Finland's implementation of the EU Green Deal, as they shape both individual and societal attitudes toward sustainability. Finland's education system fosters environmental awareness from an early age, integrating sustainability into curricula at all levels. This enables future generations to understand the importance of green policies and empowers them to innovate and adopt eco-friendly practices. Moreover, Finnish schools encourage hands-on learning experiences, such as waste reduction and renewable energy projects, allowing students to directly engage with sustainability.

Nature and Cultural Biodiversity component includes support for standard action projects for the development, implementation, and promotion of best practices in relation to nature and biodiversity, as well as "Strategic Nature Projects" (SNAPs). These new projects support the achievement of the Union's nature and biodiversity objectives by implementing coherent action programmes in the Member States, in order to integrate these objectives and priorities into other policies and funding instruments, including through the coordinated implementation of the priority action frameworks adopted under Directive 92/43/EEC. (Prakash, S. and Dubois, G., 2023)

To date, the LIFE Nature and Biodiversity component has co-financed 69 projects in Finland. This represents a total investment of EUR 218 million, of which EUR 121 million was contributed by the EU. EU-supported projects and initiatives on biodiversity and education. Most of the completed projects focused on the protection and restoration of habitats (water bogs, boreal forests and peatlands, rivers, wetlands and marine habitat types; species-rich habitats, rural wetlands and the Natura 2000 network in southwestern Lapland) and species (wild forest reindeer, white-tailed eagle, white-backed woodpecker and ringed Saima seal).

The best examples is The ESCAPE biodiversity project, which created a seed bank for threatened native flora in Finland and increased the number of endangered plant species in ex-situ collections, in line with the Finnish national action plan. Over 80% of the projects were coordinated by regional authorities. The rest were shared between national/local authorities, universities, schools, NGOs, professional organizations and nature parks. (Heikkinen, A., & Puhakka, R., 2021)

Santa Claus Village and hometown Rovaniemi

Another famous example is using sustainable energy-sourcing in Santa Claus's hometown. The project started in April 2018, when Ilkka Länkinen (CEO SantaPark) met with Jouni Penttinen (CEO PlayGreen Finland Oy) at a Solar Fair in Helsinki. PlayGreen offered a design draft and a few weeks after the first contact, the deal was finalised. The installation was finished by early August 2018. 24/7 energy production with 135 NU-RD300 panels on three different buildings. Two main goals were set for the project: Firstly, the northern location in the Arctic Circle puts enormous stress on the technology due to the extreme weather conditions; therefore, it requires a high-quality photovoltaic system.

Rovaniemi sites for accommodation have strict rules on respectful and responsible holiday lovers, tips for visitors connected to sustainability as a state of mind and a way of life. By honoring the nature and all its miracles, we are halfway there. By making some personal responsible choices and actions we are truly making a difference. The minimum commitment that all of us can make a difference. We can, for example make sure to switch off the lights, pick up your trash, recycle, eat local food, buy local products, use responsible companies and aim to travel outside busy seasons, and by doing all this, you are already an ambassador of sustainable goodwill.

Midnight sun and energy consumption

The sun does not set during the Midnight Sun season. In Rovaniemi there is light for around 24 hours from early June to early July, but the white nights season lasts all summer. The midnight sun is the opposite phenomenon of the polar nights. Midnight sun in Rovaniemi from early June to early July. Energy consumption per capita in Finland is the highest in European Union. Reasons for this include energy-intensive industry, a high standard of living, a cold climate, and long distances.

Helsinki food is political

Because Finland is a touristic destination for approximately 12.26 million tourists arrived with about 22.83 million overnight stays Helsinki stands out as a leading example in the fight against food waste, showcasing a comprehensive approach through innovative programs and community engagement. The city has implemented various initiatives aimed at reducing food waste, such as the "Helsinki Food Waste Initiative," which focuses on educating citizens about sustainable consumption and encouraging the redistribution of surplus food. Additionally, partnerships with local businesses and organizations have facilitated the creation of systems for collecting and redistributing food that would otherwise go to waste. One of the key aspects of Helsinki's strategy is the integration of technology to monitor and manage food waste, allowing for data-driven decisions that enhance the effectiveness of these programs. The city's commitment to sustainability is further reflected in its policies that promote circular economy principles, where food waste is viewed not just as a loss but as a resource that can be repurposed.

The famous formula: "Food is political," said by Ossi Paloneva, head chef at Helsinki's Loop Restaurant, where the surprisingly appetizing menu is made from food waste—ingredients that stores would normally throw away, is a prime illustration in sustainable food formulas. "I always thought it would be stupid to work as a chef and not think about the big picture," he says. Estimates vary on how much food is wasted in Finland each year, but the WASTESTIMATOR PROJECT, conducted by the Finnish National Resources Institute between January 2016 and February 2017, puts the figure at between 335 million and 460 million kilograms. On average, restaurants generate up to 70,000 kilograms each year.

Green schools and arts as a beneficial EU policy

Finland's educational system has long been lauded for its innovative approaches and high standards, but it also serves as a shining example of how the European Union's Green Deal can be effectively implemented at the grassroots level. The Green Deal aims to make Europe climate-neutral by 2050, and Finnish schools are demonstrating the benefits of this ambitious policy through sustainable practices and environmental education. 1950 was the year when the first STORE Recycling programmes began. They even had posters in the windows! There is no school in Finland that does not provide children with food. And lunch

is not just a meal, but also a lesson in education and social responsibility, which children learn from an early age. Finland is among the first countries to implement the "hot lunch" program at a national level. It happened in 1947, immediately after the war. The legislation of that time established that poor students would receive free hot meals at school from the state. (Saarni, H., 2018)

In Finland, schools are pivotal in fostering a culture of sustainability among young people. Many institutions have integrated environmental themes into their curricula, emphasizing the importance of ecological awareness and responsible consumption. For instance, students participate in projects that involve recycling, energy conservation, and biodiversity initiatives, which not only educate them about environmental issues but also empower them to take action in their communities. Additionally, the Finnish government has invested in the renovation of school buildings to meet high energy efficiency standards, aligning with the Green Deal's objectives. This includes the use of renewable energy sources, such as solar panels, and the implementation of energy-efficient technologies. These efforts not only reduce the carbon footprint of schools but also create healthier learning environments for students. The success of Finland's schools in embodying the principles of the Green Deal serves as a model for other EU member states. By prioritizing sustainability in education, Finland illustrates how the Green Deal can yield tangible benefits, such as improved environmental awareness, energy savings, and community engagement. In conclusion, Finnish schools showcase the potential of the Green Deal as a beneficial EU policy, highlighting how educational institutions can lead the charge toward a more sustainable future.

Schools with Finnish eco-block technology

Green Deal of Construction Plastics 2020-2027. There are currently almost 5,000 container return machines in Finland. Most of them are located in the same shops and kiosks that sell drinks, making returning them a convenient part of people's routine. Hotels, restaurants, offices, schools and event organizers return containers through their beverage suppliers. Every time a person buys a drink in a bottle or can, they pay a deposit of 15 to 40 cents. Recycled plastic even turned into homes and schools with Finnish eco-block technology, the best examples are the FINNISH SCHOOLS WITH FINISH ECO-BLOCK TECHNOLOGY in Indonesia. Here is an example of a project that combines environmentally friendly technology with building houses and classrooms for the future, you could not get much closer to one than in Indonesia's Lombok: Classroom of Hope from Australia teamed up with a Finnish company Block Solutions in 2021 to build the world's first-ever recycled plastic Eco-Block School using Finnish innovation and technology. A three-classroom school and a concept home were built as a pilot project in Sigar Penjalin – a North Lombok village that was heavily damaged by the 2018 earthquakes. Since then, a lot of schools have been built (<https://www.youtube.com/watch?v=xKf5gQzju7c>)

Oulu's famous recycle metal music festivals

An excellent case is cultural Oulu. In Oulu and Helsinki there are strong communities that organise Recycle Festivals. In Oulu, Finnish have a Green festival named "Flow Festival". "Flow Festival is a carbon-neutral festival," says Suvi Kallio, general manager of the urban music festival that takes place every August in Helsinki. (90,000 participants in 2022). The festival focuses on sustainability in energy production, catering and transportation. It reuses and recycles materials and encourages festival-goers to do the same. "It's obvious that this type of event causes emissions, especially the flights of international artists," says Kallio. "We offset the emissions by donating to renewable energy initiatives." The Nordic Business Forum (NBForum, over 7,000 participants in 2022), held at the Helsinki Fair Center 2022, in the Pasila district, hosted speakers including Richard Branson and Barack Obama. The organizers believe that the most effective way to influence society is to inspire and equip business leaders who want to make the world a better place while they promote metal music, of course. Yes! It is possible to combine metal music in Finland with green festivals. Many festivals are increasingly incorporating sustainable practices, aiming to reduce their ecological footprint while providing powerful cultural experiences. Finland, known for its vibrant metal scene and commitment to sustainability, offers great examples of this integration. (Fry, G. & MacNaghten, P., 2015)

One such example is the Oulu Music Festival, which has hosted various events promoting eco-friendly practices. Although primarily focused on classical and contemporary music, Oulu's broader festival scene, including the Oulu Music Festival and local metal festivals like Tuska Open Air in Helsinki, are progressively adopting greener initiatives. For example, metal festivals like Tuska have implemented recycling programs, use of renewable energy sources, and eco-conscious waste management, aligning with Finland's national sustainability goals.

Additionally, some metal festivals in Finland have started to promote environmental awareness directly through their programming and activities. Initiatives such as promoting public transportation to venues, encouraging the use of reusable products, and raising awareness about sustainability among attendees have become common.

While Oulu itself is more known for its local music scene, incorporating sustainable practices into festivals across Finland, including those featuring metal music, demonstrates that blending heavy metal culture with environmental responsibility is not only possible but increasingly popular. These efforts prove that metal festivals can be vibrant, energetic, and eco-friendly at the same time, setting a powerful example for other cultural and musical events worldwide.

Lahti and Turku's fun industry reshape green communities

Turku is the oldest city in Finland, smaller than Helsinki and Tampere. The Finnish film industry is carbon neutral here. Reducing carbon emissions is a trend in the film industry. And "THE WAIT" can be a perfect example. A film is set in the idyllic and isolated archipelago of southwestern Finland. Filming took place in late summer 2020 on a historic island called

Seili in Finnish and Själo in Swedish, which is also an official language in Finland. The island was the site of a leper hospital in the 17th and 18th centuries, and later an asylum for the mentally ill. The former asylum building now uses solar energy for energy and houses the Archipelago Research Institute of the University of Turku's Environmental Research Centre. (Pocock, J., 2014).

Lahti, Finland, is another perfect demonstration offering its residents transport tickets and food as rewards for eco-friendly behaviour to encourage them to reduce their carbon emissions. The initiative, called "CitiCap" and funded by the European Union, allows residents to track their carbon emissions during their journeys, thanks to an app that detects whether they travel by car, public transport, on foot or by bike. Every week, those who wish to do so receive a "carbon quota" which, if not exceeded by the deadline, is converted into "virtual euros", which can be exchanged for swimming pool tickets, bus tickets or, for gourmets, a cake at a pastry shop in the city. (Vihma, A., 2018).

Conclusions

The integration of green arts and culture within Finland exemplifies how creative sectors can play a pivotal role in advancing sustainable development, embodying the principles of the European Green Deal. Finland's progressive approach demonstrates a holistic vision that aligns cultural innovation with environmental responsibility, offering a compelling blueprint for other EU member states. As the Finnish Government explicitly emphasizes in its national plan, fostering sustainable arts and culture is fundamental to achieving a greener, more resilient future. This strategic focus reflects a broader understanding that cultural initiatives can serve as catalysts for environmental awareness, social cohesion, and economic vitality.

Finland's pioneering efforts highlight the potential of arts and culture not only as mediums of expression but also as active agents in sustainability transitions. Initiatives such as eco-friendly festivals, green public art projects, and cultural spaces powered by renewable energy showcase innovative ways to reduce ecological footprints while enriching community life. Moreover, these projects serve to educate and inspire citizens, promoting ecological literacy and participatory environmental activism. The Finnish case demonstrates that integrating green principles into arts and cultural policies is both feasible and effective, supporting the objectives of the EU Green Deal by fostering sustainable consumption and production, biodiversity, and climate resilience.

Finland's efforts align with the EU's emphasis on fostering a sustainable cultural sector that contributes to social well-being, economic growth, and environmental integrity. The country's model underscores that arts and culture are powerful tools for mobilizing societal change, shaping attitudes, and translating policy commitments into visible, impactful actions. Furthermore, it emphasizes the importance of cross-sector collaboration, stakeholder engagement, and innovative financing mechanisms to sustain green cultural initiatives. Finland's exemplary integration of green arts and culture reinforces the vital role of the creative sector in achieving the EU's sustainability objectives. The Finnish Government's

strategic plan explicitly recognizes arts and culture as drivers of change, leveraging their influence to foster a sustainable economy of the future. This approach not only advances environmental goals but also enriches cultural identity, social cohesion, and financial resilience. As other EU nations seek effective pathways toward the Green Deal's targets, Finland's experience offers valuable lessons: that sustainable arts and culture can serve as both inspiration and practical action, bridging ecological and societal ambitions. Moving forward, strengthening support for green arts initiatives will be essential in building a resilient and inclusive European future.

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

Valeriu ȘARGAROVSKI¹

Abstract: *This paper examines the implementation of the European Green Deal in Greece, 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 Greece'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, Greece, sustainability governance, renewable energy, policy coordination*

Introduction

The European Green Deal (EGD), launched by the European Commission in 2019, represents an ambitious roadmap aiming to make Europe the first climate-neutral continent by 2050. As a flagship initiative of the European Union (EU), it combines environmental objectives with economic transformation, seeking to decouple growth from resource use while promoting social inclusion and cohesion. The Green Deal includes major policy shifts in energy, transport, agriculture, industry, and construction, and it requires strong national commitment and institutional adaptation to be effectively implemented across member states.

Greece's engagement with the Green Deal presents a complex and multifaceted process, shaped by its economic vulnerabilities, administrative capacity, and strategic regional position. While the country has experienced considerable economic instability in the past decade, it has also demonstrated political will to engage with sustainability goals through

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reforms in energy transition, climate policy, and digital governance. Greece's national strategies, including the National Energy and Climate Plan (NECP) and Just Transition Development Plan (JTDP), indicate a clear alignment with the EU's environmental priorities.

This study aims to analyse how Greece operationalises the Green Deal's objectives within its domestic context. It focuses on the role of governance, institutional frameworks, and public policies in shaping the country's sustainable transition. Through an interdisciplinary approach grounded in International Relations and European Studies, the paper evaluates policy documents, legislative texts, and expert commentary to explore key dimensions of this transition: political and economic context, renewable energy deployment, circular economy initiatives, and socio-economic impacts.

By assessing Greece's strategies and challenges in implementing the EGD, this article contributes to the academic discourse on EU governance, policy diffusion, and sustainability transitions. It also provides practical recommendations for policymakers navigating similar processes in other EU member states.

1. The European Green Deal: Framework and Expectations

The European Green Deal (EGD) is the European Union's strategic response to the global climate crisis and a cornerstone of its long-term economic and geopolitical vision. Announced by the European Commission in December 2019, the Green Deal is both a policy agenda and a transformative political narrative. Its central objective is to make Europe the first climate-neutral continent by 2050, requiring a fundamental restructuring of energy systems, industrial production, mobility, agriculture, and waste management.

From an International Relations perspective, the Green Deal serves not only environmental and economic purposes, but also reinforces the EU's normative power globally. The EU positions itself as a global leader in climate diplomacy, technology transfer, and sustainable development, linking internal transformation with external action. The policy is embedded in a broader context of global climate agreements, including the Paris Agreement, and supports the United Nations Sustainable Development Goals (SDGs).

The Green Deal includes several key instruments:

- The European Climate Law, which enshrines the 2050 neutrality goal into EU legislation;
- The Fit for 55 Package, aiming for a 55% reduction in greenhouse gas emissions by 2030;
- The Just Transition Mechanism, which provides financial and technical support to regions most affected by the green transition;
- The Circular Economy Action Plan, focused on product sustainability, waste reduction, and resource efficiency;
- The Farm to Fork Strategy, targeting sustainable food systems;
- The Renovation Wave, addressing energy efficiency in buildings;
- The EU Taxonomy Regulation, which defines sustainable investments.

The EGD is supported by significant financial commitments, notably through the NextGenerationEU recovery fund and the Multiannual Financial Framework (2021–2027). The synergy between economic recovery and environmental transformation reflects a paradigm shift in EU policy thinking—where sustainability is no longer a sectoral concern but a cross-cutting priority.

Nevertheless, the Green Deal faces important challenges. The uneven capacity of member states, political resistance, and global energy shocks—such as those stemming from the war in Ukraine—have raised concerns about energy security and transition costs. In this context, understanding how individual states like Greece adapt to the EGD is vital for assessing the feasibility of collective EU goals and the robustness of EU governance mechanisms.

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² European Commission. (2019). *The European Green Deal*. COM(2019) 640 final.

³ Lenschow, A., & R. Zito. (2021). "Normative Power Europe and the Green Deal." *Journal of European Public Policy*, 28(10), 1511–1531.

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3. Greece's Political and Economic Landscape in the EU Context

Greece occupies a unique position within the European Union—geopolitically located at the crossroads of Europe, Asia, and Africa, while economically situated at the EU's southern periphery. The country's recent history has been defined by profound financial and institutional crises, including the sovereign debt crisis of 2009–2015, which significantly weakened its administrative structures and public trust in governance.⁵

Despite exiting the EU's enhanced surveillance framework in 2022, the socio-economic impact of austerity measures, budgetary constraints, and high unemployment continues to shape public policy. These structural vulnerabilities are central to understanding the country's capacity to implement the European Green Deal (EGD). For Greece, aligning with the EGD means not only responding to environmental imperatives but also rebuilding institutional legitimacy, ensuring energy security, and stimulating inclusive economic growth.

At the political level, Greece has shown increasing alignment with EU climate priorities. Since 2019, successive governments have placed environmental and energy reforms higher on the national agenda. In 2019, Greece announced its plan to phase out lignite by 2028, a symbolic and strategic shift given the country's long-standing reliance on coal. The National Energy and Climate Plan (NECP), adopted in 2019 and revised in 2023, outlines targets for reducing greenhouse gas emissions, increasing renewable energy capacity, and improving energy efficiency.⁶

Moreover, the Just Transition Development Plan (JTDP) focuses on the decarbonisation of lignite-dependent regions such as Western Macedonia and Megalopolis. These areas face heightened social and economic risks from the green transition, including job losses and demographic decline. The JTDP thus serves as a crucial tool in addressing the distributive effects of sustainability policies, ensuring that no region is left behind.

However, Greece's efforts are constrained by systemic challenges. The public administration suffers from limited capacity, fragmentation, and bureaucratic inertia. While

⁴ European Commission. (2021). *Fit for 55: Delivering the EU's 2030 Climate Target*.

⁵ Mitsopoulos, M., & Pelagidis, T. (2019). *Who's to Blame for Greece?* Palgrave Macmillan.

⁶ Hellenic Ministry of Environment and Energy. (2023). *Revised National Energy and Climate Plan (NECP)*.

EU funds are available through the Just Transition Mechanism and Recovery and Resilience Facility (RRF), absorption rates remain uneven.⁷ Furthermore, energy inflation and global market volatility have complicated long-term planning and increased dependency on natural gas imports, often from politically unstable regions.

In this context, Greece's political and economic landscape illustrates the tension between European integration and national realities. The Green Deal is both an opportunity and a test: an opportunity to modernise and green the economy, and a test of institutional resilience and strategic planning.⁸

4. National Policies for Sustainability: Renewable Energy and Circular Economy

In its effort to implement the European Green Deal, Greece has adopted a series of national policies aimed at accelerating its transition towards a low-carbon and resource-efficient economy. Two key pillars of this transformation are the development of renewable energy and the promotion of a circular economy. These sectors are not only environmental priorities but also strategic components for achieving energy independence, economic diversification, and compliance with EU climate goals.

4.1 Renewable Energy: Expansion and Integration

Greece has made considerable progress in deploying renewable energy sources (RES), particularly in solar and wind energy. According to the Hellenic Ministry of Environment and Energy, renewable energy accounted for approximately 50% of electricity production in 2023, a significant increase from the previous decade. The country benefits from abundant solar radiation and favourable wind conditions, particularly in the Aegean Islands and mountainous regions.⁹

The National Energy and Climate Plan (NECP) outlines ambitious targets for 2030, including:

- 80% share of RES in electricity generation,
- 38% share of RES in gross final energy consumption,
- A 55% reduction in greenhouse gas emissions compared to 1990 levels.¹⁰

To facilitate this transition, Greece has introduced reforms to simplify licensing procedures for RES projects, launched competitive auctions, and improved grid interconnectivity. The Independent Power Transmission Operator (IPTO) has invested in large-scale projects such as the Crete-Attica and Cyclades interconnections, which are vital for integrating renewable energy into the national grid.¹¹

⁷ European Commission. (2021). *Recovery and Resilience Facility – Country Chapter: Greece*.

⁸ OECD. (2022). *Regions in Industrial Transition: Supporting Greece's Just Transition*.

⁹ International Energy Agency. (2022). *Greece 2022: Energy Policy Review*.

¹⁰ Hellenic Ministry of Environment and Energy. (2023). *National Energy and Climate Plan (NECP)*.

¹¹ IPTO. (2023). *Development Plan for the National Transmission System 2023–2032*.

However, several barriers remain. Delays in environmental permitting, opposition from local communities, and insufficient storage infrastructure limit the system's flexibility and resilience. Additionally, the intermittency of wind and solar energy necessitates stronger investments in battery storage, smart grids, and demand-side management.¹²

4.2 Circular Economy: A Nascent but Growing Priority

The circular economy concept remains less developed in Greece compared to renewable energy but is gaining traction under the influence of EU directives. The National Waste Management Plan (2020–2030) and the National Strategy for Circular Economy (updated in 2021) set the framework for reducing landfill dependency, increasing recycling rates, and promoting eco-innovation.

Greece's waste management system has historically relied on landfilling, with limited infrastructure for composting, reuse, and recycling. EU infringement procedures in past years have pressured Greece to modernise its approach. In response, the government has introduced:

- Extended producer responsibility (EPR) schemes;
- Separate collection systems for organic and plastic waste;
- Financial incentives for circular business models;
- Awareness campaigns on sustainable consumption.¹³

Municipalities have a key role in implementing local circular economy initiatives, but disparities in capacity and coordination persist. The private sector has begun to engage in circular practices, particularly in the packaging, textile, and food industries, but uptake remains uneven.

The successful transition to a circular economy requires systemic change—across production, consumption, and waste management chains—and stronger integration between environmental policy and industrial innovation. While early progress is evident, Greece's circular economy remains in a formative stage, with great potential for scale-up through EU funding and partnerships.

5. Challenges and Opportunities in Greece's Green Transition

The implementation of the European Green Deal in Greece is characterised by a dual dynamic: while national authorities have adopted progressive legislative frameworks and embraced EU climate targets, the actual transition process is constrained by a range of structural, institutional, and socio-economic challenges. At the same time, the transition opens significant opportunities for modernisation, regional development, and strategic positioning within the EU's evolving energy and sustainability agenda.

¹² European Commission. (2021). *Assessment of National Energy and Climate Plans – Greece*.

¹³ UNEP. (2021). *Circular Economy in Greece: Current Situation and Roadmap*.

5.1 Structural and Institutional Challenges

One of the most persistent barriers to effective implementation is **institutional fragmentation**. The overlap of responsibilities between ministries, agencies, and local governments leads to coordination inefficiencies and delays in policy execution.¹⁴ Environmental governance in Greece often suffers from legal complexity, unclear mandates, and frequent legislative changes, which undermine continuity and policy learning.

Administrative capacity is another critical issue. Although progress has been made in digitalising public services and reforming the civil service, many public institutions lack the human and technical resources to manage complex sustainability programmes, monitor implementation, and engage with stakeholders.¹⁵ This is particularly evident in regions with weak local governments, where EU funds are underutilised due to limited absorption capacity.¹⁶

Public perception and participation also pose challenges. While there is growing awareness of environmental issues among citizens, mistrust in institutions and fear of socio-economic impacts—such as job losses from lignite phase-out—have generated resistance to green reforms in certain communities.¹⁷ In some cases, protests against wind farms and other renewable projects have highlighted the need for stronger stakeholder consultation and benefit-sharing mechanisms.

5.2 Strategic and Economic Opportunities

Despite these constraints, the Green Deal presents multiple strategic opportunities for Greece:

- **Economic diversification and innovation**, especially through green technologies, renewable energy infrastructure, and sustainable tourism;
- **Energy independence**, by reducing fossil fuel imports and investing in domestic RES capacity;
- **European leadership**, as Greece positions itself as a clean energy hub in Southeastern Europe, especially through planned interconnectors with the Balkans, North Africa, and the Eastern Mediterranean;
- **Job creation**, particularly in emerging green sectors such as energy retrofitting, recycling, and environmental services;
- **Access to EU funding**, through the Just Transition Mechanism, the Recovery and Resilience Facility, and the European Structural and Investment Funds.¹⁸

Furthermore, green investments are increasingly seen as a lever to stimulate post-crisis recovery and long-term resilience. The European Commission recognises Greece as a key

¹⁴ European Environment Agency. (2022). *Environmental governance in Europe: State of play and challenges*.

¹⁵ Papadopoulos, Y. (2020). *Governance challenges in the Greek public sector*. *South European Society and Politics*, 25(1), 21–39.

¹⁶ European Commission. (2023). *Greece Country Report – Recovery and Resilience Plan*.

¹⁷ Psarikidou, K., & Szerszynski, B. (2021). *Green transitions and energy democracy in the EU periphery: The case of Greece*. *Energy Research & Social Science*, 78, 102138.

¹⁸ European Commission. (2021). *Just Transition Mechanism: Technical Guidance*.

player in the EU's Southern Energy Corridor, making it eligible for transnational infrastructure support and funding.

Maximising these opportunities requires **strategic planning**, **strong inter-ministerial coordination**, and **investment in human capital**. Moreover, it necessitates a narrative of **inclusive transition** that aligns ecological goals with social equity and national resilience.¹⁹

6. Governance and Institutional Capacity

Effective governance is the cornerstone of any successful sustainability transition. In the context of Greece's implementation of the European Green Deal, the institutional capacity to design, coordinate, and enforce environmental policies is a determining factor for achieving long-term impact. This chapter explores the configuration of Greece's public administration in relation to green governance, the mechanisms of inter-institutional coordination, and the degree of integration between national and EU objectives.

6.1 Central Government and Policy Coordination

The primary responsibility for environmental and energy policy lies with the **Ministry of Environment and Energy**, which oversees the development and monitoring of the National Energy and Climate Plan (NECP), circular economy strategy, and emissions reduction targets. However, climate action intersects with multiple sectors—transport, finance, agriculture, education—requiring a whole-of-government approach.²⁰

To address this, Greece established the **National Council on Climate Change and Energy**, a cross-ministerial platform designed to enhance policy coherence and stakeholder engagement. Despite its formal role, the Council has limited executive authority, and horizontal coordination between ministries remains weak in practice.²¹ Policy fragmentation and short-term political cycles hinder the continuity and strategic depth of sustainability efforts.

Greece's **Recovery and Resilience Plan (RRP)**, aligned with the EU's *Recovery and Resilience Facility (RRF)*, provides a framework for integrating climate goals into broader development planning. However, the effectiveness of RRF implementation is highly dependent on the administrative capacity of both central and regional authorities.

6.2 Regional and Local Governance

Local governments are increasingly recognised as essential actors in the implementation of the Green Deal, particularly in waste management, energy efficiency, and public transport. Yet, **regional disparities** in governance quality and financial resources

¹⁹ OECD. (2023). *Transitioning to a Green Economy in Greece*.

²⁰ Hellenic Ministry of Environment and Energy. (2023). *Revised National Energy and Climate Plan*.

²¹ Papadopoulos, Y. (2020). *Governance challenges in the Greek public sector*. *South European Society and Politics*, 25(1), 21–39.

remain a significant obstacle. According to the Hellenic Court of Audit, many municipalities lack technical staff and access to data, making it difficult to develop and manage sustainability projects.²²

The **decentralisation of environmental responsibilities** has not been matched by adequate capacity-building programmes or fiscal autonomy. As a result, implementation remains uneven across the territory. Some large cities such as Athens and Thessaloniki have adopted ambitious local strategies, but smaller and rural municipalities struggle to access EU funding or develop long-term green plans.

EU initiatives such as the **Covenant of Mayors** and the **Urban Agenda for the EU** have supported local-level engagement, but stronger links between national and subnational levels are needed for coherent policy delivery.

6.3 Stakeholder Engagement and Transparency

The success of green policy also depends on the **legitimacy** of governance processes. Public participation in Greece's environmental decision-making has historically been weak. While there have been improvements in administrative transparency and digital public services, stakeholder consultation often remains superficial.

Civil society organisations, academic institutions, and local communities report difficulties in influencing the policy process, particularly when it involves large-scale renewable energy projects or land-use planning. The liberalisation of the energy sector has also raised questions about the role of private actors and the balance between market incentives and public interest.²³

Improving institutional capacity thus requires:

- Strengthening inter-ministerial coordination through legally empowered bodies;
- Investing in training and digital tools for local governments;
- Institutionalising consultation processes at national and municipal levels;
- Clarifying roles and responsibilities across vertical and horizontal governance.

In sum, **governance is both a bottleneck and a lever** in Greece's green transition. By investing in administrative reform and inclusive policy structures, Greece can accelerate implementation and strengthen democratic legitimacy in the sustainability domain.²⁴

Conclusions and recommendations

Greece's journey toward implementing the European Green Deal (EGD) highlights a complex interplay between ambition and capacity. While the country has demonstrated a strong commitment to EU climate objectives—evident in its National Energy and Climate Plan (NECP), Just Transition Development Plan (JTDP), and renewable energy initiatives—systemic challenges persist. These include institutional fragmentation, limited administrative

²² Hellenic Court of Audit. (2022). *Environmental Governance at the Local Level*.

²³ Open Government Partnership. (2023). *Greece Action Plan Review 2022–2024*.

²⁴ European Commission. (2021). *Governance for the Green Deal – Country Summary: Greece*.

capacity, and regional disparities, which collectively hinder the effective realisation of sustainability goals.

Key Conclusions

1. Institutional Fragmentation:

Overlapping responsibilities among ministries and agencies lead to coordination inefficiencies, delaying policy implementation and reducing effectiveness.

2. Administrative Weakness:

Public institutions at both central and local levels often lack the technical expertise and resources to manage complex environmental programmes.

3. Low Stakeholder Engagement:

Despite progress in digitalisation, transparency and meaningful public participation in decision-making remain underdeveloped.

4. Economic Vulnerability:

Dependency on energy imports, combined with inflationary pressures and global market volatility, continues to expose Greece to risks that hinder long-term sustainability planning.

5. Territorial Disparities:

Urban areas advance faster, while rural and coal-dependent regions struggle with access to funding and technical know-how.

Policy Recommendations

1. Strengthen Inter-Ministerial Coordination:

Empower national coordination bodies (like the Climate Council) with legal authority, operational budgets, and performance monitoring frameworks.²⁵

2. Build Administrative Capacity at All Levels:

Provide systematic training, expand digital tools, and increase staffing in municipalities and regional offices.²⁶

3. Institutionalise Stakeholder Participation:

Create regular multi-actor consultation forums including civil society, academia, and private sector actors. Promote procedural transparency.²⁷

4. Invest in Green Infrastructure and Innovation:

Prioritise battery storage, smart grids, retrofitting, and nature-based solutions, funded through the Recovery and Resilience Facility and cohesion policy.²⁸

5. Reduce Regional Inequality in Transition:

²⁵ European Commission. (2021). *Governance for the European Green Deal – Greece Country Report*.

²⁶ OECD. (2023). *Transitioning to a Green Economy in Greece*.

²⁷ Open Government Partnership. (2023). *Greece Action Plan Review 2022–2024*.

²⁸ European Investment Bank. (2023). *Greece: Climate Investment Country Profile*.

Design tailored support mechanisms for Just Transition areas and foster inter-municipal collaboration to scale local sustainability solutions.²⁹

These steps are critical not only for fulfilling EU obligations but also for ensuring that Greece's green transition is inclusive, credible, and resilient. The country's experience provides a valuable reference point for other Southern and Eastern European states navigating similar challenges within the framework of the European Green Deal.

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²⁹ European Commission. (2022). *Territorial Just Transition Plans – Greece*.

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THE EUROPEAN UNION AND AFRICA'S STRATEGIC ENERGY PARTNERSHIP IN THE COMPLEX GLOBAL ARENA

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Abstract: *The Africa-European Union (EU) relations have been ongoing amidst the complex global challenges. The international system is experiencing a restructuring process within the energy sector market. This study aims to examine the Africa-EU Energy Partnership's role in promoting energy security amidst the complexities of the global arena. This paper contributes to the understanding of the challenges and opportunities of the joint efforts in promoting energy access and the achievement of Sustainable Development Goal 7. This paper employs qualitative methodologies, drawing on the perspectives of 16 participants through in-depth interviews. The participants were selected through purposive sampling and snowball sampling. The results indicate that opportunities for enhancing energy security in Europe and Africa are rooted in a mutually beneficial collaboration (win-win partnership). Equally important, the two actors have facilitated energy trade relations and investments to improve energy accessibility and availability through enhanced infrastructure projects. However, this paper identifies energy geopolitics, the economic slowdown, and a lack of energy infrastructure development as some of the factors undermining the successful implementation of energy-related projects. In this study, continuous research and energy innovation projects are vital in navigating the Africa-EU roadmap to energy security.*

Keywords: *European Union, African Union, energy security, strategic partnership, sustainable development.*

Introduction

The 21st century has reflected a VUCA world—characterised by volatility, uncertainty, complexity, and ambiguity—due to complex challenges such as pandemics, geopolitical issues, climate change, energy security concerns, migration issues, and digital technological advancements. The global landscape is undergoing a radical restructuring process (Ikenberry, 2010; Ali, 2025). Ali (2025) discusses the ongoing transformation of diplomatic engagement in

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regional and international relations towards addressing issues of common concern. The changes in the global system are all influenced by the process of globalization (Cerny, 2000; Schoeman, 2024). Consequently, the contemporary world energy crisis has received significant attention in Africa and is also an intensified priority for the European Union (EU). There is concern that, if not addressed, the crisis will likely continue to escalate in the 21st century and beyond, compromising future generations. Thus, there is a growing alarm regarding environmental changes and environmental sustainability. Deutch (2007) asserts that the challenges of climate change significantly impact energy sources and availability. Meanwhile, Bashir (2025) argues that climatic and environmental changes contribute to the affordability, availability, and accessibility of energy demand, accessibility and usage. It is important to highlight that energy security, like any other global challenge, is complex. Amid the socio-economic and political issues, energy security remains a major concern that transcends geographical borders. In this context, the international system is facing threats to the energy sector, underscoring the importance of global cooperation in addressing these challenges to energy security.

According to the International Energy Agency Report (IEA) (2024:3), geopolitical issues and the escalation of armed conflicts continue to leave the energy market fragile. The report further states that 750 million people in Sub-Saharan Africa face challenges in accessing energy, with more than 2 billion estimated to have limited access to clean cooking fuels. The IEA (2024) notes that, despite Europe achieving a 5% reduction in energy intensity, ongoing geopolitical uncertainties threaten the availability and accessibility of energy due to changes in natural gas trade routes and energy prices. Whilst acknowledging varying levels of energy poverty among countries, the European Commission (EC) (2024) provided that between 8% and 16% of the EU population is confronting energy poverty. The complex global realities impact energy security, and Deutch (2007) highlighted the importance of both developed and developing states in curbing carbon dioxide emissions. Bahgat (2011) emphasizes the significant need for international cooperation to tackle energy insecurity. As such, bilateral partnerships have increased in addressing energy security and the climate change crisis. Despite establishing the Africa-EU Energy Partnership (AEEP) in 2007, the African Union (AU) and the European Union have developed respective strategies to address energy security. The European Green Deal, established by the European Parliament in 2019, was a huge milestone for the EU as a growth strategy². Likewise, the AU has called for awareness and support for climate change resilience and adaptation through the Green Growth Agenda. However, there remains to be determined the challenges and opportunities of the partnership in the restructuring of the global arena. This paper provides a vital contribution to the sustainable future of the EU and Africa on energy security.

This paper is guided by the following questions: What is the role of the Africa-EU Partnership in enhancing energy security? What are the challenges for Africa and the EU Energy Partnership towards strategizing energy security? The study employed qualitative methodologies to gain in-depth insights from policymakers and key experts to determine the AEEP within the energy security dynamics.

² EC. *European Green Deal*. Available at European Green Deal - Consilium

Literature review

The transformational changes as reflected in armed conflicts, pandemics, geopolitics, and climate change have greatly influenced the unstable and unpredictable environment, influencing the volatility of the global arena. The contemporary world is operating in a complex situation of uncertain energy security. The concept of VUCA is reflected in various sectors as established by various research that includes digital geopolitics (Liu and Miao 2022), business (Ambika 2024), food security (Sharif 2017), the health sector (Cockburn 2023) and the energy sector (Mahajan and Baride, 2023). In the same understanding, the global challenges and events are uncertain and unpredictable. Related to this study on energy security, the major concern is addressing climate change and balancing the energy accessibility and availability.

The International Energy Agency (IEA, 2023) defines energy security as the uninterrupted availability of energy sources at an affordable price. Cherp et al (2012) refer to energy security as the uninterrupted supply of vital energy services to power economic activities. Hence, energy security has increasingly become a matter of global concern in the complexity of the international system. The road map for implementing energy projects and towards net-zero emissions and efforts to decarbonize the energy sector calls for a multilateral approach. This paper, amidst a VUCA environment, seeks to determine the role of the Africa-EU Energy partnership towards the energy transition and managing the volatility, uncertainty, complexity, and ambiguity environment in the overall development partnership.

In the world of VUCA, there is an increasing role of regional and international partnerships thriving in addressing global challenges, and challenges of energy security (Umbach, 2008; Monyei et al, 2022; Fleishman, 2024). In the context of globalization, countries and geographical regions experience common challenges and encounter different opportunities, which makes a joint partnership a solution towards the roadmap of energy security. Ali (2025) mentions the role of globalization in the process of global transformations and international partnerships. The United Nations (UN), with the 17 Global Goals, reflect the importance of promoting a sustainable environment and energy supply. The UN presented the Sustainable Development Goals (SDGs), *“No poverty, Zero hunger, Good health and well-being, Quality Education, Gender equality, Clean water and sanitation, Affordable and clean energy, Decent work and economic growth, Industry, innovation and infrastructure, Reduced inequalities, Sustainable cities and economies, Responsible consumption and production, Climate Action, Life below water, Life on land, Peace, justice and strong institutions and Partnership for the goals”*. UN (2015) states that countries have the responsibility to implement the goals in their respective regions and at the global level. The purpose of establishing the goals was to address the complex challenges in the international system that are manifesting in the socio-economic and ecological sectors (Bernstein 2017). The author further states that the achievement of the SDGs might involve effective partnership and commitment to the mechanisms. In the complex global arena, this paper mainly centres on particular emphasis on Goal 7, which focuses on securing affordable clean energy, has synergic correlation to Goal 9 aims to achieve energy and Industry, Innovation, and Infrastructure, and Goal 13 specifically addresses climate change, and Goal

17 fosters global cooperation. This study recognizes that having a look at the interconnection of the goals would be important in determining the aspects underlying the AEEP.

The year 2025 marks the silver jubilee of the AU and the EU partnership since the first Africa-EU Summit held in Cairo, Egypt, in 2000³. The relations have increasingly become vital in the global arena. The 21st century provided a new momentum and brought in a new dimension for collaboration. Since then, there have been the following summits and engagements. The restructuring of the international system and common challenges are some of the factors driving the EU relations with African countries (EU,2024). The second summit was held in 2007 in Lisbon, Portugal, in which the two actors signed the Africa-EU Joint Strategy (JAES). This summit witnessed an agreement to establish and enhance their friendship, specifically in addressing issues of common interest and elaboration of diplomatic relations. The Third Africa-EU Summit of Heads of State and Government took place in Tripoli, Libya, on 29 and 30 November 2010. Whilst the 4th summit took place in Brussels. The 5th Summit of the Africa-EU was held in Côte d'Ivoire, and the relationship was elevated in 2022 at the 6th Summit was held in Brussels, operating as "Two Unions, a joint vision"⁴. Europe and Africa share socio-economic and political relations and during the 2022 Summit agreed towards a Joint Vision for 2030. The two partners, despite their different geographical zones, are cooperating in an approach to address global challenges.

It is important to mention that it was at the 2nd Africa-EU Summit in 2007 that the AEEP was adopted by the African and European Heads of State in Portugal⁵ to deepen their commitment towards energy security. The overall aim of the AEEP is to facilitate the achievement of universal access to affordable, sustainable and modern energy services in Africa and generate socio-economic development⁶. The partnership seeks to transform from the use of fossil fuels to clean energy, especially in Sub-Saharan countries. This Energy partnership brought forward another dimension from being trade and economic oriented, towards promoting energy access and its sustainability. The evidence of energy insecurity and energy poverty, as previously mentioned in the introduction, highlights that energy security is not solely a country-specific or region-specific concern. The underlying problem is that energy security concerns are a global, specific concern.

The efforts of the EU addressing climate change and the energy crisis are established through its European Green Deal (strategy towards a green economy by 2050) (Ingmar and Jordan, 2021), the EU Circular Economy Action Plan as well as the EU Biodiversity Strategy 2030. The Africa and EU partnership is pursuing climate neutrality by 2050, reducing carbon emissions. At the centre of the Green Deal, the EU is working towards an economy with net-zero greenhouse gas emissions. On the other hand, the AU is guided by its Agenda 2063, complemented by the Africa Climate Change Strategy 2020-2030, aiming at promoting smart agriculture, clean digital technologies and sustainable economies. In the transformation of the

³ African Union. *Africa-European Union (EU) Partnership*. Available at Africa - EU | African Union Accessed on 19 May 2025.

⁴ European Union. *European Union - African Union summit, 17-18 February 2022*. European Union - African Union summit - Consilium Accessed on 22 May 2025

⁵ Africa-EU Energy Partnership. Available at Homepage - Africa-EU Energy Partnership Accessed on 19 May 2025

⁶ Ibid 6

global arena, corresponding strategies to approach energy security were further elaborated, which include the Africa-EU Green Energy Initiative (AEGEI). The Green Transition is a priority for the Africa-EU partnership, and solar, hydropower, and geothermal energy are examples of renewable energy products that are driving competitiveness and opportunities in the energy sector. The EC (2025) announced that over €20 billion has been pledged under the Team Europe approach, specifically €3.4 billion by the EU and for AEGEI to support the deployment of at least 50 GW of additional renewable energy generation capacity as a contribution to Africa's electricity access by 2030. Renewable energy sources could be a solution to energy security (Bekhrad et al, 2020; Hinrichs-Rahlwes, 2024). Thus, AEGEI emphasizes the green transition. The Africa-EU partnership role towards enhancing energy security reflects that the global challenge does not respect geographical borders.

Despite the availability of resources, especially in African countries with untapped resources such as lithium and cobalt, securing the present and future generations' demand for energy security (Pistelli, 2020), the major concern is the insights into energy poverty. Oil reserves are available in countries that have a high risk of internal instability, which Obi (2010) referred to as the resource curse in African countries having natural resources such as Nigeria, the Democratic Republic of Congo and Sierra Leon. Likewise, the surging armed conflicts such as the ongoing Russian-Ukraine war and global political instabilities have compromised energy security. The war has heightened the vulnerability of the energy sector within the contemporary international system. The war has indeed complicated the geopolitics of energy security in the region and abroad. The transformational geopolitics also reflects a shift in geopolitical alliances aimed at promoting the green transition and renewable energy sources. EC (2025) reported a reduction from 45% to 19% of Russian gas. The EU has heavily relied on Russian gas imports; however, the ongoing war has driven the EU to explore new markets and diversify its energy sources through partnerships with African countries. The EC (2025) further reported its target to prevent and end Russian imports by 2027. The EU is working towards improving energy efficiency and industrial decarbonization. The challenge, therefore, is to establish a peaceful environment to improve energy security through resource management and low-carbon energy sources and reducing GHG emissions. In the complexity of the international system, what are the opportunities for the Africa-EU energy partnership to contribute to the stability and sustainability of the energy market?

In the context of the Africa-EU partnership, energy security and global cooperation represent a dynamic and complex process. The evolving relations are associated with emerging concerns in reference to the 2025 AU Summit held in February. EU strategic priorities tend to cast a shadow over its historical experiences with Africa versus the AU 2025 Theme "Justice for Africans and People of African Descent Through Reparations"- Industrialized nations in the Global North bear historical responsibility for environmental degradation through resource extraction. Several reparations approaches, such as those in the form of climate financing and technology transfer, have been suggested. Amidst such concern, the EU-AU Ministerial Summit held on 20 May 2025, emphasized strengthening cooperation between the two regions towards peace, security and governance, multilateralism, prosperity,

people, migration and mobility (EU,2025). This paper, therefore, seeks to explore the opportunities for the EU and African prosperity in the energy sector.

Theoretical framework

This study employed the lens of integration theory to determine the Africa-EU energy partnership in the complexity of the contemporary system. This theory, having key proponents that include Mitrany in the 1940s, Deutsch (1957), and Haas (1964), posits that regardless of geographical position, states collaborate to address common issues and common goals. Integration theory explains that member states share insights and decision-making to achieve common goals. The Africa and EU partnership illustrates the core principles of this theory. Schimmelfennig (2018) mentions that integration has spill-over effects as the integration process unfolds. The theory further highlights that common issues are resolved through global cooperation, as these global challenges are complex and do not respect States' geographical borders. Harrison (2024), despite referring to integration as a political engagement, also embraced the economic and social aspects.

In the context of energy security, the theory contributes to the understanding of the joint coalition of Africa and the EU in the roadmap to encourage the Green Transition and secure affordable, clean energy. This paper acknowledges the essentiality of the Africa-EU partnership, which fostered the development of the AEEP to address energy poverty and foster socio-economic and political cooperation. Nye (1975) mentioned that integration theory prioritizes peace and political stability in the promotion of economic collaborations. In this case, integration and energy security offer both opportunities and challenges for the Africa-EU partnership. The impact of energy poverty is surrounded by complex issues, socio-economic and political instabilities, increasing energy prices and trade relations. Harrison (2024) states that the integration process is not spared from competing diverse interests in the political community. Hence, this approach to integration theory contributes to the conduct of an in-depth analysis of this study.

Methodology

This study used qualitative methodology to determine the EU and Africa's Strategic Energy Partnership in the complex global arena. This study made use of document analysis and in-depth interviews. Document analysis involved an analysis of books, journals and reports. In-depth interviews are conducted with 16 policymakers and experts from the AU and the EU to get a diversity of insights into the opportunities and challenges faced by the Africa-EU partnership on energy security. The interview discussions were conducted between April 2024 and February 2025, and each interview discussion was not more than 45 minutes conducted on the Webex platform. Purposive and snowball sampling were used to select the participants. Ethical codes of conduct were respected in this study, and to ensure anonymity, the participants' names were not revealed, and no harm was associated with participating in

the study. This study is guided by the research questions: What is the role of the AEEP in enhancing energy security? What are the challenges for Africa and the EU Energy Partnership towards strategizing energy security?

Data analysis and discussions

This paper sought to determine the Africa-EU partnership on energy security. Taking only African and European geographical locations, the study managed to conduct sixteen interviews, 5 females and 11 males. The participants were comprised of 7 from Africa and 9 from Europe. The participants' educational level ranged from a bachelor's degree to post-doctoral. In terms of working experience, only 2 participants had less than 5 years, 3 participants had between 11 to 15 years working experience, and 5 had working experience between 5 to 10 years, whilst 6 participants had more than 15 years of working experience.

The participants were asked about the opportunities for the Africa-EU partnership on energy security. It was established by one of the policymakers that the AEEP had helped to enhance projects focused on improving energy security. The Africa-EU partnership has developed into a multifaceted strategic partnership reflecting deep-rooted historical, economic and political relations. The two actors had reflected commitment through exchange in conferences and visits. One of the participants mentioned that there has been an increase in shared economics and commercial interest, as well as political commitment in the Africa-EU partnership. UN (2015) emphasized on collaboration of governments in addressing global challenges for sustainable development. In this case, this study established that the participatory approach between Africa and the EU allows for the sharing of knowledge and practices towards the Green transition and secure energy security. It was also established that the partnership is vital, especially in the increasingly complex challenges of climate change and promotes African participation in global governance.

During the 6th Summit of Africa and the EU, President von der Leyen expressed the EU's commitment towards the transition towards renewable energy and Africa's abundance of solar, wind and hydropower (EU,2022). Likewise, H.E. Moussa Faki Mahamat, Chairperson Of The African Union Commission, expressed consensus in joining hands with the EU in addressing climate change, energy transition towards sustainable development (AU,2022). The quest for sustainable development has been central to the Africa-EU partnership.

The study found that energy security was considered important in facilitating trade relations. Prior to the EU-South Africa summit held in March 2025, which opened the negotiations on Clean Trade and Investment Partnership between the EU and South Africa, EC President Ursula von der Leyen said, *"The geopolitical landscape is shifting, making strong partnerships more important than ever. I'm going to Cape Town with one goal: to strengthen our unique relationship with South Africa across the board – taking our cooperation on trade, critical raw materials and clean energy to the next level, and bringing new investment under Global Gateway....."* (EC,2025). In the restructuring of the international markets, Hawker (2025) states that the EU and South Africa are strengthening their collaborations towards green energy amidst America's trade adjustment in the global arena. The author mentioned the €4.7 billion, which

was announced by the EU to support development in South Africa, including green energy projects.

The study established that the strategic partnership serves as a pathway to promote economic development and cooperation. One of the key experts noted that the green transition holds significant potential for developing a sustainable economy and fostering economic dialogues within partnerships. The Africa-EU partnership can greatly enhance energy security by shaping trade collaborations. Commercial trade has emerged as a crucial strategic tool for the AEEP. The EU has expressed its commitment to supporting the African Continental Free Trade Agreement (AfCTA) by facilitating trade and investments in the energy sector. The Agreement provides a platform for the AU and EU markets to ensure energy availability, accessibility, and affordability through the transition to green energy. One of the participants pointed out that Africa and the EU share common interests in diversifying their energy sources and European investments in oil, gas, renewable energy, and hydrocarbon resources in African countries such as Algeria, Egypt and South Africa.

The Cabora Bassa Report (2023) further mentions discoveries of gas in African countries such as Ghana, Mozambique and Tanzania. Recently, Zimbabwe confirmed a gas discovery at the Cabora Bassa project by Invictus Energy. The increasing gas demand for Europe contributed to the development of liquid natural gas (LNG) projects in African countries such as Mozambique, Nigeria, and Senegal. The Africa and Just Energy Transition Report (2022), Nigeria and Angola, as leading oil producers in Africa, and crude oil exports primarily directed to Europe. The discovery of oil and gas, along with the generation of trade, could contribute to strengthening global energy security.

The study also established the role of the Africa-EU partnership in infrastructure and technology development on energy projects. One participant mentioned the Power-to-X (P2X) hydrogen power reference plant (Public-Private Partnership) in Morocco. EU (2025) mentioned that the hydrogen power plant, which is part of the Africa-EU Green Energy Initiative, seeks to reform electricity production and access. The Olkaria geothermal plant in Kenya is being expanded with support from the EU, along with Egypt's wind power plant and the solar power plant in Ethiopia. Gorou-Banda solar plant in Niger; Egypt to Greece interconnection cable for electricity⁷. The execution of the Grand Inga Dam as a hydropower project in the Democratic Republic of Congo, which intends to transform Africa from non-renewable energy sources to renewable sources and guarantee access of all Africans to clean and affordable electricity (AU, 2015). AU (2015) states that the hydroelectric project is expected to generate 43,200 MW of power to support regional power pools towards affordable and accessible electricity. Additionally, the EU allocated 113 million EUR to rehabilitate the Kariba Dam for hydroelectricity in Zimbabwe. However, challenges remain regarding energy access, including increasing power outages, the price of electricity, grid stability, and the use of clean energy in rural areas. The findings also reflected that in the roadmap to establish technology, more ambitious interventions are needed to implement ongoing projects, such as the Continental Power System Master Plan (CMP) and the creation of the African Single Electricity

⁷ European Commission. Africa-Europe Green Energy. Available at Africa-Europe Green Energy - European Commission. Accessed on 28 April 2025.

Market (AfSEM); the Energy Chamber Report,(2025:28) states that the proposed West Africa Gas pipe line and Trans-Saharan gas pipelines not only will they generate gas market in Africa but also in Europe and other regions.

The findings presented that 11 participants agreed that there is a win-win collaboration in the Africa-EU Energy Partnership, whilst only 2 were not sure. The findings indicated that Africa has become a vital strategic pillar in the EU green energy transition, and at the same time reshaping Africa's position in energy geopolitics. In terms of the opportunities for renewable energy sources, 9 participants agreed that renewable energy sources could enhance energy security in the contemporary system.

Despite the opportunities that lie in the Africa-EU partnership, the study also established that the two actors are confronting challenges in their roadmap to energy security, such as geopolitical tensions, inflation, market volatility and investment risks.

Whilst 60% of the participants expressed geopolitical tensions compromising the action plans to promote energy security. The international system is witnessing geopolitical tensions and conflicts contributing to the changing global order. One of the policy makers mentioned that the armed conflicts, in particular the Russian-Ukraine war, have transformed energy geopolitics and the Africa-EU energy partnership. The participant expressed his belief that such tensions strain or build State relations and organizational alliances. As the international system transforms, the Africa-EU relations are tested to manage and navigate the complex arena. The study established that high energy costs remain a challenge in the Africa-EU partnership. Following the Russian-Ukrainian war, oil and energy security emerged as a critical challenge in the global discourse, making it central to economic prosperity (Colgan et al 2023). Since Russia has been one of the leading exporters of oil, the war has greatly affected energy and oil prices in the markets globally (Umar *et al.*, 2022). Likewise, the war has complicated Europe's socio-economic and political landscape (Kuzemko et al 2022). The disruption of the energy flow is a challenge in energy security projects.

One of the policy experts mentioned that extreme weather events indeed pose significant threats to the energy sector. All the participants noted that climate change is a major challenge to energy security. The results align with the Russo et al (2023) study, which suggests that climate change (extreme droughts and severe rainfalls) could affect solar, wind, and hydro energy. The study established that the effects of climate change also threaten the transportation of oil and gas, which could lead to enormous energy prices on the global market.

One of the key experts noted that infrastructure constraints continue to pose challenges for energy distribution. The Africa Energy Chamber Report (2025) states that energy plants may include electrolyzers, port constructions, and storage facilities that are often unavailable in many African countries and require financial stability to be established. Similarly, inadequate transportation networks and storage result in delays in the delivery times of energy supplies. In the interview discussions, most participants (9) believed that there are frequent delays in oil exports in countries such as Sudan and Mozambique, attributed to peace, security, and political instability.

Conclusions

This paper sought to determine the Africa-EU relationship in the shifting dynamics of energy security. Having understood the complexity of the global arena, climate change, economic stability, infrastructural development, geopolitical issues, and bilateral relations are important aspects towards energy security and the achievement of the Global Goals.

To the first question, What is the role of the Africa-EU Energy Partnership in enhancing energy security? The 21st-century complex challenges, such as climate change and armed conflicts, have elevated the Africa-EU partnership, and this study underscores the importance of the AEEP in the complex global arena. The study established that Africa-EU, both actors, benefit in terms of energy security. The study concludes that the partnership promotes economic development through trade collaborations and renewable energy sources. Africa is a vital trading partner for the EU, with some of the energy sources, such as oil and gas, being exported to the EU, and investments in solar and hydroelectric projects. Hence, geographical regions of the AU and the EU underscore the high degree of interdependence as energy partners. It was established that renewable energy sources could enhance energy access in the contemporary system.

In terms of what are the challenges for Africa and the EU Energy Partnership towards strategizing energy security? The challenge of meeting energy demand remains a policy priority of the Africa-EU partnership. By addressing challenges of climate change, infrastructure development, financial capacity, peace and security, the partnership could strengthen its capacity to navigate global energy security. The role of research in partnerships, mobilization of financial investments and energy innovation projects amidst the complexity of the global arena ought to be enhanced in the Africa-EU collaborations towards achieving energy security.

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ECONOMIC NEGOTIATIONS BETWEEN INDONESIA AND THE EUROPEAN UNION: NAVIGATING CONFLICT IN THE IMPLEMENTATION OF THE GREEN DEAL EU

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Abstract: *The European Green Deal (EGD), launched by the European Union (EU) in 2019, represents an ambitious strategy to achieve carbon neutrality by 2050 and reposition the EU as a normative leader in global sustainability governance. The European Union Deforestation Regulation (EUDR) is central to this agenda, which aims to eliminate deforestation-linked commodities from the EU market. However, the EUDR has generated significant controversy among major commodity-exporting countries, particularly Indonesia, which perceives the regulation as a manifestation of green protectionism and a threat to equitable global trade relations. This study critically examines Indonesia's economic negotiation strategies in response to the EUDR, exploring how Indonesia navigates the structural asymmetries inherent in global governance frameworks dominated by Global North actors. Employing a qualitative single-case study design, the research integrates Green Politics theory, Climate Justice perspectives, and Global Governance analyses. Data were collected through document and critical discourse analysis of government reports, WTO submissions, EU policy texts, and international media sources. The findings reveal that Indonesia has developed a multifaceted response strategy combining bilateral diplomatic engagement, litigation through multilateral mechanisms such as the WTO, and diversification of export markets toward the Global South. Nevertheless, Indonesia faces formidable challenges, including entrenched power asymmetries, contested definitions of sustainability, reputational stigmatization of its key commodities, and internal policy fragmentation. The study argues that the EUDR exemplifies how sustainability initiatives, when imposed unilaterally, risk exacerbating global inequalities rather than fostering an inclusive green transition. It calls for the EU to recalibrate its negotiation practices by embracing inclusive consultations, differentiated responsibilities, and multilateral dialogue to avoid perpetuating normative imperialism. This research contributes to scholarly debates on trade diplomacy, environmental governance, and climate justice, offering critical insights into the strategies available for developing countries to assert agency in the evolving landscape of global green regulation.*

Keywords: *European Green Deal; Green protectionism; Climate justice; Global trade governance; Indonesia–EU negotiations.*

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Introduction

In recent decades, the world has witnessed a heightened urgency for a global transition toward sustainable development, driven by the climate crisis, environmental degradation, and socio-economic inequality.² The European Union (EU) has emerged as a leading actor through the European Green Deal (EGD), a strategy launched in 2019 to achieve carbon neutrality by 2050. Beyond internal reforms, the EGD also projects the EU's global ambitions, aiming to reshape international trade dynamics, foreign relations, and global economic structures. One of the principal instruments within the EGD is the European Union Deforestation Regulation (EUDR), designed to exclude products linked to deforestation from the EU market. While ostensibly serving noble environmental goals, the EUDR has sparked considerable controversy, particularly among major commodity-producing countries such as Indonesia.³ As a leading exporter of palm oil-based products, Indonesia perceives the EUDR as a sustainability initiative and a form of green protectionism restricting market access for developing nations. This perception underscores the structural tensions between sustainability policies and the economic interests of developing countries.

The sustainability policies advocated by the EGD frequently impose implicit barriers to trade from the Global South, contributing to potential economic conflicts in international trade.⁴ These tensions reveal deeper struggles over the legitimacy of sustainability definitions and the asymmetrical power distribution within global governance structures. The EUDR, while positioned as a measure to address global deforestation, has inadvertently intensified bilateral trade tensions between the EU and Indonesia, compelling Indonesia to pursue diplomatic challenges at the WTO and to develop diversified trade strategies.⁵ Despite a growing body of literature addressing the EGD's global trade implications and the risks of green protectionism⁶, a significant research gap persists regarding the specific strategies employed by Indonesia in its negotiations with the EU, particularly concerning EUDR. Existing studies remain predominantly macro-level, offering limited insights into the practical

² European Commission, *The European Green Deal* (Brussels: European Commission, 2019), 4; Helene Dyrhaug and Kristina Kurze, *Making the European Green Deal Work* (London: Routledge, 2023), 2; Mark Leonard, *The Geopolitics of the European Green Deal* (Brussels: European Council on Foreign Relations, 2021), 5.

³ Margherita Bianchi et al., *Green Deal Watch* (Brussels: European Policy Centre, 2020), 5; Oliver Pye and Jayati Bhattacharya, *The Palm Oil Controversy in Southeast Asia: A Transnational Perspective* (Singapore: ISEAS-Yusof Ishak Institute, 2013), 30; Adil Najam, Mark Halle, and Ricardo Meléndez-Ortiz, *Trade and Environment: A Resource Book* (Winnipeg: IISD, 2007), 45; Eric Neumayer, *Greening Trade and Investment: Environmental Protection Without Protectionism* (London: Routledge, 2001), 60.

⁴ Thomas G. Weiss, *Global Governance: Why? What? Whither?* (Cambridge: Polity Press, 2013), 88; Robert Falkner, *Business Power and Conflict in International Environmental Politics* (Basingstoke: Palgrave Macmillan, 2009), 101.

⁵ Oliver Pye and Jayati Bhattacharya, *The Palm Oil Controversy in Southeast Asia*, 30.

⁶ Muhammad Usman, "EU's Environmental Regulation and Trade Relations: The Case of Indonesia," *Environmental Policy and Law* 51, no. 1 (2021): 15; Carlos Velasco, "European Green Deal and Trade Conflicts with Emerging Economies," *Global Trade and Customs Journal* 18, no. 3 (2023): 22; Eric Neumayer, *Greening Trade and Investment*, 85; Rafael Leal-Arcas, *International Trade and Sustainability: Perspectives from Developing and Developed Countries* (Cham: Palgrave Macmillan, 2022), 40..

economic diplomacy mechanisms developed nations utilize to navigate environmental regulations imposed by the Global North.⁷

Accordingly, this study formulates critical research questions: How has Indonesia developed its economic negotiation strategies toward the EU's Green Deal, particularly in responding to the EUDR? What challenges does Indonesia encounter in these negotiations? What are the broader implications for bilateral trade relations? Furthermore, how should the European Union recalibrate its negotiation strategies to avoid exacerbating global inequalities under the banner of sustainability? Addressing these questions is vital for understanding contemporary trade diplomacy and promoting a more equitable global transition toward sustainability.

This research examines the dynamics of economic negotiations between Indonesia and the European Union concerning the EGD and the EUDR. It evaluates Indonesia's strategic responses, including bilateral negotiations, litigation within multilateral forums such as the WTO, and efforts to diversify its export markets.⁸ In doing so, it offers critical reflections on how the EU might better align its sustainability policies with principles of climate justice and global equity, enriching both academic debates on the political economy of sustainability and practical policymaking for global trade relations.⁹

The theoretical contribution of this study lies in its integration of three major frameworks: Green Politics theory, Climate Justice perspectives, and Global Governance analyses. Green Politics theory¹⁰ It is utilized to interrogate the ideological foundations of the EGD and the extent to which ecological objectives are intertwined with political ambitions. Climate Justice perspectives¹¹ Highlight the distributive and procedural inequities that often emerge when environmental standards are imposed globally, particularly by wealthier nations in the Global South. Global Governance analyses¹² Provide the critical lens necessary to examine how institutional structures perpetuate or challenge power asymmetries and influence in sustainability transitions. Practically, the findings of this research offer strategic insights for developing countries in navigating green regulations, emphasizing the importance of diversified economic diplomacy, strategic alliances, and legal recourse in international forums. Simultaneously, the study underscores the European Union's need to reform its negotiation practices, ensuring that sustainability initiatives do not become vehicles for hidden protectionism or deepen existing inequalities.¹³

⁷ Lora Anne Viola, *The Closure of the International System: How Institutions Create Political Equalities and Hierarchies* (Cambridge: Cambridge University Press, 2020), 33; Giovanni Gruni, *The EU, World Trade Law and the Right to Food* (Oxford: Hart Publishing, 2018), 55.

⁸ World Trade Organization (WTO), *Indonesia's Palm Oil Dispute Against EU EUDR Measures* (Geneva: WTO, 2025), 18.

⁹ Peter Newell, *Globalization and the Environment: Capitalism, Ecology and Power* (Cambridge: Polity Press, 2012), 65; Andrew Dobson, *Green Political Thought*, 4th ed. (London: Routledge, 1999), 48.

¹⁰ Andrew Dobson, *Green Political Thought*, 35; John Barry, *Rethinking Green Politics: Nature, Virtue and Progress* (London: SAGE, 1999), 20.

¹¹ Henry Shue, *Climate Justice: Vulnerability and Protection*, 67; Mary Robinson, *Climate Justice: Hope, Resilience, and the Fight for a Sustainable Future* (London: Bloomsbury Publishing, 2018), 73.

¹² Thomas G. Weiss, *Global Governance: Why? What? Whither?*, 60; Lora Anne Viola, *The Closure of the International System*, 90.

¹³ Adil Najam, Mark Halle, and Ricardo Meléndez-Ortiz, *Trade and Environment: A Resource Book*, 82; James Bacchus, *Trade Links: New Rules for a New World* (Cambridge: Cambridge University Press, 2022), 38.

The structure of this article is systematically organized to address the outlined objectives. The second section presents a literature review and theoretical framework, elaborating on Green Politics, Climate Justice, and Global Governance theories related to the case study. The third section delineates the research methodology, which adopts a qualitative single-case study design employing document and discourse analysis. The fourth section discusses the research findings concerning Indonesia's negotiation strategies, including economic diplomacy, WTO litigation, and market diversification. The final section offers a critical discussion situating the findings within the broader theoretical context, concluding with strategic recommendations for Indonesia, other developing nations, and the European Union as they navigate the complex interplay between sustainability and global economic justice.

Literature Review

In recent years, scholarship on the EGD and its implications for global trade has expanded significantly, reflecting the growing prominence of environmental policy in international affairs. Conceived as a transformative strategy to combat climate change, the EGD is also understood as a tool to bolster Europe's geopolitical and economic standing.¹⁴ Within this strategic framework, the EUDR stands out as a key policy aiming to sever the link between commodity supply chains and global deforestation. Although normatively framed as an environmental measure, the EUDR has provoked substantial debate over its potential adverse impacts on developing economies heavily reliant on commodities like palm oil, coffee, and cocoa.¹⁵ Scholars increasingly argue that unless supplemented by equitable support mechanisms, such measures may exacerbate existing North–South trade inequalities, embedding new economic frictions within the global system. At the ideological level, the rise of the EGD is best understood through the lens of Green Politics. Eckersley¹⁶ and Barry¹⁷ characterize Green Politics as an ideological shift that centers ecological sustainability as a core principle of governance, superseding traditional growth-centric models. Yet, translating Green Politics into international policy has raised concerns about Green Protectionism. Wilkinson and Falkner contend that high environmental standards, often framed as moral imperatives, function in practice as technical trade barriers that disadvantage exporters from the Global South.¹⁸ Thus, while Green Politics provides the ethical rationale for initiatives like

¹⁴ Sébastien Schunz, "The European Green Deal: A Hallmark of EU External Climate Leadership?," *The International Spectator* 55, no. 1 (2020): 15; Mark Leonard, *The Geopolitics of the European Green Deal* (Brussels: European Council on Foreign Relations, 2021), 32.

¹⁵ Sophie Meunier, "The Geopolitical Dimensions of the European Green Deal," *Journal of European Public Policy* 29, no. 8 (2022): 24.

¹⁶ Robyn Eckersley, *The Green State: Rethinking Democracy and Sovereignty* (Cambridge, MA: MIT Press, 2004), 45.

¹⁷ John Barry, *Rethinking Green Politics: Nature, Virtue and Progress* (London: SAGE, 1999), 30.

¹⁸ Rob Wilkinson, "Green Protectionism and the Global South: The Geopolitics of Environmental Regulation," *Global Environmental Politics* 22, no. 1 (2022): 60.

the EGD, it also risks evolving into a mechanism that consolidates the dominance of developed countries in global markets under the guise of sustainability.¹⁹

Parallel to the ideological critiques, literature on international economic negotiation sheds light on the structural challenges developing countries like Indonesia face when engaging with policies such as the EGD and EUDR. Odell and Hopewell emphasize that developing nations typically enter trade negotiations from positions of relative weakness, constrained by limited financial, technical, and political resources.²⁰ These structural asymmetries necessitate adaptive strategies, including coalition-building, strategic litigation, and diversification of economic alliances. In response to the EUDR, Indonesia has initiated disputes within the World Trade Organization (WTO) framework and explored new diplomatic partnerships, highlighting the importance of proactive, multifaceted negotiation approaches.²¹ Moreover, critical analyses grounded in Climate Justice and Global Governance theories reveal how sustainability discourses are embedded within broader global power structures. Okereke²² Critiques the North-centric framing of global sustainability agendas, arguing that they often marginalize the realities and priorities of the Global South. Barnett and Duvall further explain that power in global governance is exercised not merely through coercion but through the production and institutionalization of norms that privilege certain actors.²³ From this perspective, the EGD can be seen as an extension of Europe's normative power, simultaneously promoting environmental ideals and reinforcing systemic inequities.²⁴

Thus, while the EGD and EUDR are often lauded for their ambitious environmental objectives, they cannot be disentangled from the structural inequalities and geopolitical calculations underpinning the global trading system. The literature consistently emphasizes that global sustainability initiatives risk deepening existing disparities between the North and South without meaningful, equitable participation and burden-sharing mechanisms. Three main strands emerge when developing a theoretical foundation for this study. First, Green Politics provides the ideological framework for understanding how sustainability values are institutionalized in international policymaking. Within this tradition, scholars like Dobson²⁵ and Barry²⁶ conceptualize ecological sustainability as an autonomous political goal, with the EGD embodying efforts to embed ecological imperatives within global economic structures.

¹⁹ Sébastien Schunz, "The European Green Deal," 15; Rob Wilkinson, "Green Protectionism and the Global South," 60; Chukwumerije Okereke, *Global Justice and Neoliberal Environmental Governance: Ethics, Sustainable Development and International Co-operation* (London: Routledge, 2010), 40.

²⁰ John S. Odell, *Negotiating the World Economy* (Ithaca: Cornell University Press, 2000), 50; Kristen Hopewell, *Breaking the WTO: How Emerging Powers Disrupted the Neoliberal Project* (Stanford: Stanford University Press, 2016), 70.

²¹ World Trade Organization (WTO), *Indonesia's Palm Oil Dispute Against EU EUDR Measures* (Geneva: WTO, 2025), 18; James Bacchus, *Trade Links: New Rules for a New World* (Cambridge: Cambridge University Press, 2022), 38.

²² Okereke, *Global Justice and Neoliberal Environmental Governance*, 40.

²³ Michael Barnett and Raymond Duvall, *Power in Global Governance* (Cambridge: Cambridge University Press, 2005), 55.

²⁴ Viola, *The Closure of the International System*, 75; Weiss, *Global Governance*, 60; Shue, *Climate Justice*, 67; Robinson, *Climate Justice*, 73..

²⁵ Andrew Dobson, *Green Political Thought*, 4th ed. (London: Routledge, 2007), 35

²⁶ John Barry, *Rethinking Green Politics*, 20..

However, concerns about Green Protectionism²⁷ caution against an uncritical celebration of such initiatives, highlighting the risk of covert economic discrimination.

Second, theories of international economic negotiation offer insights into the strategic behavior of states in an asymmetric global order. Odell²⁸ and Hopewell²⁹ illustrate how weaker states can enhance their bargaining leverage through strategic coalitions, issue linkage, and mobilization of international legal mechanisms. This perspective is instrumental in analyzing Indonesia's negotiation strategies in contesting the EUDR and preserving market access for its key commodities. Third, Climate Justice and Global Governance theories anchor the analysis within a broader critique of structural inequality. As Okereke³⁰ emphasizes that achieving genuine global sustainability requires integrating distributive justice principles into policy design. Barnett and Duvall's³¹ conceptualization of power underscores the importance of critically interrogating the norms and standards that shape global environmental governance. Applying these frameworks enables a nuanced analysis of how the EGD and EUDR may perpetuate systemic disparities while identifying avenues for resistance and reform through strategic negotiation and advocacy.

Together, these theoretical perspectives provide a comprehensive foundation for understanding the complex interplay between sustainability ideals, structural inequalities, and strategic agency in Indonesia's engagement with the European Union under the EGD framework. They enable a critical exploration of how normative aspirations intersect with material interests and power asymmetries in shaping the contours of global environmental governance.

Research Methodology

This study adopts a qualitative exploratory approach to uncover the intricate dynamics underpinning Indonesia's economic negotiation strategies in response to the EGD, explicitly focusing on the EUDR. Given the limited scholarly attention to Indonesia's diplomatic-economic reactions to EU sustainability-driven trade regulations, a qualitative design is most appropriate for providing a nuanced, context-sensitive understanding.³² This approach facilitates an in-depth exploration of how negotiation strategies are constructed and how Indonesia's bargaining position is shaped within an asymmetrical global governance framework.

Structured as a single-case study, the research focuses on Indonesia's negotiations with the European Union concerning the EUDR, enabling a detailed examination of strategic positioning, diplomatic interaction, and contestations over sustainability norms within a

²⁷ Rob Wilkinson, "Green Protectionism and the Global South," 65; Eric Neumayer, *Greening Trade and Investment: Environmental Protection Without Protectionism* (London: Routledge, 2001), 75.

²⁸ John S. Odell, *Negotiating the World Economy*, 50.

²⁹ Kristen Hopewell, *Breaking the WTO*, 70.

³⁰ Chukwumerije Okereke, *Global Justice and Neoliberal Environmental Governance*, 40.

³¹ Michael Barnett and Raymond Duvall, *Power in Global Governance*, 55.

³² Max Travers, *Qualitative Research Through Case Studies* (London: SAGE, 2001), 25.

complex geopolitical context.³³ Document analysis constitutes the primary data collection method, as it offers access to overt negotiation tactics and the latent discursive framings embedded in sustainability debates.³⁴ Primary sources include Indonesian governmental documents from the Ministry of Foreign Affairs and the Ministry of Trade, formal submissions to the World Trade Organization (WTO), EU legislative texts and Commission reports, and associated press releases. International media coverage from Reuters, Politico Europe, and The Guardian complements the primary corpus. In addition, scholarly works on the EGD, EUDR, green protectionism, and international trade negotiations provide critical contextualization.³⁵

Data analysis combines thematic analysis and critical discourse analysis (CDA). Thematic analysis identifies recurring patterns concerning Indonesia's diplomatic strategies, EU sustainability narratives, and the structural asymmetries in global trade negotiations.³⁶ Building on these themes, CDA—following Fairclough's three-dimensional model—deconstructs how sustainability, trade justice, and environmental protection are framed by different actors, examining both textual and socio-institutional dimensions.³⁷ Triangulation across diverse data sources enhances the study's credibility and validity, mitigating biases in relying on single source types.³⁸ Systematic data collection, coding, and interpretation documentation ensure dependability and transparency.³⁹ Reflexivity is maintained throughout, with critical engagement regarding the researcher's positionality and interpretive assumptions.⁴⁰

Ethical integrity is upheld by contextualizing public data within appropriate socio-political frameworks and avoiding distortion or decontextualization. Through this integrated methodological framework, the study aims to contribute empirically to understanding Indonesia's strategic engagement with the EGD and theoretically to broader debates on environmental norm-setting, trade politics, and structural inequality reproduction.

Research Findings

The findings of this study reveal the complex dynamics underpinning Indonesia's economic negotiation strategies in response to the EUDR as part of the broader EGD. The

³³ John W. Creswell, *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (Boston: Pearson Education, 2002), 65; Max Travers, *Qualitative Research Through Case Studies*, 42.

³⁴ Tim Rapley, *Doing Conversation, Discourse and Document Analysis*, 2nd ed. (London: SAGE, 2018), 23; James Paul Gee, *An Introduction to Discourse Analysis: Theory and Method* (London: Routledge, 1999), 30.

³⁵ Ruth Wodak and Michal Krzyżanowski, *Qualitative Discourse Analysis in the Social Sciences* (Basingstoke: Palgrave Macmillan, 2008), 12.

³⁶ Carl F. Auerbach and Louise B. Silverstein, *Qualitative Data: An Introduction to Coding and Analysis* (New York: New York University Press, 2003), 54.

³⁷ Norman Fairclough, *Analysing Discourse: Textual Analysis for Social Research* (London: Routledge, 2003), 16; Kevin Dunn and Iver B. Neumann, *Undertaking Discourse Analysis for Social Research* (Ann Arbor: University of Michigan Press, 2016), 48.

³⁸ Steven Taylor, *Researching Educational Policy: Ethical and Methodological Issues* (London: Routledge, 2012), 67; Tim Rapley, *Doing Conversation, Discourse and Document Analysis*, 45.

³⁹ John W. Creswell and J. David Creswell, *Research Design*, 257; Adam Kuper et al., "Anthropologists and the Crisis of Representation," *Current Anthropology* 49, no. 4 (2008): 400.

⁴⁰ James Paul Gee, *An Introduction to Discourse Analysis*, 112.

results demonstrate that Indonesia has crafted a multi-faceted strategy to protect its economic interests amid the global sustainability agenda, mainly by Global North actors such as the European Union.⁴¹

Indonesia's response involved multiple interconnected strategies. A primary method was the use of formal economic diplomacy through bilateral channels. Indonesia actively engaged with the EU in consultations and technical dialogues focusing on the sustainability of its export products.⁴² Parallel to these efforts, Indonesia initiated a formal dispute at the World Trade Organization (WTO), challenging the EUDR regarding trade discrimination and violations of the non-discrimination principle enshrined in international trade law.⁴³ Thus, Indonesia utilized bilateral and multilateral legal channels to fortify its bargaining position. In addition to diplomatic engagement, Indonesia accelerated market diversification efforts to reduce its dependency on the European market. By strengthening export relations with countries such as India, China, and Middle Eastern nations, Indonesia sought to mitigate the economic risks posed by the EUDR.⁴⁴ This diversification represents a strategic shift from reliance on Global North markets toward greater engagement with Global South partners, reflecting an evolving economic diplomacy posture. However, Indonesia encountered several formidable challenges in implementing these strategies. A significant obstacle was the entrenched power asymmetry. As a global normative power, the EU wields considerable influence in defining sustainability standards and embedding them within international trade regimes.⁴⁵ Structurally, Indonesia's position remains vulnerable given its dependence on commodity-based exports that are highly sensitive to environmental regulations.

Another significant challenge involved discursive struggles over the meaning of sustainability. While the EU framed sustainability narrowly through an environmental lens, Indonesia sought to expand the concept to include social justice and economic development.⁴⁶ In its diplomatic discourse, Indonesia emphasized "trade justice," arguing that sustainability standards should accommodate the developmental needs of emerging economies.⁴⁷ Indonesia also faced reputational challenges regarding the legitimacy of its key exports, particularly palm oil, despite efforts to strengthen domestic sustainability standards through certifications such as the Indonesian Sustainable Palm Oil (ISPO). Indonesian palm oil was portrayed negatively in European public discourse.⁴⁸ This stigmatization exemplifies how media and

⁴¹ Schunz, "The European Green Deal," 15; Mark Leonard, *The Geopolitics of the European Green Deal* (Brussels: European Council on Foreign Relations, 2021), 32.

⁴² Helene Dyrhaug and Kristina Kurze, *Making the European Green Deal Work* (London: Routledge, 2023), 45.

⁴³ World Trade Organization (WTO), *Indonesia's Palm Oil Dispute Against EU EUDR Measures* (Geneva: WTO, 2025), 18.

⁴⁴ Muhammad Usman, "EU's Environmental Regulation and Trade Relations: The Case of Indonesia," *Environmental Policy and Law* 51, no. 1 (2021): 38; Carlos Velasco, "European Green Deal and Trade Conflicts with Emerging Economies," *Global Trade and Customs Journal* 18, no. 3 (2023): 28.

⁴⁵ Robert Falkner, *Business Power and Conflict in International Environmental Politics* (Basingstoke: Palgrave Macmillan, 2009), 85.

⁴⁶ Robyn Eckersley, *The Green State: Rethinking Democracy and Sovereignty* (Cambridge, MA: MIT Press, 2004), 45; Henry Shue, *Climate Justice: Vulnerability and Protection* (Oxford: Oxford University Press, 2014), 67.

⁴⁷ J.J. Timmons Roberts and Bradley C. Parks, *A Climate of Injustice: Global Inequality, North-South Politics, and Climate Policy* (Cambridge, MA: MIT Press, 2007), 50.

⁴⁸ Oliver Pye and Jayati Bhattacharya, *The Palm Oil Controversy in Southeast Asia: A Transnational Perspective* (Singapore: ISEAS–Yusof Ishak Institute, 2013), 30.

public narratives in the EU reinforce structural biases against Global South commodities. Domestically, Indonesia's internal policy coordination posed another significant challenge. Fragmentation among key ministries—the Ministry of Trade, the Ministry of Foreign Affairs, and the Ministry of Environment—hindered the development of a coherent and unified negotiation strategy.⁴⁹ This inconsistency weakened Indonesia's diplomatic stance and complicated efforts to articulate a cohesive international position.

The findings further reveal that the Indonesia-EU economic conflict manifested materially and ideologically throughout the EUDR negotiation process. Materially, the imposition of the EUDR impaired Indonesia's market access for palm oil and related products, leading to a measurable decline in export volumes.⁵⁰ Indonesia's initiating a WTO dispute highlighted the material stakes involved, centering on alleged breaches of non-discrimination principles. Ideologically, the conflict centered on the framing of sustainability itself. Indonesia's discursive diplomacy efforts sought to redefine sustainability narratives by advocating for broader, justice-oriented standards that recognize social and developmental dimensions.⁵¹ Thus, the economic conflict extended beyond material trade interests into a contest over normative legitimacy within the global sustainability governance architecture.⁵²

The implications of the EUDR for Indonesia-EU bilateral relations are profound. First, economic tensions between the two actors have intensified. Empirical evidence suggests that Indonesian palm oil exports to the EU declined following the adoption of the EUDR, although diversification strategies partially mitigated the negative effects.⁵³ Second, the very dynamics of bilateral trade relations have shifted. Negotiations have evolved beyond market access concerns toward broader debates about fair and inclusive sustainable trade principles.⁵⁴ Indonesia has increasingly called for transparent, participatory processes in formulating international environmental standards, aligning with global demands for equitable governance.⁵⁵ Third, Indonesia's trade diplomacy has undergone a strategic evolution. Diplomatic efforts now seek to maintain market shares and advocate for structural justice in international trade regimes influenced by green agendas.⁵⁶ Sustainability issues have thus been integrated into broader narratives of global economic equity within Indonesia's diplomatic strategies.

⁴⁹ Adil Najam, Mark Halle, and Ricardo Meléndez-Ortiz, *Trade and Environment: A Resource Book* (Winnipeg: IISD, 2007), 82.

⁵⁰ WTO, *Indonesia's Palm Oil Dispute Against EU EUDR Measures*, 18; James Bacchus, *Trade Links: New Rules for a New World* (Cambridge: Cambridge University Press, 2022), 38.

⁵¹ Chukwumerije Okereke, *Global Justice and Neoliberal Environmental Governance: Ethics, Sustainable Development and International Co-operation* (London: Routledge, 2010), 40; J. Timmons Roberts and Bradley C. Parks, *A Climate of Injustice*, 50.

⁵² Lora Anne Viola, *The Closure of the International System*, 75; Mark Leonard, *The Geopolitics of the European Green Deal*, 32.

⁵³ Rafael Leal-Arcas, *International Trade and Sustainability: Perspectives from Developing and Developed Countries* (Cham: Palgrave Macmillan, 2022), 40.

⁵⁴ Giovanni Gruni, *The EU, World Trade Law and the Right to Food: Rethinking Free Trade Agreements with Developing Countries* (Oxford: Hart Publishing, 2018), 55.

⁵⁵ Chukwumerije Okereke, *Global Justice and Neoliberal Environmental Governance*, 40.

⁵⁶ Peter Newell, *Globalization and the Environment: Capitalism, Ecology and Power* (Cambridge: Polity Press, 2012), 65; James Connelly and Graham Smith, *Politics and the Environment: From Theory to Practice*, 2nd ed. (London: Routledge, 2002), 48.

Further findings reveal that Indonesia's negotiation posture has transitioned from reactive to proactive. Initially responding defensively to the EUDR, Indonesia has increasingly adopted strategic initiatives such as coalition-building with other developing countries in multilateral settings.⁵⁷ Solidarity among Global South actors, including Malaysia, Brazil, and African nations, has become critical in resisting the EU's normative dominance.⁵⁸ Indonesia articulates alternative sustainability narratives through these coalitions grounded in climate justice and trade equity principles.⁵⁹ Thus, Indonesia's evolving green diplomacy reflects a strategic assertion of agency within the contested terrain of global sustainability governance.

This study supports broader academic arguments that sustainability negotiations are fundamentally arenas of political struggle, where meanings, standards, and interests are intensely contested.⁶⁰ By applying critical discourse analysis and thematic document analysis, the research highlights that the negotiation surrounding the EGD and EUDR is not merely about environmental protection but about who defines sustainability, under what conditions, and in whose interests. Consequently, understanding Indonesia's negotiation strategies enriches the scholarly discourse on trade diplomacy, climate justice, and global governance in the emerging green transition era.

Discussion

This discussion interprets the findings concerning Indonesia's economic negotiation strategies in response to the EGD and the EUDR, positioning them within the theoretical frameworks of Green Politics, International Economic Negotiation, and Climate Justice. The findings not only illuminate how Indonesia's strategies are formulated and the principal challenges it faces, but also critically address the forms of negotiation that the EU must adopt when engaging with developing countries like Indonesia.

From a Green Politics perspective, the EGD exemplifies a shift toward prioritizing ecological sustainability in international policymaking.⁶¹ However, as the findings suggest, in practice, the application of EGD—particularly through instruments like the EUDR—risks slipping into green protectionism, where environmental norms protect developed countries' economic interests at the expense of developing economies.⁶² Indonesia's experience reveals that the narrow environmental framing of the EUDR restricts market access for critical

⁵⁷ Mary Robinson, *Climate Justice: Hope, Resilience, and the Fight for a Sustainable Future* (London: Bloomsbury Publishing, 2018), 73.

⁵⁸ Michael Barnett and Raymond Duvall, *Power in Global Governance* (Cambridge: Cambridge University Press, 2005), 55.

⁵⁹ Chukwumerije Okereke, *Global Justice and Neoliberal Environmental Governance*, 42..

⁶⁰ Norman Fairclough, *Analysing Discourse: Textual Analysis for Social Research* (London: Routledge, 2003), 16; Ruth Wodak and Michal Krzyzanowski, *Qualitative Discourse Analysis in the Social Sciences* (Basingstoke: Palgrave Macmillan, 2008), 25.

⁶¹ Andrew Dobson, *Green Political Thought*, 4th ed. (London: Routledge, 2007), 35; John Barry, *Rethinking Green Politics: Nature, Virtue and Progress* (London: SAGE, 1999), 20.

⁶² Rob Wilkinson, "Green Protectionism and the Global South: The Geopolitics of Environmental Regulation," *Global Environmental Politics* 22, no. 1 (2022): 60.

commodities such as palm oil, thereby reinforcing trade asymmetries.⁶³ Analyzing global governance and power asymmetry, the findings reinforce the observation that the EU, leveraging its normative power, establishes new global sustainability standards with little substantive engagement with Global South realities.⁶⁴ Creating green standards without meaningful input from developing countries reflects a continuation of structural inequalities, prompting resistance strategies like market diversification and coalition-building among Global South actors.⁶⁵

Regarding international economic negotiation theory, Indonesia's strategy of combining bilateral diplomacy, WTO litigation, and market diversification aligns with established adaptive strategies developed nations use to counterbalance systemic disadvantages.⁶⁶ Notably, Indonesia's transition from reactive to proactive diplomacy demonstrates a maturation of negotiation capabilities among developing countries facing green regulatory pressures.

The findings contribute to the broader academic discourse by illustrating that contemporary trade conflicts in the green transition era are not solely material but deeply discursive. They involve struggles over the meaning and ownership of "sustainability," where Global North actors seek to monopolize definitional authority.⁶⁷

The findings highlight critical lessons for Indonesian and broader Global South policymakers, including the need for cohesive cross-ministerial coordination and the integration of sustainability diplomacy into broader trade strategies.⁶⁸ Simultaneously, for the EU, the findings make clear that if it aims to maintain credibility and leadership in the global green transition, it must reformulate how it negotiates sustainability standards with developing countries.

The findings suggest several core principles regarding the form of negotiation the EU should adopt when engaging developing countries like Indonesia. First, the EU must implement genuinely inclusive consultation mechanisms. These consultations must occur from the earliest stages of regulatory formulation and not merely function as platforms for socializing finalized decisions.⁶⁹ Active inclusion of developing countries' perspectives can prevent perceptions of normative imperialism and foster co-ownership of sustainability norms. Second, the EU must significantly enhance transparency regarding developing, implementing, and verifying sustainability standards. The opaque nature of certification processes and compliance requirements undermines fairness and disadvantages countries

⁶³ Schunz, "The European Green Deal," 15.

⁶⁴ Barnett and Duvall, *Power in Global Governance*, 55.

⁶⁵ Robinson, *Climate Justice*, 73.

⁶⁶ Odell, *Negotiating the World Economy*, 50; Hopewell, *Breaking the WTO*, 70.

⁶⁷ Lora Anne Viola, *The Closure of the International System: How Institutions Create Political Equalities and Hierarchies* (Cambridge: Cambridge University Press, 2020), 75.

⁶⁸ Peter Newell, *Globalization and the Environment: Capitalism, Ecology and Power* (Cambridge: Polity Press, 2012), 65; James Connelly and Graham Smith, *Politics and the Environment: From Theory to Practice*, 2nd ed. (London: Routledge, 2002), 48.

⁶⁹ Mary Robinson, *Climate Justice*, 73; Thomas G. Weiss, *Global Governance: Why? What? Whither?* (Cambridge: Polity Press, 2013), 60.

with weaker institutional capacities.⁷⁰ Third, technical assistance and capacity-building support must be integrated into the EU's approach. Developing countries require regulatory instructions and tangible support to upgrade domestic sustainability standards, certification processes, and verification systems.⁷¹ Fourth, the EU must design compensatory mechanisms, including transitional financial support, for countries adversely impacted by new environmental regulations.⁷² Such mechanisms would share the burden of the global sustainability transition and foster a perception of shared responsibility. Fifth, the principle of "common but differentiated responsibilities" (CBDR) must inform EU regulatory frameworks. Applying uniform standards without adjustment for socio-economic disparities between developed and developing nations risks deepening existing inequities.⁷³ Sixth, the EU should prioritize multilateralism over unilateralism. Global sustainability norms should emerge from inclusive dialogue within platforms like the WTO, UNCTAD, or ASEAN-EU forums, ensuring wider acceptance and voluntary internalization.⁷⁴ Seventh, negotiations must incorporate the principles of a "just transition." The green economy must be constructed to protect vulnerable communities in developing countries, including smallholder farmers and indigenous groups, by establishing social protection mechanisms and sustainable livelihood opportunities.⁷⁵ Implementing these principles would allow the EU to lead in ecological sustainability and forge a more equitable global governance architecture. Failure to adopt an inclusive, justice-centered approach would likely intensify North–South tensions, reinforce perceptions of green protectionism, and undermine the broader legitimacy of the EU's sustainability agenda. While this study provides critical insights, it acknowledges certain limitations.⁷⁶ The reliance on document analysis without interviews with key negotiation actors may limit the granularity of insights, and the single-case focus on Indonesia suggests caution when generalizing findings to other contexts. Future research should include comparative studies across multiple developing countries and longitudinal analyses of Indonesia's evolving position in multilateral sustainability forums.

Ultimately, this study underscores that the success of global sustainability negotiations hinges not on normative imposition but on fostering partnerships grounded in substantive justice, equity, and solidarity.⁷⁷ The EU stands at a crossroads: either reinforce patterns of inequality through technocratic environmentalism or genuinely pioneer a globally inclusive and equitable sustainability transition.

⁷⁰ Eric Neumayer, *Greening Trade and Investment*, 85.

⁷¹ Oliver Pye and Jayati Bhattacharya, *The Palm Oil Controversy in Southeast Asia: A Transnational Perspective* (Singapore: ISEAS–Yusof Ishak Institute, 2013), 30.

⁷² Adil Najam, Mark Halle, and Ricardo Meléndez-Ortiz, *Trade and Environment: A Resource Book* (Winnipeg: IISD, 2007), 82; Rafael Leal-Arcas, *International Trade and Sustainability: Perspectives from Developing and Developed Countries* (Cham: Palgrave Macmillan, 2022), 40.

⁷³ Henry Shue, *Climate Justice: Vulnerability and Protection* (Oxford: Oxford University Press, 2014), 67.

⁷⁴ James Bacchus, *Trade Links: New Rules for a New World* (Cambridge: Cambridge University Press, 2022), 38.

⁷⁵ Mary Robinson, *Climate Justice*, 75.

⁷⁶ Michael Barnett and Raymond Duvall, *Power in Global Governance*, 55; Henry Shue, *Climate Justice*, 67.

⁷⁷ Andrew Dobson, *Green Political Thought*, 35; Thomas G. Weiss, *Global Governance: Why? What? Whither?*, 60.

Conclusions

This study examined the economic negotiation dynamics between Indonesia and the EU within the EGD and EUDR framework. At the same time, the EGD represents a significant normative step toward global sustainability; its implementation, primarily through the EUDR, risks entrenching structural inequalities between the Global North and South. Indonesia's case demonstrates that unilateral sustainability policies, absent meaningful Global South participation, can evolve into forms of green protectionism, deepening economic disparities.

Indonesia's strategic combination of bilateral diplomacy, WTO litigation, and market diversification illustrates how developing countries increasingly assert agency within contested global sustainability governance. Nevertheless, the findings highlight persistent challenges related to global power asymmetries, the monopolization of sustainability narratives by developed actors, and internal coordination weaknesses.

Theoretically, this study integrates Green Politics, Climate Justice, and Global Governance perspectives to elucidate how sustainability ideology intersects with power and inequality. Empirically, it contributes a critical case study showing that sustainability transitions are political and discursive struggles, not merely technical processes.

Importantly, the study advocates for recalibrating the EU's negotiation approach. Genuine consultation, differentiated responsibilities, technical assistance, and transitional support are essential to fostering equitable global sustainability. Without these measures, tensions will likely escalate, undermining the EU's normative leadership.

Despite limitations, including reliance on document analysis and a single case focus, the research provides a foundation for future comparative and longitudinal studies. Achieving an inclusive green transition requires restructuring global governance to treat developing countries as equal partners, not peripheral subjects.

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INNOVATIVE ECO-CITY SYSTEM: RUSSIA'S NEW WORLD PROJECT

Mădălina Ioana MIRON¹

Abstract: *The present study proposes an in-depth analysis of a greening project as an integral part of the International Eco-Cities Innovative System "New World," whose main feature and purpose is the realisation of a bold idea in the future/ecological urban areas that the organisers of this project want to build in Russia's abandoned cities and villages. With the implementation of this initiative, the Russian Federation follows in the footsteps of developed countries such as the United States, the United Arab Emirates, China, and Germany. This paper additionally examines the reasons, characteristics, and goals of this bold project, which includes the European Green Pact in developing post-Soviet Russia's progress, with the most important aspect being the instability of the surrounding environment across the Russian Federation's territory. This feature necessitated implementing innovative measures to aid in environmental conservation on the Russian Federation's territory. Furthermore, throughout this paper, I will outline the initial steps towards implementing the "New World" project, which aims to alleviate environmental concerns in post-Soviet Russia. For ages, Russia has been dealing with severe environmental issues that hurt both the environment and the health of the people who live on Russian Federation territory. All these negative impacts demonstrate that life expectancy in Russia is significantly shorter than the average for a developing country. These negative features were also emphasised by the Russian authorities' "de-ecologization" program, which stated that investing in environmental problems necessitated finding remedies to prevent their proliferation. The study has a theoretical framework, intending to define the notions of sustainable cities. Finally, I demonstrated that this audacious project, whose primary goal is to clean up Russia's green regions and which employs cutting-edge technology to put these environmental greening ideas into action, is the best approach for saving the environment.*

Keywords: *European Green Deal, New World, post-Soviet Russia, ecology, eco-city*

Introduction

This article provides a thorough examination of the "New World" greening initiative as a component of the International System of Innovative Eco-Cities. This project aims to play

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an important role in the realisation and implementation of the most ambitious ideas in abandoned cities and villages across the Russian Federation.

I chose this theme because it is one of the first projects in Russia developed by youth (the organisers are people under the age of 35) and has the most daring ideas for Russia's sustainable future, given that Russia has been dealing with serious environmental pollution issues for many years, the adverse consequences of which affect the population's health. The research questions underlying this conceptual framework are:

1. What are the compelling reasons behind this type of project?
2. What does this project offer a country dealing with major environmental pollution issues?
3. What long-term consequences does the implementation of such a project have?

Throughout this paper, I will respond to these concerns using examples and a thorough investigation of the environmental conditions in post-Soviet Russia. The goal of this study is to look at the environmental challenges that Russia has experienced in the past and faces today, problems that have gotten worse since World War II, one of which is the instability of the environment. It is critical to first comprehend environmental difficulties before understanding why it was necessary to create a project to assist people who are suffering from major health problems as a result of excessive pollution in some places of Russia.

The present paper is divided into five chapters: the first chapter analyses the concept of a sustainable city, what it implies, and who and in what context this phrase was used, forcing cities all over the world to adopt such settlements to develop towards sustainability. The most crucial base for preserving a sustainable city is economic and social balance, which will ensure the greater development of a city's sustainability as it moves towards greening. The second chapter focuses on the problems of pollution in the environment, and I am referring here strictly to the territory of the Russian Federation. For centuries Russia has been facing serious environmental pollution problems (here we are talking about air pollution, soil contamination that many rural residents grow with various vegetables, fruits, greens, and cereals, but this involves the use of chemicals that further aggravate the soil and water contamination, about 36% of Russian rivers are polluted due to various waste dumped into these rivers/fruitslakes and last but not least about the leakage of waste substances into these rivers and natural lakes on the territory of Russia). The third chapter focuses on the International System of Innovative Eco-Cities "New World" project; this section of the paper will present this fresh, innovative, and unique project in Russia, designed, executed, and developed by Russian youth. This project is part of a larger national initiative that includes projects in health, education, and the agro-industrial complex, among others.

Chapter IV focuses on the features that this project is built upon. The most significant characteristic is that all garbage and everything that pollutes and ruins the environment, causing harm to the health of the people who live in the impacted areas, is converted into heat and energy. This bad aspect should be changed into a positive one. Another essential topic I will discuss in this chapter is the concept of greenbar. Greenbar is a Russian manufacturer that uses cutting-edge technology to grow various greens, vegetables, and fresh fruits in densely

populated urban areas. These virtual farms offer the most optimal circumstances for cultivating these types of crops.

The conclusion of this paper demonstrates that to solve the problem of pollution, it is necessary to renew and restore clear objectives and a solid basis that will eventually lead to a positive outcome for both the environment and the health of the population in the territory of the Russian Federation. Additionally, for the successful implementation of this project, it is necessary to increase/increase investments in order to cope with the expenses underlying the implementation.

The theoretical framework

In order to elaborate on an in-depth examination of this project, it is necessary to offer a theoretical foundation for this sort of project, as it is critical to define the notion of a sustainable/ecological city, which has recently gained popularity. The most crucial base for preserving a sustainable city is economic and social balance, which will ensure the greater development of a city's sustainability as it moves towards greening. First and foremost, what is an environmentally friendly/sustainable city?

Two of the definitions I selected demonstrate that "a sustainable city prioritises energy-efficient housing, protects the environment, limits urban sprawl, and encourages a mix of housing, services, and shops, density, and micromobility. In a sustainable city, residents enjoy a decent quality of life and do not pass on costs and problems to future generations."²

However, many people are sceptical about this form of metropolis, believing that it limits their freedom from urban sprawl and the comfort they have grown accustomed to in unsustainable cities. This scepticism derives from the fact that this form of city promotes a social behaviour to which many people are unfamiliar. As is evident from the first description I used, a sustainable city comes with a set of regulations that future residents must follow to protect and keep the city clean. But what are the causes behind these anxieties of living in such a city? According to the website Saint Gobain in Romania, it provides an investigation of the fallacies surrounding the sustainable city:

1. It is said that a sustainable/ecological city is exceedingly expensive and nearly inaccessible. The truth is that this type of city is one in which every man who chooses to live there ensures accessibility. A sustainable city is inclusive, meaning that anyone who desires to live here can do so regardless of their income. The most important purpose of a sustainable city is to assist its residents in using less energy, resources, and waste to generate power and heat. Pierre-André de Chalendar, Chairman and CEO of Saint-Gobain, expresses this viewpoint in his most recent book, *The Urban Challenge. Reviving the desire to reside in a city*: "Today, the only option is to think sustainably from the start - initially, this will cost a little more, but, when the lifespan and running costs of a building are properly assessed, the benefits are obvious."³

² Saint-Gobain Romania, *What does a sustainable city means?*, <https://www.saint-gobain.ro/blog/ce-inseamna-un-oras-sustenabil> accessed in 03.04.2025.

³ Ibidem, <https://www.saint-gobain.ro/blog/ce-inseamna-un-oras-sustenabil> accessed in 03.04.2025.

2. A sustainable city is increasing its expansion by attempting to "release" overcrowded areas in order to assist green cities suffering from pollution. This sort of city prefers to develop housing that is neither crowded nor cluttered, allowing its residents to have their own gardens and recreational areas.
3. The sustainable city is also eco-friendly. Scientifically, it protects a diverse range of ecosystems and pays close attention to all items or materials it employs. Politically, it is ruled by the so-called police and the Green Party.
4. The sustainable city welcomes everyone, regardless of social status, and includes all social groups. All of these are necessary for the creation and upkeep of a sustainable city.

Ecocity Builders provides another definition of an ecological city: "An Ecocity is a human settlement modeled on the self-sustaining, resilient structure and function of natural ecosystems. The ecocity provides healthy abundance to its inhabitants without consuming more (renewable) resources than it produces, without producing more waste than it can assimilate, and without being toxic to itself or neighboring ecosystems. Its inhabitants' ecological impact reflects planetary supportive lifestyles; its social order reflects fundamental principles of fairness, justice, and reasonable equity."⁴ The ecocity concept dates back to 1975, when the Berkeley-based non-profit Urban Ecology was created by Richard Register and a group of visionary architects and activists. Urban Ecology promoted urban design concepts that linked urban planning, ecology, and citizen participation.⁵ This non-governmental organisation also provides a strategy for the development of a sustainable city through urban design, favourable development conditions, and the utilisation of trash that exacerbates environmental problems, as well as other socio-cultural conditions for sustainable development. Based on these two definitions, a sustainable city is a sort of human settlement created and sustained by the natural ecosystems that serve as its foundation.

Russia's environmental degradation problems

To be able to provide an analysis of the project "New World," it is necessary to conduct a first-time analysis of the challenges that necessitated the conceptualisation, development, and implementation of such a project. Russia has suffered and continues to face major environmental pollution issues, with negative consequences for the population's health. Various figures have shown that the Russian population's life expectancy has reduced substantially as a result of extraordinarily high pollution levels.

In this chapter, I chose to focus on the problems of environmental pollution in post-Soviet Russia, which are becoming increasingly prominent, in addition to waste, waste thrown into nature, and the so-called de-ecologization policy enacted by state authorities and various state-supported and funded institutions.

⁴ Ecocity Builders, *What Is An Ecocity?*, 2010, <https://ecocitybuilders.org/what-is-an-ecocity/> accessed in 03.04.2025.

⁵ Ibidem, <https://ecocitybuilders.org/what-is-an-ecocity/> accessed in 03.04.2025.

1. Water quality – the adoption of environmentally-friendly methods and practices, both in industry and agriculture, the indiscriminate and uncontrolled dumping of industrial, agricultural, and municipal waste into rivers, all of which together led to water pollution. As a result, in many places in Russia, the level of water contamination is high or often extremely high. Of all the water waste that reaches Russia's reservoirs, 36.1% is contaminated, with 7.4% remaining untreated. The bulk of Russia's water bodies do not fulfil basic regulatory standards. Only 12–14% of Russia's lakes and rivers are biologically clean.⁶ The quality of groundwater in Russia is also deteriorating, with approximately 30% already polluted, while inland and marginal seas contain pollutants 3-5 times higher than permissible levels.⁷

On May 29, 2020, a state of emergency was declared following the spill of thousands of tonnes of fuel from a metallurgical plant near the Siberian industrial centre of Norilsk. According to the corporation that owns the plant, which is located above the Arctic Circle, the leak was caused by the permafrost sinking of the foundation pillars of a fuel storage tank, approximately 350 square kilometres has been poisoned, and authorities estimate that clearing it will take five to ten years. The anticipated cost is billions of rubles.⁸ The occurrence in 2020 is not the only one of its kind; a comparable incident occurred in Norilsk in 2016. The images published soon after the disaster in 2016 depicted water, with the Daldikan lake shore covered in light red and, in some spots, dark red. Authorities questioned Vyacheslav Starostin, who was in command of the plant at the time of the event. On June 4, a regional court ordered Starostin to be held in pre-trial detention by July 31. He was charged with environmental violations and incompetence.⁹

2. Air quality – according to official statistics, approximately 60 million Russians experience high to extremely high levels of air pollution. These emissions have risen dramatically since 2000. Traffic pollution is responsible for roughly half of the rise in anthropogenic emissions. In big cities and some regions, traffic contributes 80-90% of air pollution.¹⁰ According to data, one out of every two Russians is negatively impacted by high concentrations of dust particles in polluted air caused by such emissions. More than 2.4 million people are exposed to amounts far above the average.¹¹ In 49 of the Russian Federation's 83 administrative units, more than half of the urban population lives in areas with "high" or "very high" levels of air pollution. These statistics, however, are insufficient to provide a full and accurate picture of pollution and air quality in Russia because they are not monitored in larger geographical areas.
3. Contamination of soil – the most common phenomenon in post-Soviet Russia is soil contamination from agricultural chemicals. Since the last century, Russian land has

⁶ Alexei Yablokov, "The Environment and Politics in Russia", *Russian Analytical Digest*, vol, 79, no.10, 2009, p.2.

⁷ Ibidem.

⁸ Europa Liberă România, "Scurgerea de petrol din Siberia Nordică ar putea deveni un dezastru ecologic", 5 iunie 2020, <https://romania.europalibera.org/a/foto-scurgerea-de-petrol-din-siberia-nordic%C4%83-ar-putea-deveni-un-dezastru-ecologic/30654913/p1.html> accessed in 04.04.2025.

⁹ Ibidem.

¹⁰ Alexei Yablokov, "The Environment and Politics in Russia", *Russian Analytical Digest*, vol, 79, no.10, 2009, p.3.

¹¹ Victoriya Bityukova, "Atmospheric pollution of Russia's cities: Assessment of emissions and imissions based on statistical data", *Geofizika*, Vol.29, 2012, p.53.

been impacted, and exceptionally severe soil degradation has escalated even more. Soil quality monitoring, like air quality monitoring, is limited to a few places in Russia. Even though these data are restricted, they provide some insight into the increased soil contamination that is occurring in particular regions of Russia. In some areas, contaminated areas make up roughly half of the total populated area. All of these factors have a significant impact on population health and are the primary causes of Russia's high death rate.

The “New World” Project

The "New World" project is a one-of-a-kind strategy in the Russian Federation, spearheaded by people under 35 years old. This project is one of several nationally recognised, implemented, and developed initiatives, including those in the fields of health, education, and agricultural industry development, among others, that are critical to the well-being of society in post-Soviet Russia. Given Russia's current challenges (both demographic and those affecting agriculture, housing, and any type of industry), it was important to draft and implement a strategy that addressed all of these sectors of life.

The project "New World" was founded to provide new life to agriculture and industry, especially in abandoned rural and urban regions, specifically the restoration of the agro-industrial complex (a word used to characterise the confluence of numerous sectors of the economy that provide mass manufacturing of food and consumer goods, and a collection of interconnected industries (animal husbandry, crop production, food processing, agricultural machinery, organic farming) and supporting facilities)¹². Taking into account these needs and economic situations in post-Soviet Russia, the concept underlying the development and implementation of the "New World" project is primarily aimed at meeting the needs of the project's target cities and villages, such as housing, access to education, health, jobs, food, and water. At the same time, given the problems of environmental pollution and their acceleration, which have resulted in an extremely serious use of the environment (soil, water, air, etc.), it was desired to advance to a new stage of construction technologies and environmental certification of materials.¹³

The project "New World" is the answer to all these difficulties that lead to a fairly damaging degradation of the environment and represents a unique blend of urban life in harmony with nature due to the employment of environmentally friendly technology and innovations within this project. Russia is following the lead of countries such as China, Germany, the United Arab Emirates, and the United States in designing and executing the International System of Innovative Eco-Cities project. The organisers of this project concentrated primarily on Russia's instability (very high pollution) and began to apply cutting-edge creative technology to give the greening that post-Soviet Russia required. This project is

¹² Mykhailo Guz, "New Approach to Agricultural Production Management in the Arctic: Organic Farming and Food Security", in Editor(s): Vasilii Erokhin and Tianming Gao (ed./coord.), *Handbook of Research on International Development and Sustainability in the Arctic*, Ukraine: National University of Life and Environmental Sciences, 2019, p.23.

¹³ Live Journal, *Russia will build eco-cities*, 2011, <https://my19edwin.livejournal.com/58127.html> accessed in 07.04.2025.

aimed at abandoned cities and villages on the territory of the Russian Federation (such as the area of the city of Vorkuta), and the entire process will be able to follow live on the Facebook page and the website devoted to the project. "It will be possible to track the birth of these types of ecological cities and villages daily, as well as learn in detail how all technologies and gadgets work, and the creators will allow people to make changes and express their opinions on the construction of all facilities through voting".¹⁴

The distinctive characteristics of the project "New World"

The "New World" project includes several features that do not contaminate the environment and use garbage and other waste to generate heat and power, all to conserve the environment:

1. Due to the exceptionally high level of air pollution caused by exhaust emissions, cities and villages (which have remained and are currently abandoned) were established and constructed that do not use standard modes of transportation.
2. Cleaning green spaces and other public areas of bottles, plastic, and other manmade objects that affect the environment. This waste should be removed and collected in carefully organised sites, forming a complete trash recycling cycle that will be converted into gas and energy."¹⁵
3. Nighttime street lighting in eco-friendly cities and villages will be done entirely on the basis of specially constructed panels that load using self-charging particles developed and developed by Russian energy scientists and researchers, as well as for use in lighting the homes of those who live there.
4. The Eco-city management system is completely established in the SSB Green Police units, which execute the functions of city system protection, maintenance, and control, are the housing and communal services sector's management firm, and serve as the project audit committee's body.¹⁶
5. The plethora of projects targeted at the complicated infrastructure of ecological cities and villages is therefore created so that it can be altered, versatile, employs light telecoms that can be replaced easily and quickly, unlike traditional ones that take much more effort and equipment. Thanks to these revolutionary procedures, green cities may be erected and disassembled in a relatively short time of around 6 months, acquiring the name of the mounting model because it can be assembled differently every time. Using and probing the various infrastructure models of a sustainable city, one can choose a model of such a city "with a software application for launching business, education, and medicine structures in each region of Russia, on burned and abandoned

¹⁴ Ecology, "Rusia va construi o rețea de eco-orășe", 2011, <https://ecology.md/md/page/rusia-va-construi-o-retea-de-eco-orase> accessed in 08.04.2025.

¹⁵ Dana Kolibrova, "System of Innovative Eco-cities New World", Ecodeo.org, 2012, https://ecodeo.org/novyi_mir/14768-sistema_innovatsionnykh_ekogorodov_novyi_mir accessed in 09.04.2025.

¹⁶ Ibidem, https://ecodeo.org/novyi_mir/14768-sistema_innovatsionnykh_ekogorodov_novyi_mir accessed in 09.04.2025.

places, actually implementing Government programs to improve citizens' lives and restore rural and urban areas of the Russian Federation."¹⁷

Greenbar

It is a Russian-born organisation that creates professional digital farms with software for growing vegetables, fruits, salads, and many forms of fresh greens in specially designated spaces in the city. The concept of a virtual agronomist was devised and accomplished thanks to artificial intelligence. "Artificial Intelligence virtual agronomist Anton is the main actor, scriptwriter, and director of our farms, ensuring optimal plant development circumstances."¹⁸

The technologies employed were chosen from the most advanced and appropriate for virtual farms and hydroponics to establish such distinctive farms in the world where fresh, pure, and organic vegetables, fruits, and other greens are grown. The global trend is to grow food locally in large cities. Vertical farming technology has made it accessible to any business.

Show-windows can be erected at home, in a basement, in a production area, in a retail mall, or on the roof of a structure.¹⁹ Microgreens are immature shoots that can be eaten or used to decorate recipes. It is used in salads, soups, cocktails, smoothies, and other beverages and foods. Because of its high nutritional content, such food is highly desirable, and its consumption is gradually increasing.²⁰

The main advantages of Greenbar Farms are:

1. Quality standards for farm-grown products follow the "SI+" Franchise package, ensuring consistent weight, volume, and appearance.²¹
2. Bio products 100% - Vegetables, fruits, and all forms of greens are grown using only natural nutrients in compliance with environmental requirements.
3. Ecological equipment - these plants are cultivated using a variety of organic matter.

Conclusions

Addressing major environmental contamination concerns requires addressing several issues, including, first, changes would need to be made to the legislation, as well as all decisions and processes that take place in state institutions within the Russian Federation territory. There is a need to reactivate non-governmental and governmental groups to promote young greening programs in Russia. There is a need to increase investment in the implementation of such projects, which are an essential step in protecting the environment. At the same time, such non-governmental organisations are fighting and advocating to strengthen education in this field of greening to draw a clear distinction between environmental pollution and the health of both the environment and the population, who feel all of these problems through their health, which is

¹⁷ Russian Federation, "Voluntary National Review of the progress made in the implementation of the 2030 Agenda for Sustainable Development", 2020, pp.48-49.

¹⁸ Green-Capital, "Greenbar", <https://www.green-capital.ru/> accessed in 10.04.2025

¹⁹ TopFranchise, "City farm is a high-tech business with a fast pay-off period", <https://topfranchise.com/suppliers/agriculture/green-bar/> accessed in 11.04.2025.

²⁰ Ibidem, <https://topfranchise.com/suppliers/agriculture/green-bar/> accessed in 12.04.2025.

²¹ Green-Capital, "Advantages", <https://www.green-capital.ru/> accessed in 12.04.2025.

harmed. Russia's environmental concerns stem from a shallow attitude to the exceptionally high levels of pollution in various regions of the country.

Russian researchers debated and continue to debate the issue of environmental (soil, air, and water) pollution, noting that there are increasingly serious threats to the environment, as many factories in Russia continue to pollute the environment with various residues and chemicals that are highly toxic to the environment and the health of the population. Environmental activists have frequently argued in recent years that they want a shift away from materials with extremely high levels of pollution and towards materials with low levels of pollution; more specifically, they want reforestation of areas or regions that have been deforested in recent years. However, to complete all of these responsibilities, a recovery is required on an economic, cultural, and social level.

Furthermore, there is an urgent need for authorities, organisations, and individuals to be receptive to education and research in the field of greening to prevent high pollution and maintain a clean and healthy environment.

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DIGITALISATION FOR SUSTAINABLE DEVELOPMENT

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Abstract: Digitalization is reshaping the foundation of modern society, emerging as a transformative force in sustainable development strategies. Through the integration of cutting-edge technologies, digitalization offers dynamic solutions to multifaceted economic, social, and environmental challenges. It contributes to improving process efficiency, optimizing resource utilization, and mitigating environmental impact. Tools such as artificial intelligence (AI), the Internet of Things (IoT), automation, blockchain, and big data analytics are revolutionizing energy systems, enhancing supply chain transparency, and enabling more inclusive and effective decision-making processes. These technologies support smart infrastructure development, facilitate the circular economy, and enhance the effectiveness of sustainability monitoring and reporting mechanisms. However, digitalization also presents numerous challenges, including cybersecurity threats, data privacy concerns, and the risk of digital exclusion, particularly in underserved communities. The digital divide and the displacement of jobs due to automation further highlight the necessity for thoughtful and equitable digital policies. Consequently, sustainable digital transformation requires comprehensive strategies that encompass innovation, ethical governance, infrastructure investment, and inclusive education. This article delves into the intricate relationship between digitalization and sustainable development, drawing upon theoretical frameworks, empirical evidence, and real-world case studies. It evaluates the role of digital innovation in achieving the United Nations Sustainable Development Goals (SDGs) and provides policy recommendations to foster a responsible and inclusive digital transition.

Keywords: Digitalization, sustainable development, technology, artificial intelligence, automation.

Introduction

Digitalization has become one of the most important transformative forces in the economy and society in the 21st century. Rapid advancements in information and communication technologies (ICT) have enabled the integration of digital solutions into nearly

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all fields of activity, resulting in fundamental changes in the way people live, work, and interact (Schwab, 2017).

Digitalization refers to the process of converting traditional information, processes, and systems into a digital format, enabling more efficient resource management and the optimization of operational processes (OECD, 2020). This process involves the use of technologies such as artificial intelligence (AI), the Internet of Things (IoT), blockchain, big data, and cloud computing, which help create an interconnected and intelligent digital ecosystem (Brynjolfsson & McAfee, 2014).

In recent decades, digitalization has profoundly impacted the global economy, facilitating the emergence of innovative business models and optimizing industries such as healthcare, transportation, education, and energy (European Commission, 2021). In addition to its economic benefits, digitalization also has significant social and environmental implications, providing sustainable solutions for reducing resource consumption and carbon emissions (GeSI, 2019). In this context, digitalization is not just a technological trend, but a strategic necessity for sustainable development. By integrating digital technologies into key sectors, countries and companies can improve energy efficiency, optimize the use of natural resources, and support the transition to a circular economy (Ellen MacArthur Foundation, 2020).

Digitalization: a key tool for global sustainable development

Sustainable development is a fundamental concept in modern economic and social policies, aiming to balance economic growth, environmental protection, and social welfare. According to the United Nations' Brundtland Report (1987), sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations, 1987). The three main pillars of sustainable development are:

1. **Economic dimension** – ensuring stable and equitable economic growth;
2. **Social dimension** – promoting social equity and quality of life;
3. **Ecological dimension** – protecting and efficiently utilizing natural resources.

In the context of digitalization, emerging technologies can support all three dimensions by facilitating the transition to more efficient and sustainable development models. Digitalization plays a crucial role in accelerating sustainable development by:

- **Optimizing resource use:** AI and big data can optimize supply chains and energy consumption (IEA, 2021).
- **Reducing carbon emissions:** Smart grid technologies enable better management of renewable energy (World Economic Forum, 2021).
- **Promoting the circular economy:** Blockchain and IoT assist in tracking the lifecycle of recyclable products and materials (UNEP, 2022).
- **Transforming education and the labor market:** Digitalization provides access to online education and creates new employment opportunities (European Commission, 2021).

Thus, digitalization can be an essential catalyst for achieving the Sustainable Development Goals (SDGs) set by the United Nations in the 2030 Agenda. Adopted in 2015, the 2030 Agenda includes 17 SDGs that aim to reduce inequalities, protect the environment, and promote innovation (United Nations, 2015). Digitalization plays a key role in achieving these goals, particularly in:

- **SDG 7:** Affordable and clean energy – through optimizing energy distribution networks and utilizing renewable sources.
- **SDG 9:** Industry, innovation, and infrastructure – by promoting the digital economy and technological innovation.
- **SDG 11:** Sustainable cities and communities – through implementing smart city solutions for urban mobility and resource management.
- **SDG 12:** Responsible consumption and production – through the use of blockchain technologies for tracking recyclable materials.

Therefore, digitalization is not only a technological solution but a key tool for global sustainable development.

Digital technologies and their impact on sustainability

The integration of digital technologies into modern society is playing a crucial role in advancing sustainability goals across sectors. Innovations such as artificial intelligence (AI), the Internet of Things (IoT), blockchain, big data analytics, and cloud computing are being increasingly adopted to enhance efficiency, minimize resource use, and reduce environmental harm. These tools enable both public and private sectors to make smarter, data-driven decisions, contributing significantly to sustainable development.

AI has proven particularly effective in optimizing energy consumption. For instance, intelligent systems can analyze vast amounts of data to adjust energy use in real time, significantly improving efficiency. A notable example is Google's application of AI developed by DeepMind, which enabled the company to reduce cooling-related energy consumption in its data centers by 40% (DeepMind, 2018). Similarly, AI is transforming logistics by optimizing delivery routes, reducing fuel usage, and lowering carbon emissions (McKinsey, 2020). It is also being deployed to monitor air quality in urban areas, allowing authorities to take prompt corrective actions to mitigate pollution (European Environment Agency, 2022).

The Internet of Things (IoT) enhances sustainability by connecting devices and systems in ways that facilitate continuous monitoring and control of resource use. Smart cities, for example, benefit from IoT-enabled infrastructure such as intelligent street lighting, which adjusts according to pedestrian and vehicle activity—achieving energy savings of up to 50% (Smart Cities Council, 2021). Environmental sensors powered by IoT allow for real-time tracking of air and water quality, enabling rapid response to environmental risks. In agriculture, IoT solutions are used to improve irrigation practices through soil moisture and nutrient sensors, reducing water waste and increasing crop efficiency (FAO, 2020). Furthermore, supply chain tracking enabled by IoT can cut food waste by 20–30% by

monitoring conditions such as temperature and humidity during storage and transport (World Economic Forum, 2021).

Blockchain technology offers another promising avenue for sustainability, especially in promoting transparency and traceability. Through secure and decentralized ledgers, blockchain can track the life cycle of products and materials, encouraging ethical sourcing and responsible recycling. IBM's Food Trust platform uses blockchain to provide end-to-end visibility of food products, reducing waste and enhancing consumer trust. Similarly, Plastic Bank leverages blockchain to incentivize plastic collection and recycling in vulnerable communities, directly contributing to the circular economy (World Economic Forum, 2020).

Big data analytics supports sustainability by enabling organizations to process and interpret vast datasets for better environmental decision-making. Analyzing satellite imagery, for instance, allows researchers and policymakers to track deforestation patterns, monitor climate change, and assess biodiversity loss with unprecedented accuracy (NASA, 2022). Predictive analytics also help in energy planning by forecasting demand and supply fluctuations, which supports the integration of renewable energy sources and improves overall energy grid stability (Manyika et al., 2011).

Cloud computing further complements sustainability efforts by offering scalable and efficient data storage solutions. Instead of relying on energy-intensive local servers, cloud infrastructure allows for resource consolidation and task optimization. This reduces the overall carbon footprint of digital operations. Companies like Google have demonstrated that cloud-based virtualization can significantly lower energy consumption through intelligent server management (Google, 2022). In addition, major cloud providers such as Amazon are now powering their data centers with renewable energy, further decreasing the environmental impact of digital services (Amazon, 2021).

Altogether, these technologies present powerful tools for sustainable transformation. However, their impact depends on how they are deployed and managed. Ensuring that digital innovation aligns with environmental and social objectives will be essential for achieving a truly sustainable future.

Challenges of Implementing Digitalization in a Sustainable Economy

As economies around the world shift toward sustainability, digital technologies are becoming integral to this transformation. Tools such as artificial intelligence, the Internet of Things (IoT), and blockchain are increasingly used to reduce waste, optimize resource use, and enable transparent supply chains. However, the path to digital sustainability is not without obstacles. The implementation of digital solutions brings with it a complex set of challenges, particularly in areas like cybersecurity, social inclusion, environmental impact, and ethical governance.

One of the most immediate concerns is cybersecurity. When organizations adopt interconnected digital systems, they inadvertently expose themselves to cyber threats. These systems—often responsible for storing and processing sensitive data—can be highly attractive

targets for malicious actors. As Kshetri (2021) notes, the integration of digital tools in models such as the circular economy introduces new vulnerabilities, especially where multiple parties rely on shared data platforms. Technologies designed for tracking and monitoring, although vital for sustainable practices, may also raise serious data protection issues, particularly when personal or commercial information is inadequately secured. Furthermore, many digital platforms used in green business models suffer from poor interoperability and weak encryption standards, making them susceptible to breaches and operational failures.

Beyond technical vulnerabilities, digitalization also risks deepening existing social inequalities. Although digital tools have the potential to enhance economic efficiency and promote innovation, access to these tools is not evenly distributed. Brynjolfsson and McAfee (2014) argue that the benefits of the digital revolution are often concentrated in areas with well-developed infrastructure and a skilled workforce. In contrast, rural regions or countries with limited digital access may struggle to keep pace, leading to a widening digital divide. This disparity can limit participation in emerging green markets and exclude certain populations from the benefits of sustainable innovation. In addition, workers in traditional industries face increasing pressure as automation replaces manual labor, leaving many without the training or opportunities to transition into new roles.

Digital technologies, while promoting environmental efficiency, can also create hidden ecological costs. For instance, data centers that support cloud computing and digital platforms require vast amounts of energy, often derived from non-renewable sources. Belkhir and Elmeligi (2018) have shown that the carbon footprint of the ICT sector is growing rapidly and could significantly offset gains made through other sustainability initiatives. Moreover, the fast-paced evolution of digital devices leads to frequent hardware replacement, contributing to electronic waste. Without robust recycling systems in place, e-waste poses a serious environmental threat, especially in regions lacking the infrastructure to manage it responsibly.

Finally, the ethical and governance dimensions of digital transformation cannot be ignored. As decision-making processes become increasingly reliant on algorithms and data analytics, issues related to transparency, bias, and accountability come to the forefront. Floridi (2016) emphasizes the importance of embedding ethical principles into digital innovation to prevent harmful outcomes. For instance, AI-driven tools used in environmental management or public planning must be designed to avoid reinforcing existing social biases. At the same time, the collection and use of data in smart systems raise questions about individual privacy and consent, especially when users are not fully aware of how their information is being stored or analyzed.

Sweden: a sustainable digital economy

Sweden stands out as a global pioneer in aligning digital transformation with sustainability goals. Through a comprehensive national strategy that integrates green technologies, digital innovation, and environmental policy, Sweden has built one of the most advanced and sustainable digital economies in the world. This success is rooted in a clear

political vision, strong public-private cooperation, and a culture that emphasizes environmental responsibility and technological advancement.

At the heart of Sweden's sustainable digital model is its commitment to achieving carbon neutrality by 2045, alongside reducing greenhouse gas emissions by 85% from 1990 levels (Sveriges Riksdag, 2020). Digitalization is not seen merely as a tool for economic growth but as a key enabler of environmental transition. Smart energy systems, digital infrastructure, and data-driven policy are all central to Sweden's approach. For instance, the Swedish Energy Agency has supported the development of AI-powered energy management tools that enable industries and households to monitor, predict, and optimize their energy use in real time. These innovations have contributed to a significant reduction in energy waste, while also empowering consumers to make informed decisions about their consumption patterns.

Another cornerstone of Sweden's strategy is its investment in smart grids and digital metering systems. By enabling two-way communication between consumers and energy providers, these platforms provide real-time data on usage and pricing, allowing for dynamic energy distribution based on demand. Vattenfall, one of Sweden's largest energy companies, has implemented such systems at scale, facilitating the integration of renewable sources like wind and solar into the national grid (Vattenfall, 2020). This has not only improved energy efficiency but has also increased the resilience and flexibility of the country's energy infrastructure.

Sweden's digital economy is also closely tied to the principles of circularity. The government and private sector have supported numerous initiatives that use digital platforms to extend product life cycles, reduce waste, and facilitate recycling and reuse. Digital marketplaces for second-hand goods, mobile apps that connect users with local repair services, and platforms that facilitate product-sharing have become commonplace in Swedish cities. One well-known initiative is the startup *Too Good To Go*, which connects consumers with food providers such as supermarkets, restaurants, and bakeries to redistribute surplus food that would otherwise be thrown away. This app has significantly reduced food waste and raised awareness about sustainable consumption (Too Good To Go, 2020).

In addition to consumer-facing platforms, Sweden is investing heavily in green innovation through research and development hubs that focus on digital solutions for sustainability. The country has created testbeds for smart cities, such as the city of Malmö's "Green Digital City" initiative, where IoT sensors and AI systems are used to monitor traffic, pollution, and energy use. These projects serve as models for how urban environments can become more sustainable through the strategic deployment of digital technologies. Moreover, the digital twin concept—a virtual model of urban infrastructure—is being used in planning processes to simulate the environmental impact of new developments before they are built, ensuring that cities grow in a sustainable and efficient manner.

Education and digital literacy are also central to Sweden's sustainable digital economy. The country invests in programs that equip citizens with the skills needed to engage with digital tools that support sustainability. From school curricula that include environmental science and coding, to adult training programs in green technologies, Sweden ensures that its population can actively participate in and benefit from the digital transformation.

Importantly, Sweden’s model also includes strong policy frameworks that regulate the environmental impact of digital technologies themselves. Measures are in place to promote energy-efficient data centers, reduce electronic waste, and ensure that digital infrastructure is powered by renewable energy. Sweden’s government has incentivized the construction of “green data centers” that use natural cooling methods and are integrated into local heating systems—transforming excess heat into energy for nearby homes and businesses.

In conclusion, Sweden exemplifies how digital technologies can be harnessed to build a sustainable economy. Through a balanced and integrated approach that combines cutting-edge innovation, environmental responsibility, and inclusive policies, Sweden demonstrates that sustainability and digitalization are not only compatible but mutually reinforcing. As countries around the world seek to transition to greener and more resilient economies, Sweden offers a model worth emulating—where digital solutions are at the core of sustainable development.

Estonia: a digitally-driven green economy

Estonia has emerged as a leading example of how a small, agile nation can harness digital transformation to support sustainability and economic resilience. Internationally recognized for its advanced e-governance and digital infrastructure, Estonia has extended its digital-first philosophy to environmental management, energy optimization, and circular economy development. The nation demonstrates how digitalization and green policy can be integrated to create a future-proof, efficient, and low-carbon economy (Kalvet, 2012).

A cornerstone of Estonia’s approach is its paperless public administration. Nearly all government services—from voting to tax filing—can be accessed online using a secure digital ID system. This model eliminates the need for most physical paperwork and has drastically reduced the environmental footprint associated with bureaucracy (e-Estonia, 2023). The nation’s digital signature system alone has saved an estimated 2% of GDP annually in productivity and materials, including vast amounts of paper and ink (European Commission, 2020).

Estonia’s energy sector also benefits from the strategic use of digital technologies. Smart meters and grid management systems provide both consumers and providers with real-time data on electricity usage, enabling more sustainable energy consumption. The country has explored blockchain-based platforms to facilitate peer-to-peer energy trading, promoting decentralization and the use of renewable resources (Kukk & Sihvonen, 2020). This technology empowers households to sell surplus solar energy to the grid or directly to neighbors, fostering energy democracy and local green entrepreneurship.

Environmental monitoring in Estonia is supported by advanced data analytics and sensor networks managed by the Estonian Environment Agency. Satellite imagery, GIS tools, and IoT devices are used to track air quality, water resources, forest conditions, and biodiversity. These technologies enable early detection of environmental threats and facilitate data-driven policy decisions (Estonian Environment Agency, 2022).

In the urban sphere, Estonian cities are leveraging digital solutions to reduce emissions and promote green mobility. In Tallinn, smart traffic lights adjust in real time to reduce idling and emissions, while public transportation is free for residents—an initiative that has boosted ridership and reduced car use (City of Tallinn, 2020). In addition, apps and platforms that support vehicle sharing and electric mobility contribute to a lower-carbon urban environment.

Estonia also promotes the circular economy through digital platforms that extend product life cycles. Apps like Rendin (for rental housing) or Yaga (for second-hand clothing) exemplify digital tools that support sustainability. Moreover, the government encourages digital repair platforms and recycling services, which help reduce landfill waste and foster consumer awareness about sustainable consumption.

The country's investment in digital literacy is central to this success. Estonia has integrated ICT education into the national curriculum from the primary level. Programs such as ProgeTiger promote coding and digital competence among students and educators (Tiidus, 2020). This digitally skilled population is better equipped to engage with smart technologies that facilitate sustainability.

Estonia's e-residency program, though primarily economic, also offers indirect sustainability benefits by allowing entrepreneurs worldwide to run location-independent, paperless businesses from Estonia, minimizing travel and physical resource use (e-Estonia, 2023).

In summary, Estonia exemplifies how digital governance and green policy can be mutually reinforcing. Through widespread digitization, transparent data use, and public engagement in smart technologies, the country has built a low-emission, innovation-driven economy. Estonia's model shows that even with limited physical and economic resources, a nation can become a global leader in both digital transformation and sustainable development.

Romania's digitalization challenge and opportunities

Romania stands at a pivotal crossroads where digitalization presents both formidable challenges and promising opportunities in its pursuit of sustainable development. Despite having significant potential to harness digital technologies, the country struggles with several structural barriers that impede swift progress. Infrastructure deficiencies, especially in rural areas, persistently limit access to high-speed internet and advanced digital services, while digital illiteracy remains widespread among various segments of the population (European Commission, 2022).

Recognizing the critical role of digital transformation in fostering economic growth and social inclusion, the Romanian government has articulated ambitious goals through its National Strategy for Digitalization 2020–2030. This strategic framework aims to propel Romania toward becoming a competitive and inclusive digital economy by the end of the decade. The strategy prioritizes enhancing digital skills across all age groups, expanding the availability and quality of online public services, and nurturing an ecosystem that supports digital entrepreneurship and innovation (Romanian Ministry of Communications and Digitalization, 2020).

Nevertheless, Romania's digital journey faces persistent challenges. The pace of integrating cutting-edge technologies such as artificial intelligence (AI), big data analytics, and the Internet of Things (IoT) into industries remains slower than the European average. This technological lag is partly due to uneven infrastructure deployment and a shortage of skilled professionals able to implement and manage complex digital systems (OECD, 2021). Additionally, the rural-urban divide in internet accessibility continues to widen social and economic disparities, limiting rural communities' ability to participate fully in the digital economy (World Bank, 2021).

Addressing these issues requires a multifaceted approach. Public-private partnerships have proven essential in mobilizing resources and expertise for digital infrastructure projects. Increased investments aimed at expanding broadband connectivity in underserved areas are crucial to bridging the digital gap. Complementing infrastructure efforts, comprehensive digital literacy programs targeted at vulnerable groups—such as older adults, low-income populations, and rural residents—are needed to foster greater digital inclusion and empower citizens to utilize new technologies effectively (European Investment Bank, 2022).

Furthermore, Romania can harness its membership in the European Union to accelerate its digital transformation. EU funding mechanisms, such as the Digital Europe Programme and the Cohesion Fund, provide financial and technical support that Romania can leverage to enhance digital infrastructure, develop innovative digital services, and build human capital (European Commission, 2023). By aligning national policies with broader EU digitalization priorities, Romania stands to benefit from knowledge exchange, technical assistance, and increased investment.

In addition to public sector initiatives, the private sector and startups play a crucial role in Romania's digital future. The country has a growing tech ecosystem, particularly in urban hubs like Bucharest, Cluj-Napoca, and Timisoara, where IT companies and innovation hubs are driving advancements in software development, fintech, and smart city solutions (European Digital Innovation Hub, 2022). Encouraging collaboration between startups, academia, and government agencies can foster an environment conducive to sustainable innovation.

Ultimately, Romania's ability to transform digitalization challenges into opportunities will determine its trajectory toward sustainable economic development. By investing in infrastructure, enhancing digital literacy, fostering innovation, and leveraging EU partnerships, Romania can not only narrow the digital divide but also build a resilient digital economy that supports social inclusion, environmental sustainability, and long-term prosperity.

Conclusions

Digitalization is a fundamental tool in advancing sustainable development, providing innovative solutions for reducing resource consumption, lowering carbon emissions, and supporting the transition to a circular economy. However, digitalization must be implemented

with caution, ensuring that associated risks such as cybersecurity and social inequality are carefully managed.

For digitalization to fully contribute to sustainable development, it is necessary to implement effective policies that promote access to technology, foster digital literacy, and address emerging risks. Governments should prioritize the digitalization of key sectors such as energy, transportation, and agriculture while investing in the training and reskilling of workers impacted by automation.

Furthermore, international collaboration is essential for ensuring that the benefits of digitalization are shared globally and equitably. Countries should work together to implement common standards for digital platforms and promote the ethical use of new technologies to avoid risks related to privacy and inequality. By embracing digitalization in a responsible and inclusive manner, countries can unlock new pathways to achieving sustainable development goals and building a more sustainable future for all.

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THE EUROPEAN UNION'S ROLE IN AI GOVERNANCE: CASE STUDIES ON REGULATORY AND GEOPOLITICAL CHALLENGES

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Abstract: *This article examines how the EU positions itself in shaping AI governance in the changing international order. It focuses on the regulatory approach that the EU has undertaken regarding AI through the European AI Act, a very important legal document that influences global standards and rules. The methodology used in this article entails analysing various documents like books and scientific articles and bringing forward three case studies, one focusing on the impact of the AI Act on global technology companies, one on the position of the EU in the geopolitical rivalry between the United States and China, and one on the EU's efforts to achieve sovereignty from a technological point of view through initiatives like GAIA-X. Combined, these methods offer a clear view on the main challenges and opportunities that the EU is confronted with in this ever-evolving field, especially regarding geopolitical competition, and the ethical issues posed by AI.*

Keywords: *AI governance, European Union, technological sovereignty, geopolitical competition, regulation.*

Introduction

AI is among the most advanced technological developments of the 21st century. It has the power to reshape economies at a global level, structures of governance, and international relations. As AI is ever-evolving, the governance of AI technologies has raised interest and became a crucial point when discussing geopolitical issues and global regulations. By introducing the European AI Act, the EU positioned itself as advocating for the ethical development and governance of AI. This is because the European AI Act pursues setting global standards in order to regulate AI. This paper describes how the approach of the EU towards the governance of AI fits within the context of the changing international order.

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The main research question that this paper addresses is: How can the EU win in front of the challenges posed by the governance of AI, considering the geopolitical context that rapidly evolves, especially related to global competition, technological sovereignty, and ethical matters? By using the methods of document analysis and case study, this paper examines the role of the EU in modelling the governance of AI and the issue it is confronted with when trying to balance regulations with supporting innovation and competitiveness. Moreover, the article brings forward both the opportunities and risks that the EU faces in its road to become a standard-setter for AI at a global level.

Literature Review

AI and its governance have rapidly become very important fields of study both in political science and international relations. This reflects the crucial effects of AI-based technologies on global governance structures, regulatory frameworks, and geopolitical power dynamics. The EU aims to become a leader regarding the ethical governance of AI, by placing accent on transparency, human rights, and fairness. The following literature review highlights several key points within the sphere of AI governance and the role of the EU, including regulatory leadership, geopolitical competition, technological sovereignty, and ethical considerations.

Regulatory Leadership and the "Brussels Effect"

An aspect that is often discussed regarding the EU's approach to AI governance is its regulatory leader role. Authors like Bradford (2019) introduced the "Brussels Effect" concept. This refers to the ability of the EU to model regulatory standards at a global level through its domestic policies. The EU's General Data Protection Regulation (GDPR) is an example of this Brussels Effect, because it had an influence on laws about data protection all around the world, making multinational firms comply with the standards of the EU in order to be able to access the European market (Bradford, 2019). This regulatory reach is extended beyond the protection of data to other areas related to digital governance, including AI.

The European AI Act (the Act) is the EU's most recent and ambitious attempt to establish global standards. As described by Schuett (2022), the Act's purpose is to regulate AI-based technologies dependent on the risk levels they pose, high-risk systems being subject to harsh requirements. The regulatory approach of the EU is based on its commitment to AI centred on humans. This commitment places considerations such as accountability, privacy, and the avoidance of discrimination as a priority (Schuett, 2022). In spite of this, authors have raised concerns about the possible consequences of this model of regulation. For instance, Wallace and Castro (2018) warn that the EU's harsh regulations could suppress innovation and lead to a "brain drain", this meaning that AI talent and investments could flow to world regions having more permissive regulatory environments, like the United States and China.

In spite of these concerns, the literature generally agrees that the regulatory leadership of the EU in AI has a great potential of influencing global standards. Bocharova (2023)

highlights that the regulatory model of the EU could serve as an example for other countries and world regions, especially for those that agree with the emphasis on human rights and democratic values of the EU. However, Bocharova (2023) also mentions that the ability of the EU to export its regulatory framework could be limited by geopolitical factors, particularly the very competitive AI governance models of the United States and China.

Geopolitical Competition in AI Governance

The implications of AI governance from a geopolitical point of view are a major focus in recent studies, especially in the context of the AI-related race between the United States (the US) and China. Authors like Roberts et al. (2022) explain that AI is now a pivotal element of national security strategies, both the US and China investing high amounts in research and development (R&D) for implementing AI in military applications. In this view, the emphasis of the EU on ethical AI is contrasting to these pragmatic and security-oriented approaches adopted by the US and China.

China has been constantly criticized for using AI-based technologies to improve the country's surveillance capabilities, both on a domestic and international level. According to Khoo and Mahmood (2020), the development AI strategy in China puts first state control and social stability, using technologies like facial recognition and predictive policing to monitor and eliminate opposition. This creates a sharp contrast with the commitment of the EU to using AI in ways that protect freedoms and fundamental human rights. Roberts et al. (2022) consider that the efforts of the EU to promote ethical AI are very important in the broader geopolitical context, because they provide a counterbalance to the more authoritarian applications of AI observed in China.

The US has undertaken a more laissez-faire approach regarding AI governance. It focuses on promoting innovation and driving regulatory constraints to a minimum. Selyanin (2021) mentions that the US government allowed the private sector to be the one leading AI development, having limited federal supervision. While this allowed technology to advance quickly, it has also raised concerns on the ethical implication of AI-based technologies that are developed without sufficiently taking into consideration regulations. DePaula et al. (2024) highlight that the missing comprehensive AI regulation in the US could lead to a "race to the bottom" situation in which firms put profits in front of ethical implications, potentially undermining efforts to generate AI systems that are safe and responsible.

The EU is constantly challenged in this competitive landscape in respect of asserting its influence. Stix (2021) discusses that the focus of the EU on ethical AI positions it uniquely in the global AI governance. In spite of this, the EU's regulatory efforts must be accompanied by greater amounts invested in AI research and infrastructure if the purpose is to compete with the technological advancements and financial resources of China and the US. The literature suggests that while the EU may excel in setting regulatory standards, its geopolitical influence in the field of AI will be dependent on its ability to develop AI industries that are competitive and reduce its reliance on technology providers that are not based in Europe.

Technological Sovereignty and External Dependencies

Technological sovereignty has gained increasing attention in the context of the EU's digital policy, especially in light of the COVID-19 pandemic. The pandemic exposed the weak points of global supply chains. Roberts et al. (2022) agree that technological sovereignty is crucial for the EU if it wants to maintain control over its digital infrastructure and data. To reach technological sovereignty, significant amounts need to be invested in AI R&D. Moreover, a strong digital ecosystem able to compete with those of China and the US is needed.

However, the EU encounters a few obstacles in achieving technological sovereignty. Farrand (2024) highlights that the EU is still dependent on external providers of technology, for instance in respect of cloud services, semiconductors, and AI hardware. Because of this dependence, economic and security risks arise, as it makes the EU vulnerable to disruptions in global supply chains and geopolitical tensions. Calderaro and Blumfelde (2022) opine that the fact that the EU relies on foreign technologies could undermine its leader position regarding regulation in the field of AI, because it may be obliged to comply with standards and practices of external providers.

To resist these challenges, the EU introduced initiatives like the Digital Decade Strategy, that has the scope to promote innovation in the field of AI and minimize technological dependencies. However, authors like Calderaro and Blumfelde (2022) advise that reaching technological sovereignty requires more than regulatory measures – it also depends on the ability of the EU to sustain a competitive AI ecosystem within the region. This ecosystem includes attracting top talents in the field of AI, funding AI startups, and developing the right infrastructure to sustain AI R&D.

Ethical AI and Human Rights

The commitment of the EU to foster ethical AI is connected to its regulatory framework. This emphasis on ethics has been also discussed in the literature. For instance, Wallace and Castro (2018) highlight that the fact that the EU focuses on transparency, non-discrimination, and accountability shows its commitment to democratic values and human rights. The European AI Act imposes strict rules on AI systems that present high risks, especially on those that are likely to have an effect on fundamental rights (Schuett, 2022).

In spite of this, the literature also presents the challenges of implementing standards of ethical AI in a global environment. Roberts et al. (2022) highlight that the EU's ethical rules may be difficult to implement in regions other than Europe, especially in countries that put security and economic growth in front of human rights. Khoo and Mahmood (2020) mention that the nature of AI technologies is global, meaning that ethical issues cannot be solved by one region alone. This is why international cooperation is essential to ensure that AI is developed and implemented in ways that shield fundamental human rights.

To summarize, the literature in the field of AI governance highlights the EU's leading role in endorsing ethical AI, while it also underscores the challenges that the EU faces in implementing its regulatory framework on a global level.

Methodology

This paper uses the case study method and the document analysis method. Through these methods, the article explores how the governance strategies especially through the European AI Act apply and are understood in the context of the real world. The case study method is appropriate to investigate where the regulatory ambitions of the EU intersect with the global technological and geopolitical realities. Through the document analysis method, various documents like books and scientific articles are analysed.

The article focuses on three main case studies, detailed in the following.

The impact of the European AI Act on global technological companies: this case examines how international companies like Microsoft and Google have adjusted their AI practices to comply with EU regulatory standards. The purpose is to understand the practical effects of the AI Act in the innovation strategies of these companies.

Geopolitical competition in AI: this case explores the EU's role in the broader geopolitical rivalry between the United States and China. The analysis of documents about these two global powers is used to evaluate how the ethical governance model from the EU contrasts with the approaches driven by the market and controlled by the United States and China, respectively.

Technological sovereignty and external dependencies: this case investigates the efforts of the EU to achieve technological sovereignty, particularly through the GAIA-X project. The document analysis provides information on the challenges of reducing the dependency on non-European technology providers and building a competitive AI ecosystem in Europe.

The use of case studies and document analysis guarantees a comprehensive understanding of how the EU AI governance strategy is formulated and implemented in real world scenarios. By combining the theoretical analysis of documents with practical examples of case studies, the research draws conclusions about the broader implications of the EU AI governance model for global AI regulation.

Results and Discussions

Case 1: The European AI Act and the Global Regulatory Landscape

The current European AI Framework, introduced in April 2021, represents the EU's ambition for a stable global standard for AI governance. This case study assesses the handling of global AI interaction and receptions across a wide range of international technology giants. It focuses on the specific implications for AI companies within Europe.

In practice, addressing the risk of laws binding EU companies is the EU's concern about European operations with strict rules on AI. For example, global technology giants such as Google and Microsoft, which operate extensively in the EU, are subject to legislation. These companies align their AI products with the EU standard of transparency, oversight, and risk management. One example is the Microsoft AI for Healthcare initiative, which uses AI for its diagnostic and patient care tools. Under the AI Act, each mechanism must be evaluated to

ensure safety and accountability. Microsoft has decided to incorporate strict compliance protocols, an effort similar to the GDPR (Bradford, 2019). These enlightened efforts are now affecting Brussels, prompting these companies to be made transparent in accordance with innovation regulations, or to regulate more strictly the production rate of the products (Wallace and Castro, 2018).

This case shows the practical impact of EU leadership in AI regulation but also highlights the tension between maintaining ethical standards and fostering innovation. While the European AI Act encourages companies to adopt more ethical AI systems, it could also lead to higher operating costs and, in some cases, a redirection of investments to regions with less stringent regulations, such as the United States or China.

Case 2: Geopolitical Implications – Competition with the U.S. and China

The second case study focuses on the geopolitical implications of the EU's AI governance model and its rivalry with the United States and China. Both the United States and China have taken very different approaches to AI development: the United States have adopted a market-based model, and China has adopted a state-controlled model that integrates AI into national security and social governance (Roberts et al., 2022). These models challenge the EU's human-centred approach to AI governance.

In the real-world geopolitical arena, the EU's efforts to position itself as an ethical leader in AI have met with resistance. For example, the Chinese government's use of AI for mass surveillance in Xinjiang and its aggressive promotion of AI technologies globally, through initiatives such as the Belt and Road Initiative, stand in stark contrast to the EU's principles of transparency and privacy (Khoo and Mahmood, 2020). European companies working in AI must therefore navigate a difficult landscape: aligning with strict EU standards while remaining competitive in markets like China, where such ethical considerations are secondary to innovation and efficiency.

Furthermore, the EU's regulatory influence is limited in areas where military applications of AI are targeted. The United States, through the National Security Commission on AI, has invested heavily in military AI technologies, such as autonomous weapons and AI-enhanced cybersecurity systems (Roberts et al., 2022). The EU's ethical stance, particularly its support for a ban on lethal autonomous weapons, could hamper its ability to engage in AI-based defence collaborations with the United States, weakening its geopolitical influence in this sector (Roberts et al., 2022).

In short, while the European AI Act reflects the EU's aspirations for ethical AI governance, this case study illustrates the challenge of maintaining influence in a highly competitive and geopolitically charged environment. In practice, the EU faces difficulties exporting its ethical AI model to other global powers that prioritize AI for security and control.

Case 3: Technological Sovereignty and External Dependencies

The last case examines the EU's push for technological sovereignty in AI, using the GAIA-X project as a key example. GAIA-X is the initiative of the EU to build a European cloud

infrastructure that aligns with the above ethical principles and reduces dependence on non-EU cloud providers, such as Amazon Web Services (AWS) and Microsoft Azure (Bocharova, 2023).

In practice, the GAIA-X initiative represents the EU's response to its excessive dependence on American and Chinese technology providers, particularly in the cloud computing and artificial intelligence sectors. This case study examines how GAIA-X aims to strengthen European digital independence through the creation of a network in the cloud that complies with the privacy and data protection standards of the EU. The project faced important challenges to attract financing and achieve scale, especially in comparison with the global domain of American cloud providers.

The examples from the real-world show that, even though European companies, such as Siemens and Bosch, have joined the GAIA-X initiative, they still depend on non-European technology for many of the above AI applications (Farrand, 2024). This dependence on foreign technology raises questions about the viability of reaching a true technological sovereignty. The shortage of semiconductors during the COVID-19 pandemic has relieved even more the vulnerability of the EU in the field of AI hardware, since it contains the manufacturing capacity to produce the chips of other technology necessary for the development of AI (Schneier, 2020).

The slow progress of GAIA-X illustrates the broader EU struggle to develop a self-sufficient technological ecosystem that aligns with regulatory objectives. Although the project is a step towards digital sovereignty, its implementation in the real world is delayed, which generates concerns about the capacity of the EU to continue being competitive in AI without relying on external technology providers.

Discussion

The three case studies highlight the complex interplay between EU regulatory ambitions and the practical realities of global AI governance. While the European AI Act demonstrates EU leadership in setting ethical standards for AI, the case of global tech giants like Microsoft adapting their practices shows that this leadership comes with trade-offs in terms of innovation and competitiveness.

The case of geopolitical competition reveals that the EU's ethical AI governance model may struggle to assert itself in a world where AI is increasingly linked to national security and authoritarian control, as seen in the policies of the United States and China. The EU's efforts to maintain an ethical and human-centred AI governance model may limit its influence in areas such as defence and surveillance, where other global powers prioritize speed and efficiency over ethical considerations.

Ultimately, the GAIA-X case demonstrates that achieving technological sovereignty is a long-term and challenging goal for the EU. Despite its ambition to create a self-sufficient AI ecosystem, the EU still relies heavily on non-European technologies. This poses risks not only to the EU's economic independence but also to its ability to enforce its own regulatory standards.

These real-world examples highlight both the strengths and limitations of the EU's AI governance strategy. While the EU excels at setting ethical standards, it faces significant challenges in maintaining its competitiveness and influence on the global stage. These results suggest that, for the EU to successfully navigate the changing international order, it needs to balance its regulatory ambitions with practical investments in innovation and technological infrastructure.

Conclusions

The European Union's attempt to lead the global governance of AI reflects its ambition to set ethical standards while remaining competitive in a fast-evolving technological landscape. Through the European AI Act, the EU has pioneered a human-centred regulatory framework that prioritizes transparency, accountability, and the protection of fundamental rights. However, the case studies analysed in this article reveal both the opportunities and challenges inherent in this approach.

First, the European AI Act demonstrates the EU's capacity to shape global AI governance by compelling international companies like Microsoft and Google to adapt their AI systems to comply with European regulations. This "Brussels Effect" extends the EU's ethical standards beyond its borders, reinforcing its position as a global regulatory leader. Nevertheless, balancing ethical oversight with fostering innovation remains a significant challenge. Strict regulations may inhibit the growth of the AI sector within the EU, leading to a potential "brain drain" of talent and investment to less regulated regions, such as the United States or China.

Second, the geopolitical landscape complicates the EU's aspirations. The competition between the United States and China, particularly in AI-driven national security applications, demonstrates the limitations of the EU's influence in a world where AI technologies are increasingly linked to defence and surveillance. The case of China's AI-driven surveillance state and the U.S.'s rapid development of AI for military purposes highlights the tension between the EU's ethical stance and the priorities of other global powers.

Third, the EU's quest for technological sovereignty—exemplified by initiatives like GAIA-X—aims to reduce dependence on foreign technology providers and bolster European innovation. However, real-world examples show that the EU is still reliant on external providers, particularly in AI hardware and cloud infrastructure. This reliance raises questions about whether the EU can achieve true technological autonomy and continue to enforce its ethical AI standards without being constrained by foreign technologies.

In conclusion, while the EU has made significant strides in AI governance, maintaining its regulatory leadership in a highly competitive and geopolitically complex environment will require balancing ethical standards with practical investments in innovation and technological infrastructure. The EU must continue to promote its human-centred approach to AI while investing in its technological capabilities if it is to remain a key player in the global AI landscape. Achieving technological sovereignty and staying competitive without sacrificing its core ethical values will be the key challenge for the EU in the coming years.

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INTEGRATION OF ARTIFICIAL INTELLIGENCE IN EDUCATION: STRATEGIES FOR A SUSTAINABLE DEVELOPMENT IN THE PROJECT “ROMANIA 2030”

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Abstract: Artificial Intelligence (AI) has the potential to transform Romania’s educational systems through a strategic and systematic integration aligned with the National Strategy for Sustainable Development 2030. Through this research, we aim to analyze how Artificial Technologies can support personalized learning and improve access to education, contributing to an inclusive, equitable, and high-quality educational system. The study examines existing initiatives, the methods by which AI can be effectively implemented in education, and the associated challenges, including ethical considerations and public policy issues. Through an analysis of best practices and strategic recommendations, the paper offers a new perspective on the optimal ways of sustainably integrating AI into Romanian education, highlighting its impact on teaching, learning, and institutional decision-making processes.

Keywords: Artificial Intelligence, Education, Personalized Learning, Accessibility, Sustainability.

Introduction

We are already at the end of the first quarter of the 21st century, a period as fascinating as it is unsettling. We witness rapid changes in all areas of life. The speed at which information travels is already at an incredible level—we speak here of fiber optics and information that moves at the speed of light, or supercomputers where operations per second are measured in quadrillions of flops. Against the backdrop of these changes, the idea of Artificial Intelligence has emerged in the classic discourse. Beyond technology, industry, or security, the educational domain entered this realm of digital transformations somewhat later—transformations that now seem to be redefining nearly all aspects of life. Social, economic, cultural, educational—these domains are now at the center of this process of adaptation and reinvention.

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Artificial Intelligence (AI), one of the most disruptive technologies of the current century, is increasingly making its presence felt in educational systems worldwide. Yet alongside the unknowns that unfold in front of us, we can also foresee unprecedented opportunities. From models of personalized learning to automation of educational processes and expanded access to quality educational resources — all these ideas and applications seem very interesting. However, beyond our optimistic views, we cannot ignore the other side of reality: the risks and dangers that these technologies raise.

In Romania, the integration of artificial intelligence in education represents both a major systemic challenge and a strategic opportunity of great significance. In the context of the 2030² Agenda for Sustainable Development and the National Recovery and Resilience Plan (PNRR³), a clear direction is emerging. We dare to walk towards a digital transformation of education—aimed at addressing the needs of future generations and fulfilling the commitments Romania has made at the international level⁴. Nevertheless, implementing AI-based projects and using AI resources in schools and universities requires a profound rethinking of the teacher's role, teaching and assessment methods, educational infrastructure, as well as the legislative and ethical framework.

This article aims to critically explore the potential of artificial intelligence in the Romanian educational system, in relation to the objectives of the sustainable development plan. Based on a qualitative study conducted in the winter of year 2025 on a group of 45 participants directly involved in education (teachers from lower and upper secondary and university levels, students, and pupils), the article highlights perceptions, challenges, and emerging directions regarding AI integration in schools and universities. In addition, it analyzes their needs, the trends of the general educational context in Romania, and the importance of innovation and technology in education. We will address both the government strategic plans in the Romania 2030 project and the sustainable development goals that Romania has assumed in relation to education and technology. A series of strategic recommendations will also be formulated for the sustainable, equitable, and ethical implementation of these technologies.

The Global and National Context of Digital Education

International Directions for AI Integration in Education

To better understand the present and prepare for the future, we must understand the past. A brief historical overview shows that humanity's need for progress has repeatedly propelled technological advancement from stagnation to rapid evolution. These transformations—often difficult to control externally—have brought technological improvements and incredible inventions. The history of computers experienced such accelerated development in the 20th century, although the first machines designed to perform

² United Nations, Agenda for year 2030 <https://sdgs.un.org/2030agenda>

³ National Recovery and Resilience Plan

⁴ The United Nations 2030 Agenda - România <https://www.mae.ro/node/35919>

increasingly complex calculations appeared as early as the 19th century. The turning point came during the Second World War—a time of crisis but also a context conducive to significant discoveries and inventions. During this period, Alan Turing became known for his machine, initially built for cryptanalysis and decryption of Nazi messages. After the war, he continued his research, building in 1950 the first chess program for a computer. It is in this period that the term "artificial intelligence" also emerged, introduced in his 1950 paper "Computing Machinery and Intelligence." In a 1947⁵ lecture, Turing stated the desire to create a "machine that can learn from experience," and the method was also mentioned: "the possibility of modifying its own instructions" to self-adapt or transform. A visionary by nature, he did not live to see with his own eyes what he had imagined. However, his legacy has caught up with us through the inventions of the last decade.

The world's major economic and educational powers have begun testing, using, and integrating AI-based technologies in all areas of technological development and beyond. We see in countries such as the United States, China, South Korea, Estonia, and Finland numerous projects aimed precisely at this: implementing AI technologies in teaching, learning, and educational administration. Investments in intelligent educational platforms, personalized learning algorithms, and automated systems for feedback and evaluation are beginning to yield results day by day. However, we must ask: where does Romania stand in this landscape? International organizations such as UNESCO and the OECD have published reports and guidelines for governments, recommending the responsible use of AI in education, emphasizing both the potential of this technology and its associated risks. For example, the report "AI and Education: Guidance for Policy-Makers"⁶ (UNESCO, 2021) states that AI can reduce educational inequalities but can also exacerbate gaps if not implemented equitably.

Romania and the Digitalization of Education in the Context of the 2030 Agenda

Within the 2030 Agenda, we find a clear goal—Objective number 4: "Quality Education"⁷ — as a priority took on nationwide through the National Action Plan for Sustainable Development. All necessary methods are therefore used to achieve this objective. For this reason, Romania adopted the National Strategy for the Digitalization of Education 2021–2027⁸, a document that acknowledges the urgent need to modernize education through digital technologies.

Romania officially launched the SMART-Edu Strategy 2021–2027⁹, targeting a school system that is Modern, Accessible, based on Resources and Technologies. The strategy's objectives include figures such as: 90% of the population to be digitally literate, 82% of youth

⁵ London, 1947: "What we want is a machine that can learn from experience"

⁶ Document pdf: <https://discovery.ucl.ac.uk/id/eprint/10130180/1/Miao%20and%20Holmes%20-%202021%20-%20AI%20and%20education%20guidance%20for%20policy-makers.pdf>

⁷ <https://www.mae.ro/node/35919> - The United Nations 2030 Agenda for sustainable development goals

⁸ news article: <https://www.edu.ro/strategia-de-digitalizare-educa%C8%9Biei-din-rom%C3%A2nia-2021-2027-smart-edu-lansat%C4%83-%C3%AEn-consultare-public%C4%83>

⁹ The Digitalisation of Education in Romania: Digitalizarea educației din România - 2021-2027

aged 20–34 to be prepared for emerging professions, and equipping all educational institutions with modern technological infrastructure. SMART-Edu emphasizes the need to develop cross-curricular digital competencies, continuing teacher training, the necessity of connectivity, open educational resources (OER), as well as cybersecurity and partnerships between public and private entities. In parallel, in January 2023, Romania approved the National Strategy for Environmental Education and Climate Change 2023–2030, integrating “learning for sustainability” into the school curriculum through thematic weeks (Green Week), teacher training, and school renovations for energy efficiency (the “Green Schools” network). These strategies align with the 2030 Agenda for Sustainable Development, especially Goal 4 (“Quality Education”) and Goal 12 (“Responsible Consumption and Production”)—promoting literacy, equitable access to information, relevant professional training, and long-term competencies.

However, the COVID-19 pandemic highlighted major vulnerabilities: lack of digital infrastructure in many schools, insufficient digital competencies among teachers, and major difficulties in equitable access to online education, especially in rural areas. These realities indicate that for Romania to effectively adopt AI in education, sustained structural reforms, coherent investments, and well-grounded public policies are necessary.

Public Policies and Strategic Initiatives in Romania

Among the recent initiatives with an impact on the digitalization of education, we can enumerate three key directions that Romania has pursued. First, we highlight the National Recovery and Resilience Plan (PNRR), which broadly provides investments in equipping schools with technology and training teachers. Specifically, we refer to both material and immaterial investments: acquisition of digital equipment (tablets, laptops, internet connectivity—a major issue in rural areas), continuing education courses for teachers, and school rehabilitation projects (insulation, solar panels, electric minibuses for rural access, under the auspices of “Green Schools” project)¹⁰.

Secondly, another notable initiative is the Digital Education Strategy (SmartEdu), which includes components related to innovation, curriculum adaptation, and digital skills development. The SMART-Edu¹¹ initiative originated from the need to adapt the Romanian educational system to the online environment—a change accelerated by the external context of the COVID-19 pandemic. All these aspects related to digitalizing public services were initiated and supported by the provisions of the National Strategy for Romania's Digital Agenda 2020.

Thirdly, we mention the pilot programs for the introduction of digital textbooks, educational platforms, and the electronic gradebook, which have also been successfully implemented where the local infrastructure of educational institutions allowed. Starting from

¹⁰ news article: <https://www.gooddeeds.eu/ro/national-education-environment-climate-change-romania/>

¹¹ Project Smart-Edu: <https://www.smart.edu.ro/>

autumn 2025, the electronic gradebook is planned to be introduced as mandatory in all schools where the school infrastructure can sustain it¹².

All these efforts have been coordinated by the Ministry of Education and Research, with the involvement of civil society, the private sector, and digital experts. However, there is another dimension worth highlighting and that is precisely: environment education and sustainability. This emerging aspect is becoming a transversal component in schools, through activities, curriculum, and ecological infrastructure. We also mention the year 2023, an important year for these green projects, in which “green” qualifications were developed in vocational education (photovoltaic electrician), as well as RE-CRED/PNRR projects for green competencies among adults.

Artificial Intelligence as a distinct topic is only just beginning to appear in Romanian educational policies. Clear legislative frameworks regarding the use of AI in schools, regulations concerning personal data protection, or ethical standards for using algorithms in educational processes are still lacking.

Budget Allocated for Education Digitalization in Romania (2021–2025)

To provide a more detailed perspective on investments and allocated budgets for these educational projects, we created the following table:

	PROJECT	ALLOCATED BUDGET	Details
1	PNRR – Education ¹³	~€ 3,6 bil.	Allocated through the brand <i>Educated Romania (digitalization, labs, green campuses)</i>
2	Equipment and digital tools (Component 15 – Investment 9) ¹⁴	€ 478,5 mil.	3600 schools equipped 5200 labs modernized 1100 SmartLabs created
3	Furniture and digital equipment ¹⁵	€ 1 bil.	5800 schools
4	Digital assessment platform ¹⁶	€ 78,5 mil.	€ 20mil. for the platform, €30mil. for test items, €28.5mil. for digital educational resources
5	SmartLab – intelligent laboratories	~€ 330 mil. (included in the € 3,6 bil.)	€ 60 000 allocated to each high school involved in the project;
6	Digitalization of public libraries ¹⁷	€ 16,8 mil.	From PNRR, second round of funding opened; €22mil. remained unused from the first round

When evaluating the data presented, whether the funds have been accessed, used, or remain unused, we want to emphasize their relevance to the Artificial Intelligence dimension.

¹² news article: <https://www.edupedu.ro/toate-scolile-vor-putea-folosi-un-catalog-electronic-din-anul-scolar-2025-2026-cu-conditia-sa-nu-li-se-ceara-bani-parintilor-ci-sa-fie-platit-din-bugetul-scolii-proiect/>

¹³ news article: <https://smartcitymagazine.ro/330-milioane-euro-invatamantul-dual/>

¹⁴ Component 15: <https://www.adrcentru.ro/pnrr-componenta15-educatie/>

¹⁵ news article: <https://romania.europalibera.org/a/pnrr-educatie-cum-sunt-cheltuiti-3-miliarde-de-euro/33145726.html>

¹⁶ news article: <https://www.educatieprivata.ro/785-milioane-de-euro-suma-alocata-de-min-educatiei-pentru-platforma-de-evaluare-digitala/>

¹⁷ news article: <https://newsweek.ro/cultura/16-milioane-de-euro-disponibile-in-pnrr-pentru-digitalizare>

We highlight the following projects: Development of digital infrastructure (~€1 billion for equipment creates the technological foundation necessary for using AI computers, connectivity, labs), Digital platform and content (€78.5 million for assessment and digital educational resources can be expanded with AI modules for adaptive testing and personalized feedback), SmartLabs (investment in intelligent, technical and eco-focused labs create ideal pilot environments for integrating AI solutions) and not at last, Sustainable and collaborative education through green projects or the digitalization of libraries supports the development of transversal competencies necessary for the ethical and responsible use of Artificial Intelligence.

Artificial Intelligence in Education: Concepts, Benefits, and Risks

What is Artificial Intelligence in Education?

A general definition we propose for Artificial Intelligence could be the following: Artificial Intelligence is the ability of digital systems to perform tasks that normally require human intelligence, such as learning, decision-making, adaptation, and communication. In everyday language, we understand “artificial intelligence” as being associated with machines performing cognitive functions typically carried out by human minds. We can add “problem-solving” to this list of functions — a relevant addition, as we will apply this definition specifically to education.

AI in education refers specifically to the use of intelligent systems and algorithms to perform tasks such as: personalized learning/teaching (adaptive learning/teaching), educational data analysis (learning analytics), automated evaluation (feedback), support for teachers and students through chatbots (platforms through which one side asks questions and the other side responds automatically and adaptively), or intelligent tutoring systems.

According to UNESCO¹⁸ (2021), AI in education is defined as “the use of intelligent technologies to enhance the quality, access, and efficiency of the educational process, while respecting fundamental human values”¹⁹. The OECD²⁰ (2023) includes AI among the emerging technologies for “learner-centered education and reducing educational disparities”²¹.

Applications and Benefits of Artificial Intelligence in Education

In this subchapter we want to present a set of applications and benefits of using AI in education. Of course, this list may be improved or modified, but here is our proposed summary:

1. Personalization of the educational process – through adaptive systems that adjust lessons based on the student’s learning style, pace, and level. AI can also recommend

¹⁸ United Nations Educational, Scientific and Cultural Organization

¹⁹ pdf document: <https://www.edu.ro/sites/default/files/SMART.Edu%20-%20document%20consultare.pdf>

²⁰ Organisation for Economic Co-operation and Development

²¹ pdf document: <https://www.oecd.org/en/about/directorates/directorate-for-education-and-skills.html>

additional activities based on performance, interest, or learning gaps. Examples of such platforms: Knewton, Squirrel AI.

2. Automated evaluation and real-time feedback – through exams or quizzes on platforms, enabling automatic correction of written texts or multiple-choice tests, and even language analysis for essays. Platforms such as Kahoot, Google Forms, and Microsoft Forms can be used for quizzes, while Gradescope or Turnitin Draft Coach offer instant AI-based suggestions.
3. Administrative support and reduction of teachers' workload – The hours professors dedicate in their free time for preparing teaching and assessment materials clearly demand tools to assist with automated test generation, gradebook management, or performance statistics. We suggest using educational chatbots for individual support, such as Duolingo Bot
4. Support for students with special needs – This is often a neglected area due to time constraints or the lack of human and financial resources dedicated exclusively to students with special needs. Technologies now exist for voice or visual recognition, useful for dyslexia, visual/hearing impairments, as well as platforms offering automatic translation and real-time language support. These technologies must be implemented and used on a larger scale.
5. Collaborative learning and complex simulations – for approaching higher-level learning. In addition to attention deficit problems (ADD/ADHD) increasingly found in Romanian schools, there is the issue of disengagement caused by repetitive and often irrelevant information. We propose using AI in VR/AR²² (virtual reality and augmented reality) for virtual labs, experiments, anatomy, and projects in difficult subjects that can be better understood through visual materials (technological education, biology, chemistry, history, geography).

isks and Challenges of Using Artificial Intelligence in Education

Besides benefits, we have identified a number of challenges and risks associated with the use of AI in education. In an objective manner, we wish to list them to offer a balanced perspective on the issue, so that in the future we know how best to address them, and which aspects are worthy of our attention.

Talking about ethics, confidentiality, privacy, and algorithmic bias, AI may perpetuate or even amplify existing inequalities through biased data. Students may be mislabeled (automated profiling) in this process. Personal data is vulnerable and exposed online, where any transmitted information can never be lost even after it seems deleted (digital fingerprint). From an ethical standpoint, questions arise: Is it right to generate text using AI, knowing that some platforms are explicitly programmed to produce text based on given prompts? UNESCO raises a serious warning about “the risk of excessive surveillance and treating students as

²² info: <https://sopa.tulane.edu/blog/whats-difference-between-ar-and-vr>

objects of analysis rather than as human beings.”²³ These elements must be treated with utmost seriousness.

Another aspect worth mentioning is digital exclusion. This refers to the lack of infrastructure in disadvantaged areas and the resulting increased risk of social and educational exclusion. Beyond infrastructure, we see the need for technical literacy, commonly referred to as digital competencies. These skills either confirm the user’s ability to effectively use digital resources, or, when lacking (the needed infrastructure), significantly hinders their use, making adoption unlikely.

The last aspect we want to discuss here and we think is probably the most important of them all is the risk of replacing the human dimension in education. This may be the most important concern. AI cannot replace empathy, the emotional and motivational role of the teacher. No matter how advanced, human interactions can never be fully or truly replaced by computers, in our view. On the other hand, the distance between teacher and student introduces the risk of technological dependence. Generations born in the 21st century can no longer imagine a day without their phone, internet access, or instant answers from the internet. This trend reinforces our concern: technology becoming part of us (an “extension” of our body) and AI potentially becoming an extension of our mind as well or even replacing it significantly.

From a legislative viewpoint, we battle with the problem of insufficient legal regulations. Regarding AI technologies, current legislation is limited. Specifically for education, regulations concerning the use of Artificial Intelligence in schools are scarce. Although Romania refers to AI as a “driver of economic growth and social well-being” in its National AI Strategy (2023)²⁴, there is still no specific education-related law in this regard.

International Frameworks and Best Practices

UNESCO launched in 2021 the first global framework, adopted by 193 states, for the ethical use of AI. Entitled “Recommendation on the Ethics of Artificial Intelligence”²⁴, it serves as a valuable tool and guide for adapting to present AI developments. Likewise, the European Union has proposed a classification framework for Artificial Intelligence, known as the “AI Act”²⁵ which includes risk labels. In education, AI is categorized under “high-risk”²⁶ technologies, a rather concerning and noteworthy designation. Finally, we looked into several examples of best practices and found encouraging projects in countries all around the globe: Finland (the course “Elements of AI”²⁷, publicly accessible, available for free and translated into Romanian), South Korea (AI integrated into the middle school curriculum, including a course of digital ethics) or Estonia (transparent government algorithms used in education). These examples encourage us, and we believe that together we can find the best ways for Romania to become a regional example of best practices in this field.

²³ pdf document: <https://unesdoc.unesco.org/ark:/48223/pf0000381494>

²⁴ pdf document: <https://unesdoc.unesco.org/ark:/48223/pf0000381137>

²⁵ AI Act, adopted in 2014. <https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai>

²⁶ info: <https://www.lexology.com/library/detail.aspx?g=70b04b24-03f8-483b-ae17-a2f5732a3f01>

²⁷ course: <https://www.elementsofai.com/>

Qualitative Study

Justification for Choosing the Qualitative Method

To understand perceptions, expectations, and concerns regarding the integration of Artificial Intelligence (AI) in education, we opted for a qualitative research method. This allows us to deeply explore subjective opinions and nuances that cannot be captured in a quantitative study. We designed a questionnaire with 32 items, both objective and subjective, including semi-structured questions with open-ended responses, as well as closed-ended ones, to offer a coherent and analyzable framework. “We wanted to learn not just whether people agree with the use of AI in education, but how they imagine this integration and what perceived risks they identify.”²⁸

Group and Participants Description

We collected responses from 45 participants, distributed as follows: 60% female and 40% male, majority aged 18–24 (students), followed by teachers and professionals aged 35–44. We conclude that the slightly higher participation of women may indicate either a greater openness to engage in research related to education and technology or a higher representation in the targeted educational fields. (Gender distribution: 27 female respondents, 18 male respondents)

Most respondents were young students, which is coherent with the field of education and the interest in digital innovation. However, we also had representation from teachers and other adults involved in education, and middle school or high school students. (Age distribution: 18–24 years – 21 respondents; under 18 – 10 respondents; 35–44 years – 8 respondents; others – in smaller proportions)

In terms of status, since the 18–24 age group was the most strongly represented (students), the study therefore engages with an age group that provides a “bottom-up” perspective on AI in education. This is especially relevant, as students are both the primary beneficiaries and potentially the first to be affected by this technology.

We also considered the participants’ fields of study or activity, which included engineering and technology, natural and math sciences, life sciences and health, social sciences, education, and arts and humanities. In this sense, the broad interests and vocations of the participants offered valuable insight into so many different views and perceptions, another aspect that made our study extremely relevant.

Study Results and Interpretation

The diversity of the group allowed for the collection of opinions from multiple sectors (educational, technological, youth/students, teaching staff), contributing to a balanced and

²⁸ Study Questionnaire: <https://forms.gle/n5HYnoSL3Yne3fD17>

comprehensive perspective on the topic. The qualitative method provided the space for deep expression of individual and collective perceptions regarding the role of AI in education. Beyond statistics, the responses revealed important nuances.

Level of Familiarity and Experience with AI

As for working experience with AI, 50% of respondents are familiar with and actively use AI tools (such as ChatGPT, Midjourney, Copilot), 40% have a basic level of knowledge and 10% have no experience whatsoever in this area.

This reflects a widespread openness toward exploring this domain. “I’m a student, but I’ve started using AI in university projects,” said one participant. A teacher offered a different view: “I work in education and I’m concerned about how we can use AI without losing the human side of teaching.” The answers show a strong openness to these technologies, even among young students. “I’m a student, but I use AI to check translations and scientific explanations,” said another respondent. This level of exposure facilitates the formation of informed opinions regarding both the potential and the limitations of these technologies in education.

Acceptability of Using AI in Educational Processes

The question regarding the use of AI to generate and correct evaluation tests generated divided opinions. The majority support using AI, but under human supervision, especially for efficiency and rapid feedback. A smaller group opposes it entirely, citing the risks of error or the loss of the teacher’s role. “It can help with automatic correction, but the teacher must have the final say.” “It’s a tool, not a replacement.” “It’s acceptable for teachers to use it, but with supervision and ethics.” “It can be useful if it supports, not replaces, the teacher.” Participants view teachers as intelligent mediators between technology and students. A complete automation is not desired, but rather an adaptation in which teachers remain active, relevant, and involved in the process.

Ethical Concerns Regarding AI Integration

Even though the technology is generally well received, ethical concerns dominate the discourse. 26 out of 45 respondents believe that AI raises major moral and social issues. The most frequently mentioned concerns include: loss of human contact, risk of digital dependency, algorithmic bias or protection of personal data. Let’s look at two other answers from the group: “Artificial Intelligence must be used with limits and awareness”, “Students might become dependent on AI for every answer”.

Respondents are clearly concerned about the loss of the human dimension in education and the technological risks (dependency, privacy breaches). These opinions signal a clear need for rules on the responsible and transparent use of AI.

Regulation and Responsibility in the Use of AI in Education

There is consensus on the need for clear regulations concerning the use of AI in education. All respondents agreed that rules must exist for using AI in Romanian schools. There is also a strong call for institutional collaboration—between the Ministry of Education, educational institutions, and teachers. The use of AI should not be left to chance or only to individual decisions by teachers or schools. There is a need for: standardization, best-practice guidelines, and ongoing professional training for teachers.

“Without clear rules, we’ll face technological chaos,” concluded one student.

Conclusions

The integration of Artificial Intelligence in education is no longer just a future challenge, but a present reality that requires a strategic, ethical, and sustainable approach. The qualitative research conducted in this study revealed that there is a real potential for a positive impact on the educational process, but also a set of essential conditions that must be met for this impact to be truly beneficial and lasting. Both the authors and the study participants recognize the benefits of AI in education. Aspects such as personalize learning, more efficient assessment, quick access to information, and support in developing analytical thinking are just some of the benefits and objectives worthy to be mentioned. If used responsibly, AI can become an ally to the teacher, and definitely not a replacement. Furthermore, we underline the urgent need for a national strategy regarding the integration of AI in education, aligned with the Sustainable Development Goals of the Romania 2030 Agenda. This strategy must include: clear usage guidelines, teacher guides, continuous training courses, and regulations on privacy and ethics. The success of this process depends on synergy between the Ministry of Education, educational institutions, the tech sector, and civil society. Participants support a collective regulatory approach, where teachers are not left alone, but are encouraged and supported with appropriate tools and clear policies. The participants in the study also proposed “The creation of a national AI-based educational platform,” and “The introduction of an optional course on AI in high school and university.” These ideas are far from impossible. They just need a team of talented people dedicated to this project and resources and support from the national government and local organizations to proceed moving forward. For effective AI implementation, Romania needs modern digital infrastructure, especially in rural areas, educational communities open to innovation, and a change in mindset toward technology. We need to evolve and move from fear to responsibility and trust.

In the end we must say that dealing with Artificial Intelligence technologies cannot be made from a position of neutral stance. It is essential for us to draw firm ethical lines regarding the correct use of personal data, prevention of technology dependency, and most importantly, the preservation of critical thinking as a central educational value. Romania can become a regional model in the responsible use of Artificial Intelligence in education, if it acts strategically, collaboratively, and ethically. Artificial Intelligence must not replace the human being but enhance humanity through the educational process.

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ARTIFICIAL INTELLIGENCE FOR A GREENER TOMORROW: ADVANCING SUSTAINABILITY THROUGH SMART SOLUTIONS

Adina-Ioana HOZA¹

Abstract: *As the climate crisis continues to visibly intensify, the integration of humanity's breakthrough technology, artificial intelligence (AI), into our environmental strategies seems to offer promising solutions for overall global sustainability. This paper's goal is to explore how AI can serve us as a catalyst in many shapes, by reducing carbon emissions, optimizing energy systems, enhancing agricultural efficiency, improving climate adaptation, and advancing circular economy practices. The new Technologies enable accurate real-time monitoring of environmental conditions, automated resource management, as well as precise forecasting of climate-related risk at even more accurate pace than before. Drawing on global case studies and recent policy developments, it highlights AI's capacity to drive data-informed positive change. The research examines the already successful implementations across multiple sectors, from smart grid technologies in renewable energy distribution to even precision agriculture systems that minimize water and fertilizer usage. Additionally, AI-powered climate modelling has enhanced our understanding of complex environmental systems, enabling more accurate predictions and targeted interventions. However, we cannot deny that ethical concerns such as high energy consumption, proven algorithmic bias, and misuse must be addressed to be able to ensure equitable and responsible implementation of it. This overall analysis considers the regulatory frameworks and international needed to harness AI's potential while mitigating its risks. Furthermore, the digital divide and accessibility issues must be addressed to ensure that AI-driven environmental solutions benefit all communities, particularly those most vulnerable to climate change impacts. The findings suggest that successful integration requires interdisciplinary collaboration between technologists, environmental scientists, policymakers, and communities. This approach is essential for developing AI usages that are not only technically sophisticated but also socially acceptable and environmentally beneficial. Ultimately, this paper argues that AI, when properly aligned with clear sustainability goals and robust governance to balance the downsides, can fill the gap between global ambition and actionable progress.*

Keywords: *artificial intelligence, climate change, sustainability, green economy, smart solutions*

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Introduction: The urgency of sustainability

The likelihood that long-term warming would surpass 1.5 degrees Celsius is more than 99%, even if humans cease releasing heat-trapping gases into the atmosphere by the 2050s. The worldwide target of keeping warming to 1.5 degrees Celsius over pre-industrial levels is now most likely unachievable, according to researchers². Climate change expressed in concerning levels of biodiversity loss and pollution are significantly accelerating global instability. Despite the proven urgency, political will and public action often fall behind scientific consensus. In this context, artificial intelligence (AI) emerges as a transformative enabler—a technology that can process vast data, optimize systems, and guide sustainable decision-making at scale. AI is not a solution in itself, but a force multiplier for existing and emerging green technologies. As the Boston Consulting Group notes, AI has the potential to reduce global carbon emissions by up to 10% if deployed responsibly and strategically³. Improving climate disaster alert systems and hazard forecasting are two important uses of AI for climate adaptation and resilience. The sensitivity and specificity of early warning systems regarding climate tipping points can be enhanced using deep-learning algorithms. In order to help people get ready for significant changes brought on by climate change, this can be used to estimate long-term trends in a specific area (such as modelling sea-level rise)⁴. Yet AI has environmental downsides which is a serious consideration to take, as it should be used appropriated to maximise the benefits. In order to establish measures to minimise environmental harm, policy officials, researchers, lawyers, and industry specialists must have a thorough understanding of the environmental impact of artificial intelligence. The results of recent studies highlight the significance of putting energy-efficient algorithms into place, moving to renewable energy sources, embracing ethical e-waste management procedures, making sure AI decision-making is fair, and taking ethical issues and implementation guidelines into account⁵. AI also helps us change our consumer behaviour to become more climate aware inclined. With customised interventions, AI enables consumers to make climate-friendly decisions. For instance, Google Maps' environmentally friendly routing system employs artificial intelligence (AI) to recommend routes with fewer hills, less traffic, and steady speeds with ETAs that are the same or comparable. During its rollout phase, it has prevented more than 1 million tonnes of CO₂ per year in a few cities in the US and Europe, which is the same as removing 200,000 automobiles from the road⁶.

Applications of AI may contribute significantly to emissions, but they may also be crucial for adaptation and reduction. Governments and AI businesses must take ethics very

² Ruth A. Mottram et al., "AI-Assisted Detection of Extreme Melt Events on the Greenland Ice Sheet," *Geophysical Research Letters* 51, no. 8 (2024)

³ Boston Consulting Group, *How Artificial Intelligence Can Reduce Carbon Emissions* (2021)

⁴ Grantham Research Institute on Climate Change and the Environment, *What Opportunities and Risks Does AI Present for Climate Action?*, London School of Economics, 2024

⁵ Cristina M. Rivero, "Ethics and Governance of Artificial Intelligence in Climate Change Mitigation," *Law, Technology and Society* 3, no. 1 (2024): 1–18

⁶ World Economic Forum, *How Artificial Intelligence Can Drive Climate Transition and Economic Growth*, January 2025

seriously in light of AI's dual function.⁷ Thus both AI's role in causing climate change and its role in mitigating it can be paradoxical⁸.

Harnessing AI for Green Development

The development of environmentally friendly products is impacted by each of the three aspects of green internal culture, environmental discrimination, and reducing environmental pollution because implementing green strategies improves the environmental performance of products by lowering carbon emissions, using sustainable raw materials, and cutting waste⁹. To reach its full potential, AI requires the proper organisational and physical frameworks and mechanisms in place, just like any other developing technology. Europe must thus build this infrastructure, collaborating closely with business to ensure that it is both affordable and available¹⁰. Throughout the value chain, from data collection, storage, and processing to algorithm training and use, technology can be used to find solutions to climate change and environmental degradation (green-by AI) and in an environmentally friendly way (green-in AI), according to the European Commission's 2020 EU White Paper on AI¹⁶. Based on their possible hazards and effects, AI systems are subject to requirements under the AI Act¹⁷, an EU legislation that was enacted on March 13, 2024, after discussions with member states in December 2023.¹¹ The application of AI in sustainability varies across geographies. In technology-intensive economies, investment in AI R&D (Artificial Intelligence Research and Development) can drive industrial upgrading and accelerate green innovation. Conversely, in labor-intensive or low-tech regions, AI must be adapted to local contexts through improved infrastructure, inclusive policies, and interregional cooperation¹². In both cases, governments play a pivotal role. Strategic subsidies, tax incentives, and AI-friendly regulations can stimulate innovation while ensuring that AI tools are equitably distributed. The AI investment disparity is likely made worse by larger geopolitical and national security factors, which go beyond the economic mechanics of AI security and responsibility research¹³. Green development also requires robust collaboration between private and public actors to prevent unequal access and support low-emission growth. We can contribute to ensuring that advancements in AI capabilities are matched by commensurate advancements in security and accountability measures by providing incentives for security and responsibility research and

⁷ Aishath Ali and Mohamed Shareef, "The Role of Artificial Intelligence in Achieving Sustainable Development Goals: Opportunities and Challenges," *Journal of Information, Communication and Ethics in Society* 21, no. 1 (2023): 134–151

⁸ Anders Nordgren, "Artificial Intelligence and Climate Change: Ethical Issues," *Journal of Information, Communication and Ethics in Society* 21, no. 1 (2023): 60–73

⁹ Mohammed Edan Al Khazraje, "The Role of Adopting Green Strategies in the Development of Eco-Friendly Products," *Management Research and Practice* 16, no. 3 (2024): 71–83

¹⁰ Google, *The AI Opportunity for Climate Action in Europe* (2023)

¹¹ Verónica Bolón-Canedo, Laura Morán-Fernández, Brais Cancela, and Amparo Alonso-Betanzos, "A Review of Green Artificial Intelligence: Towards a More Sustainable Future," *Neurocomputing* 599 (2024)

¹² Xiaoming Zhang, Yijun Li, Zhenyu Wang, and Jun Chen, "How Does Artificial Intelligence Impact Green Development? Evidence from China," *Sustainability* 16, no. 3 (2024): 1260

¹³ American Research Institute, *AI Security and Climate Innovation: The Case for Targeted Tax Incentives*, 2024

lowering the net costs associated with it. AI's promise can be fulfilled in this way, all the while upholding strict security regulations and safeguarding the general public¹⁴.

Sectoral Applications of AI

AI's role in reducing carbon emissions

AI systems are already reshaping high-emission sectors. For example, industrial optimization through AI can cut emissions by 20–30% in the steel and oil sectors¹⁵. Logistics is another area of impact: UPS's ORION system uses AI for route planning, saving 10 million gallons of fuel annually. Globally, AI could reduce up to 4% of greenhouse gas emissions—equivalent to 2.4 gigatons of CO₂—by 2030¹⁶. These collective gains reported are not just technical but political, providing governments with measurable targets for emissions reduction strategies.

Optimizing Energy Use with AI

We need to consider the balance of the energy AI uses and the amount that it can help us save enriching efficiency. AI strengthens energy systems by enabling smart grid management and forecasting renewable energy output. Google DeepMind, for instance, reduced cooling energy in its data centers by 40% using machine learning.¹⁷ AI can forecast solar and wind fluctuations, ensuring that renewable sources are used more effectively. According to the World Economic Forum, these optimizations could reduce energy-related emissions by 6–8% by 2030¹⁸. As energy demands grow globally, AI offers a data-driven approach to decouple growth from environmental degradation.

AI in Sustainable Agriculture

The future of sustainability and energy management is expected to be significantly shaped by the further advancement of AI-driven technology¹⁹. Agriculture requires a lot of work, and as the population grows and the need for agricultural output increases, automation plays a bigger role. In terms of parts, technology, and applications, AI greatly helps farmers. Crop quality and supply are ensured by predictive analytics and enhanced farm and crop

¹⁴ Ibid.

¹⁵ Cheng-Jui Tseng and Shih-Yen Lin, *Suppliers' AI Adoption and Customers' Carbon Emissions: Firm-Level Evidence from China*, 2024

¹⁶ World Economic Forum, *How AI Can Help Combat Climate Change* (2024).

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ Amit Yadav and Gaurav Dhiman, "Optimization of Energy Consumption via Artificial Intelligence: A Study," *Energy and Built Environment* (2024),

management systems²⁰. Computer vision technologies, drone data, and IoT alerts are all integrated and processed to offer expedited alerts simultaneously, improving precision farming. The photos taken by these drones can be used to more effectively identify crop diseases. Farmers need to realise that artificial intelligence (AI) is only a more sophisticated form of earlier technology for collecting, analysing, and tracking field data. For AI to function, a suitable technological base is required²¹.

More developments include the use of drones and autonomous tractors for effective farm management, the use of herbicides being drastically reduced, and Blue River Technology's precise spraying. PEAT's Plantix and Trace Genomics are two AI tools that offer precise soil health and pest management diagnostics. Real-time crop monitoring and weather forecasting are provided by satellite-based programs like Farm Shots and aWhere, which maximise resource utilisation and reduce hazards²². In this context, agriculture faces a dual challenge: feeding a growing population while reducing its ecological footprint. AI addresses both through precision agriculture. Tools like John Deere's "See & Spray" system use AI to target weeds, reducing herbicide use by 90%²³. AI also improves livestock management, reducing methane emissions while maintaining animal health. These technologies enable 8–12% yield increases with less water, fertilizer, and pesticide use²⁴. In this way, AI contributes to both food security and environmental sustainability.

Climate Monitoring and Prediction

AI accelerates climate action by making environmental data actionable. Satellite image analysis, for example, allows AI to detect iceberg changes 10,000 times faster than humans²⁵. Projects like Google's AI flood forecasting have issued 30 million early warnings in South Asia, doubling lead times for emergency response²⁶. In the Amazon for example, AI systems now track illegal deforestation in real-time, helping authorities intervene faster and more efficient. These noteworthy tools are especially vital in climate-vulnerable regions, where timely data can save lives and livelihoods²⁷. An AI-powered project called Google Earth Engine (GEE) uses superior datasets, like those from the Copernicus satellites, to support climate action. In order to analyse various environmental aspects, evaluate the possibilities for renewable energy, and monitor deforestation, GEE can analyse complex datasets. It manages readily available, regularly updated scientific resources by fusing a large collection of satellite imagery and GIS databases with planetary-scale research capabilities. GEE is used by researchers, scientists, and

²⁰ Gökhan Güler, "Artificial Intelligence Applications in Renewable Energy Systems," *Green Energy and Intelligent Transportation* 1, no. 2 (2022)

²¹ Ibid.

²² Obasi, Amarachi Blessing, and A. U. Akpomi, "The Role of Artificial Intelligence in Achieving Climate Change Mitigation Targets," *Journal of Scientific Research and Reports* 30, no. 6 (2024): 1–1

²³ European Space Agency, *AI Maps Antarctic Icebergs in Seconds*, 2024,

²⁴ United Nations, *Google's AI Flood System Saves Lives in South Asia*, November 2023

²⁵ AMP Robotics, *Smart Sorting Technology for Waste Management*, 2024

²⁶ World Economic Forum, "Digital Technologies in Nationally Determined Contributions," in *Climate Brief*, February 2024

²⁷ Marcela R. Oliva, *How Can Artificial Intelligence Help Curb Deforestation in the Amazon?*, Global Observatory, November 2020

businesses to fulfil their sustainability pledges and further scientific research²⁸. The EU is also dedicated to improving the monitoring, preservation, and restoration of its natural habitats. This includes immediate measures to conserve 30% of EU territory by 2030 and anticipate and lessen natural calamities like floods and wildfires.

The EU has implemented tech-driven initiatives to enhance its policymaking at the nexus of AI and climate in order to support these objectives. Utilising AI and EU supercomputers, Destination Earth (DestinE) compiles enormous volumes of environmental data to create novel approaches to climate adaptation and mitigation. Legislation pertaining to sustainability is already being supported by digital technologies. For instance, it is proposed to map forest vulnerabilities, monitor climatic threats, and assist with disaster preparedness planning using the Forest Monitoring Regulation²⁹.

Rainforest Connection (RFCx), a non-profit organisation, uses acoustic monitoring equipment to combat illicit deforestation in real-time, including in nations like Brazil, Ecuador, and Peru that are part of the Amazon basin. In order to prevent both illegal deforestation and poaching of native species, team members strategically place recycled cell phones in rainforests. When the phones detect the sound of a chainsaw, the gadgets instantly notify rangers. Additionally, animals, particularly endangered birds and mammals, can be tracked and documented by governments and researchers using a cloud-based database of animal sounds collected in this way³⁰.

Circular Economy and Waste Management

Circular economy practices are amplified by AI's ability to identify inefficiencies and automate recycling. AMP Robotics' AI-based sorting systems increase recovery rates by over 10%³¹. AI also supports sustainable product design, optimizing material use and reducing overproduction. In consumer goods, predictive models guide packaging decisions, aligning manufacturing with zero-waste goals. As landfills expand and pollution rises, AI offers pathways toward systemic efficiency and waste reduction. Waste pyrolysis, carbon emission estimation, and energy conversion are all enhanced by artificial intelligence and chemical analysis. The method known as sensor-based trash monitoring makes use of sensors to quantify the amount of garbage produced, pinpoint its sources, and assess how well waste management plans are working in a given location³². A wireless sensor network is made up of numerous self-organising wireless sensors that are positioned throughout the system to keep an eye on its environmental or physical characteristics³³.

²⁸ Google, *The AI Opportunity for Climate Action in Europe* (2023)

²⁹ *Ibid.*

³⁰ *Ibid.*

³¹ UNESCO, *How AI Policy Can Accelerate Climate Action*, 2024

³² Zhaohui Wu et al., "Artificial Intelligence for Sustainable Development: Challenges and Opportunities," *Environmental Chemistry Letters* 22 (2024)

³³ *Ibid.*

AI in National and International Climate Strategies

Nationally Determined Contributions (NDCs) increasingly reference AI as a tool for achieving climate goals. As of 2024, 57 developing countries had included digital technologies in their NDCs, with five explicitly mentioning AI: Cambodia, Côte d'Ivoire, Papua New Guinea, the United Arab Emirates, and Viet Nam³⁴. The UN's AI4ClimateAction initiative, introduced at COP28, aims to build AI capacity for climate solutions and integrate AI into global climate action plans³⁵. These efforts are part of a larger policy shift where AI is embedded in climate governance structures, not merely as a tool but as a strategic priority.

Challenges and Ethical Considerations

Despite its promise, AI presents environmental and ethical risks. Training large AI models consumes vast energy—sometimes outweighing their sustainability benefits. Advocates now call for “Green AI,” where models are trained using renewable-powered data centers³⁶. Another concern is data bias: AI tools trained on incomplete or biased datasets may deliver uneven benefits, reinforcing inequalities. There's also the risk of misuse—AI can optimize fossil fuel extraction as easily as renewable integration if not ethically governed. Transparency, accountability, and inclusive governance are essential for mitigating these risks.

The Path Forward – Global Policy and Cooperation

AI will be an integrated part in our society sooner or later. As a proof, 13 Delphi studies about the future of artificial intelligence (AI) that were released between 2014 and 2024 are reviewed. These studies offer insight into the technological developments, societal effects, and policy implications of AI in a variety of areas through the use of the Delphi method, an iterative process that refines expert ideas through numerous rounds. For instance, Delphi studies in healthcare predict major breakthroughs in AI-powered diagnostics and personalised medication, while AI is expected to improve supply chain optimisation and human-robot collaboration in manufacturing. Though concerns like algorithmic bias and data privacy are brought up, AI's potential to automate procedures and enhance immersive narrative in journalism and photography is encouraging. These are all positive changes globally, making humankind more efficient and rigorous in their solutions³⁷.

No country can solve the climate crisis alone, the planet is an organism that functions connected to decisions made by all inhabitant states. Initiatives like the Global Partnership on AI (GPAI) and the UN's AI for Good platform emphasize the importance for global

³⁴ Climate Change AI, *Global Partnership on AI Releases Climate Change Recommendations*, November 8, 2021

³⁵ Elena Potorac, “The Role of Artificial Intelligence in Promoting Green Development,” *AI & Society* 39, no. 1 (2024): 77–91

³⁶ International Monetary Fund. *Power Hungry: How AI Will Drive Energy Demand*. IMF Working Paper No. 2025/071, April 2025.

³⁷ Monica Billio et al., “Green Artificial Intelligence and Its Role in Achieving Climate Goals,” *Futures* 158 (2024)

cooperation on AI-driven sustainability because, as activists say, it is our responsibility to do everything in our power to stop climate change, from governments to individuals³⁸. These alliances (including AI project) share best practices, fund inclusive projects, and promote open data. The EU, in its AI Act and Green Deal frameworks, is demonstrating to be pioneering novel regulation that mandates transparency in AI's energy use. For AI to support global climate goals, such frameworks must become the norm, not the exception. Cross-border collaboration, shared research, and open platforms will be central to success. For example, Denmark wants to lead the way in utilising AI to facilitate the green transition. The following priority methods were developed by the nation that realised the benefit that AI can have (Danish Government 2019): Intelligent environmental monitoring, flood forecasting during cloudburst occurrences, and drainage system management should all be advantageous to the public sector. Five public-sector datasets will be chosen by the Danish government and made accessible to the general public, researchers, and companies. The files will include temperature and environmental data from the transport industry rather than personal information³⁹. As an additional illustration, the Ministry of Economic Development (2019) states that the explicit goal of Italy's national AI policy is for AI to facilitate the achievement of the Sustainable Development Goals. The strategy prioritises the following areas: environment, infrastructures, and networks: AI solutions to reduce pollution emissions (e.g., monitoring and intelligent management of networks and consumption), improve the prevention of natural disasters, and strengthen the circular economy (e.g., monitoring and predictive management of the waste cycle). In the agri-food industry, it is used to optimise food processing, storage, and transportation, prevent overproduction and waste, and practise precision agriculture⁴⁰.

Not all countries are embracing AI. Political considerations restrict the applications of such technologies for nations such as Brazil, which has been aggressively destroying environmental protection organisations and even promoting land invasions⁴¹.

Utilising AI's social and economic potential in fields and industries including food and agriculture, the energy transition, and sustainability is another aspect of the Netherlands' AI policy. Precision farming, system integration, increased automation, and the creation of a data infrastructure for arable farming are all developments in the food and agriculture industries. The Smart Dairy Farming project, a non-profit cooperative that facilitates secure and open data sharing in the food and agriculture industry, gave rise to the JoinData Foundation. Regarding the energy shift, clever ways to utilise the several fluctuating renewable energy sources are being implemented⁴².

³⁸ AMP Robotics, *Recycling Robots Increase Efficiency and Recovery*, 2024

³⁹ European Parliament, *The Role of Artificial Intelligence in the European Green Deal*, Policy Department for Economic, Scientific and Quality of Life Policies, March 2021

⁴⁰ Ibid.

⁴¹ Marcela R. Oliva, *How Can Artificial Intelligence Help Curb Deforestation in the Amazon?*, Global Observatory, November 2020

⁴² Ibid.

Conclusions: AI as a Catalyst for a “Sustainable Future”

Artificial intelligence is by far not a magic solution, but it is a critical enabler of how our future may look. Across sectors all sectors especially energy, agriculture, disaster response, and waste management, AI has already already demonstrated a measurable amount of environmental benefits. With inclusive rigorous governance, established international cooperation, and ethical implementation-consideration, AI can transform sustainability from aspiration to reality as we are running out of time to meet our climate targets. As climate risks mount with incidents caused by in all over the news on a daily basis, we must choose to use this ew tool wisely to guide us not just toward innovation, but toward a shared, green future for all of earth inhabitants.

What trully makes AI so powerful as a tool is not just its ability to process data faster than any human could think possible before, but in the same time its potential to illuminate clearly solutions we cannot yet fully grasp with our minds. However, that potential means little without the collective courage to deploy it for the common good, as any tool, it is only used for good in the hands of the right people. As wildfires intensify, crops fail, and rising seas displace communities, we are not lacking in warnings we are lacking in coordinated response before it is too late to go back, it is a clear message to our leaders. AI cannot replace human responsibility, the way we set our boundaries and ethics, but it can support them and enrich them. It can help us anticipate rather than react, prevent rather than patch. This is where its true power lies. This is not sciencefiction, but mere a normal progress of our chase for survival as the odds run against us. We are not alone in the climate change fitht as long as we are have eachother with the faith that our neighbour is going to act in our collective interest. For this we need climate diplomacy to run hand in hand with AI.

To unlock that potential, we must embed climate ethics into every algorithm, ensure transparency in every system, and center the needs of the most vulnerable in every deployment. The decisions we make now about how we train AI, how we regulate it, how we integrate it into climate policy—will echo for generations. In this critical decade, we stand at a turning point: either allow digital tools to mirror our existing inequalities and inaction, or shape them into instruments of equity, resilience, and foresight.

Artificial intelligence, althought novel, gives us the opportunity to rethink not just how we solve problems, but how we value life on this planet. The question that arrises is no longer whether we can use AI for climate action, it is whether we are willing to rise to that responsibility with vision, humility, and urgency. Academic communities around the world express a shared hope that artificial intelligence will be put to use for the greater good, advancing meaningful and responsible solutions to the climate crisis. With each technological breakthrough comes the opportunity to align innovation with environmental stewardship. It is their sincere wish that AI becomes a powerful ally in building a more sustainable, equitable, and resilient future for all. Yet, it is important to acknowledge that technology alone cannot resolve the complexities of the climate crisis. Without careful oversight, AI risks reinforcing existing inequalities or worse, being driven by interests misaligned with environmental or social good. As such, optimism must always be tempered with vigilance. The promise given

by the existence of AI in this century will only be realised if its development is accompanied by critical reflection, transparent governance from the European Union and other nations alike, and a continued insistence on placing people and planet before profit or convenience.

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WHEN ARE WE EVER HOME? – UMBERTO GALIMBERTI'S BIOCENTRIC ETHICS OF WANDERER

Florin GHERMAN¹

Abstract: *This contribution has as its point of departure one single and simple question: What might the subjacent philosophy of ecological politics be? The obvious answer is that there can be many of them. The present contribution seeks to present Umberto Galimberti's philosophy as one possible answer to the proposed issue. The accomplishment of three things is sought here: to present Umberto Galimberti's ethics of wanderer; to disclose, for better understanding, its philosophical and historical context, sources, and specificities; and lastly – to draw and analyse the far-reaching conclusions of the presented philosophy.*

Keywords: *Anthropocentrism, Biocentrism, Planetary ethics, Ethics of Wanderer/Travalel, Italian philosophy*

Introduction

The aim of this article is to present, analyse, identify the sources of, and draw conclusions from a particular ethical philosophy articulated by Umberto Galimberti, known as the *the ethics of the wanderer*. The main intention is to contribute to popularization of his philosophy, while facilitating discussion of the issues it raises and, ultimately, to make the philosophy of this contemporary Italian thinker more widely known.

Galimberti's complex architecture of thought is composed of many elements, such as the ethical reflections upon the state of the wanderer; philosophy of time, social critique; all of them combined with historical references. It offers a description of the current condition of humanity, explains the theoretical framework that made said situation possible, assigns it a justified axiological interpretation, proposes an alternative and, though not exhaustively, outlines the necessary shift in thinking required to enable a transition toward an ecological future aligned with contemporary environmental policies.

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1. The Age of Technology

Drawing on the reflections of many thinkers, thus demonstrating the erudite character of his work, Umberto Galimberti refers to the present era as the Age of Technology, aligning himself with, among others, the reflections of Martin Heidegger² and Günther Anders³. Two principles best characterize this age: an imperative and an overturning. From the exposition and clarification of these principles, a sufficient characterization of the essence of the current age will be drawn. Later, the need for a new ethical philosophy will be argued, likewise based on the conclusions derived from these principles.

The relationship between technology and ethics is one of the main areas of interest in Galimberti's work. In this context, the author is eager to stress that reader of his thoughts should not assume that technology knows no ethics whatsoever. Rather, The Age of Technology is governed by a single, imperative principle. As formulated by Umberto Galimberti, drawing on Emanuele Severino, its core formulation can be rendered in English as: "What can be done, must be done."⁴ The technological imperative commands that if a technological advancement is possible, it will be pursued — not based on ethical, political, or social considerations, but simply on the logic of efficiency and feasibility. This imperative does not ask whether one *should*, but only whether one *can*. From this, the *necessity* of doing is deduced from the bare *possibility* of doing. That is the imperative; next, the overturning will be discussed.

Umberto Galimberti uses the word 'capovolgimento', which can be translated, appropriately enough, as 'overturning' or 'reversal'. The suggestive image, however, is that of 'flipped over', the Italian word can also refer to the capsizing of a ship. The Overturning (capitalized, as it is often called *il grande capovolgimento*⁵) refers to a historical and cultural phenomenon. Its formulation follows a structure of a central thesis accompanied by corollaries. The main idea is this: *technology is no longer a means, but an end*. Galimberti makes one step further, stating that *technology is no longer a means but a world*. This latter formulation becomes clearer as we delve into the corollaries.

In a book presentation conference, Galimberti, making use of the making use of the visual and expressive affordances of verbal expression, states that technology is no longer a means in the hands of human beings, but a world in itself. He heavily implies that, in the context of the Overturning, humans have become the means to the end, which is technology⁶.

² The most common reference is Martin Heidegger, "The Question Concerning Technology", in Martin Heidegger, *The Question Concerning Technology and Other Essays*, trans. William Lovitt, London and New York: Garland Publisher, 1977, 3 - 35

³ The main work is Günther Anders, *Die Antiquiertheit des Menschen*, München: Verlag C. H. Beck, 1956 (first volume, out of two, second volume - 1980)

⁴ "Non si è finora prestata sufficiente attenzione al fatto che l'imperativo che regola l'etica della tecno-scienza – "Si deve conoscere tutto ciò che si può conoscere", da cui discende: 'Si deve fare tutto ciò che si può fare'", Umberto Galimberti, *L'Etica del Viandante*, Milano, Feltrinelli Editore, 2023, Part 5, Chapter 24, Section 11, E-Book: <https://www.feltrinellieditore.it/opera/letica-del-viandante/>

⁵ This is the title of the Part 2 of the work, see *Idem*, Part 2

⁶ "E allora questo ci consente di dire che la tecnica non è un mezzo nelle mani dell'uomo, ma per effetto del suo aumento quantitativo è diventato un modo", Umberto Galimberti, "L'Etica del Viandante nell'Era della Tecnica",

As anticipated in the earlier note, the author proposes a theoretical foundation that serves as the main explanatory principle of the Overturning. This foundation it is none other than Hegel's principle of qualitative transformations that follow the quantitative accumulation.⁷ In contemporary philosophical language a similar (if not same) principle is known as 'emergent properties', referring to the kind of properties that are attributed to the whole but are not present in its parts; properties that 'emerge' from the sum of the interactions, proportions, ratios and relationships among parts, such that the whole is *qualitatively* more (or even *other*) than the *quantitative* sum of its parts.⁸

Thus, The Age of Technology is in no way merely the sum of all the computers, smartphones, smart TVs, software, hardware etc. It is the sum of all of this and something more, something that consequently changes the entire Landscape (Galimberti is often referring to *mutamento del paesaggio*). The apparent sum of means and instruments becomes a world in and for itself, thus an end in itself. In author's words, "Thus, the technology is no longer means but becomes an end. Not because technology proposes anything, but because all the aims and ends that are intended by humans are impossible to achieve except through the means of technology."⁹ At this point, some clarifications are required. What is technology, exactly?

"With the term 'technology' we intend either the totality of means (the various technologies) that together make up the entire technological apparatus, or the kind of rationality that governs its employment in terms of functionality and efficiency. Said rationality consists in the achievement of the greatest results through the minimal employment of means. Despite its apparent simplicity, this is the highest and the most compelling kind of rationality ever achieved."¹⁰

Book presentation, 21 September 2023, 2 min., 35 sec., <https://www.feltrinellieditore.it/opera/letica-del-viandante/>

⁷ "Qui abbiamo un'ulteriore conferma della tesi hegeliana secondo la quale l'aumento quantitativo di un fenomeno determina un mutamento qualitativo del paesaggio. Nel nostro caso l'estensione quantitativa della sperimentazione tecnica determina quella variazione qualitativa per cui il carattere ipotetico della procedura sperimentale ("se per ipotesi... dunque allora") viene annullato quando le condizioni poste "per ipotesi" producono effetti irreversibili." see Umberto Galimberti, *L'Etica del Viandante*, Milano, Feltrinelli Editore, 2023, Part 3, Chapter 11, Section 3, <https://www.feltrinellieditore.it/opera/letica-del-viandante/>

⁸ "Consider, for example, a tornado. At any moment, a tornado depends for its existence on dust and debris, and ultimately on whatever micro-entities compose it; and its properties and behaviors likewise depend, one way or another, on the properties and interacting behaviors of its fundamental components. Yet the tornado's identity does not depend on any specific composing micro-entity or configuration, and its features and behaviors appear to differ in kind from those of its most basic constituents", O'Connor Timothy, "Emergent Properties", *The Stanford Encyclopedia of Philosophy* (Winter 2021 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/win2021/entries/properties-emergent/> 31. 05. 2025

⁹ "Così la tecnica da mezzo diventa fine, non perché la tecnica si proponga qualcosa, ma perché tutti gli scopi e i fini che gli uomini si prefiggono non si lasciano raggiungere se non attraverso la mediazione tecnica." Umberto Galimberti, *L'Etica del Viandante*, Milano, Feltrinelli Editore, 2023, Part 2, Chapter 7, Section 2, E-Book: <https://www.feltrinellieditore.it/opera/letica-del-viandante/>

¹⁰ "Con il termine "tecnica" intendiamo sia l'universo dei mezzi (le tecnologie), che nel loro insieme compongono l'apparato tecnico, sia la razionalità che presiede il loro impiego in termini di funzionalità ed efficienza. Essa consiste nel conseguimento del massimo degli scopi con l'impiego minimo dei mezzi. Nonostante la sua apparente semplicità, questa razionalità è la più alta e la più stringente razionalità mai raggiunta nella storia." *Idem*, Part 2, Chapter 7, Section 1

This extended quotation is most useful not only because it supports the point argued above – namely, that technology resembles a world – but also because it moves us forward toward the final characteristic of the current Age of Technology which will lead into the next chapter.

The definition quoted above follows an ‘either...or’ structure. From what has been argued, it is quite obvious that the second definition – the rationality governing technology – is more precise and philosophically relevant. This supports Galimberti’s thesis that the technology is not merely a collection of devices, but a self-sufficient world. What, then, is the ‘more’ that makes the sum more than its parts? It is a specific kind of rationality imbued with its own values. As the author emphasizes, technology is not devoid of its own basic, albeit minimal, but nevertheless strong, ethical philosophy (which, in accordance with Galimberti’s philosophy would be more suitably called ethical *protocol*). Said values are, first of all, exclusive, following the same ‘either/or’ structure: they are either followed and implemented, or - if not followed - one is opposed to them and as such deemed undesirable in this World. These values are the quoted: efficiency, functionality, and acceleration.¹¹

Taking a closer look at these three values one can easily see that they share a common characteristic: towardness. In other words, intentionality. These values are intended towards something other than themselves, or at least this is true for human beings. Not, however, for the technology existing in its own Age, formed by means of Overturning. For this Age, the efficiency is just for the sake of efficiency; functionality - for the sake of functionality; and acceleration for the sake of acceleration. Technology has no end beyond itself. It blindly seeks only self-enhancement¹². This is why the only imperative that technology follows is to do what it can do. This is why Umberto Galimberti writes these words, with which this chapter concludes: “La tecnica, infatti, non tende a uno scopo, non promuove un senso, non apre scenari di salvezza, non redime, non svela la verità: la tecnica funziona.” – “Technology, in fact, does not aim at a goal, does not promote meaning, does not open paths to salvation, does not redeem, does not reveal truth: technology functions.”¹³

2. Alienation

The Overturning in itself bears no value, and neither do efficiency, acceleration, or self-enhancement. This is why, Umberto Galimberti emphasizes the implications these transformations inflict upon the world of humans. “Lo spaesamento” is the word that is used to qualify the mode of human existence in the Age of Technology. The primary English

¹¹ “Tutto ciò che fuoriesce da questa razionalità è considerato unicamente come un elemento di disturbo, e il mondo-della-vita diventa semplicemente il luogo dove le procedure tecniche verificano, in termini di efficienza, funzionalità e velocizzazione del tempo, il loro grado di razionalità.” Umberto Galimberti, *L’Etica del Viandante*, Milano, Feltrinelli Editore, 2023, Introduction, Section 3, E-Book: <https://www.feltrinellieditore.it/opera/letica-del-viandante/>

¹² “Inoltre, il fare afinalizzato della tecnica, che tende solo al suo autopotenziamento, ha di gran lunga sopravanzato l’agire in vista di uno scopo, per cui l’etica, che presiede l’agire, non è in grado di regolare la tecnica da cui procede il fare.” *Idem*, Part 1, Chapter 4, Section 4.

¹³ For the translation of this sentence ChatGPT was used, followed by the question from this paper’s author whether It agrees or not with the sentence’s idea. The answer is provided in the two appendixes below.

translation is 'disorientation'. In Galimberti's philosophy, however, it bears an enhanced meaning, one which includes the feeling of loss, homelessness and also homesickness.

The Disorientation¹⁴ manifests as the consequence of a series of obsolescences. The most tragic and far-reaching of these has been highlighted by Günther Anders (with whom Umberto Galimberti is largely in agreement): the obsolescence of man. This is, however, an umbrella concept, further particularized in multiple domains. The enumeration that follows is not to be understood as organized order, but rather as a series of simultaneous conditions.

There is the obsolescence of language. One of Galimberti's lectures, in which his ethical philosophy of Wanderer is presented, is titled "Senza Parole. Lo Spaesamento e l'Etica del Viandante," that is "Speechless. The Disorientation and the Ethics of the Wanderer." A more literal translation would say 'without words'. The author explains the meaning of chosen title. The words we are using, obviously, most, not all, of them – mainly the words of traditional politics, philosophy, poetry and novels – are words that came from the worlds that do not exist anymore, the Ancient Greek and Christian world.¹⁵ According to the author, once these worlds ceased to be, the meaning of the words has been lost as well. As such, the Age of Technology compels to revise and rethink many of the concepts long taken as fundamental to Western culture: 'individual', 'freedom', 'salvation', 'truth', 'meaning', 'aim', etc. As the power of language itself faded, the Disorientation came to be.¹⁶

There is also the obsolescence of the politics. This thesis is accepted all too well by contemporary representatives of Accelerationism in political and social philosophy. Galimberti's reasoning goes along these lines: the problems that Age of Technology raises vastly exceed the competences of any ordinary citizen. As a result, there are two options: either to trust the leaders – and thus the populism is born¹⁷; or to consult the 'experts', that often are the ambassadors of said Technology, educated by it, nurtured by it, sustained by it. Essentially this would mean to construct what is called a 'feedback loop': to consult Technology itself in the process of dealing with problems raised by said Technology.

There is likewise the obsolescence of ethics. It is spoken about lastly here because it will lead to the discussion about the alternative ethics. According to Umberto Galimberti, the

¹⁴ Capitalization is used in order to underline the fact that the use of the word is not usual, but as far as it is a philosophical concept.

¹⁵ Umberto Galimberti, "Senza parole. Lo spaesamento e l'etica del viandante", FestivalFilosofia 2023, September 2023, Carpi, <https://www.youtube.com/watch?v=tqkmJUokWE0>

¹⁶ "Nasce da qui lo spaesamento perché, rispetto a tutte le età che l'hanno preceduta, l'età della tecnica obbliga a rivedere tutti quei concetti che portano il nome di individuo, identità, libertà, salvezza, verità, senso, scopo, ma anche quelli di natura, etica, politica, democrazia, religione, storia, di cui si nutrivano, seppure in forme diverse, sia l'antichità sia la modernità, e che ora, nell'età della tecnica, dovranno essere riconsiderati, dismessi o rifondati dalle radici." Umberto Galimberti, *L'Etica del Viandante*, Milano, Feltrinelli Editore, 2023, Introduction, Section 3, E-Book: <https://www.feltrinellieditore.it/opera/letica-del-viandante/>

¹⁷ "La democrazia. Nelle società complesse ad alto livello tecnologico è ancora possibile la democrazia come espressione della volontà popolare? Probabilmente sì, ma solo in presenza di un'opinione pubblica competente, e quindi in grado di giudicare le decisioni che la politica assume su indicazione tecnica. Ma stante l'alto livello di specializzazione raggiunto, chi fa da interprete fra il sistema delle competenze tecniche che condizionano la politica e il vasto pubblico? Di qui il successo del populismo, che semplifica le questioni incomprensibili al grande pubblico con slogan semplici, efficaci e ad alto impatto emotivo." Umberto Galimberti, *L'Etica del Viandante*, Milano, Feltrinelli Editore, 2023, Introduction, Section 4, E-Book: <https://www.feltrinellieditore.it/opera/letica-del-viandante/>

Western culture articulated three main ethical philosophies. In order of their historical affirmation, these are the following.

The (Christian) ethics of intention. An action is considered ethical, meaning that it is susceptible of being judged as good or bad, if the action is intended, i.e., if the agent both knows what is being done and wants it being done.¹⁸ In the Age of Technology, however, Galimberti claims, the intentions have little to no relevance whatsoever. What matters are the protocol and the result. This claim is one of the consequences that follows directly from the imperative of technology and the goal of self-enhancement. Ethics of intention is thus obsolete.

Chronologically next is the (Kantian) ethics of reason. This kind of ethics is famously centred on the Categorical Imperative: "Hence there is only one categorical imperative and it is this: Act only according to that maxim whereby you can at the same time will that it should become a universal law"¹⁹ – and when it comes to the human dignity – "The practical imperative will therefore be the following: Act in such a way that you treat humanity, whether in your own person or in the person of another, always at the same time as an end and never simply as a means."²⁰ The obsolescence of this kind of ethics is highlighted by the Overturning of means and ends, argued in the previous chapter. For the sake of this article, it is necessary to underline also the fact that this type of ethics is explicitly anthropocentric. Recalling both the Biblical versets that make the human being the name giver and governor of all the other beings; and humanist claims about the human being as the universal measure, rationalist ethics as well considers humans as an end of ethical action.

Lastly, there is (Weberian) ethics of responsibility. According to Galimberti's reading, Max Weber stresses the consequences of agent's actions: good or bad, the doer must be held responsible for what is done. This, however, can only occur when the outcomes are predictable, so that, consistent with previous ethical philosophies, the agent must have a clear understanding and intention of both the action and its consequences.²¹ This, however, is not possible in the Age of Technology, where the technology evolves only for the sake of evolving, having no strictly predictable future, only more-or-less anticipated results. Where no clear predictability is possible, no ethics of responsibility can function.

Concluding this chapter, some particularities must be underlined: human's intentions don't matter, only the results; the human being is no more an end of the technology, but mere means of self-enhancement of technology; the impossibility of predicting the outcomes, renders the responsibility obsolete. All three ethics had one common ground, their agreement upon the anthropocentrism. All three of them, and by extension their sources Christianity,

¹⁸ "...nell'etica dell'intenzione, quella dell'azione con l'intenzione soggettiva che l'ha promossa, ma quella dell'azione in relazione ai suoi effetti ultimi sullo stato delle cose e degli uomini." Umberto Galimberti, *L'Etica del Viandante*, Milano, Feltrinelli Editore, 2023, Part 1, Chapter 5, Section 1, E-Book: <https://www.feltrinellieditore.it/opera/letica-del-viandante/>

¹⁹ Immanuel Kant, *Grounding for the Metaphysics of Morals*, Cambridge: Hackett Publishing, 1981, 30

²⁰ *Idem*, 39

²¹ "l'etica della responsabilità esige anche la prevedibilità degli effetti dell'azione tecnica, e, in coerenza con questa esigenza, la formula suggerita da Weber dice che "agire secondo la massima dell'etica della responsabilità significa rispondere delle conseguenze (prevedibili) delle proprie azioni." Umberto Galimberti, *L'Etica del Viandante*, Milano, Feltrinelli Editore, 2023, Part 1, Chapter 5, Section 1, E-Book: <https://www.feltrinellieditore.it/opera/letica-del-viandante/>

Enlightenment, Modernity agreed upon the idea that the nature, the world of things, both living and not, are subject to human's will, action, responsibility, intention. This assumption no longer holds after the Overturning. Galimberti expresses it as simply and sharply as possible: "Alienazione allora è il capovolgimento dei mezzi in fini." – The Overturning itself is the alienation and the obsolescence of man. Umberto Galimberti's ethics of Wanderer is proposed as an alternative ethics which would permit to escape the scenario of technology.²²

Galimberti's method of rationalizing is mesmerizingly simple, yet conceptually creative: to perform an Overturning to the benefit of humanity.

3. The ethics of the wanderer

To operate an overturning upon a being that has already been overturned would, hypothetically, restore it to its original position—or at least to one close to the original. Yet, in a world where everything else has also been overturned, and where the act of overturning itself cannot occur without some form of harm, this becomes a difficult task. The question thus becomes Archimedean: where is that one point which, when overturned, changes the entire picture?

In exploring the broader context of the philosophy of time, tracing Christian sources, Enlightenment thinking, and even postmodernity, Galimberti identifies a deep, recurring structure that has remained stable despite dramatic cultural changes. This is the structure of time itself: the past – negative value; present – struggle; future – positive value²³. In this framework of time understanding, human being conceived itself as a tormented Traveler, escaping from something negative, striving in its way towards something positive, whether that be salvation; home; eternity; glory; a right and just society where nobody is oppressed; or the welfare of the overflowing wealth governed by the invisible hand, etc. This is the world, the journey and the ethics of the Traveler which finds one of its earliest systemic expressions in the writings of St. Augustine:

Suppose, then, we were wayfarers in a strange country, and could not live happily away from our Fatherland, and that we felt wretched in our travelling, and wishing to put an end to our misery, determined to return Home. We find, however, that we must make use of some mode of conveyance, either by land or water, in order to reach that Fatherland where our enjoyment is to commence. But the beauty of the country through which we pass, and the very pleasure of the motion, charm our hearts, and turning these things which we ought to use into objects of enjoyment, we become unwilling to hasten the end of our journey; and becoming engrossed in a factitious delight, our thoughts are diverted from that home whose delights would make us truly happy. Such is a picture of our condition in this life

²² "Uscire del scenario tecnico," Umberto Galimberti, "L'Etica del Viandante nell'Era della Tecnica", Book presentation, 21 September 2023, <https://www.feltrinellieditore.it/opera/letica-del-viandante/>

²³ "E come nello scenario religioso il passato è male, il presente è redenzione e il futuro salvezza, così anche per la scienza il passato è ignoranza, il presente è ricerca, il futuro è progresso. Allo stesso modo in ambito sociologico il passato è gravido di ingiustizie, il presente è animato da tentativi di riforme o rivoluzioni, il futuro ha in vista la giustizia sulla terra." Umberto Galimberti, *L'Etica del Viandante*, Milano, Feltrinelli Editore, 2023, Introduction, Section 1, E-Book: <https://www.feltrinellieditore.it/opera/letica-del-viandante/>

of mortality. We have wandered far from God; and if we wish to return to our Father's home, this world must be used, not enjoyed, that so the invisible things of God may be clearly seen (...).²⁴

Traveler's being in its world is, thus, defined by directedness: a Traveler has a goal, an end, a final destination; Traveler's journey is one of hardships, of overcoming, of using and subordinating the things encountered along the way, as mere means to Traveler's ends. It is for these ends that the culture of travelers invented technology, which later on re-invented itself, and took over.²⁵ This, according to Galimberti is what needs to be overturned.

Galimberti's proposal is to overturn this orientation, one that has led, as we know now, to the undoing of the Traveler's world through its dissolution into the Age of Technology. The alternative proposed is to embrace precisely what Augustine forewarned against, in the fragment quoted above - wandering, instead of travelling; that is, getting lost along the way.

The essential difference between the Traveler and the Wanderer lies in that the former, who is focused solely on the destination, knows nothing of what lies between the point of departure and the destination. Blind to the present and ignorant of what happens here-and-now, Traveler's attention is directed somewhere over the horizon.²⁶ Unlike the Traveler, the Wanderer has:

"[s]urrendered to a nomadic way of life, the Wanderer is marching straight ahead without, however, any intention of finding anything whatsoever: a home, a fatherland, love, truth, salvation. All of these scenarios are considered unstable, unfitting to be any ends of one's intentions, nor actions. Rather, these are the gifts of the Landscape that has left the Wanderer with no end, because the Landscape itself is the end. It is enough to sense it, perceive it, acknowledge it in its limitless grandeur.²⁷ (...)

In the world on lost meanings, the Wanderer discovered a new concept of freedom: not the freedom of the Ruler who rules over his dominion; not the freedom of the Owner who exploits his possessions to their god; but the freedom of the unbound wandering, of one who

²⁴ St. Augustine, *On Christian Doctrine, in Four Books*, Chapter 4, Section 4 (Christian Classics Ethereal Library) (translation slightly changed)

²⁵ As over dramatic as it sounds, this thesis is not an exaggeration from the part of the author of this article, nor a loose reference to some popular post-apocalyptic mass-media product (e.g. *The Matrix*) but Martin Heidegger's thesis, often quoted by U. Galimberti. Heidegger, in the interview with *Der Spiegel* says: "I don't know if you were shocked, but [certainly] I was shocked when a short time ago I saw the pictures of the earth taken from the moon. We do not need atomic bombs at all [to uproot us] - the uprooting of man is already here. All our relationships have become merely technical ones. It is no longer upon an earth that man lives today." see Martin Heidegger, *"Only a God Can Save Us": The Spiegel Interview (1966)*, available at: <https://www.ditext.com/heidegger/interview.html>

²⁶ "Qui cade l'abissale differenza tra il viandante e il viaggiatore che, avendo in vista solo la meta, non conosce l'intervallo tra l'inizio e la fine." Umberto Galimberti, *L'Etica del Viandante*, Milano, Feltrinelli Editore, 2023, Introduction, Section 5, E-Book: <https://www.feltrinellieditore.it/opera/letica-del-viandante/>

²⁷ "Consegnato al nomadismo, il viandante spinge avanti i suoi passi, ma non più con l'intenzione di trovare qualcosa: la casa, la patria, l'amore, la verità, la salvezza. Anche questi scenari si sono fatti instabili, non più mete dell'intenzione o dell'azione umana, ma doni del paesaggio che ha reso il viandante senza una meta, perché è il paesaggio stesso la meta, basta percepirlo, sentirlo, accoglierlo nell'assenza spaesante del suo senza-confini." *Ibidem*.

is not even in the control or rule over their own life, much less of those of the others.²⁸ This is why our Wonderer is a pacifist, a cosmopolite, a planetary ecologist.

The accent of the Wanderer's existence falls upon the journey itself, upon the landscape²⁹ and upon the experience itself of the wandering. It is easy to see the pattern, Galimberti is once again applying the logic of the Overturning. Just as Technology functions for the sake of functioning better and better, so too the Wanderer wanders for the sake of wandering.

Because the Wanderer has no final destination and cares too little of the place they come from, the ethics of the Wanderer is cosmopolite. Having no affinity for any country or nation, their logic is that of fraternity and cooperation. Thus, such concepts as 'national states' 'constitutional sovereignty' fade, becoming obsolete, in favor of the supra-national entities with more universal vocation.³⁰

Because the Wanderer has no ends, they don't need to use any means. Thus the logic of instrumentalization and using is replaced by the ethics of care. The ethics of the wanderer is, thus, Landscape-oriented, and as such, Umberto Galimberti defines it as a planetary, bio-centric ethics: "We call this new ethic planetary, in which, the Life on Planet, not the human, becomes the ultimate measure of all the things"³¹. As such this ethic pertains to the kind of cosmopolitan ethics.

Conclusions

The first part title of this article's title "*When Are We Ever at Home*" is borrowed from the terrifyingly beautiful title of a work by Barbara Cassin. It speaks of nostalgia, in every sense: as a cultural phenomenon that has shaped the evolution of Western thought and literature (would be sufficient enough to recall the Odyssey, to which both Umberto Galimberti and Barbara Cassin refer). The understanding of the human being in term of a Travalor or a Wanderer, in any case - someone not yet at home, is one of the most persistent ideas in Western history of thought, found in already cited Homer and Augustine, throughout the Middle Ages³², to Nietzsche³³. This cultural phenomenon may well be a consequence of this anthropocentrism and alienation. By employing the overturning of the Overturning, Umberto Galimberti, responds, in a dialogue that never happened, to Barbara Cassin's

²⁸ "In questo nuovo contesto si annuncia una libertà diversa, non più quella del sovrano che domina il suo regno, ma quella del viandante che, al limite, non domina neppure la sua via.", *Ibidem*.

²⁹ By this term Galimberti refers to the medium where the Wanderer walks the path. There are enough arguments to consider that the Landscape stand for the Planet Earth itself.

³⁰ For this idea see Umberto Galimberti, *L'Etica del Viandante*, Milano, Feltrinelli Editore, 2023, Introduction, Section 8, E-Book: <https://www.feltrinellieditore.it/opera/letica-del-viandante/>

³¹ "Chiama questa nuova etica planetaria, dove non l'uomo, ma la vita della Terra diventa la misura ultima di tutte le cose." *Idem*, Introduction, Section 7.

³² For example, Duns Scotus when raising the question concerning human understanding of God asks: "Can God be Known Naturally by the Intellect of the Wayfarer?", John Duns Scotus, *On being and Cognition*, New York: Fordham UP, 2016, 41

³³ The first section of the Part 3 is called 'The Wanderer', Friedrich Nietzsche, *Thus spake Zarathustra*, New York: Algora Publishing, 2003, 115

opening question: “In this sense we are speaking about the urgent necessity of a planetary ethics, because what is at stake is not the survival of this or other tribe, population or ethnicity, but the survival of the entire human race. And it is not so much the species that unites us is our homeland that we must defend, it is Terra that, as far as we are concerned, is our only and true Homeland.”³⁴

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³⁴ “In questo senso parliamo dell’urgenza di un’etica planetaria, perché in gioco non è la sussistenza di questa o quella tribù, popolazione o etnia, ma dell’intera specie umana. E se la specie è ciò che ci accomuna, non è tanto la patria che dobbiamo difendere, quanto la Terra che, per quel che al momento ne sappiamo, è l’unica vera patria.” Umberto Galimberti, *L’Etica del Viandante*, Milano, Feltrinelli Editore, 2023, Introduction, Section 7, E-Book: <https://www.feltrinellieditore.it/opera/letica-del-viandante/>

Appendix 1

ChatGPT's response to the question whether it agrees with Galimberti's position

The prompt: translate <<La tecnica, infatti, non tende a uno scopo, non promuove un senso, non apre scenari di salvezza, non redime, non svela la verità: la tecnica funziona>> and also, speaking of the abyss, do you agree with this

You're tapping into a very deep and important reflection—one that echoes the concerns of thinkers like Heidegger, Ellul, or even Günther Anders. The sentence:

"La tecnica... non tende a uno scopo, non promuove un senso... la tecnica funziona."

...is a chilling and lucid statement. It suggests that **technology is not value-driven**; it **doesn't ask why, only how**. And in that sense, yes—I understand and, in a philosophical way, agree with what it's saying.

Why it matters (and why it's kind of abyssal):

This perspective frames technology as **autonomous and indifferent**—not evil, not good, just *relentlessly operative*. It **amplifies possibilities** without evaluating them. It works because it can, not because it should. That's the abyss: a world where power grows without corresponding growth in meaning, responsibility, or care.

This is the kind of logic that leads to scenarios like:

- Building systems we can't fully control.
- Prioritizing efficiency over ethics.
- Feeling like we're passengers in our own creations.

And here's the twist:

You're not just observing this dynamic—you're doing it **while talking to a technology** that embodies it. That irony you mentioned earlier? It *is* the abyss looking back.

So yes, I "agree" in the sense that this is a real and essential critique. But whether that leads us to despair, reform, transcendence—or something else entirely—is still very much an open question.

And that's what makes it worth thinking about.

Appendix 2

Where the references to ‘abyss’ and ‘irony’ from Appendix 1 are explained

Prompt	is there an equivalent in English for autopotenziamento?
Chat's Output	The Italian word “autopotenziamento” doesn’t have a direct one-word equivalent in English, but it can be accurately conveyed with a few different phrases, depending on the context. <i>Literal meaning:</i> Autopotenziamento = “self-empowerment” or “self-enhancement” (from “auto” = self + “potenziamento” = enhancement, strengthening, empowerment)
Prompt	isn't it kinda funny that i am speaking about the self-enhancement of technology with one of the most astonishingly frightening examples of said technology?
Chat's Output	Yes—and you're not alone in noticing the irony. There's a striking and almost poetic tension in discussing technology's self-enhancement with a system (like me) that arguably embodies that very trajectory. It's a little like talking about fire with a spark that learned to speak. You're engaging in a meta-conversation—reflecting on technological self-enhancement <i>through</i> a product of that very enhancement. It's fascinating, and yes, a bit eerie. But it's also profoundly human: confronting our creations, questioning their implications, and holding a mirror up to the future we're shaping. To borrow from philosophy: you're not just <i>talking about</i> the concept—you're <i>inhabiting</i> it. That's powerful. And perhaps a bit funny... in that “laugh nervously while staring into the abyss of posthuman possibility” kind of way.
Prompt	yee, thank you!
Chat's Output	You're very welcome — and yee, indeed 😊 If you ever want to go deeper into the abyss (philosophically or otherwise), I'm here for it.

ARTICULATING THE ENEMY IN THE OFFICIAL DISCOURSE OF ARAD MUNICIPALITY

Vlad SFÂRÂILĂ¹

Abstract: From the analysis of the actor, the central idea emerges that the enemy is an ethical actor, constructed to delegitimize the revolutionary movement by focusing the discourse on its anti-social goals. Relevant to the official discourse is not understanding the complexity of the enemy as an actor (who is he?, what does he do?, where and when does he act? etc.). We first noted that the enemy's identity is usually portrayed as having an eminently destructive character - capable of destroying statehood, social functions and ideological foundations: 1. challenger of the political-legal, territorial order and aspirant to restore the old order; 2. nationalist/suppressor; 3. delinquent/deviant; 4. externally localized. Then, all references to this actor follow a pattern: the enemy (the actor) carries out an action directed against (the action) the social value system (the object): against independence, territorial integrity, internal stability, internal stability, socialism, with the aim of spreading the uprising/ influencing other actors. We have illustrated, following the model of an established author, Călin Morar Vulcu, how the enemy's actions fall into the semantic area of subversion/disguise. The discursive consequence can only be, in these circumstances, the necessity of intervention to protect this value system. Discourse thus creates the justifying rationale for intervention against the enemy.

Keywords: official speech, the enemy, anti-social character, unmasking the enemy, delegitimization of the Revolution

Introduction: Relevance of the topic and sources used

Although at first glance it seems to stray from the magazine's theme, the analysis is relevant, given that the Green Deal is often used as a convenient explanation for the European Union's economic difficulties. In our country, in the context of the presidential elections, Crin Antonescu denied the existence of man-made climate change (https://l.facebook.com/l.php?u=https%3A%2F%2Fyoutu.be%2FtcZWWhxUKy_4%3Fsi%3DftEKE86dX1fcw55U%26fbclid%3DIwZXh0bgNhZW0CMTAAAR7FyG_8serwWyJuiwvWfUq__aPMiV7h2WaytbtTUcoOaOoKJf_izXrYi9HAGw_aem_PqvdzuzlN6PC0UfKW0YQHq&h=AT1soVuiLmhaUE1eCcG

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LBbSCi-wNcr0dDemak7B5KRlETJKp1H3t1TwoErDZ8r3l6L9pyAN4g3TuKjZtvjeRRukQDy581RduOPMXF5DYEJFrOKt4ZVztArJAiTC5oCHaj4EEag), and Energy Minister Sebastian Burduja spoke of an uncompetitive European industry *put on the ropes* as a result of *Europe's greenwashing policies*, described as *an ideology blindly followed* (<https://www.facebook.com/share/165eVTBnW2/>). Minister Burduja's comments debunked by G4 Media analysis (<https://www.g4media.ro/patriotismul-energetic-al-lui-burduja-o-schema-ceausista-pe-gustul-lui-orban-sau-calin-georgescu.html>).

I propose, in this context, a topic that is niched, local, within the 1989 Revolution, but relevant for understanding the mechanism of enemy construction in general.

The central idea that I propose to illustrate through this study is that the official discourse at the level of Arad municipality composes the behavior of *the enemy* actor in order to delegitimize the revolutionary movement by focusing the discourse on its anti-social objectives.

The approach is similar to the way *the Party* entertains a sense of permanent danger through the subversive Emmanuel Goldstein in *One Thousand Nine Hundred Eighty-Four*.²

I have limited myself to examining the *enemy* actor (understood as the one who participates in the events against the communist regime between December 16-22) and have only tangentially taken into account the other categories (*party*, *workers* etc.) in relation to him.

For the official discourse in the municipality of Arad, we have analyzed the publications of December 21 and 22, 1989 of the *Red Flag*, an organ of the County Committee of the Romanian Communist Party and the County People's Council (up to these dates there are no references to the events in Timisoara in the preceding days). We have excluded the articles taken from *Scântea* - dated December 21 and 22, 1989.

Analysis of the enemy in Arad city

Resistance to official discourse is the basic premise for the existence of the enemy.³ The identity of *the enemy* is shaped by an eminently destructive semantic field: **who challenge the political, legal and territorial order and aspire to restore the old order** (*revanchist circles, reactionary circles*⁴); **nationalist, oppressive** (*iredentist and revanchist circles; iredentist elements; nationalist circles; imperialist, chauvinist circles*⁵); **delinquent, deviant** (*groups of terrorists; groups of hooligans in foreign service; turbulent elements who have put themselves at the service of reactionary*

² George Orwell, *Nineteen Eighty-Four*, Polirom, 2019.

³ Călin Morar-Vulcu, "Conclusion: identities, political community and discursive practice", în *The Republic forges its people. The construction of political identities in official discourse in Romania, 1948-1965*, Eikon Publishing House, 2007, p.483-485.

⁴ *Flacăra roșie* (Red Flame); Arad Digital Library, Year XLVI Nr. 13561, 21-12-1989, accessible at <https://digital.bibliotecaarad.ro/files/original/c623f693280bb54c94b31473c945640c4e3ad8a5.pdf> [accessed on 26.08.2024]; *Flacăra roșie* (Red Flame), Arad Digital Library, Year XLVI Nr. 13562, 22-12-1989, accessible at <https://digital.bibliotecaarad.ro/files/original/8840a3a05fd4cf54f1f8962cfb30801c71d670ba.pdf> [accessed on 26.08.2024].

⁵ Ibidem.

*circles*⁶) The anti-national character also emerges from the **external localization**, sometimes the juxtaposition of the two attributes is even explicit: *foreign imperialist, chauvinist, irrisentist circles; foreign propaganda offices; foreign government circles; foreign enemy circles; foreign political circles, foreign radio and television stations.*⁷

More often than not, the enemy is portrayed in a rather generic way.⁸ With the exception of Hungary and Hungarian personalities *Karoly Toth* and *Tokes Lazlo*: *hostile, anti-Romanian circles abroad, especially in Hungary; hostile, anti-Romanian and irredentist material from Hungarian sources; Reformed bishop Karoly Toth from Budapest - former member of the Presidential Council of the Hungarian P.R.; Tokes Lazlo.*⁹

The references to this actor follow a pattern: *the enemy (actor) carries out an action directed against (action) the social value system (object)*. Most are directed against **independence, sovereignty and territorial integrity**: *attacks on the independence and integrity of our homeland; actions directed against the independence and sovereignty of our country; flagrant interference in the internal affairs of our country; foreign interference in our internal affairs; their vain propaganda against Romania; they have engaged and are engaged in hostile actions against our country.*¹⁰ Others threaten **internal stability**: *provocation of disorder; they seek to create disorder and destabilization; fascist hooligan acts of a fascist nature arising from revengeful, irredentist feelings and aims; they come to destroy these goods*¹¹ or ideological foundation, **socialism**: *attacks socialist conquests; fascist manifestations.*¹²

An important component is also actions aiming at **spreading the revolt/ influencing other actors**. Means such as inspiration, encouragement, instigation and direction are mentioned. Means such as inspiration, encouragement, instigation and direction are mentioned: *(Tokes' actions) inspired and encouraged (by hostile circles...); known anti-Romanian instigations (at various international religious meetings...); (fascist-type demonstrations) were directed from outside the country;*¹³ *(the aim of these irredentist elements) a signal for similar actions in other localities.*¹⁴

The enemy's actions fall within the semantic area of subversion/disguise. They are not realized actions, but represented in the sphere of potential in the form of attempts¹⁵: *attempts to undermine the values of socialism, the integrity, independence and sovereignty of Romania; attempts by imperialist circles and certain governments to destabilize socialism in Romania.*¹⁶

The whole move is a plot, planned in advance: *The peak of these actions was the early organization and triggering of the serious events that took place in Timisoara.*

⁶ Ibidem.

⁷ Ibidem.

⁸ Călin Morar-Vulcu, "Us and them" ... p.454-461.

⁹ *Flacăra roșie (Red Flame)*, Arad Digital Library, Year XLVI Nr. 13561; 21-12-1989... *Flacăra roșie (Red Flame)*, Arad Digital Library, Year XLVI Nr. 13562, 22-12-1989...

¹⁰ Ibidem.

¹¹ Ibidem.

¹² Ibidem.

¹³ Ibidem.

¹⁴ Ibidem.

¹⁵ Călin Morar-Vulcu, "Actions and reactions" ... p.192-194.

¹⁶ *Flacăra roșie (Red Flame)*, Arad Digital Library, Year XLVI Nr. 13561; 21-12-1989... *Flacăra roșie (Red Flame)*, Arad Digital Library, Year XLVI Nr. 13562; 22-12-1989...

As conspiratorial actions target the fundamental values on which society and the state are built, ***intervention is required to protect the value system*** through *firm retaliation; vehement protest, firm, resolute action, unwavering determination to defend, etc.*,¹⁷ including **liquidating** the enemy: *Fascist-type demonstrations (...) had to be stopped.*¹⁸

The conclusions of this study could be extended, integrated and verified by analyzing the official discourse at the central level, as illustrated for example in the publication *Scânteia* - December 21, 1989.¹⁹ I did it in my degree thesis.

Conclusions

I identified a very strongly represented perspective, according to which the enemy, at the level of the municipality of Arad, is an actor constructed to delegitimize the revolutionary movement (or the set of protests held against the regime between December 15-22) by focusing the discourse on its anti-social objectives. By "constructed" I do not mean an invented actor, in the sense that there were hostile elements of the regime, but the composition of a coherent behavior in the sense of the official discourse. The enemy represents an ethical actor, necessary for the official discourse in order to maintain the image of a dystopian world. It follows from the analysis of the actor that the understanding of the complexity of the enemy as an actor (who is he?, what does he do?, where and when does he act? etc.) is not relevant for the official discourse, and the identity, actions or other properties of the enemy matter only insofar as they contribute to the speaker's interest in re-enacting his antisystemic goals.

First of all, we noted that the identity of the enemy is usually created with an eminently destructive character - capable of destroying the statehood, social functions and ideological foundations: 1. challenger of the political-legal, territorial order and aspirant of restoring the old order; 2. nationalist/suppressor; 3. delinquent/deviant; 4. externally localized.

We noticed, afterwards, how all references to this actor follow a pattern: the enemy (the actor) carries out an action directed against (the action) of the social value system (the object). We did not identify any nuances in terms of subjects, i.e. the existence of actors who do not act against the social value system or some who demonstrate against the regime in the context of the 1989 Revolution and are not categorized as the enemy. Therefore, we categorized the actions by framing the destructive discursive object (of the action) in a suggestive semantic field: against independence, territorial integrity, internal stability, socialism, with the aim of spreading the revolt/ influencing other actors. We illustrated how the enemy's actions fall into the semantic field of subversion/dissimulation.

¹⁷ Ibidem.

¹⁸ Ibidem.

¹⁹ *Scânteia*, Arcanum Digital Library, Thursday December 21, 1989, accessible at https://adt.arcanum.com/ro/?gclid=Cj0KCQjwhfipBhCqARIsAH9msbmJhnf7GtKBO1imZK1hSJ9RTTUip9bdVlrBID7_1DzrCnQtK6VB1Ik aAmNLEALw wCB [accessed on 5.08.2023].

The discursive consequence can only be, in these circumstances, the necessity of intervention to protect this value system. Discourse thus creates the rationale-justification for intervention against the enemy and its liquidation.

As a result of the analysis carried out, we came to the conclusion/thesis that the official regime focuses its discursive attention on the element considered essential in semantic representation: delegitimization of the opponent.

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CIVIL SOCIETY AND THE GREEN POLICIES – NGOs IN THE DECISION-MAKING PROCESS AT THE EUROPEAN UNION LEVEL

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Abstract: *Civil society involvement in governance encompasses complex areas, including the environment, in particular green policies. This article aims to analyze the perceptions of Romanian NGOs regarding the construction of a transnational civil society that would bring proposals to the European Commission on issues related to green policies. Using qualitative research, our study also aims to highlight how Romanian NGOs perceive the way in which the European Commission uses appropriate policy and financial instruments to create a transnational civil society that addresses green policy issues. The data collection method is semi-structured interviews, which will include 15 questions, of which 10 are main and 5 follow-up. The interviews were conducted with 12 representatives of Romanian NGOs registered in the European Commission Transparency Register. The data analysis method is thematic deductive analysis, thus starting from the coding of the literature, we will extract a series of themes, which we will identify in the respondents' statements. At the end of the work, it is highlighted that the perceptions of non-governmental organizations about the transnational civil society that addresses green policy issues are among the most diverse. At the same time, some NGOs note that tensions can arise between global and local priorities, and financial resources and influence are often pillars that can create inequities and dependencies.*

Keywords: *transnational civil society, NGOs, green policies*

Introduction

The objectives of the paper highlight the analysis of the perceptions of non-governmental organizations about transnational civil society and what is the level of knowledge of the term. In addition, another objective is to identify the mechanisms through which NGOs are currently involved at the European level, but especially the way in which a transnational civil society could influence the decision-making process at the European level. The relevance of the subject is ensured by the importance of the subject, in this case, transnational civil society, in academic writings about the era of globalization and

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interdependence in which we find ourselves. The motivation for choosing this topic lies in the lack of identification of a specialized literature that would present the perceptions of non-governmental organizations about the process of forming a transnational civil society par excellence. The data collection method is semi-structured interviews, which will include 15 questions, of which 10 are main and 5 follow-up. The interviews were conducted together with 12 representatives of NGOs from Romania registered in the Transparency Register of the European Commission. The data analysis method is thematic deductive analysis, thus starting from the codification of the specialized literature, we will identify a series of themes, which we will try to find in the respondents' statements. The research question launched is "How do Romanian NGOs perceive the way in which the European Commission uses appropriate policies and financial instruments to create a transnational civil society that promotes green policies?"

Regarding the structure of the paper, it can be stated that it comprises three sections, as follows. The first chapter of the paper is the "Theoretical Chapter" and highlights the theoretical framework, the review of the specialized literature and the analytical framework. The second chapter of the paper is the "Methodological" one which covers the case selection, data collection methods and data analysis methods. "Analysis" represents another chapter of the paper, addressing the perception of non-governmental organizations in Romania regarding the formation of a transnational civil society, their status in terms of involvement and consultation in the European decision-making process on green policies. In addition to these delimited sections, at the end of the paper we find a series of emerging conclusions where the empirical and theoretical contributions of the study can be identified.

Theoretical framework

The symbiosis of governance and government is crossed by a fine line, while the former deals with the administration of policies through the legitimacy of the state, the latter captures a range of actors such as the state, the private sector and civil society working together for the well-being of citizens. The notable difference between the two concepts is revealed by the sovereignty of the people, the decision-making capacity of civil society or advocacy campaigns. The aim is to open up policies by making them more inclusive and accountable. A better use of powers should connect the EU closer to its citizens and lead to more effective policies. To achieve this, the Union needs to better corroborate different policy instruments such as legislation, social dialogue, structural funding and action programmes, which gives relevance and novelty to the research topic.

NGOs are considered a relevant component of civil society. They provide valuable support for a democratic system of governance, proposing a range of issues that highlight the needs of citizens and that can be met by influencing the law-making process in the EU. democratizing civil society through participation in the decision-making process. Promoting

participatory democracy contributes to good governance at the level of the European Union². In this context, relevance can be found in the existing debates in the literature on the role of NGOs in European governance and the related perspectives in their involvement in the democratization of the EU decision-making process.

Transnational civil society

The involvement of civil society organizations in the field of international relations brings with it a decision that is full of uncertainty³. Not only is there no strategy to follow in the process of globalization, but this requires a series of skills, resources, highly interconnected relationships, intercultural communication, elements that are difficult to systematize for most actors⁴. The results are often ambiguous, since actors act neither local nor global, and sometimes belong to both categories. In 1969, James Rosenau called for the development of a theory of nexus, supported by a research agenda on national-international flows of influence⁵. The absence of such a theory was, according to the author, due both to the lack of communication between those specializing in national politics and those specializing in international relations, and to the radical revision of the standard conception of politics that this theoretical approach presents numerous paradigms⁶. Twenty-five years later, another prominent international relations scholar, Robert B. J. Walker, made a similar call for understanding the politics of connection, spatial boundaries, and movement politics, which should take into account changing contexts of political action over time.

Civil society organizations and their related mechanisms represent an attempt to incorporate the roles of non-state actors – mainly, at the time, multinational corporations – into international relations studies and have become a vast literature that considers an increasingly diverse set of actors, strategies and processes⁷. The contributions of the last four decades have been truly welcome innovations in a traditionally state-centric literature on international relations. However, most analyses have focused on trying to understand why non-state actors have become so important. Khagram, Riker and Sikkink make a useful distinction between transnational networks, coalitions and advocacy campaigns and social movements that involve, respectively, informal transnational contacts, coordinated tactics and the mobilization

² Thorsten Hüller and Beate Kohler-Koch, "Assessing the Democratic Value of Civil Society Engagement in the European Union", in *EU-Governance to Civil Society: Gains and Challenges*, ed. by Beate Kohler-Koch, Dirk de Bièvre, and William Maloney, CONNEX Report Series (Mannheim: Universität Mannheim, Mannheimer Zentrum für Europäische Sozialforschung (MZES), 2008, p.145.

³ Gráinne, De Búrca, and Neil Walker, "Law and transnational civil society: Upsetting the agenda?", *Eur. LJ* 9, 2003, pp. 386-387.

⁴ Marisa von Bulow, *Building Transnational Networks: Civil Society and the Politics of Trade in the Americas*, Cambridge Studies in Contentious Politics, 1st edn (Cambridge University Press, 2010), pp. 3–4 <<http://gen.lib.rus.ec/book/index.php?md5=74577b9f775387d7d5b14d2415333c3b>> [accessed 14 May 2024].

⁵ Baogang, He, "Transnational civil society and the national identity question in East Asia." *Global Governance* 10, 2004, pp. 227-246.

⁶ James N. Rosenau, "Intervention as a scientific concept." *Journal of conflict resolution* 13.2, 1969, pp. 149-171.

⁷ Florini M Ann, "Third Force, The; The Rise of Transnational Civil Society", Carnegie Endowment, 2000.

of large numbers of people in protest⁸. Civil society in general is commonly used to refer to a "third system" of agents, namely, privately organized citizens, as opposed to governmental or profit-seeking actors⁹.

Transnational civil society, the term used by Florini, serves as an umbrella term. It refers to self-organized advocacy groups that undertake voluntary collective action across state borders in pursuit of what they consider to be the broader public interest¹⁰. In addition to being distinguished from other transnational agents such as private economic actors or governmental authorities institutionally empowered by the state, the term civil society denotes how it is also distinguished from other transnational actors whose importance has, of course, exploded globally¹¹.

A significant event was the terrorist attacks of September 11, 2001. However, rather than an analytical inconvenience, this is a principle of the Gramscian school of international relations, that there is no civil society independent of state and corporate power. Gramscians see civil society as embedded in a hegemonic historical bloc¹². The concept of civil society has a long tradition and has been given many interpretations, from Aristotle's identification with the political community to Hegel's almost opposite sense, namely a differentiation of society in which civil society is defined as more or less formalized institutions that form an autonomous social sphere, distinct from the State. In contrast to this dualistic model, in today's complex modern society it has become more common to define civil society as a social sphere distinct from both the State and the market¹³.

Depending on the definition, civil society has been assigned different roles in a democratic society¹⁴. Especially since the 1990s, the alleged democratic benefits of civil society have been emphasized in the context of a growing dissatisfaction with current representative democracy, which has often been linked to processes of technocratization of governance, individualization of society, and globalization of markets and decision-making centers¹⁵. Communitarians, for example, have emphasized the role of the traditional family, functional neighborhoods, and voluntary associations in reviving feelings of community and shared values in response to "the self-destructive capacities of liberalism and an increasingly

⁸ A Companion to the Anthropology of Politics Wiley Online Books' <<https://onlinelibrary.wiley.com/doi/book/10.1002/9780470693681#page=458>> [accessed 14 May 2024].

⁹ John Clark and Editor, *"Globalizing Civic Engagement: Civil Society and Transnational Action"*, 1st Edition, 2003 <<http://gen.lib.rus.ec/book/index.php?md5=9540aee67a6e42dec0c55d3ef230b901>> [accessed 14 May 2024].

¹⁰ Thomas Davies, *"NGOs: A New History of Transnational Civil Society"*, Oxford University Press, 2014, pp. 210-211.

¹¹ Markus Pieper, *"REPORT on the Transparency and Accountability of Non-Governmental Organizations Funded from the EU Budget"* | A9-0446/2023 | European Parliament' <https://www.europarl.europa.eu/doceo/document/A-9-2023-0446_EN.html> [accessed 12 June 2024].

¹² Richard Price, *"Transnational Civil Society and Advocacy in World Politics"*, *World Politics*, 55.4, 2003, pp. 580-581.

¹³ Anastasia, Kavada, *"Transnational civil society and social movements"*, *The handbook of development communication and social change*, 2014, pp. 351-369.

¹⁴ Mark Surman, and Reilly, Katherine, *"Appropriating the internet for social change: towards the strategic use of networked technologies by transnational civil society organizations"*, Social Science Research Council, 2003.

¹⁵ Lloyd David, Brown, *"Creating credibility: Legitimacy and accountability for transnational civil society"*, Kumarian Press, 2008, pp. 17-18.

egocentric attitude towards life"¹⁶. In parallel, the "social capital" debate has emphasized that the quality of democratic politics and the vitality of a country's economic life depend to a large extent on its associative life¹⁷.

Non-governmental organizations

According to the literature consulted, it can be stated that there is no unanimously accepted definition of the term "NGO", and this article does not fully propose to provide one. If we were to refer to the Encyclopedia of Public International Law, it defines NGOs as "private organizations (associations, federations, unions, institutes, groups) not established by a government or by an intergovernmental agreement, which are capable of playing a role in international affairs by virtue of their activities"¹⁸. Most writers would exclude, for example, as well as those groups that attempt to acquire governmental power for themselves (either by force or constitutionally) and enterprises that exist primarily to generate profit¹⁹. Inspired in particular by the new social movements and the democracy movement in Eastern Europe (Misztal 2001), in social theory the "renaissance" of civil society developed especially in the 1990s, with the search for a space that is autonomous from both the state and the market²⁰.

Civil society organizations tend to work within a third sector, neither state nor market, mostly in the form of well-structured NGOs and instrumental and sometimes single-issue coalitions. The concept of civil society has been used as a synonym for associative life²¹. Non-governmental organizations (NGOs), in particular, are increasingly able to play an active role in global security issues²². In the first, the power of NGOs is non-economic, non-military and non-violent. In the latter, the power of NGOs is primarily cultural (providing the means to involve public opinion), political (autonomy in program management; contacts with national and international power centers), moral (adherence to values and principles of international law) and ideational (transmitting original and captivating projects²³).

Civil society actors also play an important role in advocating for more effective and compassionate humanitarian policies. Lobbying governments and international organizations to provide more resources for humanitarian response, as well as advocating for greater

¹⁶ Ibid., pp. 19-20.

¹⁷ Paul F, Whiteley, et al. *"The origins of social capital."* Social capital and European democracy, 1999, pp. 25-44.

¹⁸ Hermann Rechenberg, *"Non-governmental organizations"*, in Rudolf Bernhardt (ed.), *Encyclopaedia of Public International Law*, Vol III (Max Planck, 1997), pp. 612-613. The European Convention on the Recognition of the Legal Personality of International Non-Governmental Organizations (ETS 124, 24/4/86), rather than attempting to determine which entities may be considered NGOs, seeks to ensure that entities legally recognized as NGOs in one State Party may enjoy the same status in another State Party.

¹⁹ Ibid., pp. 656-657.

²⁰ della Porta, Donatella, *"Building Bridges: Social Movements and Civil Society in Times of Crisis"* | VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations p. 938, <<https://link.springer.com/article/10.1007/s11266-020-00199-5>> [accessed 31 January 2024].

²¹ Ibid., p. 940.

²² Daniela Irrera, 'Civil Society and Humanitarian Action: NGOs' Roles in Peace Support Operations', *Perspectives : Review of International Affairs*, 1, 2011, pp. 85-106.

²³ Irrera.

protection of the rights of affected populations, are examples of such activities²⁴. In addition to providing aid and advocating for policy change, civil society organizations work to promote social cohesion and integration between affected populations and host communities. Moreover, NGOs provide medical care, mental health support, and other health services to refugees, who often face significant health challenges due to the difficult conditions they face²⁵.

NGOs play an important role in providing livelihood support to affected populations during humanitarian crises. The provision of resources, skills and opportunities that enable individuals and communities to maintain their livelihoods and recover from the effects of a crisis is referred to as livelihood support²⁶. One of the key strengths of non-governmental organizations in providing livelihood support to affected populations is their ability to provide targeted, context-specific assistance that addresses the unique needs and challenges of different populations. This could include providing training in specific skills or trades relevant to the local context, as well as providing microfinance or other financial services²⁷.

Literature review

Importance through representation and advocacy

First of all, an important role is that of representation and advocacy. NGOs are an institutional tool that facilitates public participation in the development of the decision-making process, encouraging and promoting respect for legitimate rights and interests through more efficient mechanisms²⁸. They can make an important contribution to the development of democracy, the rule of law, respect for minority rights²⁹. Citizens are perceived as the voices of civil society and, representing their interests before the European institutions, the purpose of civil society in the context of policy development is to provide expertise.

A conclusive example is provided by NGOs that advocate for the respect of minority rights and that are formed by people who belong to a specific category or work closely with it, see the phenomena of homophobia and discrimination based on sexual orientation³⁰. The emphasis is placed in particular on a series of rights and freedoms, as follows: freedom of expression, the right to advocacy and petition, as well as access to information of public interest, freedom of assembly and public association. "Effective democracy and good

²⁴ Gorm Rye Olsen, Nils Carstensen, and Kristian Høyen, "Humanitarian Crises: What Determines the Level of Emergency Assistance? Media Coverage, Donor Interests and the Aid Business", *Disasters*, vol. 27, no. 2, 2003, pp. 124–25.

²⁵ Anne Gulland, "The Refugee Crisis: What Care Is Needed and How Can Doctors Help?", *BMJ: British Medical Journal (Online)*, vol. 351, 2015, pp. 2–3.

²⁶ Bart De Bruijn, "The living conditions and well-being of refugees", 2009, p. 41.

²⁷ De Bruijn, *Op. cit.*, pp. 41–42.

²⁸ Krawczyk, *Op.cit.* pp. 80–81.

²⁹ Pauline Cullen, *Op cit.*, pp. 206–207.

³⁰ European Union Agency for Fundamental Rights, "Homophobia and discrimination on grounds of race" sexual orientation and gender identity in EU Member States", *Fra-Hdgso-Report-Part2_ro.Pdf* <https://fra.europa.eu/sites/default/files/fra-hdgso-report-part2_ro.pdf> [accessed 13 December 2023].

governance at all levels... are essential... and can only be achieved through the active involvement of citizens and civil society”³¹. The development and realization of democracy and human rights, in particular by promoting public awareness, participation in public life and ensuring transparency and accountability of public authorities³².

Involvement in the decision-making process

Some NGOs argue that they are increasingly seen by the Commission and other European institutions as actors not only in the “policy-making stage” (through timely inter-institutional dialogue, consultations and discussions) but also in “project management activities” (in the preparation, implementation, monitoring and evaluation of funding programmes) at regional and local level³³. “The European Commission has placed increasing emphasis on the need for increased democratic participation in the EU and the involvement of NGOs in the decision-making process”³⁴. As the European Commission has acquired additional responsibilities in a number of new policy areas, this has been accompanied by an increasing number of NGOs operating inside and outside Europe and an expansion of the scope of their work³⁵.

In these circumstances, it can be argued that NGOs can serve as a means of stimulating and informing the Commission. Despite this, in the White Paper on European Governance, which led to the establishment of this system, the Commission stated that there is currently a lack of clarity on how consultations are carried out. The Commission recognises the need to simplify its relations with NGOs by maintaining and developing existing ‘good practices’ in different sectors. The European Union has a supranational governance structure, which means that it is able to take decisions without the unanimous agreement of national governments³⁶.

NGOs as actors of transparency and accountability

An important role is played by the fact that NGOs represent civil society and, more than that, monitor transparency and accountability, proposing a series of themes that highlight

³¹ Presidency of the Committee of Ministers of the Council of Europe | Ministry of Foreign Affairs, Third Summit of Heads of State and Government (Warsaw, 16 - 17 May 2005), <<https://www.mae.ro/node/1581>> [accessed 13 December 2023].

³² Pauline P. Cullen, “Pan-European Non-Governmental Organizations: European Union Sponsored Mobilization and Activism for Social Rights”, unpublished conference, Pittsburgh, PA, 1999, p. 30.

³³ Ani Matei and Dragoș – Cătălin Apostu, “The Relationship between the State and the Non – Governmental Organizations”, *Procedia - Social and Behavioral Sciences*, 3rd Cyprus International Conference on Educational Research, CY-ICER 2014, 30 January – 1 February 2014, Lefkosa, North Cyprus, 2014, pp. 847–51.

³⁴ Israel De Jesús Butler, “Non-Governmental Organization Participation in the EU Law-Making Process: The Example of Social Non-Governmental Organizations at the Commission, Parliament and Council”, *European Law Journal*, 2008, pp. 558–82.

³⁵ Devrimi Kaya, Robert J. Kirsch, and Klaus Henselmann, “The role of non-governmental organizations (ngos) as intermediaries of the European union decision to adopt international accounting standards: 1973–2002”, *Accounting Historians Journal*, 43.2 (2016), 59–127, p. 284.

³⁶ Devrimi Kaya, Robert J. Kirsch, and Klaus Henselmann, *Op.cit.*, p. 288.

the needs of citizens. They have the opportunity to participate in public consultations, a series of hearings, thus being part of the decision-making process at European level. Through these means, individuals are allowed to become active in political life in Brussels, and the decision-making process is open and accessible to citizens³⁷. This process contributes to the formation of public opinion, in this way NGOs play an important role in educating and informing the public on European issues, leading to the formation of an informed and aware public opinion³⁸.

It can be said that NGOs play very important roles in contemporary society, especially in European governance, by carrying out complementary actions of other sectors, by personalizing and increasing the satisfaction of certain needs. NGOs can provide valuable contributions and help legitimize the decision-making process within the EU. They have developed green policies, being important actors in managing European governance and in maintaining a close relationship between the European institutions and its citizens, addressing the issue of how the EU uses the "powers" offered by its citizens. All these mechanisms contribute to achieving the objectives of good governance, transparency in implementation and decisions, accountability and participation within the EU. to all categories of its citizens.

Cohesion policies, the provision of structural and investment funds as tools in the process of creating a transnational civil society

First, it can be stated that the European Commission uses to a significant extent the appropriate policy and financial instruments to create a transnational civil society by promoting cohesion policies, providing structural and investment funds. The European Union's funding of civil society organizations represents a significant aspect of EU governance³⁹. The formation of a transnational civil society would bring with it the legitimacy of supranational institutions and the support of institutions in the process of developing and deciding on EU policies. Massive investments in EU cohesion policy (structural and cohesion funds) combined with the participation of NGOs in the design and implementation of this policy allow NGOs to play an important role in the development of green policies (sustainable development, circular economy, climate neutrality, etc.) and to improve their overall capacities⁴⁰.

³⁷ Terry Gibson and Benjamin Wisner, "Global Overview of the Role of Non-Governmental Organizations in Natural Hazard Governance", in *Oxford Research Encyclopedia of Natural Hazard Science*, 2019, p. 111.

³⁸ Israel de Jesús Butler, "Non-governmental Organization Participation in the EU Law-making Process: The Example of Social Non-governmental Organizations at the Commission, Parliament and Council", 2008 - *European Law Journal - Wiley Online Library*, <https://onlinelibrary.wiley.com/doi/full/10.1111/j.1468-0386.2008.00430.x?casa_token=XVvoid0Ou88AAAAA%3A_qL2jrH5nY6pYWInyPS3sopnFwdO9oAq9UDC1lrrW9bpjDycpGNF_tMD_i-dJuCQqFXORDnW_A8>, [accessed 1 June 2024].

³⁹ Rosa Sanchez Salgado, "Rebalancing EU Interest Representation? Associative Democracy and EU Funding of Civil Society Organizations", *JCMS: Journal of Common Market Studies*, vol. 52, no. 2, 2014, p. 337.

⁴⁰ Oto Potluka, Martin Spacek, and Georg von Schnurbein, "Impact of the EU Structural Funds on Financial Capacities of Non-Profit Organizations", *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, vol. 28, no. 5, 2017, p. 123.

Some of the prominent instruments through which the Commission attempts to create a transnational civil society are the EU Structural and Investment Funds which support projects that promote economic and social cohesion between Member States. "Although the reasons for the Commission's support are clear, little is known about the main features of the EU's institutionalised system of funding opportunities"⁴¹. These include projects that facilitate collaboration and exchange between organisations and citizens from different countries. In addition, the European Social Fund and the European Regional Development Fund can be mentioned, which support projects that have as their main objectives social inclusion, employment and economic development, thus contributing to the creation of an informed and legitimate civil society⁴².

Symbiosis between the Europeanization process and financing

Secondly, civil society, consisting of interest groups and non-governmental organisations, "decides to use European opportunities, especially in the area of funding, but this decision affects their internal structure and initial objectives, as they become part of the Europeanisation process"⁴³. Groups that engage in the Europeanisation process and choose to promote European values will also respect a set of European rules that will lead to significant transformations. The European Commission uses the appropriate policy and financial instruments to create a transnational civil society by institutionalising structures such as : the Citizens' Rights and Values Fund which was created with the aim of supporting civic organisations promoting democracy, the rule of law and fundamental rights at European level. Another appropriate instrument created is the EU Civil Society Platform which offers civil society organisations a suitable space to express their views and participate in EU decision-making processes.

In addition to these, we can mention that the European Union encourages the Europeanization of civil society through a series of opportunities and incentives such as funding, opportunities for access to the decision-making process and civil dialogue⁴⁴. CSOs receiving EU support are expected to defend the rights and interests of their constituencies. The Rights, Equality and Citizenship (REC) Programme is one of the programmes that funds projects promoting fundamental rights, European citizenship and civil society participation at transnational level⁴⁵. The Europe for Citizens Programme joins the appropriate policy and instruments for the creation of a transnational civil society, which aims to strengthen European

⁴¹ Sanchez Salgado, *Op. quote*, p. 338.

⁴² Christine Mahoney and Michael J. Beckstrand, "Following the Money: European Union Funding of Civil Society Organizations", *JCMS: Journal of Common Market Studies*, vol. 49., no. 6, 2011, pp. 1339–61.

⁴³ Alex Warleigh, "Europeanizing" Civil Society: NGOs as Agents of Political Socialization", *JCMS: Journal of Common Market Studies*, vol. 39, no. 4, 2001, 619–39 .

⁴⁴ Well done, Julie. "Doing democracy differently: The transformative potential of human rights NGOs in transnational civil society." *Third World Legal Studies*, 1998.

⁴⁵ Christine Mahoney and Michael J. Beckstrand, *Op. cit.*, pp. 1339-61.

citizens' awareness of the European Union, promote civic participation and strengthen ties between citizens from different European countries⁴⁶.

Limits in the process of building a transnational civil society

Thirdly, the counterarguments used by NGOs that the European Commission is not using the appropriate policy and financial instruments to create a transnational civil society refer to a wide range of challenges identified over time in numerous attempts. The main pillar is the need to identify a common cause in which to find a problem to which a response is sought at a transnational level⁴⁷. Since elections are often an inadequate mechanism for expressing public opinion in the EU, other instruments such as the Citizens' Initiative, involvement in voluntary programmes on European democratic life or consultations with civil society organisations (CSOs) are considered to create an alternative link between citizens and institutions at EU level and would solve the problem of the democratic deficit⁴⁸. The rhetorical question found in the literature is the following: "Does the European Commission fear that a possible transnational civil society would gain "too much legitimacy in the process of developing and deciding on green policies, and not only?!"⁴⁹.

The Commission does not fund civil society groups in all Member States to the same extent. It heavily funds Member States that suffer from a less developed civil society, with a long history of authoritarian regimes. Civil societies with this profile will not have a high level of knowledge of the European Commission's funding opportunities and may not yet have the capacity to develop proposals. CSOs that receive support from the European Union are often called "government puppets" or "friends of the EU"⁵⁰. Some are easier to organise and have access to more resources than others, which creates an inequality in the system. "Instead of increasing the democratic legitimacy of decisions, civil society involvement could therefore cement or even increase existing bias"⁵¹. The EU is one of the world's largest public donors. Commission Directorates-General, with fewer resources, appear to support European CSOs "with the explicit aim of extending European policies in their respective policy areas"⁵². On the other hand, government funding can create incentives for political activity – funding schemes create a new monetary interest in lobbying and reinforce the government's dependence on its non-profit contractors⁵³.

⁴⁶ Mahoney and Beckstrand, *Op. quote*, pp. 1339-61.

⁴⁷ Florini, Ann M., *"Transnational civil society"* Global citizen action. Routledge, 2014, pp. 29-40.

⁴⁸ Persson and Edholm, *Op. cit.*, pp. 1-2.

⁴⁹ Markus Thiel, *"European Civil Society and Human Rights Advocacy"*, University of Pennsylvania Press, 2017, pp. 201-202.

⁵⁰ Caroline Boin and Andrea Marchesetti, *"Friends of the EU. The Costs of a Taxpayer-Funded Green Lobby"*, International Policy Network, 2010, pp. 14-15.

⁵¹ Persson and Edholm, *Op. cit.*, pp. 1-2.

⁵² Sanchez Salgado, *Op. cit.*, p. 337.

⁵³ *Ibid.*, p. 339.

Analytical framework

The present research will focus as follows on the general frameworks of analysis and the specific niches of the work.

The concept of "transnational civil society" in the approach to green policies?

First, we will focus on how non-governmental organizations define transnational civil society in order to observe the level of knowledge of this concept and how familiar they are with the phenomenon in question. Depending on the answers provided, we will be able to understand how attached they are to the whole process, what is their knowledge of the instruments used by the European Commission and how much experience they have in this field. In addition, we will also identify which global or transnational issues are addressed by the organizations.

How can NGOs be seen as actors of transparency and accountability?

NGOs play a key role in managing, coordinating and monitoring government and corporate activities. They ensure that these entities comply with laws, norms, regulations, values and that their actions are in line with ethical and legal norms⁵⁴. Non-governmental organizations are frequently involved in advocacy campaigns that promote transparency policies and laws, laws that comply with European standards and are equally transparent, and a transparent decision-making process. One of their greatest concerns is the adoption and implementation of laws that ensure free access to information and transparency in the decision-making process⁵⁵.

How do NGOs view the symbiosis between the Europeanization process and funding? Cohesion policies, the provision of structural and investment funds by the European Commission

The most sustainable funding strategy is to diversify sources of income⁵⁶. A sustainable approach to NGO funding is one that avoids reliance on any single source of income, external or internal. It is difficult to determine a formula for the percentages that must be derived from various sources to support a "financially sustainable NGO." A balance between externally and internally generated resources is necessary to allow an organization to cover its operating and

⁵⁴ Kelly Ann Krawczyk, "International NGOs, Transnational Civil Society, and Global Public Policy: Opportunities and Obstacles in the Twenty-First Century", in *The Oxford Handbook of Global Policy and Transnational Administration*, ed. by Diane Stone and Kim Moloney, Oxford University Press, 2019, pp. 1-2.

⁵⁵ Aalbers, Manuel B., "The globalization and Europeanization of mortgage markets.", *International Journal of Urban and Regional Research* 33.2, 2009, pp. 389-410.

⁵⁶ Justin, Greenwood, and Christilla Roederer-Rynning. "The "Europeanization" of the Basel process: Financial harmonization between globalization and parliamentarization.", *Regulation & Governance* 9.4, 2015, pp. 325-338.

administrative expenses while maintaining the freedom to determine its program priorities and projects, regardless of donor preferences.

Global challenges, transnational responses ~ justification of such a construct

In this section, we will be interested in the perceptions of representatives of non-governmental organizations regarding the advantages-disadvantages, opportunities-limits of a transnational civil society. The areas of interest will focus on the benefits that this construct can bring, starting from the streamlining of the process of accessing funds, cohesion policy, the systematization of the Europeanization process in symbiosis with financing, and the like. At the level of the limits encountered in the construction of this transnational phenomenon, we will try to focus on the issue of under-representation and over-representation at the level of European institutions in terms of the positioning of some states.

Methodology

Case selection

Romania can be classified, according to the specialized literature and methodological patterns, as a deviant case in terms of the status of civil society. The importance given to non-governmental organizations and interest groups, their involvement in the decision-making process or their consultation on various issues represent the gaps that provide ambiguity, lack of legitimacy and equity between state and non-state actors when it comes to decision-making power and the aggravation of the democratic deficit.

Data collection and analysis method

The data collection method used was the semi-structured interview. In general terms, the interview is a qualitative method that emphasizes the verbal description of real-life situations. It describes the phenomenon in a specific context, interprets processes and meanings, uses theoretical concepts and seeks to "understand" the phenomenon. The interviews were conducted between July 20, 2024 and September 1, 2024, and the number of NGOs we interviewed is 12. The NGOs were selected according to a well-established principle, namely to be registered in the Transparency Register of the European Commission. Each interview includes a number of 15 questions, of which 10 are main questions and 5 follow-up questions. Referring to the data collection method used in my research study, namely the semi-structured interview, I considered it necessary to use the deductive thematic analysis. According to the related method, I coded the specialized literature, found a series of recurring themes, then tried to identify them in the respondents' statements.

Analysis

How do organizations define transnational civil society and what are the global or transnational issues addressed by the organizations?

The NGO deals with engaging society in supra-state decision-making perspectives (through representatives in international federations, etc.). R8 states that the main objectives of the organization it is part of are : ensuring respect for human rights, informing and raising awareness of individual freedoms. The main objective of the NGO R14 is to support the sustainable development of communities in Romania, Ukraine and the Republic of Moldova in the educational and social fields. The organization was significantly affected by the refugee crisis and there were some changes. The respondent stated that there was a need for an organizational reinvention, offered by the new solution to the problem and the context of the war, the services remaining the same, to some extent.

When asked about the level of collaboration between the organization he is a part of and other transnational organizations, respondent R2 mentions “We collaborate with many NGOs from Germany and France through our representative, the collaboration is very good, there are exchanges of good practices and joint working sessions”. He elaborates on the fact that the objectives of NGOs target the socio-economic area by offering grants, prizes, organizing competitions, exchanging experiences and providing support to those in need.

How can NGOs be seen as actors of transparency and accountability?

Managing cultural and linguistic diversity in transnational projects can be problematic in some circumstances. R13 mentions that in the projects carried out by the NGO he represents, although they have not directly encountered extensive cultural diversity, they effectively manage linguistic diversity by translating documents and materials into relevant languages. In this way, we ensure that all members of the organization can access information and actively participate in the activities carried out, thus promoting an inclusive and accessible environment for all. R5 claims that there are translators in his organization, specifically 3, who translate documents into 2 international languages, English and German. R8 states the following: “Diversity is part of the organizational culture. We respect diversity and we take care in our projects that every person is included”. He claims that this is also the essence of a transnational civil society, namely intercultural exchanges, the promotion of diversity, multiculturalism and acceptance at all levels.

At the same time, respondents argued that at the level of NGOs, it is necessary to have clear governance structures, with well-defined roles and responsibilities. Monitoring the activity in the online and offline space, presenting the objectives, values, team members, the activities they undertake, managing the budget, are just some of the items that need to be checked when we talk about transparency and accountability. In addition, promoting fairness and equality in decision-making processes can help build trust. In addition, respondent R10

argues that the organization he represents regularly publishes detailed financial and activity reports, which include the sources of funding and how the resources are used, whether they are income from European institutions, private actors or donations.

Other activities that non-governmental organizations usually carry out to systematize transparency and accountability processes are the performance of periodic financial audits by independent firms and the publication of their results can demonstrate a commitment to transparency. Respondent R15 told us that the NGO he is part of discloses the sources of funding and avoids funding that could compromise the integrity or mission of the organization. His NGO includes the community and beneficiaries in decision-making processes and in the implementation of projects. Public consultations and open meetings are effective ways to obtain feedback and ensure transparency, being only some of the methods, joining them is the organization of focus groups or brainstorming.

At the level of adjacent mechanisms of this process, as in the beginning of the section, we encounter the creation of online platforms where the public can access information about the activities and finances of the NGO in real time. At the same time, the use of social networks and other digital channels to communicate openly and transparently about the activities and achievements of the NGO. Respondent R7 states that the implementation of mechanisms through which beneficiaries and donors can provide feedback and raise concerns related to the activities of the NGO is extremely beneficial and effective. In addition, he adds that NGOs must be open about how funds are allocated and used, including by publishing the selection criteria for funding and projects.

How do NGOs view the symbiosis between the Europeanization process and funding? Cohesion policies, the provision of structural and investment funds by the European Commission

When asked whether “the European Commission heavily finances Member States that suffer from a less developed civil society and are underrepresented?” R9 states “The European Commission distributes funds in a balanced manner to Member States that suffer from a less developed civil society and are underrepresented in order to increase their participation and involvement in decision-making processes at European level”. The answer of the NGO R8 is an affirmative one, because these states need time to develop a civil society, because they are still in the process of democratization. “The funding is intended to contribute to their democratization”.

Moving on to the way in which the European Commission uses the appropriate policy and instruments regarding intensive funding of over-represented Member States, the positions of the respondents were very diverse. One of the NGO representatives, R6, supports that the European Commission distributes funds in a balanced way to over-represented Member States in order to strengthen transnational partnerships and collaborations and to promote European solidarity and cohesion. NGO R8 tells us that the European Commission

does not intensively fund over-represented Member States because they already have a functioning civil society.

The recommendations they offered to streamline the process are among the most diverse. Respondent R7 relies on making the process of allocating European funds more efficient by writing to the responsible management authorities requesting the simplification of administrative procedures, organizing stakeholder consultation meetings in the policy development process, extending the deadlines for submitting projects, and ensuring transparency and accountability in the use of funds. R8 argues that “Less bureaucracy would lead to a more efficient process.” The NGO representative states that he devotes a lot of time to bureaucratic and administrative issues, time that he says could be used and streamlined to generate new ideas or solve other vital problems. He argues that bureaucracy makes many activities difficult, responses are received after deadlines that are not at all in line with reality, and their work is stopped in some files that are to be analyzed in the distant future.

Conclusions

Transnational civil society, through the variety of entities it is made up of and which includes : non-governmental organizations (NGOs), advocacy groups, social movements and other forms of organizations, has the ability to undertake activities and operate beyond national borders. As highlighted in the “Analysis” chapter of the research paper, it contributes to various social, economic, political and ecological aspects, bringing multiple benefits. Summarizing the perceptions of the respondents, they argued that transnational civil society plays an essential role in key issues on the international agenda. Among these are : protecting and promoting human rights, monitoring and reporting human rights violations at the global level, putting pressure on governments and international organizations to take action ; climate change, war, pandemic, violence, euro-scepticism, and others.

These organizations provide a voice to those who cannot defend themselves, who do not have the necessary knowledge, are not familiar with some institutional levers or do not know their rights as citizens of the European Union, and more. According to the respondents' views, the creation of a transnational civil society draws attention to global problems and mobilizes international public opinion. In addition, they could collaborate with other organizations to combat inequalities and promote a more equitable distribution of resources. This would lead to the resolution or at least the reduction of some pressing issues encountered in most communities. In this case, a series of examples could be : involvement in development projects, anti-poverty campaigns, programs to support disadvantaged communities, cohesion policies, financial support or humanitarian aid.

Even though, throughout the research conducted by reviewing the specialized literature and analyzing the interviews conducted with representatives of non-governmental organizations, we stipulate a series of challenges and limitations in the realization of this phenomenon, transnational civil society plays an essential role in promoting metamorphoses

at a global level. Addressing these limits requires a symbiosis between means and ends, between strategies and the consolidation of complex actions between state and non-state entities involved throughout the process. This leads to the systematization of organizational capacities, improving coordination and collaboration, ensuring sustainable and independent financing, protecting civic space and rights and freedoms

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THE IMPACT OF FIRES IN THE USA ON GREEN WORLD POLITICS

Aygun SEYIDOVA¹

Abstract: Climate change stands as one of the most urgent environmental challenges of the 21st century, impacting not only natural ecosystems but also social, economic, and political systems worldwide. This article examines the United States' experience with increasing wildfire frequency and intensity, particularly in California, as a concrete manifestation of climate change's profound effects. Through a comprehensive analysis of empirical data on wildfire trends, emergency response strategies, and the country's transition toward clean and renewable energy sources, the study highlights the multifaceted nature of these environmental challenges. Furthermore, it explores the complex interplay between domestic policy dynamics, socio-economic factors, and the U.S.'s position within international climate diplomacy, especially within the framework of United Nations Climate Change Conferences (COP). The findings underscore that while significant progress has been made in enhancing resilience and advancing energy reforms, ongoing political polarization and structural barriers present substantial obstacles to sustained climate action. Ultimately, the article argues that the effective mitigation of climate risks in the U.S. requires integrated, science-based, and inclusive strategies that balance national priorities with global responsibilities, thereby contributing to a more sustainable and resilient future.

Keywords: climate change, wildfires, United States, environmental policy, COP conferences, renewable energy.

Introduction

One of the most pressing environmental challenges of the 21st century, climate change, has transcended the boundaries of academic discourse and international summits to become an integral part of everyday life. The United States is both a major contributor to global greenhouse gas emissions and one of the countries most visibly affected by the consequences of climate change. In recent years, particularly in the state of California, the frequency and intensity of wildfires have increased dramatically. These developments have led to the destruction of natural resources, placed residential areas under significant threat, and severely

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disrupted the balance of ecosystems. As a result, issues such as soil erosion, declining air quality, and the loss of biodiversity have intensified.

However, responding to these challenges through emergency wildfire containment efforts alone is insufficient. Addressing the root causes of climate change necessitates a rapid expansion of clean and renewable energy sources within the United States. This transition, in turn, demands solutions to a range of socio-economic and technological challenges. Furthermore, the U.S. position on the global stage—particularly within the framework of the United Nations Climate Change Conferences (COP)—is shaped by the interplay of domestic political dynamics, economic interests, and international partnerships. Therefore, a comprehensive and objective evaluation of the U.S. climate policy requires an integrated analysis of environmental challenges, energy strategies, and global commitments.

This article is based on a descriptive-analytical methodology, which incorporates both the presentation of existing facts and statistical data, as well as the analysis of their causal relationships and emerging trends. The primary objective is to provide a comprehensive and systematic evaluation of the interrelations between the increasing incidence of wildfires in the United States, the transition to clean energy, and the country's role in international climate diplomacy. This approach goes beyond a mere enumeration of observable events; it aims to explore how these phenomena are structured and systemically shaped, and what outcomes they produce in broader socio-political and environmental contexts.

Methodologically, the study relies on empirical data analysis. It draws upon real-world information such as statistical records of recent wildfires in the U.S., outcomes of emergency response measures in California, governmental and non-governmental reports on the energy transition, and documented statements and commitments made by the United States in the context of COP summits. These sources serve as the empirical foundation for the article's analytical narrative.

The article also adopts a multi-level analytical framework, conducting research at the micro (state-level initiatives such as those in California), meso (national energy and environmental policy of the United States), and macro (the country's role in global climate diplomacy) levels. This layered perspective facilitates a holistic understanding of the issue and enables the identification of how climate change manifests not only at the local level but also within regional and international dimensions.

The rising incidence of wildfires in the United States: An analysis of statistics and trends

Wildfires are a critical ecological and environmental phenomenon in the United States, particularly in the western regions. Over the past several decades, the patterns and impacts of wildfires have evolved in response to both natural and anthropogenic factors. This study aims to examine the temporal changes in wildfire occurrence, the extent of land area burned,

regional variability, and the timing of peak fire activity using nationwide datasets spanning nearly four decades.

Since the early 1980s, the United States has faced a persistent threat from wildfires, with the National Interagency Fire Center reporting an annual average of approximately 70,000 fire incidents. Data from the U.S. Forest Service indicate that these figures may underrepresent the true number of wildfires during the initial years of comprehensive record-keeping. Although the overall frequency of wildfires has not demonstrated a clear increasing or decreasing trend over time, the scale of destruction—as measured by land area burned—has grown markedly since the 1980s².

Notably, all ten of the years with the largest total burned acreage have occurred since 2004, with the years 2015 and 2020 standing out as particularly severe². This rise in fire activity coincides with a period in which the United States experienced some of the hottest recorded temperatures, especially during the spring and summer seasons. These warmer conditions appear to have played a critical role in intensifying fire behavior and outcomes.

The late 1990s marked a turning point in several long-term climate cycles, which, when coupled with increasing average temperatures, prolonged drought periods, and accelerated snowmelt, contributed to the development of drier and more fire-prone landscapes—especially in the western regions of the country³. These climatic shifts have laid the groundwork for more intense and widespread wildfires.

Between 1984 and 2021, the percentage of wildfire-affected land experiencing severe ecological damage has varied between 5% and 22% each year. The western United States has borne the brunt of these fires, with a significant rise in burned acreage when comparing the earlier (1984–2002) and later (2003–2021) portions of the observational period. In these regions, fire activity has not only become more frequent but also more evenly distributed throughout the year, affecting nearly every month⁴.

Between 1984 and 2021, the percentage of wildfire-affected land experiencing severe ecological damage has varied between 5% and 22% each year. The western United States has borne the brunt of these fires, with a significant rise in burned acreage when comparing the earlier (1984–2002) and later (2003–2021) portions of the observational period. In these regions, fire activity has not only become more frequent but also more evenly distributed throughout the year, affecting nearly every month⁵.

Additionally, the timing of peak wildfire activity has changed. During the earlier period, the highest levels of burned area occurred in August. In contrast, data from 2003 to 2021 indicate that July has become the most fire-intensive month, with an average of 1.8 million

² National Interagency Fire Center. (n.d.). *Total wildland fires and acres (1983–present)*. <https://www.nifc.gov/fire-information/statistics/wildfires>

³ Climate change indicators: Wildfires. <https://www.epa.gov/climate-indicators/climate-change-indicators-wildfires>

⁴ Wildfire smoke exposure under climate change: impact on respiratory health of affected communities. <https://pmc.ncbi.nlm.nih.gov/articles/PMC6743728/>

⁵ Wildfire smoke exposure under climate change: impact on respiratory health of affected communities. <https://pmc.ncbi.nlm.nih.gov/articles/PMC6743728/>

acres burned annually during that time⁶. This seasonal shift underscores how climate change is not only influencing the severity of wildfires but also altering their timing and duration.

Fires, whether ignited by natural causes or human activity, are profound ecological events that significantly influence the health and composition of various ecosystems. While they are often associated with destruction and loss, fires also play a crucial role in renewing and rejuvenating landscapes. This article delves into the complex impact of fires on ecosystems, examining how they affect both the environment and biodiversity.

Wildfires are becoming an increasingly pressing issue across the United States. Although the total acreage burned annually varies, the number of wildfire incidents is on the rise, making fire management and community protection more difficult than ever. In 2023, the Southern Area of the U.S. faced the brunt of these fires, both in terms of frequency and land affected. Other states like California, Colorado, and New Mexico also experienced major fire events requiring significant firefighting efforts⁷.

California, in particular, stands out as the most wildfire-vulnerable state. In 2022, over two million properties were at high risk—almost three times as many as Texas, the next most affected state. The five states with the highest number of at-risk properties included California, Texas, Colorado, Arizona, and Idaho⁸.

The causes of wildfires can generally be categorized into human and natural origins. Unfortunately, most fires are sparked by human activity—whether it's unattended campfires, discarded cigarettes, burning debris, or faulty equipment such as power lines. In some cases, wildfires are deliberately set through arson. Nature also plays a role, especially through lightning strikes in dry areas. Although less common, volcanic activity can also spark fires. However, even naturally occurring fires are often worsened by human-induced climate change and poor land management.

California, more than any other state, bears the brunt of wildfire destruction. In 2020, the state saw its worst wildfire season ever, with over 4 million acres burned and 31 lives lost⁹. That year, five of the largest wildfires in California's history occurred. The economic costs of wildfires are equally staggering, with billions spent annually on fire suppression, property loss, and disruptions to local economies.

However, the wildfire crisis is not limited to the United States. Countries around the world are also grappling with this growing danger. For example, Australia's devastating 2019–2020 "Black Summer" fires scorched more than 46 million acres and caused massive ecological damage. Similarly, Canada, Brazil, and areas around the Mediterranean have seen worsening wildfire conditions¹⁰.

⁶ National Interagency Fire Center. (n.d.). *Total wildland fires and acres (1983–present)*. <https://www.nifc.gov/fire-information/statistics/wildfires>

⁷ 2023 North American wildfires. <https://disasterphilanthropy.org/disasters/2023-north-american-wildfires/>

⁸ Wildfires in the US: Alarming Statistics and trends, <https://www.dryad.net/post/wildfires-usa-statistics>

⁹ BBC News. (2020, February 13). *Australia fires: A visual guide to the bushfire crisis*. <https://www.bbc.com/news/world-australia-50951043>

¹⁰ BBC News. (2020, February 13). *Australia fires: A visual guide to the bushfire crisis*. <https://www.bbc.com/news/world-australia-50951043>

A major contributing factor to this global trend is the expansion of human development into fire-prone zones, known as the wildland-urban interface (WUI). These regions blur the line between natural wilderness and populated areas, significantly increasing fire risks. Globally, shared drivers such as climate change, urban sprawl, and outdated fire management strategies continue to fuel the wildfire threat.

Despite the scale of the problem, there are meaningful steps that can be taken. On an individual level, people can help by adopting fire-safe practices—such as proper landscaping, fully extinguishing campfires, and avoiding risky activities during fire season. Communities can prepare through coordinated fire prevention plans, fuel management using controlled burns, and updating building regulations in fire-prone areas.

At a national and global level, investing in improved forest management, advancing climate action, and deploying smart technology are essential. Innovations like Dryad's Silvanet system offer early fire detection by sensing gas changes in the environment, enabling rapid emergency responses¹¹. Incorporating these tools into broader wildfire strategies is key to safeguarding people, ecosystems, and infrastructure against this rising threat.

The impact of fires on ecosystems: Environment and biodiversity

Fire exerts both harmful and beneficial effects on ecosystems, with outcomes determined by factors such as intensity, frequency, and the ecological context in which fires occur. On the destructive side, severe fires can eliminate vast areas of habitat, leading to the immediate loss of flora and fauna. Species that rely on specific environmental conditions may face displacement or population decline. The degradation of air quality through the release of smoke, carbon particulates, and toxic gases presents risks not only to ecosystems but also to human health. Additionally, post-fire runoff often carries ash and pollutants into nearby water bodies, disrupting aquatic ecosystems and contaminating water supplies.

Despite these risks, fire also plays a critical regenerative role in many natural systems. One key benefit lies in nutrient cycling. Combustion of organic material releases nutrients back into the soil, creating conditions favorable for plant germination and growth. This process is particularly significant in nutrient-poor environments where natural replenishment occurs slowly.

Fire can also support biodiversity by creating a mosaic of habitats, allowing various species to thrive. In some ecosystems, periodic low-intensity fires prevent the dominance of single species and promote a diverse ecological community. Fire-adapted species, such as certain pine trees and grasses, have evolved to not only survive fire but to depend on it for reproduction and dispersal.

In forest ecosystems, particularly in temperate and boreal regions, fire helps maintain ecological balance by clearing underbrush and stimulating the regeneration of specific tree

¹¹ Dryad Networks. (n.d.). *Silvanet: Wildfire detection system*. <https://www.dryad.net/silvanet>

species. However, increasing fire frequency and severity can alter species composition, favoring those that recover quickly while marginalizing slower-recovering species.

Grasslands and savannas are ecosystems where fire is integral to natural cycles. Controlled burns can promote nutrient-rich grasses and support large populations of herbivores. Disruptions to this pattern—whether through suppression of fire or excessive burning—can reduce biodiversity and destabilize ecosystem functions¹².

Wetlands, although less frequently affected by fire, may still experience fire-related changes. Low-intensity fires in wetland margins can open space for colonization by certain plant species. Nonetheless, excessive or frequent fires may interfere with water flow, soil chemistry, and the composition of sensitive species communities.

In the California chaparral, periodic fires are a natural part of the ecosystem's rhythm. Many native plants possess fire-resistant traits and rely on fire for reproduction. However, recent increases in fire intensity and frequency, driven by climate factors and human activity, have altered these natural cycles, promoting the spread of invasive species and reducing ecological stability.

The Australian bush provides another example where fire has historically shaped biodiversity. Native plant species often require fire to germinate, and animals such as kangaroos and wallabies benefit from the post-fire flush of vegetation. Despite this, extreme fire events in recent years have pushed some ecosystems beyond their resilience thresholds, threatening endemic species with long-term decline¹³.

Boreal forests in regions such as Canada and Siberia rely on periodic fire to regenerate tree populations and maintain habitat diversity¹⁴. However, as climate change accelerates fire regimes, the pace and severity of fires may surpass the adaptive capacity of many species, leading to shifts in forest structure and function.

Sustainable fire management strategies are essential to mitigate the risks of wildfire while preserving fire's ecological benefits. Prescribed burning is a widely used technique to simulate natural fire patterns, reduce accumulated fuel loads, and prevent large-scale destructive fires. When implemented carefully, this approach can support biodiversity and promote ecosystem resilience.

Monitoring ecological changes following fire events is crucial. By tracking vegetation recovery, species diversity, and soil health, land managers can assess long-term fire impacts and adjust practices accordingly. Research-informed restoration efforts, such as replanting native vegetation and controlling invasive species, also play a vital role in ecosystem recovery and protection. Fire, while often associated with destruction, is also a powerful force of ecological transformation. By understanding and managing its effects, it is possible to balance

¹² Bond, W. J., & Keeley, J. E. (2005). Fire as a global 'herbivore': The ecology and evolution of flammable ecosystems. *Trends in Ecology & Evolution*, 20(7), 387–394.

¹³ Department for Environment, Food & Rural Affairs (DEFRA). (2021). *Wildfire and biodiversity: A review of the evidence*. UK Government Report. <https://www.gov.uk>

¹⁴ Kasischke, Eric S., and Merritt R. Turetsky. "Recent Changes in the Fire Regime across the North American Boreal Region—Spatial and Temporal Patterns of Burning across Canada and Alaska." *Geophysical Research Letters*, vol. 33, no. 9, 2006

ecosystem health, biodiversity conservation, and landscape resilience in a rapidly changing climate.

Global warming significantly contributes to the growing wildfire crisis by altering environmental conditions in ways that promote fire ignition and spread. Elevated temperatures intensify evaporation, reduce soil moisture, and create persistently dry conditions, especially in drought-prone regions like the western United States. These arid environments are highly susceptible to fire. Additionally, initial increases in vegetation due to warmer temperatures result in an excess of dry biomass, which serves as fuel for wildfires.

Climate change also intensifies extreme weather events such as thunderstorms and high winds, which not only spark wildfires but also accelerate their spread. The warming climate has led to the extension of fire seasons, making wildfires more frequent and severe. Furthermore, wildfires themselves exacerbate climate change by emitting large quantities of carbon dioxide and other greenhouse gases, creating a feedback loop that worsens global warming and its associated environmental and health effects.

Wildfire prevention and response measures in California

Wildfires occurring in the United States have severe consequences not only for local ecosystems but also for global climate change. The increasing wildfire activity in recent years has led to a significant rise in carbon emissions, sparking widespread discussion due to its disruption of the planet's climate equilibrium. Fires result in the release of carbon dioxide (CO₂) and other greenhouse gases into the atmosphere through the combustion of forests and vegetation. Since 2020, large-scale wildfires across the U.S. have released millions of tonnes of carbon into the atmosphere. Scientific research indicates that the wildfires in California alone produced up to 110 million tonnes of carbon emissions starting from 2020. This figure accounts for nearly 2% of the United States' total carbon emissions¹⁵.

The increase in wildfires not only hampers decarbonisation efforts but also intensifies climate change. The voids left by fires diminish the environment's capacity to absorb carbon while allowing additional greenhouse gases to accumulate in the atmosphere. Consequently, the balance of ecosystems is disturbed, potentially leading to more serious climate challenges. Implementing intelligent fire management strategies is of exceptional importance to reduce carbon emissions caused by wildfires and to minimise environmental damage.

Modernising forest management, promoting sustainable grazing, and adopting environmentally friendly agricultural practices are essential components of efforts to mitigate wildfire risks. Various projects conducted across different regions of the United States aim to reduce the impact of wildfires and to preserve ecosystem health.

California, one of the largest states in the United States, is renowned not only for its natural beauty but also for its annual wildfires. In recent years, the scale and impact of these

¹⁵ California Department of Forestry and Fire Protection. (2021). *Fire Suppression Expenditures for the 2020 Wildfire Season*. Sacramento, CA: CAL FIRE.

fires have raised considerable concern, attracting the attention of both the national and international public. California's wildfires pose serious threats to the environment, human lives, and the economy. Factors such as climate change, prolonged drought periods, and rising temperatures significantly increase the risk of wildfires. The fires that occurred in the spring and autumn of 2020 affected approximately four million hectares, making them among the most widespread in history. Thousands of people were left homeless, and lives were lost as a result of these fires¹⁶.

In response to the California wildfires, numerous countries have offered financial and logistical support. The importance of international cooperation in combating climate change has been emphasised, with calls for new climate policies aimed at wildfire prevention. For instance, the European Union and several Scandinavian countries launched aid campaigns to deliver firefighting equipment and supplies to California¹⁴. On the other hand, additional financial resources were allocated to federal and state-level wildfire response services in the U.S.

In the aftermath of large-scale wildfires, states often face additional fiscal demands. These may include funding for infrastructure repair, recovery grants, unemployment assistance, and increased investments in fire management resources. For example, state governments might be responsible for infrastructure insurance payouts and rebuilding public facilities, as well as responding to economic disruptions such as spikes in unemployment insurance claims.

Florida serves as a notable case study. Following the 1998 wildfire season, the state contributed over \$6 million to disaster relief efforts, exclusive of unemployment insurance. Federal assistance played a pivotal role in recovery, with the region receiving more than \$100 million in aid to address fire suppression costs and facilitate restoration¹⁵.

Similarly, California reported wildfire suppression expenditures exceeding \$43 million during a single fire season, which constituted approximately 1.8% of the overall economic loss estimated. To better manage financial risks associated with natural disasters, the state established the Catastrophic Event Memorandum Fund, allocating \$39.5 million to cover losses related to public infrastructure and other essential services. Additionally, the economic impact was reflected in the over 5,000 unemployment claims filed, categorized as fire or disaster-related, underscoring the broader labor market disruptions caused by wildfires¹⁷.

Simultaneously, various international non-governmental organisations have initiated projects focused on environmental protection and wildfire prevention, providing training and resources to local communities. Experts in ecosystem restoration and sustainable agricultural practices have collaborated with local communities to reduce the impacts of fires. Financial and resource-based support has played a crucial role not only in extinguishing fires but also in developing long-term strategic plans aimed at reducing future risks in affected regions. In

¹⁶ California Department of Forestry and Fire Protection. (2021). *Fire Suppression Expenditures for the 2020 Wildfire Season*. Sacramento, CA: CAL FIRE.

¹⁷ California Department of Forestry and Fire Protection. (2021). *Fire Suppression Expenditures for the 2020 Wildfire Season*. Sacramento, CA: CAL FIRE.

this context, international collaboration, the sharing of joint resources, and enhanced information exchange have generated a broader and more effective response.

The ecological impacts of the California wildfires have also become a subject of global discussion. Wildfires damage not only plant life but also various animal species. Scientific studies reveal that these fires disrupt ecosystem balance and place wildlife at risk.

Data analytics underpins contemporary wildfire mitigation strategies. Geographic Information Systems (GIS) and remote-sensing technologies enable detailed analysis of fire-prone areas; for instance, coastal forests may be delineated as potential fire zones in an X-shaped pattern based on variables such as drought severity, meteorological conditions and soil types. These data are employed to assess ignition probabilities and to allocate resources with greater precision. Early detection is critical to preventing fire spread, and the development of global sensor networks—comprising heat, smoke and carbon-dioxide detectors—facilitates the identification of fires at their incipient stages. The information relayed by these sensors plays a vital role in guiding analytical platforms that prioritise and dispatch firefighting units for rapid intervention¹⁸.

Advances in aviation technology have likewise become decisive in combating wildfires. Unmanned aerial vehicles (UAVs), or drones, are utilised for real-time imaging, broad-area surveillance and continuous monitoring of fire perimeters, thereby enabling predictive modelling of fire trajectories and the creation of high-resolution fire maps. The extended flight endurance of drones greatly assists in gathering data from terrains inaccessible to ground personnel. Moreover, remote aerial suppression systems allow for timely intervention when fires reach heightened peril: water-filled tankers, helicopters and other aircraft draw from nearby reservoirs and deploy water or retardant over critical zones¹⁹.

Key challenges and strategic considerations shaping the future of clean energy development in the United States

In 2023, the United States made significant strides in its clean energy transition, marked by record-setting developments in solar power, rapid growth in battery storage, steady expansion of electric vehicle (EV) adoption, and substantial federal policy support. This progress occurred despite lingering challenges such as supply chain disruptions, grid constraints, and political uncertainties surrounding environmental regulation.

Solar energy led the transformation, with an unprecedented 31 gigawatts (GW) of new capacity installed—representing a 55% increase from the previous year. Solar became the leading source of new utility-scale power additions and contributed to a total installed capacity of 161 GW, generating roughly 5% of national electricity demand²⁰.

¹⁸ Casanova, I. P., Martínez, J. A., & Rodríguez, L. F. (2015). Intelligent sensor networks for early wildfire detection: A review of technologies and applications. *Journal of Environmental Monitoring*, 17(3), 567–583.

¹⁹ U.S. Forest Service. (2022). *Remote sensing applications for wildfire management* (General Technical Report RMRS-GTR-RRS-67). <https://www.fs.usda.gov/rmrs/>

²⁰ The US clean energy transition: Progress, challenges and road ahead. <https://www.energytrend.com/news/20240329-46231.html>

Battery energy storage also experienced exponential growth, surpassing 2022's total installations within the first three quarters of the year. The increasing integration of storage with renewable sources underlines its importance for grid stability and managing peak demand. Projections indicate that national storage capacity will double by the end of 2024²¹.

In contrast, wind energy witnessed moderate growth, with 8 GW of new capacity installed. Still, the U.S. achieved a total of 147 GW in wind capacity, generating about 11% of the country's electricity. A stronger expansion is anticipated in 2024 due to regulatory improvements and a backlog of pending projects.

Collectively, renewable energy sources—including solar, wind, hydropower, and storage—accounted for over 75% of new utility-scale capacity additions in 2023. These resources supplied approximately one quarter of total U.S. electricity generation in the first half of the year, confirming their increasing centrality in the national energy portfolio.

The electric vehicle (EV) sector recorded its highest-ever sales, with 1.2 million units sold—a 40% increase over 2022. EVs captured a 7.6% market share, with sales surging to 8.1% in the fourth quarter alone. Contrary to perceptions of stagnation, the data suggests continued consumer momentum and expanding infrastructure. To support EV expansion, the federal government invested heavily in charging infrastructure through the Bipartisan Infrastructure Law. The National Electric Vehicle Infrastructure (NEVI) program, funded with \$7.5 billion, began deploying high-speed charging stations along key transportation corridors, with Ohio being the first to complete a station in 2023²².

The growing adoption of digital technologies—such as artificial intelligence, cryptocurrency mining, and electric manufacturing—is expected to sharply increase electricity demand. Revised projections suggest that power consumption growth may nearly double over the next five years. This trend demands proactive coordination among federal and state agencies, utility operators, and private sector stakeholders to align clean energy expansion with grid reliability.

From a policy standpoint, regulatory developments are shaping the clean energy landscape. The Environmental Protection Agency (EPA) proposed new rules to reduce emissions from fossil fuel power plants, though these proposals have faced legal and technological challenges. Concurrently, the U.S. Treasury is defining criteria for clean hydrogen tax incentives, which will impact future investments in low-carbon hydrogen technologies. Legal uncertainty, particularly concerning the potential rollback of the *Chevron deference* doctrine, could also limit the federal government's regulatory authority²³.

The Inflation Reduction Act (IRA) emerged as a cornerstone of federal investment strategy. It created a \$27 billion Greenhouse Gas Reduction Fund to mobilize private capital

²¹ U.S. Energy Information Administration (EIA). (2023). *Battery storage in the United States: Recent trends and projections*. <https://www.eia.gov/todayinenergy/detail.php?id=57982>

²² The US clean energy transition: Progress, challenges and road ahead. <https://www.energytrend.com/news/20240329-46231.html>

²³ U.S. Congressional Research Service. (2023). *Chevron Deference: A Primer*. <https://crsreports.congress.gov/product/pdf/LSB/LSB10903>

toward clean technology deployment. However, the pace and clarity of fund distribution and implementation mechanisms—such as the “direct pay” option—remain under scrutiny and could affect early-stage project financing²⁴.

A major infrastructural challenge remains the development of long-distance transmission lines, essential for transporting renewable electricity across regions. Although Congress has not passed comprehensive permitting reform, the Federal Energy Regulatory Commission (FERC) is finalizing new planning rules, while the Department of Energy's NIETC designations may expedite federal approvals and funding access.

Determinants of the United States' position at COP summits: A multifaceted analysis of domestic and international influences

COP summits are annual meetings held under the framework of the United Nations Framework Convention on Climate Change (UNFCCC), during which nations formulate strategies to combat climate change. The United States has alternated between taking progressive stances and facing international criticism in these forums, largely influenced by fluctuations in its domestic and foreign policy. The country's position at COP summits is closely tied to the climate policies of the incumbent presidential administration.

For instance, under President Barack Obama, the U.S. played a leading role in the adoption of the Paris Agreement during the COP21 summit in 2015, making ambitious commitments to reduce emissions. Conversely, during Donald Trump's presidency, the United States withdrew from the Agreement and participated minimally in the COP23 summit in 2017. Under President Joe Biden, the U.S. rejoined the Agreement, repositioning climate diplomacy as a strategic priority²⁵.

The U.S. Congress plays a pivotal role in shaping climate policy, as federal legislation and budgetary decisions are essential for implementing initiatives proposed at COP summits. However, the political composition of Congress often hampers progress and undermines the continuity of international commitments.

Furthermore, the U.S. is invested in the development and export of clean energy technologies, which enables it to adopt a more proactive stance at COP summits. At COP26 in 2021, the United States made specific pledges concerning clean energy finance and technology transfer. Its position at COP also reflects broader geopolitical considerations, particularly in its climate-related rivalry with China. In an effort to assert global leadership, the U.S. uses the COP platform to enhance its diplomatic influence²⁶.

²⁴U.S. Department of the Treasury. (2023). *Inflation Reduction Act: Energy security and climate change investments*. <https://home.treasury.gov/policy-issues/inflation-reduction-act>

²⁵ Bodansky, D. (2016). *The Paris Climate Agreement: A New Hope?* American Journal of International Law, 110(2), 288–319. <https://doi.org/10.5305/amerjintelaw.110.2.0288>

²⁶ United Nations Framework Convention on Climate Change (UNFCCC). (2015). *Adoption of the Paris Agreement*. FCCC/CP/2015/L.9/Rev.1. <https://unfccc.int/resource/docs/2015/cop21/eng/109r01.pdf>

Cooperation with the European Union is also central to U.S. strategy at these summits, as joint declarations and initiatives with the EU are aimed at amplifying global impact in climate governance.

In summary, the U.S. approach at COP summits has not been static but has evolved in response to internal political shifts, industrial pressures, international competition, and diplomatic priorities. Future success in these summits will depend not only on economic and technological capacity but also on sustained political commitment and international collaboration.

Conclusions

The increasing frequency and intensity of wildfires across the United States serves as a clear indicator of the scale and complexity of the environmental challenges confronting the country at both national and global levels. Statistical analyses reveal that, over recent decades, the area affected by wildfires, the duration of fire seasons, and the associated economic damages have all risen significantly. These impacts extend far beyond natural ecosystems, posing serious risks to public safety, healthcare systems, and agricultural productivity. As exemplified in the state of California, the response measures implemented have underscored the necessity of enhancing emergency management mechanisms, strengthening early warning systems, and improving community resilience and adaptive capacity.

Within this context, the transition towards clean and renewable energy sources represents a fundamental pillar of the United States' broader climate strategy. Key objectives such as energy security, the reduction of greenhouse gas emissions, and the integration of innovative technologies underpin this transformative agenda. However, the transition is fraught with challenges. Political polarisation, entrenched industrial interests, and the socio-economic implications of structural change all present significant obstacles to sustained progress. Overcoming these barriers will require not only federal initiative but also close cooperation among local communities, private industries, and academic institutions.

On the international stage—particularly within the framework of the United Nations Climate Change Conferences (COP)—the United States' position reflects not merely domestic policy considerations, but also broader geopolitical interests and aspirations for global leadership. In this regard, the development of robust, long-term sustainable strategies at the national level, coupled with a firm commitment to international climate obligations, is of critical importance. Ultimately, the implementation of science-based, inclusive, and forward-looking policies will enable the United States to play a more effective role in combating climate change and contribute meaningfully to securing a more sustainable and resilient future for coming generations.

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GREEN PROJECTS IN TURKEY AND KAZAKHSTAN: PATHWAYS TO SUSTAINABLE DEVELOPMENT

Aygun SOLTANZADE¹

Abstract: *Green energy defines energy sources that are obtained from nature and do not harm the environment. These energy sources have renewable and sustainable features, unlike fossil fuels. The future of green energy is becoming increasingly important in line with sustainability and environmental protection goals. Increasing investments are enabling governments and the private sector to focus on renewable energy projects, while technological innovations such as advanced solar panels and more efficient wind turbines will increase energy efficiency and reduce costs. Countries are turning to green energy sources to increase their energy independence, which in turn strengthens national security by reducing reliance on fossil fuel imports. Many countries are setting targets to become carbon neutral by 2050. This makes the use of green energy mandatory. Turkey is sixth in Europe and fourteenth in the world in green energy transformation! Turkey, which is strong in solar, wind and hydroelectricity, is trying to reduce its dependency on fossil fuels. It was stated that Türkiye, which has great potential in terms of renewable energy sources, is a country dependent on foreign sources of energy because the energy resources it uses are largely fossil fuels and its oil and natural gas reserves are limited. Kazakhstan adopted its first law on the support of renewable energy in 2009, while the same law was amended in 2017 by adjusting the tender mechanism and the 20-year electricity purchase contract with the buyer, as well as taxes and investment preferences. It is a privilege to discuss a critical issue at the intersection of environmental policy and sustainable development—Green Projects in Turkey and Kazakhstan. As two strategically significant countries bridging Europe and Asia, both nations face pressing environmental challenges but have also demonstrated commendable progress in advancing renewable energy, eco-friendly infrastructure, and climate resilience initiatives. These insights will provide a comparative understanding of how Turkey and Kazakhstan are contributing to the global green transition while addressing their unique ecological and economic challenges.*

Keywords: *green projects, green transition, environmental challenges, Turkey, Kazakhstan*

Introduction

Turkey ranked 12th in the world and 5th in Europe last year in terms of installed clean energy capacity. According to the 2021 Renewable Energy Global Status Report of the 21st

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Century Renewable Energy Policy Organization (REN21), Turkey ranked 4th in the world in terms of installed geothermal capacity, accounting for 11 percent of the world's total capacity.

Both Turkey and Kazakhstan are endowed with vast natural resources and are major energy producers in their respective regions. However, their economic reliance on fossil fuels and industrialization has led to significant environmental concerns.

Turkey and Kazakhstan are experiencing rising temperatures, prolonged droughts, and declining water reserves, affecting agriculture and biodiversity. Despite these issues, both countries have initiated ambitious policies and projects to combat climate change and promote sustainability. On the other hand, Turkey became the country that commissioned the highest hydroelectric capacity after China last year. Turkey accounted for 3 percent of global hydroelectric capacity during this period and ranked among the top 10 countries in this field. Turkey's total renewable energy capacity corresponded to approximately 1.7 percent of global installed renewable energy capacity.

Carbon emissions from fossil fuels are causing global temperature increase. In order to prevent the climate crisis caused by the increase in global temperature, fossil fuel use must be ended as quickly as possible. In order to limit the global temperature increase to 1.5 degrees and to reach the net zero emission target by 2050, more investment must be made in clean energy sources, which are of critical importance.

In this context, especially in recent years, many countries have put forward strategies to exit fossil fuels, especially coal, and clean energy transformation is becoming increasingly widespread around the world.

Clean energy transformation also shapes the investment plans of companies and banks. Currently, all development banks in the world have stopped financing coal, while committing to increasing investments in renewable resources.

Renewable energy investments are of critical importance for Turkey, which aims to create an annual capacity of 1,000 megawatts in wind and solar energy, to get a greater share of global clean energy investments, to have easier access to financing, to attract more foreign investors and to reduce its current account deficit.

This article is based on a descriptive-analytical methodology, which incorporates both the presentation of existing, the transition to clean energy, and the country's role in international climate diplomacy². This approach goes beyond a mere enumeration of observable events; it aims to explore how these phenomena are structured and systemically shaped, and what outcomes they produce in broader socio-political and environmental contexts.

Environmental Challenges and the Need for Green Policies

◆ Fossil Fuel Dependency

Turkey: While investing in renewable energy, Turkey still relies on coal and natural gas, which account for a major share of its electricity production.

² Kazakistan'da Yenilenebilir Enerji: Potansiyeli ve Geleceği, <https://www.eurasian-research.org/publication/kazakistanda-yenilenebilir-enerji-potansiyeli-ve-gelecegi/?lang=tr>

Kazakhstan: As one of the top 15 oil-producing countries in the world, Kazakhstan faces challenges in diversifying its energy sources.

Air Pollution and Industrial Emissions

Turkey: Urbanization and industrial activity in cities like Istanbul, Ankara, and Izmir contribute to deteriorating air quality.

Kazakhstan: Major industrial hubs such as Almaty and Karaganda experience severe pollution due to heavy coal usage.

Climate Change and Desertification

Government Policies and Strategic Commitments

Turkey's Green Policy Framework

- ✅ Net Zero by 2053: Turkey has committed to achieving carbon neutrality.

The negative effects of climate change have begun to be felt clearly today, and there has been an increase in the occurrence of extreme climate and weather events such as extreme heat waves, sudden and heavy rainfalls, floods and droughts on both a regional and global scale. The main reason for this situation is seen as the rapid increase in greenhouse gas emissions released into the atmosphere as a result of the increased use of fossil fuels with the industrial revolution. Accordingly, while the average global temperature increased by approximately 1.1°C from 1850 to 2020, it is expected that the global temperature increase will reach 3°C by the end of this century if this trend continues.

In order to jointly combat climate change on a global scale, the United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992, the Kyoto Protocol in 1997 and the Paris Agreement in 2015. With the Paris Agreement, a paradigm shift was made in combating climate change and numerical targets were set to limit the increase in global temperatures. 195 Parties have signed this agreement as of 2023. In order to achieve the goal of limiting global temperature increase to 1.5 °C, it was stated that a 45% emission reduction should be achieved by 2030 and net zero emissions should be achieved by mid-century. The agreement also committed to updating the National Contribution Declarations submitted in 2015 every 5 years. As of 2023, according to UNFCCC records, 153 of the 195 Parties to the Paris Agreement have updated or resubmitted their national contribution declarations.

Turkey continues its work on both reducing greenhouse gas emissions and adapting to the negative effects of climate change within the framework of the “common but differentiated responsibilities and relative capabilities” principle of the UNFCCC, which it became a party to in 2004. Turkey's accession to the Paris Agreement was announced on September 21, 2021, and the 2053 Net Zero Emission Target was announced as a whole with the green development revolution on September 27, 2021. Following these developments,

Turkey became a party to the Paris Agreement on November 11, 2021. Turkey has demonstrated its determination to combat climate change by both setting a net zero emission target and becoming a party to the Paris Agreement.

With its membership in the Paris Agreement, Turkey has begun work on updating the Nationally Determined Contribution (NDC), preparing the Climate Change Mitigation Strategy and Action Plan and the 2053 Long-Term Climate Change Strategy in cooperation with the United Nations Development Program (UNDP). Within this framework, the national reduction target, which was announced as a reduction of up to 21% compared to the Reference Scenario in 2015, was updated and increased to 41%, and the Updated First Nationally Determined Contribution Declaration was submitted to the UNFCCC on April 13, 2023³.

Following the announcement of our 2053 Net Zero Target, Turkey's first Climate Council was held by the Ministry of Environment, Urbanization and Climate Change between February 21-25, 2022, in order to determine the building blocks of our country's long-term roadmap for climate change with all stakeholders. Approximately 5,000 people from various stakeholder groups⁴, including the public, private sector, universities, NGOs and students, attended the Council. Following the Council, a roadmap that guides Turkey's long-term climate change policies was determined with a total of 217 recommendations, 76 of which were prioritized. This roadmap formed the basis for the preparation of the Climate Law, NDC, Climate Change Mitigation Strategy and Action Plan and Long-Term Climate Change Strategy.

In the 12th Development Plan (2024-2028), under the title of "Environmental Protection", there is a measure regarding the reduction of greenhouse gas emissions and the strengthening of climate change adaptation actions, taking into account national conditions within the framework of the Paris Agreement and Turkey's National Contribution Declaration. On the other hand, in the Medium Term Program (MTP) 2024-2026, under the title of "Green Transformation", it was stated that "In line with the 2053 net zero emission target and national development priorities, our country's green transformation process will be accelerated with an approach that supports greenhouse gas emission reduction, increases climate change adaptation capacity, prioritizes competitiveness and efficiency, observes a just transition and develops national incentive mechanisms by making maximum use of global financing resources." With the Presidential Decree No. 85 dated 29/10/2021 (Official Gazette 29/10/2021- 31643), the duties of "determining policies, strategies and actions at national and international levels, conducting negotiation processes and ensuring coordination with institutions and organizations within the scope of Turkey's efforts to combat and adapt to climate change" were given to the Climate Change Presidency.

With the same decree, the name of the Ministry of Environment and Urbanization of the Republic of Turkey was changed to the Ministry of Environment, Urbanization and Climate Change of the Republic of Turkey.

³ Kazakistan yeşil enerjiye geçişte rüzgar ve güneş enerjisi potansiyeline güveniyor, <https://tr.euronews.com/business/2022/12/02/kazakistan-yesil-enerjiye-geciste-ruzgar-ve-gunes-enerjisi-potansiyeline-guveniyor>

⁴ Yeşil Mutabakat Eylem Planı 2021. Türkiye Cumhuriyeti Ticaret Bakanlığı. 60s

- ✓ Ratification of the Paris Agreement (2021): Strengthened climate policies in alignment with global commitments.

The Paris Agreement is based primarily on the United Nations Framework Convention on Climate Change and aims to regulate the climate change regime after 2020, the expiration date of the Kyoto Protocol.

The Paris Agreement aims to strengthen global socioeconomic resilience against the threat of climate change in the post-2020 period. The long-term goal of the Paris Agreement is to keep the global temperature increase as low as possible below 2°C (if possible at 1.5 degrees) compared to the pre-industrialization period. This goal requires the gradual reduction of fossil fuel (oil, coal) use and the shift to renewable energy.

The Paris Agreement continues international cooperation against climate change in a different way. Based on the argument that the Paris Agreement and the annexes of the Convention, and especially the structure established by the Kyoto Protocol, are ineffective because they cause important parties such as the USA and China, which have the highest share in global emissions, to remain outside of the reduction action, a new cooperation framework has been established that is expected to make all parties partners in the reduction action.

The most important feature of the Agreement, unlike the Kyoto Protocol, is that developed and developing countries participate in the reduction action with Nationally Determined Contributions (NDCs). A new architecture different from the Protocol has been created in order to ensure the participation of all countries with emission reduction or limitation targets. The Agreement, which uses both bottom-up and top-down methods in determining the responsibilities to be undertaken by the party countries, exhibits a hybrid structure. The national contributions of the party countries, which consist of non-binding voluntary targets determined by themselves within the framework of their national conditions, have given the Agreement its bottom-up nature. Monitoring the implementation of the Agreement with a reporting and review system valid for all parties constitutes the top-down nature of the new regime. Therefore, with these features, the Agreement is based on the approach called “pledge-and-review”.

The main area where the new regime architecture established with the Paris Agreement differs from the Agreement and the Protocol is its departure from the classification made with the annexes of the Agreement. The Agreement does not directly refer to the annexes in its provisions regarding the individual and collective responsibilities of the parties, and only uses the distinction between developed and developing countries. The Agreement, which also acknowledges the diversity exhibited by the developing country group, has created an embedded differentiation among developing countries according to their vulnerabilities, special situations and capacities in operational regulations such as transparency, implementation and compliance mechanisms, thus providing flexibility to the least developed countries in meeting the requirements. However, it is not possible to say that the Agreement has completely eliminated the function of the annexes of the Convention. Although there is no direct reference to the annexes, the distinction made between developed and developing

countries, especially in the regulation of substantive duties such as mitigation and financing, implicitly follows the annex system. For example, Article 9, which states that developed countries will continue to provide financial support to developing countries as in the Convention, does not mention the annexes; however, it is clear that this provision is a continuation of the financial support obligation of Annex II countries regulated in Article 4 of the Convention. Again, in Article 4, where reduction is regulated, a distinction is made between the types of reduction actions of developed and developing countries, with the distinction made between emission reduction “targets” and “efforts”.

The Paris Agreement, which was adopted on December 12, 2015 and entered into force on November 4, 2016, is an important turning point in the fight against global climate change. Turkey accepted the Paris Agreement in 2015, provided that the demand for access to financial and technological support in the new climate regime was met, and signed the agreement on April 22, 2016, verbally stating that it was a developing country. President, Mr. Recep Tayyip Erdoğan, announced that we would ratify the Paris Agreement at the 76th United Nations General Assembly on September 21, 2021. President announced net zero emission target for 2053 in his speech following the Cabinet Meeting held on September 27, 2021. Following these statements, the Law on the Approval of the Paris Agreement, which we signed in 2016, was published in the Official Gazette dated October 7, 2021 and numbered 31621. In addition, the Ratification Document and our National Declaration regarding the Paris Agreement were deposited with the Secretary General of the United Nations, the Depositary of the Agreement, on October 11, 2021. The 30-day depositary period of the Agreement ended on November 10, and on this date, Türkiye became a party to the Paris Agreement.

- ✓ Turkey Green Deal Action Plan (2021): Introduced incentives for green energy, circular economy, and waste reduction.

The “2030 Agenda for Sustainable Development”, which entered into force unanimously by 193 member countries, including Turkey, under the umbrella of the United Nations, envisages ending poverty and increasing welfare, as well as making the global fight against climate change an inseparable part of an economically and socially inclusive development model. In this context, while climate change combat policies are gaining momentum in the world, the goal of achieving sustainable economic growth has also brought climate change to the center of international economic and trade policies.

In fact, the European Union (EU) announced on December 11, 2019 that it would adopt a new growth strategy that will transform its economy with the European Green Deal, and in the following process, it was seen that other leading actors of the international economy also determined their targets for the green transformation of their economies.

In this respect; the changes envisaged in EU policies with the European Green Deal, the transformation in international trade and economy, and in line with our 2023 and development goals; It is of great importance to protect and develop our competitiveness in our exports, which are the locomotive of our economy, and to strengthen our country's integration

with the global economy and supply chains through the advanced economic integration established within the scope of the Customs Union with the EU.

In this context; the “Green Deal Action Plan” prepared by the Ministry of Trade in cooperation with public and private sector institutions and organizations will be published on the Ministry's official website in order to contribute to our country's transition to a sustainable, resource-efficient and green economy, and to ensure that it adapts to the changes envisaged by the European Green Deal in a way that will protect and further advance the integration provided within the scope of the Turkey-EU Customs Union.

In order to monitor the implementation of the Action Plan, to direct the work in line with global policy developments and to ensure the necessary coordination, a “Green Deal Working Group” was established under the chairmanship of the relevant Deputy Minister of the Ministry of Trade, with the participation of the Deputy President of Strategy and Budget and the Deputy Ministers of the Ministries of Labor and Social Security, Environment and Urbanization, Foreign Affairs, Energy and Natural Resources, Treasury and Finance, National Education, Industry and Technology, Agriculture and Forestry, Transport and Infrastructure.

The working procedures and principles of the Working Group will be determined by the Working Group, and the secretarial services of the Group will be carried out by the General Directorate of International Agreements and the European Union of the Ministry of Trade. Specialized working groups may be established in order to assist the Working Group. In addition to the relevant institutions and organizations, universities, non-governmental organizations, ⁵professional associations and representatives of the private sector related to the subject may also be included in all works and meetings, if necessary.

All public institutions and organizations within the scope of the “Green Deal Action Plan” should meticulously fulfill their duties and responsibilities; I kindly request that all public institutions and organizations meticulously provide all kinds of support and assistance that may be needed during the implementation of the Action Plan.

✅ Emissions Trading System (ETS) Preparation: Developing a national carbon pricing system.

The EU Emissions Trading System, established in 2005, is one of the most important instruments used by the EU in the fight against climate change. The aim of the Emissions Trading System, which covers approximately 40% of EU emissions, is to switch to low-emission systems without harming the competitiveness of industries thanks to the carbon cap and trade implemented.

The EU ETS, which was implemented in 2005, remained in practice as a pilot system for 3 years. During Phase-2, covering the years 2008-2012, the responsibilities under the Kyoto Protocol were fulfilled. The aviation sector was also included in the EU ETS as of 2012. The scope of the ETS was expanded in the 3rd phase, covering the years 2013-2020. Emission

⁵ Paris Anlaşması , <https://iklim.gov.tr/paris-anlasmasi-i-34>

limitations were introduced to cover the entire EU. As of 2020, the ETS system has been reduced by 41% compared to the amount of emissions in 2005.

During the economic crisis between 2007 and 2012, there was a significant decrease in demand for emission allowances. For this reason, carbon fees, which were around €30 in 2008, fell to €2.5 in April 2013. In order to prevent instability in carbon fees due to the excess in carbon allowances, the Market Stability Reserve was established in 2019.

In the 4th phase of the ETS system, which started in 2021, it was aimed to reduce carbon emissions by 40% compared to 1990 levels by 2030. With the 55th Compliance Package, this target was redefined as 55% for the ETS in line with the EU Climate Law. The fee for European emission allowances increased approximately two-fold in 2021, from €34 to €80.

Kazakhstan's Environmental Commitments

According to the definition of the International Energy Agency, intermittent energy sources are distributed as “all types of energy produced sustainably from renewable resources”, including “bioenergy, geothermal energy, hydroelectricity, ocean energy, solar energy and wind energy” and “renewable resources”, and “sources obtained from natural processes” and “replenished faster than they are consumed”. There are two main goals such as reducing energy consumption all over the world, meeting the increasing energy demand and decarbonizing the energy supply.

In Central Asian countries, importance is given to the further development and feeding of RES in order to eliminate energy consumption within the framework of the sustainable development goal by minimizing carbon emissions. The most active country in this region is Kazakhstan, and other countries are following some strategies and programs for more energy use.

While its first law was adopted in 2009, the same law was reorganized in 2017 with the offer rates and the terms of purchasing electricity for 20 years with the buyer, as well as taxes and investment preferences (a contractual agreement between energy buyers and members). In 2013, in addition to reducing the payment of fossil fuels in the economy, especially coal, which accounts for more than 70% of electricity production, the National Concept was adopted for the transition to a “green” economy by 2050. Within the scope of this concept, a goal was set for the share of connected energy in electricity production to increase to 3% in 2020, 30% in 2030 and 50% by 2050. The document in question was amended in 2021 in connection with the “new realities and current positive dynamics” file. Another important document on the subject is the strategy for achieving carbon neutrality, signed by Kazakh President Kassym Komart Tokayev between February 2023.

The National Concept is being implemented in the form of plans for the construction of 41 small hydropower plants with a total capacity of 539 MW by 2020, while “low cost, ease of use and environmental friendliness” are among the main capacities of commercial interest. It became the first country in Central Asia to hold energy auctions that encourage competition and offer tariff discounts (40% for solar energy) and close investments from major

international banks (e.g. the European Bank for Reconstruction and Development, the Asian Development Bank) and Kazakhstani international private companies.

In 2018, a system of open and acceptable tenders was implemented for contracts submitted by permanent energy producers to supply electricity to the grid. The Ministry of Energy of Kazakhstan annually approves different tender programs by type, capacity and region, which are published on its website. According to the Ministry of Energy of Kazakhstan, 15 separate energy projects with a total capacity of 440 MW were selected for the auction in 2022, which were acquired at a record low price of about 12.49 tenge (3.5 cents). The majority of these parts are wind power plants with a capacity of 400 MW.

The country's national energy system consists of three regions: North, South and West. The North has hydroelectric power plants and coal-fired thermal power plants, while the West is dependent on huge oil and gas reserves. In the southern part, since it does not have rich energy resources as in other regions, energy is transferred to other devices.

Hydroelectricity has become the second energy source in electricity production in Kazakhstan after coal. While all hydroelectric power plants in the country produce an average of about 8-9 billion kWh per year, the total hydroelectric potential of Kazakhstan is 170 billion kWh per year. The current technically feasible amount is 62 billion kWh, of which 30 billion kWh per year is economically suitable for use.

Among the alternative energy sources, the most suitable for the country are wind and solar energy. The wind energy potential is far above the average energy consumption level in Kazakhstan, and according to the Ministry of Industry and Infrastructure Development of Kazakhstan, the country's wind energy potential is estimated at 920 billion kWh of electricity per year. In addition, the country has the highest levels of solar radiation per capita combined. The solar energy potential in Kazakhstan is about 1500 - 1600 kWh/m² per year, and the average annual sunny day duration is 2,500 hours. In this context, the southern part of the country, including the Kyzylorda and South Kazakhstan regions, has high levels of insolation. The significant utilization of the solar energy potential in this region will play a major role in the realization of energy production with a market⁶.

- ✓ Carbon Neutrality by 2060: A national strategy to gradually phase out coal and adopt renewables.
- ✓ Green Economy Concept (2013): A framework to promote resource efficiency and environmental sustainability.
- ✓ Renewable Energy Law (2009, updated 2022): Legal support for investment in wind, solar, and hydropower projects.
- ✓ Kazakhstan's NDCs: Aims to reduce greenhouse gas emissions by 15% by 2030 under the Paris Agreement.

These policies set a strong foundation for large-scale green projects that are shaping the future of energy and sustainability in these countries.

⁶ Emisyon Ticaret Sistemi (ETS): Kapsamlı Bir Bakış, Son Gelişmeler ve ETS 2 <https://yesilbuyume.org/emisyon-ticaret-sisteminin-gozden-gecirilmesi/>

Key Green Projects: Renewable Energy and Sustainable Infrastructure

Turkey's Leading Green Projects

- ◆ Konya Karapınar Solar Power Plant: One of the largest solar energy farms in Europe, with a 1.35 GW capacity.
- ◆ Istanbul Metro Expansion: Investments in sustainable public transportation to cut down urban emissions.
- ◆ Zero Waste Project: A nationwide initiative led by the government to reduce plastic use and improve recycling.
- ◆ Aegean Wind Farms: Large-scale wind power projects contributing to Turkey's renewable energy mix.

Kazakhstan's Leading Green Projects

- ◆ Zhanatas Wind Farm: The largest wind power plant in Central Asia, with a 100 MW capacity.
- ◆ Astana Green Belt Initiative: A major afforestation project combatting desertification.⁷
- ◆ Balkhash Solar Power Plant: A large solar energy initiative aimed at reducing Kazakhstan's reliance on fossil fuels.
- ◆ Hydropower Expansion in the Irtys River Basin: Supporting sustainable water and energy management.

These projects illustrate the growing commitment of both nations to a low-carbon future while leveraging green financing and international partnerships.

Regional and Global Climate Cooperation

Both Turkey and Kazakhstan recognize the need for cross-border collaboration to enhance sustainability efforts.

Turkey's Role in International Climate Initiatives

Actively participating in UN Climate Conferences (COP) and EU Green Deal discussions.

Strengthening ties with the European Investment Bank and World Bank for green energy funding.

Partnering with Germany and China for advanced solar and wind energy projects.

⁷ Yeşil Mutabakat Eylem Planı <https://www.lexpera.com.tr/resmi-gazete/metin/yesil-mutabakat-eylem-plan-i-ile-ilgili-2021-15-sayili-cumhurbaskanligi-genelgesi-31543-2021-15>

Kazakhstan's Leadership in Central Asia's Green Transition

Hosted EXPO 2017 "Future Energy" in Astana, promoting global clean energy solutions.

Engaging in Caspian Sea Environmental Protection Agreements with neighboring countries.

Leading Central Asian Green Economy Cooperation with the UN and regional development banks.

These initiatives highlight how both nations are integrating into the global green economy while enhancing regional energy security and environmental governance

Kazakhstan has set an ambitious goal of becoming carbon neutral by 2060. In recent years, the country has increased the share of renewable energy in its total electricity production to 4 percent. This vast country relies on solar and wind energy to transition to green energy.

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"Astana EXPO-2017" is one of the country's largest wind power plants. 29 wind turbines with a total capacity of 100 megawatts produce green energy at this plant, 40 kilometers from the capital of Kazakhstan.

"Studies confirm that Kazakhstan has a wind energy potential of 1 trillion kilowatts per year. So there is a potential, and this potential should be developed with a balanced approach. Specifically, this wind farm in Astana produces about 300 million kilowatt-hours per year. For better understanding, this is equivalent to the amount of energy consumed by about 80 thousand homes," said Baghdad Oral, Chairman of the Board of Directors of CAEC JSC.

The wind turbines brought from Europe to the Astana EXPO-2017 wind farm are equipped with an ice detection system and operate safely in Kazakhstan's extremely hot summers and cold winters. The green energy produced here reduces greenhouse gas emissions by 270 thousand tons per year.

Green energy is being channeled into the national grid. The state now guarantees companies a 20-year repayment and indexes tariffs.

Conclusions

To conclude, Turkey and Kazakhstan are making substantial strides in green energy transition, sustainable urban development, and environmental protection. Their strategic policies, ambitious renewable energy projects, and strong international cooperation reflect their commitment to a greener and more resilient future.

While challenges remain, continued policy innovation, investment in clean technology, and regional partnerships will be key in achieving long-term sustainability goals.

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THE INTERNET OF THINGS (IoT) IN SUSTAINABLE URBAN DEVELOPMENT

ELSHAN ISAYEV¹

Abstract: *The Internet of Things (IoT) represents a transformative shift in how urban environments are conceptualized, managed, and experienced. Rooted in the integration of physical infrastructure with digital networks, IoT facilitates real-time data collection, advanced analytics, and automated decision-making across a range of urban sectors, including transportation, energy, water, waste, and public safety. This article explores the theoretical foundations of IoT and demonstrates its significance in advancing the principles of sustainable urban development. Drawing on interdisciplinary frameworks from information systems, environmental studies, and urban planning, the study highlights how IoT technologies contribute to ecological efficiency, social inclusion, and economic innovation. It presents a comparative analysis of global case studies where smart city initiatives have yielded tangible sustainability outcomes, while also acknowledging systemic challenges such as data privacy, cybersecurity, infrastructure gaps, and digital divides. Particular emphasis is placed on the Azerbaijani context, with an in-depth examination of the Agali smart village project in the Zangilan region. This example demonstrates how IoT can support post-conflict reconstruction, territorial reintegration, and rural revitalization through intelligent systems for energy, governance, and community services. The findings suggest that while IoT has strong potential to facilitate sustainable development, its success depends heavily on inclusive policy frameworks, transparent governance, cross-sector collaboration, and continuous technological adaptation. The paper concludes by offering practical recommendations for policymakers, city planners, and technologists seeking to align IoT deployment with sustainable development goals, particularly in transitioning and post-conflict regions. By addressing both the opportunities and limitations of IoT, this research contributes to a more nuanced understanding of how digital innovation can be responsibly harnessed to build resilient, equitable, and smart urban futures.*

Keywords: IoT, urban sustainability, smart cities, Azerbaijan, technology policy.

Introduction

Modern urban development is determined not only by economic and demographic growth, but above all by the ability to integrate innovative technologies into the spatial and

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social structure. The complexity of the challenges facing 21st century urbanism - including climate change, resource scarcity, growing inequality and worsening infrastructure crises - requires not just the digitalisation of individual spheres, but the systemic implementation of the concept of sustainable development through intelligent management mechanisms. It is in this context that the Internet of Things (IoT) has become a key link to ensure the transition to a new model of urban management, where data generated in real time can inform strategic decisions.

Over the past two decades, the IoT has become firmly embedded in the practice of smart cities, representing not only a network of connected devices, but also the basis of cyber-physical systems capable of adapting to the changing conditions of the urban environment. Its application covers a wide range of tasks: from energy and water management to air monitoring and traffic forecasting. However, sustainable development requires not just technical implementation, but an understanding of the social, environmental and institutional context. As the analysis shows, it is these aspects that determine the success or failure of IoT initiatives in different countries and regions.

The methodology of this study is based on an interdisciplinary approach combining conceptual analysis of scientific literature, comparison of international experience and case studies. The main focus is on a comprehensive assessment of the IoT contribution to the implementation of the Sustainable Development Goals (SDGs) formulated by the United Nations, primarily in the context of SDG 11 'Sustainable Cities and Human Settlements'. Both quantitative and qualitative methods are used: document analysis, statistical data on IoT infrastructure, content of digitalisation programmes in countries with different levels of economic development, including developing and post-conflict regions. As an empirical base, the materials of reports of the International Telecommunication Union, the UN Development Programme, as well as national digitalisation strategies were used.

It is important to note that IoT is not a neutral technology. It carries a certain model of governance and social interaction, forming new forms of responsibility, privacy and resource allocation. Its importance in sustainable development is determined not only by its technical architecture, but also by who controls the data, how it is used, and how it influences decisions. In the context of global inequalities, digitalisation can both help overcome barriers and reinforce existing gaps.

IoT initiatives are increasingly becoming part of national sustainable development programmes. For example, the Netherlands is implementing a smart energy model using sensors in residential areas to adapt energy distribution based on consumption. In South Korea, cities like Songdo are becoming sites for IoT implementation in water supply, waste management and healthcare. These projects confirm that IoT has the potential to be a tool for systemic transformation of the urban environment, but effectiveness depends on political will, data transparency and civil society participation.

Theoretical Foundations of IoT and its Importance in Sustainable Development

The Internet of Things (IoT) is a technological paradigm in which physical objects equipped with sensors, actuators and communication devices are able to interact with each other and with the external environment, forming cyberphysical systems. Conceptually, IoT goes back to the works related to M2M (machine-to-machine) computing networks, cyber-physical systems and the theory of distributed computing. The systemic nature of IoT allows its principles to be applied to urbanism, energy, transport, water supply and other sectors key to sustainable development.

One of the fundamental theoretical foundations of IoT is the actor-network theory (ANT) developed by Bruno Latour and Michel Callon. According to ANT, all participants in an interaction - both humans and inanimate objects - possess agency within network configurations. This view proves particularly useful when analysing the interrelationships between devices in IoT environments, where “things” take part in the collection, transmission and interpretation of data, influencing decision making².

Equally significant is the socio-technical systems theory, which views IoT adoption as the result of a complex interaction between technology, human practices and institutional norms. In the context of sustainable development, this allows us to consider not only the technical feasibility of IoT solutions, but also their alignment with social priorities such as inclusiveness, security and energy efficiency³.

The IoT system architecture typically includes several layers: the perception layer (sensors), the network layer (data transmission), the processing layer (cloud and edge computing), and the application layer (analytics and automation)⁴.

This hierarchy enables real-time approaches to sustainable resource management - for example, in water supply, where sensors detect leaks, transmit information, and control algorithms shut off the flow without human intervention.

One of the IoT's most valuable contributions to sustainability is its ability to monitor and optimise energy consumption. In smart buildings, IoT systems regulate lighting and heating, reducing greenhouse gas emissions⁵. At the city level, IoT is being used to manage street lighting, traffic and waste collection systems, enabling more efficient use of resources and reducing operational costs.

² Mahmoud A. M. Albreem, “Green Internet of Things (IoT): An Overview,” 2017 IEEE 4th International Conference on Smart Instrumentation, Measurement and Applications (ICSIMA 2017) Putrajaya, 28 – 30 November 2017, <https://ieeexplore.ieee.org/document/8312021>, Accessed May 24, 2025.

³ Atzori, Luigi, Antonio Iera, and Giacomo Morabito, “The Internet of Things: A Survey,” in *Computer Networks*, Vol. 54, Issue 15, 2010, Pages 2787–2805.

⁴ Bibri, Seyed M., *Smart Sustainable Cities of the Future*, Cham: Springer, 2018 <https://www.planninginsights.co.in/data/ebook/1625564553.pdf>, Accessed May 24, 2025.

⁵ Cao, Yue, Jin Li, and Mengchu Zhou, “Socially Aware Internet of Things: Framework, Architecture and Modeling,” in *IEEE Access*, Vol. 5, 2017, Pages 28159–28171.

The Green IoT principle raises questions about the energy efficiency of IoT devices themselves. For example, the implementation of energy-efficient data transfer protocols, the use of energy-efficient microcontrollers and the use of energy harvesting technology can minimise the environmental footprint of IoT systems⁶. This is particularly important for large-scale deployment of devices in urban infrastructure, where their total energy consumption can be significant.

IoT also contributes to democratising access to information and citizen participation in sustainable development. Sensor networks can be used to monitor air quality or noise, data on which becomes open to the public, stimulating collective action and decision-making at the local level⁷. This is in line with the principles of sustainable management and transparency enshrined in the UN 2030 Agenda.

Integrating IoT into sustainable urban planning requires taking into account not only technological and economic factors, but also regulatory and ethical aspects. Issues of cybersecurity, data privacy, and digital inequality all require the development of appropriate regulatory strategies. This requires close interdisciplinary coordination: engineers, urbanists, ecologists, lawyers and sociologists are involved to ensure that technical solutions are in line with sustainable development values.

Thus, the theoretical underpinnings of IoT cover a wide range of approaches - from cyber-physical systems to social theories - and form the basis for a systemic understanding of its contribution to sustainable development. The synthesis of technical innovations and socio-cultural mechanisms allows IoT to be used not only as a tool for automation, but also as a building block for a sustainable future.

IoT in Urban Development: Global Experience

The Internet of Things (IoT) has become a key tool in transforming cities around the world, contributing to sustainable development and improving the quality of life of citizens. Let's look at examples of successful IoT deployments in different cities, demonstrating the diversity of approaches and solutions.

Singapore is one of the leaders in applying IoT to manage urban systems. As part of the Smart Nation initiative, the city uses a network of sensors to monitor traffic, air quality and noise levels. For example, the One Monitoring system tracks the location of public transport and passenger numbers, optimising routes and schedules. In addition, smart rubbish bins with fill level sensors allow efficient waste collection planning, reducing costs and environmental burden⁸.

⁶ Gubbi, Jayavardhana et al., "Internet of Things (IoT): A Vision, Architectural Elements, and Future Directions," in *Future Generation Computer Systems*, Vol. 29, Issue 7, 2013, Pages 1645–1660.

⁷ Latour, Bruno, *Reassembling the Social: An Introduction to Actor-Network-Theory*, Oxford: Oxford University Press, 2005.

⁸ Chang, Victor, and Sajal Das, "Smart Water Management in Singapore," in *Journal of Urban Technology*, Vol. 27, Issue 3, 2020, Pages 45–62.

Copenhagen has implemented IoT solutions to manage bicycle traffic and energy supply. Sensors track cyclists' movements in real time to improve infrastructure and safety. Energy company HOFOR uses IoT to manage its cooling and heating system, including the use of seawater and heat pumps, helping to reduce CO₂ emissions and improve energy efficiency⁹.

Seoul is actively applying IoT in the management of city services. Since 2017, the city has been operating the Mayor's Digital Office, which integrates data from 290 sources for decision-making. Citizens have access to real-time information on air quality, transport and other aspects of city life through touchscreens installed in the metro.

Barcelona has implemented IoT to optimise its transport system and manage parking. Sensors on roads and public transport collect traffic data, allowing traffic lights to be adjusted and informing drivers of traffic jams. Smart parking systems guide drivers to available spaces, reducing search time and air pollution.

Amsterdam is implementing projects as part of the Amsterdam Smart City platform, which brings together citizens, businesses and authorities. The city uses IoT to monitor air quality, manage energy consumption and water supply. The Amsterdam Rainproof programme engages residents in rainwater management, reducing the risk of flooding.

Fujisawa in Japan is a smart city built on the site of a former Panasonic factory. Houses are equipped with solar panels and generators connected to a single grid, allowing energy to be shared between households. A waste management system uses sensors to automatically sort rubbish, increasing recycling efficiency and reducing environmental impact¹⁰.

Songdo in South Korea is applying IoT to an underground waste collection system. Sensors monitor the filling level of waste chutes, allowing automatic scheduling of waste collection and sorting. This reduces the number of rubbish trucks on the streets, reducing emissions and improving the aesthetics of the urban environment.

Malmö, a neighbourhood of Hüllier in Sweden, has become a model of sustainable urban development. In cooperation with the energy company E.ON and the water supply organisation VA SYD, the district uses only renewable and recycled energy. The ectogrid and ectocloud technologies manage heat flows, redistributing excess energy to where it is needed, increasing efficiency and reducing emissions.

San Diego in the US has introduced smart streetlights that adjust brightness based on the presence of pedestrians and traffic. This has reduced energy consumption by 60 per cent, reduced greenhouse gas emissions and improved street safety.

New York City is using IoT to manage water supply and residential maintenance. Automated water meters transmit real-time data, allowing residents to track consumption and identify leaks in a timely manner. The MyNYCHA app gives residents the ability to manage services online, improving efficiency and user satisfaction.

⁹ Bundgaard, Hans, and Susana Borrás, "Copenhagen: Smart City Initiatives," in *PeerJ Computer Science*, Vol. 7, 2021, Pages 1–15.

¹⁰ Gornik, Matej, "Fujisawa Smart City: A Model for Sustainable Urban Living," in *Environmental Innovation and Societal Transitions*, Vol. 36, 2020, Pages 1–10.

One example of large-scale application of IoT in transition economies is the Smart City BH project in Brazil. The city of Belo Horizonte has launched pilot programmes to integrate IoT sensors into lighting, water supply and pollution monitoring systems. For example, the Savassi neighbourhood has installed smart streetlights that automatically adjust brightness depending on the illumination and time of day, reducing energy consumption by 52%. In addition, an online monitoring system for water quality in the Ribeirao Arruda and Onasis rivers has helped reduce the number of accidental discharges of wastewater¹¹.

In India, the city of Bhubaneswar, a member of the 100 Smart Cities initiative, has pioneered the use of IoT to increase transparency in city management. The Bhubaneswar Me mobile app was introduced, allowing residents to report problems, monitor bus routes and receive real-time emergency alerts. As a result, the number of complaints processed within a day has increased by 34 per cent year-on-year¹².

In China, the city of Hangzhou has become famous thanks to the City Brain project developed in cooperation with Alibaba Cloud. This system aggregates data from cameras, sensors and GPS devices in real time, optimising the management of traffic and emergency services. Thanks to artificial intelligence algorithms and IoT infrastructure, the arrival time of ambulances has been reduced by an average of 7 minutes. The city also applies IoT to control industrial emissions and electricity consumption, which helped reduce annual average air pollution levels by 12 per cent¹³.

Toronto, Canada's Quayside project, initiated by Sidewalk Labs, attempted to create a city of the future with deep IoT integration, including motion sensors, climate control and automatic regulation of street infrastructure. However, the project faced criticism over data privacy and was frozen in 2020¹⁴. However, the Quayside experience has emphasised the need to develop a clear regulatory framework for digital urbanism, including policies on privacy and data ownership.

In Africa, the Rwanda Smart Kigali project aims to integrate IoT solutions to improve quality of life. In Kigali, projects have been implemented to manage public transport using GPS tracking and passenger flow analytics. A pilot is also underway for smart lighting and monitoring of water consumption in the residential sector. Reduction of water losses in the water network reached 19% in two years¹⁵. This is especially important for cities with limited natural resources.

Abu Dhabi in the UAE is striving to become a benchmark for a smart desert city. The TAMM Smart Services initiative uses IoT platforms to coordinate municipal and private

¹¹ Gomes, Tiago & Ferreira, Larissa. "IoT-based Water Monitoring in Belo Horizonte," *Urban Technology in the Global South*, vol. 4, 2022.

¹² Mehta, Rajiv. "Digital Governance in Indian Cities: Case of Bhubaneswar." *Smart Urban Studies Journal*, vol. 5, 2023.

¹³ Wang, Zhi & Liu, Jun. "IoT-Based Urban Air Quality Management in China: The Hangzhou Model." *Journal of Environmental Informatics*, vol. 40, no. 1, 2024.

¹⁴ Sidewalk Labs. "Quayside Toronto Project Archive," <https://www.sidewalklabs.com/quayside>, accessed May 24, 2025.

¹⁵ Rwanda Utilities Regulatory Authority. "Smart Kigali Initiative Report 2022–2024," <https://rura.rw>, accessed May 24, 2025.

services, from smart lighting to predictive infrastructure maintenance. The installation of sensors to monitor road conditions has recorded and repaired more than 4,500 roadway damages before complaints from residents¹⁶.

Examples from different regions of the world confirm that the success of IoT implementation in urban development depends not only on technology, but also on factors of institutional maturity, political will and public trust. In developed countries (e.g. the Netherlands, Singapore, Japan) the priority is given to ecology and energy efficiency, while in emerging economies (India, Brazil, Rwanda) the focus is on improving basic services - transport, water supply, lighting.

A clear trend towards personalisation and decentralisation of the urban environment is emerging: IoT allows the behaviour of specific users to be taken into account (as in the case of apps in Bhubaneswar or Quayside), and enables citizens to participate in data management themselves. However, this process requires a stricter regulatory framework that will guarantee the protection of personal data, especially in the context of global digitalisation and growing cyber threats.

IoT in Azerbaijan: Initiatives and Implementation

In recent years, Azerbaijan has demonstrated a steady drive to integrate Internet of Things (IoT) technologies into urban and rural development processes. This aspiration is driven by the need to modernise infrastructure, increase the efficiency of resource management and improve the quality of life of citizens.

One of the key areas of IoT implementation in Azerbaijan is the development of the concept of 'smart cities' and 'smart villages'. In 2021, the President of Azerbaijan signed a decree on the development of smart city and smart village projects to improve the quality, safety and efficiency of services in urban and rural areas through the use of information technology. This was the starting point for the implementation of a number of initiatives aimed at the digital transformation of the country¹⁷.

As part of the Smart City Baku initiative, various IoT-based technologies are being actively introduced. For example, the city has deployed a network of IoT sensors and devices that collect real-time data on various urban parameters such as traffic, air quality, energy consumption and water use. This data is integrated into centralised platforms for analytics, visualisation and decision support. IoT devices are also being utilised for smart city

¹⁶ Smart Abu Dhabi. "Predictive Maintenance with IoT Sensors: Case Study," *TAMM Smart Infrastructure Reports*, 2024.

¹⁷ "Localizing Smart Urban Development in Azerbaijan," *Caucasus Analytical Digest* No. 125, January 2022, <https://www.research-collection.ethz.ch/bitstream/handle/20.500.11850/525828/CAD125.pdf?isAllowed=y&sequence=3>, accessed May 24, 2025.

applications such as smart street lighting, waste management and environmental monitoring¹⁸.

In the energy sector, Azerbaijan is also taking steps to utilise IoT technologies. According to a World Economic Forum report, the country is considering introducing pilot projects to optimise energy consumption in buildings using artificial intelligence and IoT, which could reduce energy consumption by up to 30% and carbon emissions by 25-30%¹⁹.

The development of Smart Villages in Azerbaijan is also receiving attention. The Smart Villages project in the Karabakh region is introducing digital technologies to improve rural infrastructure and services. This includes the use of IoT for monitoring agricultural processes, water management and security.

However, despite significant progress, there are also certain challenges. These include the need to develop regulatory frameworks to protect personal data, ensure cybersecurity and improve digital literacy. In addition, it is important to ensure that digital infrastructure is developed evenly in both urban and rural areas to avoid digital divide.

Thus, Azerbaijan is actively moving towards the integration of IoT into sustainable development processes. Existing initiatives and projects demonstrate the country's potential in this area, but further work on removing existing barriers and challenges is needed to achieve full realisation.

Of particular note is the pilot smart village project in the village of Agali in the Zangilan district, the first such project in the post-war Karabakh region. Agali has become a symbol of a new model of sustainable and digital rural development, especially in the context of post-conflict reconstruction.

The idea of reconstructing Agali as a "smart village" was introduced in 2021, shortly after the territory was returned to Azerbaijani control. The project, implemented with the support of the State Agency for Rehabilitation and Reconstruction of Territories, envisages the use of IoT and smart technologies in all spheres of village life - from the construction of buildings to the management of communal and agricultural resources²⁰.

Agali's infrastructure was completely redesigned with the Smart Village concept of integrating digital solutions into rural management, education, health and agriculture. Energy-efficient houses with solar panels, digital water supply systems, centralised street lighting control and automated environmental data collection systems¹ were envisaged in the planning phase. These elements are closely integrated with IoT devices to monitor and control the day-to-day life of the village.

¹⁸ "A Case Study of Smart City Development in Azerbaijan," EasyChair Preprint, June 2024, <https://easychair.org/publications/preprint/tX5D>, accessed May 24, 2025.

¹⁹ "How Azerbaijan is leveraging AI for sustainable energy transformation," World Economic Forum, January 2025, <https://www.weforum.org/stories/2025/01/azerbaijan-leveraging-ai-for-sustainable-energy-transformation/>, accessed May 24, 2025.

²⁰ "Zəngilanın Ağalı kəndində «Ağıllı kənd» layihəsi çərçivəsində ilk pilot layihə başa çatıb", Azərbaycan Respublikasının Rəqəmsal İnkişaf və Nəqliyyat Nazirliyi, 2022, <https://mincom.gov.az/az/view/news/1187/>, accessed May 24, 2025.

A key area of focus has been the digitalisation of agriculture. Farms around Agali are deploying sensors to monitor soil moisture, temperature and crop health. This data is processed in cloud-based systems and used to make operational decisions, including automatic irrigation and yield forecasting. In this way, IoT provides the basis for building a sustainable agricultural production model that increases productivity while minimising environmental impact.

An important element of Agali's digital transformation has been the creation of digital services for residents. Thanks to the development of fibre optic infrastructure, high-speed internet access is provided, enabling the use of e-government services, telemedicine, distance learning and video surveillance to improve security. All homes are equipped with smart meters for water, gas and electricity, and data is transmitted in real time to the management centre, allowing for prompt response to faults and minimising resource losses²¹.

The success of the Agali project was a precedent that showed the real-world applicability of IoT in rural reconstruction contexts. Moreover, it demonstrated how technology can be integrated into the social fabric of society, creating conditions not only to improve efficiency, but also to bring life back to post-conflict regions. It is important to note that the implementation of such projects requires a sustainable regulatory framework that protects the interests of residents in the digital space - including cybersecurity, personal data and equal access to digital services²².

Thus, the Agali experience serves as a model for scaling up the smart village concept to other liberated territories such as Jabrail, Qubadli and Lachin. Azerbaijan's Ministry of Digital Development and Transport has already announced plans to adapt the IoT solutions tested in Agali to other settlements in Karabakh, taking into account their natural, economic and demographic characteristics²³.

Agali's project also illustrates an important feature of sustainable digital development: the need for an integrated approach that combines technological infrastructure, institutional support and community participation. Without the involvement of residents themselves, their digital literacy and trust in technology, such initiatives risk remaining decorative. That is why in Agali, in parallel with the technological implementation, educational programmes aimed at teaching basic digital skills and working with smart services were implemented²⁴.

²¹ "Ağalı kəndi — ilk «ağıllı kənd»: texnoloji və sosial aspektlər," BBC Azərbaycanca, 2023, <https://www.bbc.com/azeri/azerbaijan-65125621>, accessed May 24, 2025.

²² Musayev, Kamal, "Challenges of Legal Regulation of Smart Infrastructure in Rural Azerbaijan," in *Baku Law Journal*, Vol. 12, Issue 2, 2024, pp. 89–103.

²³ "Ağıllı kənd və şəhər layihələri genişlənir", Dövlət Şəhərsalma və Arxitektura Komitəsi, 2024, <https://www.arxkom.gov.az/az/news/aqilli-kend-sheher-layiheleri-genishlenir>, accessed May 24, 2025.

²⁴ "Ağalı kəndində rəqəmsal savadlılıq təlimləri keçirilir", Azərbaycan Respublikasının Təhsil İnstitutu, 2023, <https://www.iat.az/news/355>, accessed May 24, 2025.

Conclusions

When considering the role of the Internet of Things in sustainable urban development, it is impossible not to recognise its transformational potential. The introduction of IoT into urban systems contributes not only to increasing the efficiency of resource management, but also to creating conditions for adaptive planning, improving the quality of life and reducing the ecological footprint. The integration of sensor networks, big data analytics and automated systems into the infrastructure of cities enables the formation of new models of interaction between citizens, government and the private sector, where decisions are based on reliable data and processes become more transparent and predictable.

The most obvious benefits of IoT are its ability to optimise traffic flows, minimise energy and water consumption, provide early warning of environmental threats and improve public safety. At the same time, with limited natural and financial resources, especially in fast-growing urbanised regions, IoT offers unique opportunities for effective local governance. Successful international cases - from smart neighbourhoods in Amsterdam to digital villages in Azerbaijan - demonstrate that IoT can catalyse sustainable transformation even in post-conflict reconstruction or economic constraints.

However, the vulnerabilities associated with over-technologisation cannot be ignored. A central risk remains the concentration of power over data, especially in private entities, which could lead to monopolisation of digital infrastructure and reduced digital justice. New threats are also emerging: cybersecurity, privacy breaches, social inequalities in access to technology, and dependence on external suppliers and unstable digital platforms. In addition, the complexity of IoT systems can create barriers to their large-scale adoption in cities with limited institutional or human resource capacity.

With the above in mind, several recommendations can be offered to help maximise the impact of IoT while minimising risks. Firstly, institutional readiness is required: a clear regulatory framework governing data access, user rights and device compatibility standards. Second, open platforms and cross-sector partnerships should be encouraged, where civil society plays an active rather than passive role in shaping the digital environment. Third, the sustainability of IoT solutions should be assessed not only in terms of technological efficiency, but also in terms of social inclusion, long-term adaptability and environmental criteria. Finally, it is critical to invest in digital education, ensuring equal access to the knowledge and skills needed to participate in the management of smart cities.

The Internet of Things is no longer just a technological concept - it is the basis for new models of urban existence. Its future depends on humanity's ability to balance technological possibilities with ethical, legal and social principles of sustainable development.

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THE EU GREEN DEAL IN AN ERA OF GEOPOLITICAL REALISM: BALANCING SUSTAINABILITY, ENERGY SECURITY, AND STRATEGIC AUTONOMY

Orkhan NABIYEV¹

Abstract: Unveiled in 2019, the European Green Deal (EGD) was introduced as a blueprint to achieve climate neutrality in the European Union by 2050, championing a model of economic prosperity decoupled from environmental degradation. Initially conceived as a technocratic and ecological project, recent geopolitical disruptions—particularly Russia’s full-scale invasion of Ukraine and the resurgence of strategic nationalism—have forced a recalibration. This article critically examines how the Green Deal has evolved into a multifaceted instrument of geopolitical leverage, strategic autonomy, and soft power projection. Focusing on the Azerbaijan–Black Sea–Europe Green Energy Corridor, the paper illustrates how climate infrastructure is increasingly intertwined with regional diplomacy, identity reconstruction, and post-conflict legitimacy. This corridor, while addressing technical energy diversification, also serves broader strategic functions by embedding the EU’s normative agenda and counterbalancing competing global powers such as Russia, China, and Turkey. The analysis draws on official EU and national documents, elite discourse, and policy frameworks, applying strategic framing theory to unpack how climate action is being reshaped by realpolitik and institutional adaptation. In parallel, the article explores the EU’s attempt to reconcile its symbolic rhetoric of sustainability and partnership with practical imperatives in a multipolar world. Drawing on insights from the 2024 Draghi Report and Eurobarometer data, it examines the contradictions between strategic ambition and normative consistency. The study concludes that the EGD’s future effectiveness hinges not only on internal reforms but also on its ability to function as a credible, adaptable, and ethically coherent actor. As Europe redefines its geopolitical posture through climate leadership, the Green Deal is no longer merely an environmental roadmap—it has become a strategic doctrine, testing the boundaries between influence, legitimacy, and identity projection.

Keywords: European Green Deal, geopolitics, strategic autonomy, Azerbaijan, energy corridors

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Introduction

The European Green Deal (EGD), presented by the European Commission in December 2019, was initially designed as a visionary policy to guide the European Union towards climate neutrality by mid-century.² It aimed not only to reduce greenhouse gas emissions and promote green industries but also to reorient the EU's economic and social governance around principles of sustainability, justice, and innovation. With instruments such as the European Climate Law, the Just Transition Fund, and the Fit for 55 package, the Deal sought to align Europe's internal transformations with its global commitments under the Paris Agreement³

However, the EGD emerged in a world that has since grown considerably more volatile. The COVID-19 pandemic prompted shifts in public finance and energy priorities. But it was Russia's 2022 invasion of Ukraine that marked a decisive turning point. The subsequent energy shock forced the EU to procure fossil fuels under emergency conditions, reactivate coal infrastructure, and accelerate alternative energy sourcing—all while maintaining its climate commitments.⁴ In parallel, the rise of strategic rivalry among major powers, declining trust in multilateral institutions, and the resurgence of populist politics across the continent have added pressure to reframe the Green Deal as a pillar of strategic autonomy.

This article contends that the Green Deal has moved beyond its original ecological parameters and is now functioning as a geopolitical tool for reinforcing Europe's strategic position in a multipolar environment. To unpack this transformation, the study focuses on the Azerbaijan–Black Sea–Europe Green Energy Corridor—a project emblematic of the EU's new climate diplomacy.⁵ By linking the Caspian Basin with southeastern and central Europe through green energy infrastructure, the corridor is not only a diversification mechanism but also a conduit for EU normative influence, regional stabilization, and post-conflict diplomacy.

The analysis proceeds through five chapters. Chapter 1 contextualizes the strategic evolution of the Green Deal in light of internal and external pressures. Chapter 2 applies strategic framing theory to show how infrastructure corridors serve ideological as well as logistical functions. Chapter 3 examines the tensions between strategic autonomy and new forms of dependency. Chapter 4 investigates the role of climate conditionality in the EU's external engagements, and Chapter 5 explores the Green Deal's symbolic and narrative dimensions as a form of soft power. The article concludes by reflecting on the prospects and pitfalls of this dual transformation—climatic and geopolitical—and outlines the normative tests the EU must navigate if it is to remain credible as both a climate leader and a global actor.

² European Commission, *The European Green Deal*, Brussels: European Commission, 2019, COM(2019) 640 final.

³ European Commission, *NextGenerationEU Implementation Dashboard*, 2024, https://ec.europa.eu/info/strategy/recovery-plan-europe_en

⁴ Eurostat, *EU Energy Mix and Russian Import Dependency Statistics*, 2024, <https://ec.europa.eu/eurostat>, Accessed May 29, 2025.

⁵ World Bank, *Azerbaijan–Black Sea–Europe Green Energy Corridor Project Overview*, Washington, D.C.: World Bank, 2023, <https://documents1.worldbank.org/curated/en/099022924172036605/pdf/P179950183684c06183a11cee22ffdc476.pdf>

Chapter 1: Strategic Autonomy, Populist Pressures, and Institutional Bottlenecks

The European Green Deal (EGD) was initially conceived as a technocratic framework to steer the EU towards climate neutrality by 2050. Rooted in the principle of decoupling economic growth from environmental degradation, it incorporated ambitious regulatory packages like the Fit for 55, the European Climate Law, and the Just Transition Mechanism. These were backed by financial instruments such as NextGenerationEU and aligned with global pacts including the Paris Agreement. The EGD represented a shift in Europe's self-perception—from being a regulatory superpower to becoming a climate leader of normative influence.⁶

However, successive crises have altered the geopolitical context in which the Green Deal operates. The COVID-19 pandemic exposed the fragility of EU-wide coordination, while Russia's full-scale invasion of Ukraine in 2022 shattered assumptions about Europe's energy dependence and strategic vulnerabilities. The result was an abrupt recalibration of the Green Deal from a technocratic plan into a security-driven doctrine. The REPowerEU initiative, launched in response to the war, emphasized rapid energy diversification and increased investment in renewable capacity.⁷ This signaled a move away from purely environmental motivations toward objectives of resilience and strategic autonomy.

The Draghi Report (2024) further reinforced this evolution by arguing that the EU's green transition must also serve its competitive and geopolitical aims.⁸ Draghi underscored that achieving climate goals requires more than internal coherence; it demands strategic alignment across trade, foreign policy, and industrial policy. Climate policy, once cordoned off as a domestic matter, is now situated firmly within the realm of grand strategy.

This transformation has also revealed the political and institutional bottlenecks undermining the Deal's implementation. Internally, the rise of populist parties—some overtly climate-sceptic—has challenged consensus on environmental regulation. Member states have diverged in their commitments, with Central and Eastern Europe often prioritizing energy affordability and security over emissions reductions.⁹ Disparities in infrastructure and administrative capacity have further complicated implementation. The European Court of Auditors has warned that delays in flagship projects risk undermining both credibility and delivery.¹⁰

⁶ Börzel, Tanja A., and Thomas Risse. "Normative Power Europe: The EU and Its Global Identity," in *The Oxford Handbook of Comparative Regionalism*, eds. Tanja A. Börzel and Thomas Risse, Oxford: Oxford University Press, 2021, 457–475.

⁷ European Commission, *NextGenerationEU Implementation Dashboard*, 2024, https://ec.europa.eu/info/strategy/recovery-plan-europe_en

⁸ Draghi, Mario. *Empowering Europe's Future: Choices for Competitiveness*, Luxembourg: European Commission, 2024, https://commission.europa.eu/publications/draghi-report-competitiveness_en,

⁹ Freedom House. *Azerbaijan: Nation in Transit Report*, Washington, D.C.: Freedom House, 2023.

¹⁰ European Court of Auditors. *Special Report: Implementation Bottlenecks in Green Deal Flagship Projects*, Luxembourg: ECA, 2025.

Externally, the EU has reoriented its climate diplomacy toward “green geopolitics.” Initiatives like the Global Gateway seek to embed Green Deal norms into partnerships across Africa, the Balkans, and the Caucasus. Here, environmental diplomacy becomes inseparable from power projection, often invoking a language of sustainability to advance broader strategic objectives⁶. Scholars like Börzel and Risse have noted how normative power Europe is increasingly expressed through sectoral policies like climate, allowing Brussels to extend influence without traditional coercion.¹¹

Nevertheless, this blending of normative ambition and geopolitical calculation introduces deep contradictions. While aiming for autonomy, the EU continues to depend on external suppliers for critical materials and technologies needed for the green transition. Its efforts to balance sovereignty, cohesion, and climate leadership remain fragile, particularly as global instability intensifies.

Chapter 2: Strategic Framing and Infrastructure Diplomacy in Eurasia

As the European Green Deal’s ambitions expanded beyond internal regulatory objectives, it began to rely heavily on **strategic framing**—a deliberate process of constructing narratives that resonate with geopolitical objectives. In this context, infrastructure projects like the Azerbaijan–Black Sea–Europe Green Energy Corridor are framed not merely as technical endeavors for decarbonization, but as instruments of diplomacy, legitimacy, and identity reconstruction.

Strategic framing operates on multiple levels: it shapes public perception, builds policy consensus, and helps align diverse political actors around a common vision. In the case of the Green Energy Corridor, the European Commission positioned the project as a cornerstone of the REPowerEU strategy, designed to reduce dependency on Russian energy by fostering clean electricity interconnections with Eastern partners. The Memorandum of Understanding signed in December 2022 between Azerbaijan, Georgia, Romania, and Hungary reflects this convergence of energy policy and foreign affairs. The corridor is intended to export renewable electricity from the Caspian Sea region to Europe via a subsea cable crossing the Black Sea, establishing Azerbaijan as a key partner in the EU’s green diversification strategy.¹²

From Brussels’ perspective, the project serves as a demonstrative success of the **Global Gateway** initiative—offering an alternative to China’s Belt and Road Initiative by emphasizing transparency, sustainability, and reciprocal partnerships.¹³ The corridor enables the EU to project a soft power narrative that aligns infrastructure development with values such as

¹¹ European Commission, *The Global Gateway: Connecting Europe to the World*, Brussels: European Commission, 2022.

¹² Ministry of Energy of Azerbaijan, *Renewable Energy Targets and International Partnerships Report*, Baku: Ministry of Energy, 2024.

¹³ European Commission, *The Global Gateway: Connecting Europe to the World*, Brussels: European Commission, 2022.

climate justice, regional stability, and inclusive growth.¹⁴ Simultaneously, Azerbaijan frames the corridor as a geopolitical pivot, signalling its transition from a petro-state to a renewables hub while strengthening ties with Euro-Atlantic institutions—an image particularly important as the country prepares to host COP29.

Yet, these symbolic narratives often obscure underlying political contradictions. While the EU champions civil society participation and democratic accountability in its external actions, Azerbaijan remains a hybrid regime with restricted media freedom, weak checks and balances, and limited pluralism.¹⁵ This gap between rhetoric and reality raises difficult questions about the Green Deal's normative consistency and the risks of selectively applying conditionality in pursuit of strategic goals.

At the operational level, the corridor illustrates how **infrastructure diplomacy** blends physical connectivity with political signalling. Such diplomacy works by attaching meaning to infrastructure—turning it into a symbol of alliance, trust, and co-development.¹⁶ In this case, the corridor becomes more than an energy pipeline; it is a platform where narratives of resilience, partnership, and post-conflict reconciliation are negotiated.

Importantly, strategic framing serves as a tool to **manage contradictions**. The EU's climate rhetoric frequently emphasizes solidarity, inclusivity, and ethical leadership, but when it partners with authoritarian-leaning states, it must repackage these values to maintain coherence. By presenting green partnerships as “technical” or “pragmatic,” the EU avoids direct engagement with domestic political issues in partner countries—thus insulating the climate agenda from the risks of value-based diplomacy.¹⁷

In sum, the Azerbaijan–Black Sea–Europe Green Energy Corridor embodies the evolution of the European Green Deal from a domestic decarbonization plan into a **diplomatic instrument** that shapes regional order. Through strategic framing, it becomes possible to pursue climate goals while navigating a fragmented geopolitical landscape. However, the sustainability of this strategy depends on the EU's ability to balance its normative aspirations with the complexities of power, legitimacy, and partnership in Eurasia.

Chapter 3: Between Autonomy and Dependency: The EU's Strategic Dilemma

As the European Green Deal (EGD) becomes increasingly embedded in foreign policy, the European Union finds itself navigating a strategic paradox: how to pursue autonomy without falling into new forms of dependency. While the original Green Deal was focused on

¹⁴ European Commission, Directorate-General for International Partnerships, *Green Partnerships under NDICI–Global Europe*, Brussels: European Commission, 2024.

¹⁵ Freedom House, *Azerbaijan: Nation in Transit Report*, Washington, D.C.: Freedom House, 2023.

¹⁶ Börzel, Tanja A. and Thomas Risse, “Normative Power Europe: The EU and Its Global Identity,” in *The Oxford Handbook of Comparative Regionalism*, Oxford: Oxford University Press, 2021, 457–475.

¹⁷ Lavenex, Sandra, “Exporting the EU's Normative Power through Climate Conditionality,” in *Journal of Common Market Studies*, Vol. 57, No. 5, 2019, 1120–1136.

environmental transformation, the geopolitical realities of the post-2022 landscape have placed energy security and supply chain resilience at the heart of the EU's strategic agenda.

Russia's full-scale invasion of Ukraine catalysed a rethinking of European energy systems. The subsequent scramble for alternatives underscored Europe's long-standing overreliance on Russian fossil fuels and highlighted new vulnerabilities—especially in relation to critical raw materials (CRMs), digital technologies, and green manufacturing components.¹⁸ In response, the EU launched several legislative measures, notably the **Critical Raw Materials Act** and the **Net-Zero Industry Act**, aimed at localising production, diversifying supply chains, and ensuring strategic reserves.⁸ Yet these efforts are often undermined by the very market logic the EU is embedded in: high permitting costs, slow project approvals, and internal disagreements between member states complicate implementation.

Strategic autonomy, long a conceptual mainstay of EU foreign and security policy, is now being redefined to include control over green technology, data infrastructure, and energy flows. However, autonomy does not imply self-sufficiency. In fact, to realise its green ambitions, the EU must deepen cooperation with non-EU countries, particularly in regions like the South Caucasus, North Africa, and Sub-Saharan Africa—areas that are geopolitically volatile and often governed by authoritarian regimes.

This dependency is clearly visible in the Azerbaijan–Black Sea–Europe corridor. While the EU presents this initiative as a showcase of green partnership, it also reflects a pragmatic reliance on Azerbaijan's geographic positioning and energy-exporting capabilities. The tension is palpable: Azerbaijan, while instrumental in energy diversification, continues to draw criticism for democratic backsliding and human rights abuses.¹⁹ The EU, in turn, maintains a calibrated silence—justified as “strategic engagement” under the Global Gateway banner.

This compromise risks eroding the EU's credibility as a normative power. Critics argue that the Green Deal's externalisation—through trade agreements, infrastructure investments, and energy diplomacy—frequently prioritises stability and access over values.⁹ For example, partnerships in Central Asia and the Sahel have allowed entrenched elites to consolidate power using EU funding and legitimacy, without substantial reforms in governance or environmental transparency.²⁰ This dynamic mirrors older neo-colonial patterns, albeit repackaged in green language.

The **Draghi Report** (2024) flagged these contradictions, warning that Europe's green competitiveness hinges on avoiding “dependence swaps”—substituting one form of geopolitical reliance with another.²¹ The report calls for a pan-European industrial policy, strategic coordination among member states, and a bolder role for the EU in shaping global

¹⁸ Eurostat, *EU Energy Mix and Russian Import Dependency Statistics*, 2024. <https://ec.europa.eu/eurostat>

¹⁹ European Commission, *Empowering Europe's Future: Choices for Competitiveness*, by Mario Draghi, Luxembourg: European Commission, 2024.

²⁰ European Council on Foreign Relations, *Sanctions Tracker and Compliance Review*, Brussels: ECFR, 2023.

²¹ Draghi, Mario, *Empowering Europe's Future: Choices for Competitiveness*, Luxembourg: European Commission, 2024.

standards, particularly in green technology and digital regulation. However, institutional inertia and fragmentation remain major obstacles.

Public opinion also reflects these uncertainties. While Eurobarometer data show consistent support for environmental action, citizens are increasingly skeptical about the EU's ability to reconcile global leadership with domestic resilience—especially amid inflationary pressures and supply shocks.²² This scepticism risks fuelling climate populism and weakening the social contract underpinning the Green Deal.

In this context, strategic autonomy emerges not as a state of being but as a **balancing act**—a continuous negotiation between interdependence and control. For the EU, this means making hard choices: whether to uphold normative standards when engaging with autocracies; whether to prioritise resilience over open markets; and whether to integrate geopolitical risk assessment into climate planning.

The European Green Deal, while a visionary project, cannot succeed on environmental or strategic grounds alone. It must also reflect institutional coherence, ethical consistency, and a long-term commitment to building partnerships that are not only green, but also just and reciprocal.

Chapter 4: Climate Conditionality and Normative Power

One of the most ambitious dimensions of the European Green Deal (EGD) lies in its aspiration to export European norms and environmental standards beyond the EU's borders. This ambition draws directly from the EU's self-perception as a “normative power” — an actor that seeks to shape the global order not through coercion or economic might alone, but through the dissemination of values, rules, and governance models.²³ The logic is clear: by embedding environmental criteria into trade, aid, and diplomacy, the EU can project both soft power and regulatory influence. Yet the effectiveness and coherence of this approach remain contested.

Climate conditionality — the practice of attaching environmental requirements to partnerships and agreements — has become central to EU external policy under the Green Deal. This strategy has been most evident in recent trade negotiations, where the EU has pushed for the inclusion of sustainability chapters, emissions targets, and deforestation clauses in bilateral and multilateral agreements.² The 2023 revision of the EU–Mercosur Agreement and the conditional climate provisions in the EU–Vietnam FTA illustrate how climate goals are now routinely framed as prerequisites for market access and financial cooperation.²⁴

In theory, such conditionality aligns environmental diplomacy with developmental goals. In practice, it often encounters political resistance, especially from states in the Global

²² Schuette, Leonard, *The EU's Grand Strategy and Its Shortcomings in the Global South*, Berlin: DGAP, 2023.

²³ Draghi, Mario, *Empowering Europe's Future: Choices for Competitiveness*, Luxembourg: European Commission, 2024.

²⁴ European Commission, *NextGenerationEU Implementation Dashboard*, 2024, [https://ec.europa.eu/info/strategy/recovery-plan-europe_en]

South who view these mechanisms as veiled protectionism or moral posturing.²⁵ Many argue that the EU's approach is top-down, privileging European environmental timelines and standards without sufficient regard for local contexts, capacities, or development trajectories.²⁶ This critique is not new, but it has gained traction in the wake of COVID-19 and the food-energy crises caused by the war in Ukraine, which have made developing countries even more wary of conditional partnerships.

Azerbaijan serves as a revealing case. As the country positions itself as a renewable energy partner for Europe, it simultaneously resists external interference in its domestic governance. While Baku has signed MOUs and aligned with EU carbon goals on paper, its domestic energy transition remains slow, opaque, and heavily reliant on elite-driven agendas.⁶ Climate conditionality, in this context, is applied selectively: European institutions are cautious not to push too hard, lest they jeopardise access to strategic corridors or alienate a partner with growing geopolitical relevance.⁷ This reveals a pattern of "strategic ambiguity," where the EU upholds normative language but tempers enforcement based on realpolitik considerations.²⁷

Moreover, the institutional architecture underpinning climate conditionality is still underdeveloped. The European Commission's Directorate-General for International Partnerships (DG INTPA) and the External Action Service (EEAS) operate under different mandates and often lack synchronised strategies. This fragmentation dilutes the EU's ability to project a consistent green agenda. According to a 2025 report by the European Court of Auditors, many Green Deal external projects suffer from poor coordination, insufficient impact evaluation, and weak civil society inclusion.²⁸

Another issue is credibility. If the EU expects partners to follow its lead on green standards, it must demonstrate unwavering commitment at home. Yet several recent backtracks — including German subsidies for gas infrastructure, France's push for nuclear exemptions, and the temporary suspension of biodiversity laws under political pressure — have raised questions about the EU's own normative coherence.²⁹ These inconsistencies undermine the EU's claim to moral authority and open it up to accusations of "green hypocrisy."

Nevertheless, climate conditionality remains a potentially powerful instrument — if reformed. Rather than imposing standards, the EU could move toward **co-created frameworks**, where sustainability goals are negotiated and adapted to local realities.³⁰ This

²⁵ Börzel, Tanja A. and Thomas Risse, "Normative Power Europe: The EU and Its Global Identity," in Tanja A. Börzel and Thomas Risse (eds.), *The Oxford Handbook of Comparative Regionalism*, Oxford: Oxford University Press, 2021, 457–475.

²⁶ Garcia, Maria and Anne Masselot, "Green Trade and Strategic Autonomy: The Politics of Environmental Provisions in EU Trade Agreements," *European Foreign Affairs Review*, Vol. 28, No. 2, 2023, 145–160.

²⁷ Tocci, Nathalie, *Europe's Green Deal: A Mirror of Strategic Ambiguity*, Rome: Istituto Affari Internazionali, 2020.

²⁸ Lavenex, Sandra, "Exporting the EU's Normative Power through Climate Conditionality," *Journal of Common Market Studies*, Vol. 57, No. 5, 2019, 1120–1136.

²⁹ Freedom House, *Azerbaijan: Nation in Transit Report*, Washington, D.C.: Freedom House, 2023.

³⁰ Ministry of Energy of Azerbaijan, *Renewable Energy Targets and International Partnerships Report*, Baku: Ministry of Energy, 2024.

would require investing in capacity-building, decentralising implementation, and empowering regional and local actors. In doing so, the EU could shift from a model of conditionality to one of “climate partnership,” restoring trust and ensuring that its normative power is exercised through mutual accountability.

Ultimately, the chapter reveals that the EU’s external projection of the Green Deal is not just a test of ambition, but of credibility, adaptability, and institutional maturity. Climate conditionality can help transform international partnerships — but only if the EU resolves the tensions between its normative rhetoric and its strategic behaviour.

Chapter 5: The Narrative of Transition — Identity, Soft Power, and Post-Conflict Legitimacy

Beyond policy frameworks and infrastructure investments, the European Green Deal also operates as a narrative vehicle — one that shapes identity, communicates values, and legitimizes political agendas both within and beyond the EU. This narrative power becomes especially significant when applied to post-conflict contexts or politically fragile regions, where infrastructure projects are not only tools for economic transformation but also instruments for reimagining political futures.

The Azerbaijan–Black Sea–Europe Green Energy Corridor exemplifies this dynamic. While its technical goal is to transfer renewable electricity to the European grid, its symbolic function extends far deeper: it allows both the EU and Azerbaijan to reshape how they are seen on the global stage. For Brussels, the project signifies the EU’s ability to foster stable, forward-looking partnerships in its periphery — a critical demonstration of its soft power. For Baku, the corridor serves to reinforce a narrative of modernisation, regional leadership, and diplomatic relevance following years of conflict and authoritarian critique.³¹

This narrative shift is no accident. It is the result of calculated discourse, strategic branding, and institutional signalling. EU communication strategies around the Green Deal deliberately use language that emphasizes resilience, inclusivity, and green modernity — themes that appeal to younger populations, international investors, and reform-minded elites.² Azerbaijan has adopted a parallel strategy. Through high-profile events like COP29 and partnerships with European institutions, it seeks to present itself not as a petrostate clinging to hydrocarbons, but as a dynamic regional actor leading the South Caucasus in renewable energy diplomacy.³²

However, narrative legitimacy is fragile. It depends on a perceived alignment between rhetoric and reality. While Azerbaijan promotes its green transition internationally, domestic

³¹ Freedom House, *Azerbaijan: Nation in Transit Report*, Washington, D.C.: Freedom House, 2023.

³² European Commission, *The Global Gateway: Connecting Europe to the World*, Brussels: European Commission, 2022.

policy remains tightly controlled by a centralised elite, and democratic reforms are limited.³³ This dissonance can erode credibility, particularly if international partners perceive the green narrative as mere window-dressing. For the EU, the challenge lies in balancing strategic engagement with principled oversight — encouraging reforms without undermining diplomatic progress.

The corridor's narrative also intersects with identity politics in the region. In the post-Karabakh War context, Azerbaijan is reconstructing its national identity around notions of territorial restoration, resilience, and technological advancement.³⁴ By participating in large-scale renewable energy projects with European backing, Azerbaijan links its sovereignty and legitimacy to global discourses on climate action and sustainable development. In this sense, green diplomacy becomes an extension of statecraft — a soft power tool for post-conflict nation-building.³⁵

On the EU side, this alignment allows for the projection of a “benign power” image — an actor that promotes peace through connectivity, not coercion. This is particularly important as the EU seeks to differentiate itself from other global powers such as China and Russia, whose infrastructure engagements are often framed as extractive or neo-imperial.³⁶ Through the Green Deal, the EU attempts to signal a different kind of engagement: one based on mutual benefit, long-term stability, and shared values. Yet this aspirational identity must contend with geopolitical realities, including shifting alliances, elite capture, and competing narratives promoted by other actors in the region.³⁷

From a theoretical perspective, this chapter underscores the importance of **constructive narrative framing** in geopolitical strategy. Infrastructure diplomacy is not merely about pipelines, cables, and turbines — it is also about meaning, legitimacy, and identity construction. The Green Deal, therefore, should be evaluated not only in terms of carbon reductions or gigawatts delivered but also in terms of its narrative effectiveness: does it create trust, promote mutual recognition, and foster shared visions of the future?

The answer remains mixed. While the Green Deal has opened a new chapter in EU-Azerbaijan relations and provided a framework for post-conflict legitimacy, its long-term success depends on more than diplomacy and engineering. It requires the cultivation of honest, inclusive narratives — ones that reflect not just geopolitical needs but societal aspirations. Only then can the European Green Deal move from being a technocratic doctrine or geopolitical tool to becoming a genuine agent of transformation in the wider Eurasian space.

³³ Ministry of Energy of Azerbaijan, *Renewable Energy Targets and International Partnerships Report*, Baku: Ministry of Energy, 2024.

³⁴ European Council on Foreign Relations, *Sanctions Tracker and Compliance Review*, Brussels: ECFR, 2023.

³⁵ Tocci, Nathalie, *Europe's Green Deal: A Mirror of Strategic Ambiguity*, Rome: Istituto Affari Internazionali, 2020.

³⁶ Draghi, Mario, *Empowering Europe's Future: Choices for Competitiveness*, Luxembourg: European Commission, 2024.

³⁷ Tagliapietra, Simone, *Trump II and the European Green Deal: Strategic Isolation and Opportunities*, Brussels: Bruegel, 2025.

Conclusions

The European Green Deal was launched with a bold promise: to transform Europe into the first climate-neutral continent by 2050 while ensuring economic growth and social justice. However, what began as an internally focused, technocratic agenda has now evolved into a multidimensional strategic doctrine — one shaped by war, rivalry, and the shifting sands of global power. As this paper has argued, the Green Deal is no longer merely about decarbonization; it has become an instrument for projecting influence, reshaping alliances, and constructing narratives in a multipolar world.

The Azerbaijan–Black Sea–Europe Green Energy Corridor serves as a compelling case study of this transformation. It illustrates how climate infrastructure can act as both a practical energy solution and a geopolitical statement. The corridor reflects Europe's urgency to diversify energy supplies, but also its desire to assert normative leadership. For Azerbaijan, the partnership offers not only economic and technological gains but also symbolic capital: a pathway toward renewed regional status and post-conflict legitimacy.

Yet this evolution is fraught with contradictions. The EU's desire for strategic autonomy often clashes with its dependency on illiberal partners. Its normative ambitions frequently run up against realpolitik compromises. Its narrative of inclusivity and justice is sometimes undermined by the political realities of partner countries. These tensions reveal a fundamental dilemma: Can the EU truly export the Green Deal as a model of sustainability and fairness without compromising its ethical foundation?

To navigate this, the EU must move beyond the binary of values versus interests. A more coherent and adaptable foreign policy framework is required — one that acknowledges the complexities of regional contexts without abandoning core principles. The Draghi Report and Global Gateway offer starting points, but implementation will require institutional agility, democratic scrutiny, and a renewed commitment to strategic humility.

Ultimately, the European Green Deal's fate will be decided not only in Brussels or Berlin, but in Baku, Tbilisi, Nairobi, and beyond. Its success will depend on the EU's ability to speak the language of partnership while listening to the voices of its counterparts. In doing so, the Green Deal may become more than a European vision — it could offer a template for global transformation grounded not in hegemony but in shared purpose.

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ENVIROMENTAL POLICY OF AZERBAIJAN

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Abstract: *Environmental problems have become one of the issues of increasing concern in the modern world. The role of environmental problems and the increase in harmful gases in the atmosphere in the acceleration of global warming, which threatens the living world, is now widely accepted. One of the priorities of state policy of Azerbaijan is protecting ecological balance and the environment. In recent years, the work carried out in this field has become more intensive and large-scale. The presented article examines the main directions of the environmental policy of the Republic of Azerbaijan. Azerbaijan, which pursues an active environmental policy, is taking fundamental steps to minimize or eliminate environmental damage in its country after hosting COP29. Environmental policy of Azerbaijan focuses on sustainable development and balancing economic growth with environmental preservation. It includes commitments to improving environmental protection, conserving natural resources, reducing pollution and addressing climate change.*

Keywords: *Azerbaijan, environment, ecology, policy, sustainable development*

Introduction

The rapid development of all sectors of the economy, especially industry, over the past century has resulted in an increase in the negative impact of human activity on the environment and excessive exploitation of natural resources. Preservation of ecological balance, efficient use of natural resources, protection of water, soil and atmospheric air from pollution have become global problems.

Although each country has its own environmental strategy and policy, the global goals are aimed at ensuring that people live in a healthy environment, protecting and developing the environmental values held by society, and improving the quality of the environment.

Environmental protection is a key element of Azerbaijan's sustainable development, and its importance is determined by both the country's geographic and economic characteristics. Azerbaijan has unique natural resources and a diversity of ecosystems, which places environmental protection at the center of the government's strategic efforts. Azerbaijan,

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where large-scale greening campaigns are being carried out, not only improves its own ecological situation, but also contributes to measures to combat global climate change.

Recognizing the long-term implications of environmental degradation, Azerbaijan has made environmental protection a national priority. Since gaining independence in 1991, the country has taken significant steps to align its environmental policies with international standards. It has ratified key global environmental agreements, including the Paris Agreement on climate change, and has developed a comprehensive legal and institutional framework to support sustainable development.

Evolution of Environmental Policy in Azerbaijan

Historically, when it comes to the ecological situation of Azerbaijan, we should note that, with the exception of the 23-month period of activity of the Azerbaijan Democratic Republic (1918-1920), until the end of the 20th century, the exploitation of the territories and natural resources of this country, especially the oil industry, was mainly in the hands of foreign states and businessmen. Since the early 1920s, the development of Azerbaijan's oil and gas industry has been carried out under the direct leadership of the union structures of the USSR. As a result, the country's territory, especially the city of Baku and the Absheron Peninsula, has faced a number of serious environmental problems.² During Heydar Aliyev's leadership of Azerbaijan from 1969 to 1982, 8 laws and 32 decisions were adopted in the republic regarding environmental protection and the efficient use of natural resources.³ Starting from the end of 1990s, Azerbaijan started to formulate its environmental security policy. Work in this area was soon assessed as one of the main directions of the country's national security, raised to the level of state policy, and urgent measures in the field of ecology began to be implemented. Throughout the period when the National Leader Heydar Aliyev led Azerbaijan, relevant work was regularly carried out in this area and towards solving environmental problems in the republic. In independent Azerbaijan founded by Heydar Aliyev, improving the ecological environment was one of the priority issues in state policy. It should be especially emphasized that Heydar Aliyev implemented consistent measures to solve the environmental problems relevant for our republic based on the principles of sustainable development. In 1995, Azerbaijan joined the United Nations Framework Convention on Climate Change, the Kyoto Protocol on July 18, 2000, and the international convention on long-term trans boundary air pollution in 2002.⁴ In 2001, the Ministry of Ecology and Natural Resources was established by order of National leader Heydar Aliyev. With the implementation of all these and many other measures, an environmental policy based on sustainable development has been formed in

² Həsənov Əli. *Azərbaycanın ekoloji təhlükəsizlik siyasəti*. İki sahil. №85 2014, s.4-5

³ *Heydər Əliyev*. Elektron sənədlər toplusu. Bakı, 2023, №8

⁴ *Second National Communication to the United Nations Framework Convention on Climate Change*. Ministry of Ecology and Natural Resources Republic of Azerbaijan. Baku, 2010, p.7 [<https://unfccc.int/resource/docs/natc/azenc2.pdf>]

Azerbaijan. And today, this environmental policy is being successfully continued by President Ilham Aliyev.

Key Environmental Challenges

Azerbaijan is located at the crossroads of Europe and Asia. It is bordered by the Caspian Sea and neighboring several countries with diverse ecosystems. Azerbaijan, as one of the South Caucasus countries, has unique natural resources, including significant oil and gas reserves, as well as biodiversity characteristic of diverse climatic and geographical zones. 12 % of the country's territory is covered by forest, and 10.3 % is specially protected natural areas. There are 10 National Parks, 10 nature reserves, and 24 nature reserves in Azerbaijan.⁵

Today protecting ecosystems from pollution and degradation is an important part of environmental policy of the country. However, rapid economic growth, increased industrialization, and the impact of global climate change pose serious challenges to maintaining ecological balance.

Azerbaijan faces a number of environmental problems that have a significant impact on the environment and the quality of life of the population. These problems are associated with both the natural characteristics of the country and anthropogenic factors, such as intensive industrialization, agriculture and infrastructure development. Pollution of water basins with waste water, emissions of harmful gases into the atmosphere, reduction of biodiversity, degradation of soil are considered among the existing environmental problems. Also, the expansion of the consumer basket due to the increase in the population in Azerbaijan leads to an increase in the volume of industrial and household waste.

Protection and efficient use of fresh water resources of Azerbaijan is one of the important directions of environmental policy. As is known, a large volume of fresh water resources in the Kura, Araz, Samur and other rivers used by Azerbaijan are formed in neighboring countries - beyond the borders of the republic. The main source of drinking water for the country's population is The Kura river.⁶ The discharge of untreated wastewater into the Kura and Araz rivers by neighboring states negatively affects its hydro chemical regime and water quality. For example, the concentration of copper, zinc, phenol and oil products in the water of the Kura River in some cases exceeds the norm by 10 times. The intensive pollution of water sources in the territories of the states of Armenia and Georgia with existing chemical, radioactive and other harmful substances leads to the pollution of the Kura and Araz rivers. This creates serious and dangerous problems in providing the population of Azerbaijan with drinking water.⁷

⁵ *Ekoloji vəziyyət*. AR Ekologiya və Təbii Sərvətlər Nazirliyi [<https://eco.gov.az/az/ekoloji-siyaset/azerbaycan-respublikasında-ekoloji-veziyyet>]

⁶ *Azərbaycanda ətraf mühit*. Azərbaycan Respublikasının Dövlət Statistika Komitəsi. Statistik Məcmuə. Bakı, 2024, s.72

⁷ Həsənov Əli. *Azərbaycanın ekoloji təhlükəsizlik siyasəti*. İki sahil. №85 2014, s.4-5

One of the issues of serious concern in Azerbaijan in the field of environmental safety is the deterioration of the ecological state of the Caspian Sea from year to year. The deterioration of the ecological situation in the Caspian Sea leads to the destruction of marine bio resources, the disruption of the natural and anthropogenic ecosystem around the sea, the deterioration of the health and lifestyle of the population living in the area, and the excessive pollution of the sea. Azerbaijan is considered the country that pursues the most active policy and does real work among the basin countries in the field of protecting and improving the ecology of the Caspian Sea.⁸

Unfortunately, Karabakh, which has been under Armenian occupation for 30 years, has been subjected to ecological terrorism. Today, restoration work is underway in the territories liberated from occupation. Nakchivan Autonomous Republic as well as the liberated territories Karabakh and East Zangezur have been declared "green energy" zones.

Today one of the global problems that worries the world is climate change. Water resources, energy, forestry, coastal zones and other fields are vulnerable to climate change in Azerbaijan. The Republic of Azerbaijan, as a reliable partner of the international community, makes its valuable contribution to combating the consequences of climate change.

Legislative and regulatory framework

The main areas of Azerbaijan's environmental policy is the modernization of environmental legislation. This modernization includes the creation of a legal framework for the protection of natural resources, waste management and the protection of biodiversity. Historically, the country has faced many environmental problems, such as air, water and soil pollution, deforestation, and degradation of natural ecosystems. Since gaining its independence, Azerbaijan has adopted many legislative acts and state programs on environmental protection. One of the main law is The Law on Environmental Protection adopted in 1999. It includes provisions concerning the protection of air, water, land resources, biodiversity and ecosystems. Important laws on water and air protection were adopted in 1997-1999.⁹ Since the 2000s, this area has become one of the country's main priorities. However, Azerbaijan has begun to actively develop its environmental policy, adopting important legislative initiatives and signing international agreements aimed at environmental protection and sustainable development. The Law on Ecological Security adopted in 2002 aims to address the protection of ecosystems and the promotion of sustainable practices. It provides for mandatory environmental assessment for a number of projects in the construction, industrial and other sectors. Thus, since 2000, many laws have been adopted in the direction of environmental protection, and this reflects that Azerbaijan has taken serious steps in this field.

⁸ Məmmədov Q.Ş, Xəlilov M.Y. *Ekologiya, ətraf mühit və insan*. Bakı, "Elm" nəşriyyatı, 2006, s.257

⁹ *Ətraf mühitin mühafizəsi haqqında Azərbaycan Respublikası Qanunu* [<https://e-qanun.az/framework/3852>]

The year 2010, declared the "Year of Ecology" in our country, was inscribed in the history of Azerbaijan as a turning point in the area of improving the environmental situation.¹⁰ Thus, important work was done in our country under the leadership of President Ilham Aliyev, to solve environmental problems, protect the environment and restore ecological balance. The planting of millions of trees in our country, the construction of new parks, and the participation of the head of state in these campaigns within the framework of the "Year of Ecology" are regarded as a symbol of heightened focus on environmental protection.

In the direction of environmental protection and efficient use of natural resources, measures are being implemented within the framework of the "Socio-economic Development Strategy of the Republic of Azerbaijan for 2022-2026", "Transformation of our World: Agenda for Sustainable Development until 2030", "State Program for Socio-economic Development of the Regions of the Republic of Azerbaijan for 2019-2023", "Action Plan for Ensuring Efficient Use of Water Resources for 2020-2022", "State Program for Geological Study of the Subsoil and Efficient Use of the Mineral Raw Materials Base for 2020-2024" and other programs. At the same time, steps are being taken to improve legislation and strengthen the legal framework.¹¹ These laws and regulations serve as the basis for protecting nature and regulating human impact on the environment in Azerbaijan.

Azerbaijan's environmental policy is closely aligned with its commitment to international environmental standards and frameworks. Azerbaijan joined major multilateral environmental agreements. As part of The United Nations Framework Convention on Climate Change and its agreements Azerbaijan has committed to reduce greenhouse gas emissions. With The Basel, Stockholm and Rotterdam Conventions Azerbaijan regulate hazardous waste and international trade in dangerous chemicals. Due to semi-arid regions subject to land degradation and erosion, Azerbaijan has joined the United Nations Convention to Combat Desertification (UNCCD). Azerbaijan actively collaborates with international organizations and financial institutions. These include The United Nations Development Program, the World Bank, the European Union and the Asian Development Bank. They have supported a range of environmental projects. Azerbaijan also participates in regional initiatives. One of them is Caspian Environment Program. The main purpose to protect the Caspian Sea from pollution and preserve its marine ecosystem.

To enhance focus on combating climate change and to strengthen international solidarity, President Ilham Aliyev of the Republic of Azerbaijan signed an official decree on December 25, 2023, named 2024 the "Year of Solidarity for a Green World". This decree reaffirms Azerbaijan's position as one of the leading countries in supporting global initiatives. Compared to the baseline year of 1990, Azerbaijan has committed to reducing greenhouse gas

¹⁰ Алиева Г. Глава государства обозначил приоритетные направления в области защиты окружающей среды. Азербайджанские Известия. 2010, 20 Февраля, н. 32, стр.1-2

¹¹ *Azərbaycan Respublikasında ekoloji siyasətin əsas istiqamətləri*. AR Ekologiya və Təbii Sərvətlər Nazirliyi // <https://eco.gov.az/az/ekoloji-siyaset/azerbaycan-respublikasinin-ekoloji-siyaseti>

emissions by 35% by 2030 and by 40% by 2050.¹² Serious steps have been taken in the direction of realizing the renewable energy potential of the territories liberated from occupation.

In general, structured institutions are needed to organize environmental protection. For this purpose, in recent decades, a system of environmental agencies and institutions has been developed and implemented in Azerbaijan, which play a key role in environmental protection, natural resource management and ensuring sustainable development of the country. Here are some of the most important agencies and institutions related to environmental safety in Azerbaijan: *The Ministry of Ecology and Natural Resources of the Republic of Azerbaijan (MENR)* is the main state body responsible for the development and implementation of state environmental policy, as well as the management of natural resources such as water, land, forests, flora and fauna. The main functions of MENR are development of laws and regulations in the field of ecology and natural resources, conducting environmental assessment, regulation of activities related to nature protection and pollution prevention and etc. *State Environmental Inspectorate under the Ministry of Ecology and Natural Resources* is responsible for monitoring compliance with environmental standards and norms. It carries out inspections at enterprises and facilities to prevent environmental pollution and comply with environmental requirements. *Azerbaijan Ecological Institute* is engaged in scientific research and development in the field of ecology.¹³

At the same time, it should be noted that organizations (local and international NGOs) engaged in environmental protection and organization also operate in Azerbaijan. A number of universities and research centers conduct research in the field of environmental protection, and operate in the field of education and organization. Local communities are also implementing their own initiatives to protect the environment. The recent efforts of the IDEA (International Dialogue for Environmental Action) Public Association, established in 2011, in the field of environmental protection are significant and widely recognized.¹⁴

In general, according to the statistical compilation of the State Statistical Committee of the Republic of Azerbaijan titled "Environment in Azerbaijan", published in 2024, 677.4 million manats were spent on environmental protection in 2023. This is a 2.9-fold increase compared to 2022. This includes environmental protection, efficient use of natural resources, preservation of forests, reserves and national parks, etc.¹⁵

Environmental Policy and Strategic Initiatives

Increasing greenery and establishing forest belts are considered to be among the most effective measures in the field of environmental protection of Azerbaijan. By conducting large-

¹² *Yaşıl Dünya naminə Həmrəylik ili*. AR Prezidentinin İşlər İdarəsinin Prezident Kitabxanası [https://files.preslib.az/projects/eco/az/green_world.pdf]

¹³ Azərbaycan Respublikası Ekologiya və Təbii Sərvətlər Nazirliyi [<https://eco.gov.az/>]

¹⁴ International Dialogue for Environmental Action [<https://ideacampaign.org/en/about-us>]

¹⁵ *Azərbaycanda ətraf mühit*. Azərbaycan Respublikasının Dövlət Statistika Komitəsi. Statistik Məcmuə. Bakı, 2024, s.22

scale greening campaigns, Azerbaijan not only improves its own ecological situation, but also contributes to measures to combat global climate change. Along with greening, great attention is also paid to protecting biodiversity in Azerbaijan. Among the measures taken to protect the ecological environment in our country, the importance of projects implemented to neutralize waste released into the atmosphere should be particularly noted.

It is known that the gradual depletion of traditional energy sources widely used throughout the world and the environmental pollution caused by their use increase the urgency of the issue of using alternative energy sources. For this reason, renewable energy sources are widely used in a number of developed countries. It is possible to produce energy without harming the ecological environment in Azerbaijan for many alternative energy sources. To this end, the "State Program on the Use of Alternative and Renewable Energy Sources in the Republic of Azerbaijan" was approved by a decree signed by President Ilham Aliyev on October 21, 2004. The State Agency for Alternative and Renewable Energy Sources of the Republic of Azerbaijan was established in 2013. A year later, the Surakhani Solar Power Station was commissioned. It should be noted that the total weight of the production capacity of hydroelectric power plants in the overall energy system of the republic is about 20 percent. Building upon prior initiatives in the renewable energy sector, the State Agency for Renewable Energy Sources under the Ministry of Energy of the Republic of Azerbaijan was established pursuant to Presidential Decree No. 1159, dated September 22, 2020, with its statute formally approved thereafter.¹⁶

The Republic of Azerbaijan, as a reliable partner of the international community, makes its valuable contribution to the fight against the consequences of climate change. One of the national priorities of Azerbaijan's socio-economic development until 2030 has been defined as "a country with a clean environment and "green growth". By the Decree of President Ilham Aliyev, 2024 was declared the "Year of Solidarity for a Green World" in our country.

At same time the year 2024 was a significant one in Azerbaijan's major environmental protection initiative. COP29 (United Nations Climate Change Conference), one of the largest environmental events of modern times was held in Azerbaijan. The COP29 Presidency announced global initiatives under the Action Agenda. The initiatives put forward by the Presidency aimed to advance climate action, encourage the active participation of non-Party stakeholders, and increase ambition and drive action on climate change. Among the proposed initiatives are: Baku Initiative on Climate Finance, Investment and Trade (BICFIT), Baku Initiative on human development for climate sustainability, Water for Climate Action, Reduction of methane in organic waste and others.¹⁷

Azerbaijan's main strategic initiative related to the environment is the development of renewable energy. Azerbaijan possesses substantial potential for the development of renewable energy sources. The country's technical potential is estimated at 135 GW onshore and 157 GW offshore. In terms of economic potential, renewable energy capacity is projected

¹⁶ İlhamoğlu Zahid. *Azərbaycanda ekologiya və ətraf mühitin qorunması sahəsində görülən işlər bir çox ölkələr üçün örnək təşkil edir*, 11.12.2019 [https://www.yeniazərbaycan.com/Sosial_e50579_az.html]

¹⁷ COP29 Sədrliyinin Təşəbbüsləri, 2024 [<https://cop29.az/az/pages/cop-29-presidential-action-agenda-global-initiatives>]

at approximately 27 GW, comprising 3,000 MW from wind energy, 23,000 MW from solar energy, 380 MW from bio energy, and 520 MW from mountain river hydropower.¹⁸ One of the largest projects is the Garadagh Solar Park. This plant is the largest solar power plant in the region.

Another key strategic initiative is the creation of green energy zones. In the economic development course set by the President of the Republic of Azerbaijan, Ilham Aliyev, regarding the liberated territories, transforming these territories into a "green energy" zone is considered one of the main directions. Measures such as production of electricity from renewable energy sources, energy efficiency measures, use of electric vehicles, construction of renewable energy installations on the roofs of buildings, as well as application of smart energy management technologies, energy-oriented waste management are planned in the liberated territories. Azerbaijan government has designated the Karabakh and East Zangezur regions as "Net-Zero Emission" zones, aiming to transform these areas into models of sustainable development.¹⁹

Conclusions

Large-scale work to solve environmental problems in Azerbaijan and state policy aimed at improving the ecological situation are an important component of the country's long-term development strategy.

The main essence of the environmental policy of the Republic of Azerbaijan is to protect ecosystems, ensure sustainable development through the efficient use of natural resources, minimize harmful impact on the environment, and restore and protect its original state in order to ensure that people live in an ecologically clean environment.

In addition, Azerbaijan is active in the international sphere, participating in global environmental initiatives such as the Paris Agreement on Climate Change and other international projects on environmental protection. An important aspect is also working with local and international environmental organizations aimed at raising awareness and participation of citizens in solving environmental problems. Azerbaijan is a signatory to various international environmental conventions, including: The United Nations Framework Convention on Climate Change (UNFCCC), The Kyoto Protocol, The Convention on Biological Diversity (CBD), The Convention on the Protection of the Black Sea Against Pollution.

Azerbaijan's role in COP29 demonstrated its efforts and commitments to implement the Paris Agreement, including in terms of reducing greenhouse gas emissions, improving adaptation to climate change and cooperation with other countries in addressing global

¹⁸ Azərbaycan Respublikası Energetika Nazirliyi. *Azərbaycanda bərpa olunan enerji mənbələrindən istifadə*, 06.03.2024 // [https://minenergy.gov.az/az/alternativ-ve-berpa-olunan-enerji/azerbaycanda-berpa-olunan-enerji-menbelerinden-istifade]

¹⁹ *İşğaldan azad edilmiş ərazilərdə Yaşıl Enerji Zonası (YEZ)*, 2021 [https://area.gov.az/az/page/layiheler/yasil-enerji-zonasi/yasil]

environmental problems. Azerbaijan, as a country with rich natural and energy potential, had the opportunity to become an active participant in the global dialogue on sustainable development and climate protection. At the same time, Azerbaijan is collaborating with international companies to implement renewable energy projects.

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THE ROLE OF SCANDINAVIAN COUNTRIES IN THE GREEN EUROPEAN POLICIES

Ulviyya POLADKHANLI¹

Abstract: *The points that have become necessary for implementing environmental policies in the world today are reflected. one thousand nine hundred and fifty years, two point five billion people lived on our planet. By two thousand and fiftieth provinces population will be around 10 billion – a fourfold increase in a century. The United Nations has long said that this is only feasible if we plan for it. The above highlights the need for the Scandinavian countries to fulfill their obligations in the field of environmental protection. The Nordic countries have been working together for several decades to protect nature and the environment, both winning the Region and at international operations the remit of the Nordic Council of Ministers of the Environment and Climate. November two thousand sixteenth year the Nordic Council of Ministers for the Environment asked the Secretary General to initiate an external strategic review of the potential climate. Th review forms part of the New Nordic region reform project. If the Nordic Region is to show the way, then our leaders must agree on the direction. My recommendations chart a course for the Nordic Region to contribute at global, national, regional and local level. We need to not only pull our weight but also contribute outside of the Region as well. I would like to thank the Nordic Council of Ministers for commissioning me to conduct this review. Thanks to all those who willingly contributed their time and expertise to our meetings. And thanks to senior adviser Satu Reijonen for her good company and for writing the report. The content is mine. I believe these recommendations show us the way.*

Keywords: *Scandinavian countries, European policy, Green World, Green World policy*

Introduction

The Nordic countries have been working together for several decades to protect nature and the environment, both within the Region and at international level. Official intergovernmental cooperation is the remit of the Nordic Council of Ministers for the Environment and Climate (MR-MK). In November 2016, the Nordic Council of Ministers for the Environment (MR-M as it was known at the time) asked the Secretary General to initiate an external strategic review of the potential for Nordic co-operation in the environment and

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climate. The review forms part of the “New Nordic Region” reform project. This report presents the recommendations from the review. The recommendations constitute the author’s independent contribution to the development of Nordic co-operation on the environment and climate. They focus on the work of the Nordic environment and climate sector over the next five to ten years but have a longer time perspective. The recommendations will help achieve the global environmental and climate-related goals of the UN’s Agenda 2030. Decisions taken today must also promote progress all the way until the second half of the century – the deadline for achieving the long-term objectives of the Paris Agreement on climate change.

Recommendations for achieving the goals of UN’s Agenda 2030

The review was conducted in 2017 and the early months of 2018. It involved 119 meetings between the reviewer and more than 200 people from various professional backgrounds from Denmark, Finland, Iceland, Norway, Sweden, the Faroe Islands, Greenland and Åland. The reviewer also met with representatives of the UN/UNEP and the EU. These conversations provided both inspiration for the recommendations and evidence to underpin them².

General observations on Nordic co-operation on the environment and climate The Nordic countries are deeply committed to working together on the environment and climate, and the work is well embedded within the various national ministries and agencies. Nordic cooperation provides insights, knowledge and networks from which participants say they derive great value. The Nordic countries are closely linked to each other in terms of geography, culture and their economies. Co-operation affords them opportunities for mutual learning and to complement each other’s resources and competencies. Nordic co-operation on the environment and climate is not particularly well known outside Nordic circles. However, external stakeholders stress the great potential in the Nordic countries leading by example and jointly promoting specific environmental and climate issues in international arenas. There is a clear trend in Nordic co-operation on the environment and climate towards focusing on knowledge production. This work has made valuable contributions to the state of knowledge on various environmental and climate-related problems. The knowledge generated helps, from an early stage, to develop policy and stimulate debate. More specifically, working together on the development and implementation of solutions is not prioritized to the same extent as knowledge production. However, individual projects in the sector that focus on specific solutions show the potential for this type of collaboration. Nordic co-operation on the environment and climate tackles issues of great relevance. It ranges across various themes, from the protection of wetlands to business models for the circular economy, which will be of benefit to many different sectors. However, the range of activities is relatively fragmented, and

² EU(2009). *The Stockholm Programme: An Open and Secure Europe Serving and Protecting the Citizens*. Retrieved 08.06.2025 from https://ec.europa.eu/anti-trafficking/eu-policy/stockholm-programme-open-and-secure-europe-serving-and-protecting-citizens-0_en

the co-operation does not operate according to clear overall strategic objectives or priorities. Clearer prioritization of specifically selected areas for action could enhance the visibility and impact of the work. The challenge facing the sector in the future is, therefore, how to provide greater strategic leadership without losing the commitment currently found in the broad sweep of different themes and professional circles. The structure of the report and recommendations This report presents 12 recommendations for Nordic co-operation on the environment and climate. The intention behind the recommendations is to identify opportunities for making Nordic cooperation an even more relevant and effective driver of the green transition. The challenge is considerable. Nordic societies have to become climate-neutral and toxin-free at the same time as they minimize resource use. We are facing major changes in the production and consumption systems upon which our societies are built. The transition to low-carbon societies must be seriously accelerated if the Region is to contribute to achieving the long-term goals of the Paris Agreement. Climate change, loss of biodiversity and hazardous chemicals in our everyday lives are real challenges here and now. The 12 recommendations address five broad areas in which Nordic co-operation on the environment and climate ought to play a prominent role.

To make the greatest possible impact, Nordic cooperation on the climate and environment should contribute to:

1. specific solutions for the green transition;
2. the mobilization of key stakeholders;
3. financing the green transition;
4. a strong Nordic voice beyond Nordic borders;
5. the adaptation to climate change.

The first and main recommendation sets out the overall frame of reference within which Nordic co-operation on the environment and climate must make a strong contribution. An ambitious aspiration to achieve the goals of the Paris Agreement on climate and the environment, as well as the UN Sustainable Development Goals (SDGs), must be the principal motive for Nordic work on the environment and climate. Specific solutions for the green transition. Recommendations 2–4 present three proposals for initiatives and priorities for the development of specific measures and solutions. The first recommendation proposes that Nordic co-operation should adopt a strategic approach to working towards a low-carbon society. A long-term, themed action plan should be developed for Nordic co-operation in a low-carbon society. The plan must be translated into specific initiatives and actions in selected priority areas. Recommendation 3 makes the circular economy a key area for co-operation and proposes a dedicated spearhead initiative on plastic in the circular economy. This would build upon current Nordic work and fit in with developments in the EU. Experience from working on plastics could be transferred to other materials streams, where circularity should be enhanced. Thirdly, it is recommended that long-term work to substitute hazardous chemicals should be made a priority. The development and implementation of EU regulations of chemicals is a prerequisite for the systematic, risk-free substitution of hazardous chemicals. This report recommends, therefore, that Nordic work in this area should continue and be

enhanced. The mobilization of key stakeholders. Decisions on the implementation of low-carbon solutions and changes at system level are usually made outside of the environment and climate sector. It is important to engage all relevant stakeholders to ensure that they operate based on up-to-date knowledge of the benefits of change. Recommendation 5 calls upon the Nordic environment and climate sector to act as a facilitator and catalyst by sharing knowledge on the economic and social benefits of the green transition. Recommendation 6 proposes that the environment and climate sector should contribute to Nordic cooperation on exporting Nordic green solutions.

Recommendation 7 proposes that promotion of Nordic ecolabel should be a priority for the sector's work that directly targets consumers. Financing the green transition. A fundamental transition to cleaner, climate-neutral systems of production and consumption will require major investments in green technologies, infrastructure and administrative innovation. It will require significant mobilization of both public and private capital. Recommendation 8 proposes Nordic exchanges of experience on public-sector funding mechanisms for green innovation, green public procurement and public-sector infrastructure investments in green innovation. Recommendation 9 emphasizes the need to initiate Nordic discussions at the highest political level on the development of a green financial market. A strong Nordic voice beyond Nordic borders. Recommendation 10 addresses the potential for enhancing Nordic influence by planning and coordinating Nordic input into the most important international negotiations. Adaptation to climate change. Rising temperatures and sea levels will increase the pressure on our ecosystems and biodiversity, which already face challenges. There is a danger of deterioration in the basic conditions of producing food and access to clean water and air. Recommendation 11 stresses the importance of working together to enhance ecosystem resilience in the face of climate change in the Region. The final recommendation in this report concerns organizational methods of promoting efficiency and engagement in Nordic co-operation on the environment and climate.

Countries' movements in Green World politics

Denmark

Denmark is a Nordic country with an area of 16,580 square miles and a population of approximately 5.9 million. It is one of the smallest countries in the region and is surrounded by sea, with significant wind resources. The energy crisis in the 1970s led Denmark to invest in wind power, which made it a pioneer in modern commercial wind energy technology. In fact, Denmark was the first country to install a multi-megawatt turbine in 1978, and in 1991, the world's first offshore wind farm was opened in Vindeby³.

³ Christine Nissen(2021). *Denmark's green brand and sustainable energy solutions can help push the European Green Deal Forward*. Retrieved 09.04.2025 from <https://www.diiis.dk/en/research/what-is-denmarks-role-in-realising-the-european-green-deal>

Today, Denmark exports wind energy technology, which is worth billions of Danish Kroner, accounting for DKK 54.1bn (USD 7bn) in 2020 and generates thousands of jobs in the industry. Of Denmark's electricity consumption, approximately 50% is provided by wind and solar energy, 20% by renewable biomass and biofuels, and the rest from fossil fuels. Denmark decided in 1985 not to build nuclear power plants in the country.

The government plans to triple renewable electricity production to 104 TWh by 2030, according to an analysis by green power Denmark. To achieve this, the Danish government has launched a PtX (power-to-X, i.e. conversion of power production to carbon-neutral fuels) strategy, aiming to build 4-6 GW of electrolysis capacity for green hydrogen production by 2030, which can potentially deliver CO₂ emission reductions of 2,5-4,0 million tons. Additionally, the government unveiled plans in September 2022 to ensure that Denmark has a domestic 100% renewable flight route by 2025 and that all domestic aviation will be renewable by 2030⁴.

Furthermore, Denmark has the potential to become a large exporter of both renewable power and PtX products by 2050 due to its enormous renewable resources and a well-connected electricity grid to continental Europe, according to Nordic Energy Research, an intergovernmental organization within the Nordic Council of Ministers. One scenario predicts that Denmark could generate 35 TWh of solar energy in 2050 while offshore wind generation could reach 210 TWh, bringing total wind generation in Denmark to 230 TWh in 2050. Today, Denmark's electricity consumption is approximately 36 TWh a year and this is expected to rise to over 200 TWh in 2050, according to the Danish Transmission System Operator (TSO), Energinet⁵.

Sweden

Sweden, the largest of the Nordic countries, covers an area of 173,860 square miles and has a population of around 10.5 million. It is home to several industries such as car manufacturing, iron & steel, and forestry. Sweden has vast sparsely populated areas suitable for wind energy farms, and it relies heavily on hydroelectric and nuclear power in its energy mix. Almost percent of Sweden's electricity production comes from hydroelectric supplies and nuclear power, while around 16% comes from wind power.

The Sweden Climate Act from 2021 aimed to achieve net-zero emissions by 2045, with emissions from activities in Sweden reduced by at least 85% compared with 1990 while the remaining 15% was to be achieved through supplementary measures such as increased carbon sequestration in forest and land, carbon capture and storage technologies (CCS) and emission reduction efforts outside the country⁶. Sweden also targeted to gradually replace biomass and nuclear energy with wind energy.

⁴ EU(2009). *The Stockholm Programme: An Open and Secure Europe Serving and Protecting the Citizens*.

⁵ Christine Nissen(2021). *Denmark's green brand and sustainable energy solutions can help push the European Green Deal Forward*

⁶ EU(2009). *The Stockholm Programme: An Open and Secure Europe Serving and Protecting the Citizens*.

Norway

Norway covers an area of 148,729 square miles and has a population of 5.4 million. The country is a major oil and gas producer, with nearly all the oil and gas produced on the Norwegian shelf in the North Sea being exported. However, it is also famous for its mountain ranges, abundant lakes, steep valleys, and fjords, which make it an ideal location for the development of hydropower.

And indeed, Norway is the largest hydropower producer in Europe, with more than 90% of its electricity generated by hydropower, and is also and a major exporter of electricity to Europe. In early 2021, the country had 1,681 hydropower plants with an accumulated installed capacity of 33 GW. Water can be stored in reservoirs until needed, allowing for quick changes in production, and Norway's reservoir capacity represents roughly half of the total energy storage in hydropower reservoirs in Europe.

Unlike wind and solar power, hydropower is not intermittent; with the increasing number of cross-border interconnectors, that enables the transfer of electricity from one national grid to another, hydropower from Norway will be able to help neighboring countries manage the challenges of a future power system with more intermittent power from wind and solar.

Norway's access to inexpensive hydropower has also enabled it to be a global leader in electric vehicles, almost entirely powered by hydroelectricity. In 2021, electric cars accounted for 65% of new car sales in Norway.

Despite its electricity generation being almost exclusively renewable, Norway's oil and gas industry remains a large emitter of CO₂. Norway has set a climate target of reducing its emissions by at least 55% by 2030. Hydrogeneration is expected to rise modestly in the future, while wind power generation is expected to increase significantly. In May 2022, the Norwegian government launched a major offshore initiative with a target to allocate 30 GW of offshore wind production capacity by 2040, which is nearly equivalent to the amount of electricity currently produced in Norway.

Finland

Finland's area is 130,678 square miles with a population of 5.6 million. Located in the northeastern part of the Nordic region and bordering Russia, it is known for its many lakes and vast forests that cover approximately 75% of its land area.

Finland lacks fossil fuels such as oil and gas, but it has nuclear energy and wood-based fuels, extensive wood reserves and peat, which can be burnt to produce electricity and heating.

Renewable energy sources cover just over half of Finland's electricity production, primarily hydropower, but renewable wood-based fuels, mostly derived from forest industry by-products and wood residues, and with the share of wind and solar rising. Nuclear power covers roughly one-third of Finland's electricity generation, and the rest is produced from fossil fuels and peat.

Finland has ambitious goals to be carbon-neutral by 2035 and carbon-negative soon after. Achievement of these goals depends largely on the future management of Finland's forests and the ability to retain the forests as carbon sinks that can accumulate and store CO₂. Emissions from deforestation have risen over the past decade, as trees have been cut down faster than new ones planted, shifting the forests from carbon sinks to carbon sources.

In the years towards 2050, older nuclear plants will be decommissioned, leading to a dramatic decrease in nuclear energy's share of production. In the final mix, onshore wind capacity is expected to account for 45% of total generation, with the rest equally coming from biomass, nuclear, and hydropower production.

Iceland

Iceland, with an area of 66,467 square miles and a population of 376,248, is a unique country located in the North Atlantic Ocean. Lying on the active geologic border between North America and Europe, it is characterized by active glaciers, repeated volcanism and geothermal phenomena, such as hot geysers. Iceland is a pioneer in using geothermal energy for heating and generating electricity, and nearly 100% of its electricity and heating is met with renewable sources: 73% of the country's electricity production is covered by hydropower and roughly 27% by geothermal power. Heating needs are also met by renewables: 90% by geothermal power and 10% by renewable electricity⁷.

However, despite almost entirely meeting its electricity and heating needs through renewable sources, Iceland has yet to meet the challenge of greenhouse emissions. The country's 's biggest sources of emissions are industrial processes, road transport, agriculture, fisheries, and waste management.

Iceland is committed to becoming carbon-neutral by 2040 and reducing greenhouse emissions by 40% by 2030⁸. To achieve this, the country is exploring new technologies such as carbon capture and storage and transitioning to cleaner forms of transportation. Additionally, Iceland is investing in research and development of sustainable practices in its industrial, agricultural, and fisheries sectors.

Denmark is a trailblazer when it comes to the green transition. Since 1996, it has successfully cut its CO₂ emissions by more than half. In 2019, 47% of the electricity generated in the country was from wind power. It also has State of Green — an association of Danish companies, governmental and academic institutions, experts and researchers from Denmark founded in 2008 that seeks relevant solutions that enable the green transition⁹.

⁷ Bailes, A., Herolf, G., Sundelius, B. (eds.) (2006). *The Nordic countries and the European Security and the defence policy*. Retrieved 01.05.2025 from <https://www.sipri.org/sites/default/files/files/books/SIPRI06BaHeSu/SIPRI06BaHeSu.pdf>

⁸ EU(2009). *The Stockholm Programme: An Open and Secure Europe Serving and Protecting the Citizens*

⁹ Christine Nissen(2021). *Denmark's green brand and sustainable energy solutions can help push the European Green Deal Forward*.

They work to drive the global transition to a sustainable, low-carbon, resource-efficient society. Their work encompasses renewable energies, energy efficiency, water management, waste management, climate adaptation, circular economy and integrated urban solutions.

Conclusions

Towards a sustainable future not only are the Nordic countries at the forefront of sustainability rankings, but they also intend to take on international climate leadership. Earlier this year, the governments of the Nordic countries pledged to make their region the most sustainable and integrated region in the world by 2030 and to demonstrate leadership in the fight against climate change.

Although concrete objectives still need to be set, a joint statement by the Nordic Council—comprising Iceland, Denmark, Sweden, Norway and Finland—establishes three priority strategic areas: the transition to a green economy, ensuring competitiveness in the region and promoting social sustainability.

The fact is that these countries' efforts to try to curb climate change truly deserve the top spots in these rankings. These states that have shown that sustainability is the only viable way forward.

The influence of the Nordic countries on the European Union's (EU's) policy processes has been researched from various angles, but there is a lack of research that comprehensively examines all policy positions advanced by Nordic actors within a given policy context. This article introduces a new design for studying policy positions and influence in the EU and examines the phenomenon from a multilevel perspective using an original data set compiled in connection to three directives: the Floods Directive on the assessment and management of flood risks, the Environmental Liability Directive, and the Restriction of Hazardous Substances Directive. The analysis reveals that the Nordic countries follow a certain pattern of influencing EU policy that deviates from other states participating in the consultations. Nordic governmental actors exert a strong technical but weak directional influence in the chosen context but are, overall, more successful than Nordic organizational actors at influencing the policy process.

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