

Institutional and legal mechanisms for environmental monitoring and control within the framework of the European Green Deal: A comparative analysis of EU and Ukrainian policies

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■ **Abstract.** The study aimed to conduct a comparative analysis of the environmental monitoring and control mechanisms in the European Union and Ukraine, considering the current requirements of the European Green Deal. The study used formal-legal, institutional and comparative-legal methods to analyse regulatory framework for environmental monitoring and control, characteristics of institutional coordination in environmental governance, and compare environmental regulation models of the European Union and Ukraine. The study demonstrated that, within the framework of the European Green Deal, an integrated model of environmental governance has emerged, combining mechanisms for climate regulation, industrial environmental control, the digitalisation of environmental information, multi-level institutional coordination and the enforcement

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of environmental legislation. Five structural elements of this model have been identified, and the study established that the systems for monitoring, reporting and verifying greenhouse gas emissions, as well as the European Environment Information and Observation Network, ensure the integration of environmental data into procedures for climate planning, environmental risk assessment and supranational monitoring of compliance with climate commitments. The study has established that environmental monitoring in the European Union has evolved from a mechanism for identifying breaches of environmental legislation into a system of continuous regulatory oversight and assessment of the effectiveness of environmental policy. The study also found that the implementation of European environmental standards in Ukraine is accompanied by an expansion of environmental monitoring functions through the integration of environmental impact assessment procedures, strategic environmental assessment and the system for monitoring, reporting and verifying greenhouse gas emissions. The study determined that in Ukraine, environmental monitoring is predominantly used within the framework of control, reporting and permitting procedures, whereas in the European Union, monitoring results are integrated into mechanisms for strategic planning, environmental risk assessment and verification of compliance with climate commitments. The practical significance of the findings is determined by possible use of identified structural and functional differences between the European Union and Ukrainian models to further harmonise the Ukrainian environmental monitoring and control system with the European Union's *acquis communautaire* in the field of environmental protection

■ **Keywords:** environmental law; climate law; environmental policy; climate planning; environmental risk assessment; fulfilment of climate commitments; harmonisation of legislation

■ Introduction

The modern stage of societal development is defined by an increase in environmental risks linked to climate change, environmental pollution, the depletion of natural resources and the intensification of human impact on natural ecosystems. Under these circumstances, there is a pressing need to develop effective environmental monitoring and control systems that ensure the timely detection of adverse changes in the state of the environment, provide information to support management decisions, and monitor compliance with environmental requirements. For Ukraine, the issue of environmental monitoring and control is linked to the adaptation of the national environmental governance system to the European Union's *acquis communautaire* in the field of environmental protection and climate policy.

In academic discourse, implementation of the European Green Deal is viewed not as an environmental strategy of the European Union (EU), but as a comprehensive system of multi-level legal and institutional governance, combining mechanisms for monitoring, oversight, policy coordination and supranational regulation. Thus, N. Bruch *et al.* (2024) concluded that traditional mechanisms of "soft" environmental regulation within the EU do not ensure an adequate level of implementation of the European Green Deal's climate targets. The researchers found that strengthening the role of EU regulations and expanding the system of indicators to monitor Member States' compliance with environmental obligations has become one of the trends in the transformation of European environmental policy. Furthermore, the authors emphasised the need to integrate environmental monitoring systems into strategic planning and inter-institutional cooperation processes,

thereby ensuring more effective monitoring of progress towards climate targets. P. Graziano (2024) highlighted that EU environmental policy is gradually evolving into a component of a broader socio-environmental regulatory model. The author argued that the EU's climate initiatives are combined with social support mechanisms for the population and regions most affected by the environmental transition. The study established that environmental monitoring within the framework of the European Green Deal not only serves to monitor the state of the environment but also can also be used for assessment of the social consequences of environmental reforms, as well as their impact on employment, energy security and regional development. The issues surrounding multi-level governance and the practical implementation of the European Green Deal were explored by L. Sandmann *et al.* (2024). The researchers found that the effectiveness of EU environmental policy depends to a large extent on the coordination of actions between supranational, national and local institutions. The authors highlighted those difficulties arise not during the formulation of climate strategies, but at the stage of adapting them to the needs of individual territories and communities. At the same time, the study demonstrated that mechanisms for a just green transition require constant institutional oversight and monitoring, as disparities in the socio-economic development of regions can exacerbate the risks of fragmentation in the EU's environmental policy.

A. Testi *et al.* (2023) have contributed to research on the local-level implementation of the European Green Deal. The researchers argued that the effectiveness of environmental policy depends on the participation of local communities in

decision-making processes and the assessment of environmental risks. The study demonstrated that engaging the public in environmental governance improves the effectiveness of environmental protection measures and can tailor climate decisions to specific characteristics of individual territories. The study also emphasised that modern environmental monitoring systems must consider not only environmental indicators, but also the social, economic and spatial characteristics of regional development. A separate strand of current research concerns the political controversies associated with the implementation of EU climate policy in the countries of Central and Eastern Europe. B. Witajewska-Baltvilka *et al.* (2024) found that the politicisation of climate reforms directly affects the pace of implementation of the European Green Deal mechanisms. The authors concluded that differences in the levels of economic development among Member States create unequal attitudes towards the EU's climate goals, with the result that environmental reforms are met with political resistance. The researchers also emphasised that, for countries in Central and Eastern Europe, the green transition is linked to issues of energy security, economic stability and social support for the population.

The Ukrainian dimension of the harmonisation of environmental policy with EU law is examined by O. Ivanchuk (2025). The author found that the adaptation of Ukraine's environmental legislation to European standards is characterised by an uneven and piecemeal implementation of individual directives. According to the study's findings, difficulties arise in institutional arrangements for environmental monitoring and state control due to insufficient coordination between government bodies. At the same time, it is emphasised that Ukraine's further integration into the European environmental space requires a shift from the formal approximation of legislation to the creation of a comprehensive environmental governance system. The issues surrounding the interconnection between environmental transformation and sustainable development were explored by V. Bondarenko *et al.* (2023). Based on a comparison of international and Ukrainian experience, the researchers concluded that the development of a "green" economy is impossible without the effective functioning of environmental monitoring and state control systems. The authors emphasised that EU countries demonstrate a higher level of integration of environmental indicators into economic planning processes, whereas in Ukraine, environmental control is not yet sufficiently integrated into the strategic management system. In the context of the war and European integration, research into the legal aspects of Ukraine's environmental and energy transition is becoming increasingly relevant. In particular,

I. Yakushev *et al.* (2026) found that military risks complicate the implementation of climate and energy reforms, whilst at the same time reinforcing the need to align Ukrainian policy with EU requirements. The researchers concluded that Ukraine's post-war recovery is increasingly guided by the principles of the European Green Deal, and that environmental monitoring is regarded as one of the fundamental tools for ensuring the country's sustainable development and energy security.

Despite substantial research, studies have insufficiently addressed a comprehensive comparative assessment of institutional and legal mechanisms for environmental monitoring and control in the EU and Ukraine, specifically in the context of implementing the European Green Deal. Existing studies prioritise either general aspects of EU climate policy or specific areas of harmonisation of environmental legislation. At the same time, issues of inter-institutional coordination and the integration of monitoring systems into the EU's environmental governance mechanisms remain under-researched.

The study aimed to conduct a comparative analysis of the institutional and legal mechanisms for environmental monitoring and control in the EU and Ukraine in the context of implementing the European Green Deal. The objectives of the study were: to analyse the legal and institutional instruments for implementing EU environmental policy within the framework of the European Green Deal; to examine the specific features of the implementation of European environmental standards in Ukraine; and to identify areas for harmonising Ukrainian legislation with EU law.

■ Materials and Methods

This study is of a comparative legal nature. The chronological scope of the study covers the period 2007-2025. The lower limit is determined by the start of the development of an integrated digital system for environmental governance in the European Union, the development of mechanisms for the exchange of environmental information, and the transition to the use of spatial environmental data in monitoring and environmental control procedures. The upper limit relates to the analysis of the current stage of transformation of environmental policy in the EU and Ukraine in the context of the implementation of the European Green Deal, the development of systems for monitoring, reporting and verifying greenhouse gas emissions, and the digitalisation of environmental control.

The subject of this comparative analysis is the institutional and legal mechanisms for environmental monitoring and control in the EU and Ukraine. The choice of Ukraine is due to the process of harmonising national legislation with the European Union's

body of environmental law in the field of environmental protection¹.

For a comparative analysis of the implementation of EU environmental policy, the experiences of Germany, France, Poland and the Netherlands were examined. These countries were selected due to differences in their models of environmental governance, the level of digitalisation of environmental monitoring, the structure of institutional coordination, and practices regarding the implementation of EU environmental legislation. Germany represents a federal model of environmental control; France, an integrated system of environmental and climate planning; Poland, a Central and Eastern European model facing challenges in the regional coordination of environmental control; and the Netherlands, a high level of digitalisation of environmental monitoring and integration of environmental information systems. The comparative analysis was conducted based on following criteria: the organisation of the environmental control system; the use of digital monitoring tools; the specifics of implementing the requirements of Directive No. 2010/75/EU of the European Parliament and of the Council “On Industrial Emissions (Integrated Pollution Prevention and Control) (Recast) (Text with EEA Relevance)”²; the use of environmental data in the management decision-making process; problem areas in the implementation of environmental legislation, as identified by the Environmental Implementation Review (Directorate-General for the Environment, 2025); and the nature of interaction between national authorities and the EU’s supranational environmental governance mechanisms. The source base for the comparative analysis also comprised information materials from the European Environment Information and Observation Network (n.d.), which were used to describe the organisational and information mechanisms for environmental monitoring in EU Member States.

To examine the regulatory mechanisms for implementing the EU’s environmental policy, the formal-legal method was applied with the aim of analysing the structure, content and specific features of the legal regulation of environmental monitoring, climate policy, industrial environmental control and mechanisms for ensuring compliance with EU environmental legislation. The research drew on European Union legislative acts governing various aspects of environmental governance. To examine the legal foundations for the implementation of the European Green Deal and climate regulation, the following were used: the Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions “The European Green Deal”³ and Regulation (EU) No 2021/1119 of the European Parliament and of the Council “Establishing the Framework for Achieving Climate Neutrality and Amending Regulations (EC) No 401/2009 and (EU) 2018/1999 (“European Climate Law”)⁴ were used to examine the legal foundations for the implementation of the European Green Deal and climate regulation. The analysis of industrial environmental control mechanisms and the digitalisation of environmental information was conducted based on Directive No. 2010/75/EU of the European Parliament and of the Council⁵ and Directive No. 2007/2/EC of the European Parliament and of the Council “Establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)”⁶. Directive (EU) No. 2024/1203 of the European Parliament and of the Council “On the Protection of the Environment Through Criminal Law and Replacing Directives 2008/99/EC and 2009/123/EC” was used to examine the mechanisms of legal liability and to ensure compliance with environmental legislation⁷.

¹ Association Agreement between the European Union and the European Atomic Energy Community and their Member States, of the one part, and Ukraine, of the other part. (2014, June). Retrieved from <https://www.consilium.europa.eu/en/documents/treaties-agreements/ agreement/?id=2014045>.

² Directive No. 2010/75/EU of the European Parliament and of the Council “On Industrial Emissions (Integrated Pollution Prevention and Control) (Recast) (Text with EEA Relevance)”. (2010, November). Retrieved from <https://eur-lex.europa.eu/legal-content/EN/ TXT/?uri=CELEX%3A32010L0075>.

³ Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions “The European Green Deal”. (2019, December). Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52019DC0640>.

⁴ Regulation (EU) No. 2021/1119 of the European Parliament and of the Council “Establishing the Framework for Achieving Climate Neutrality and Amending Regulations (EC) No 401/2009 and (EU) 2018/1999 (“European Climate Law”)”. (2021, June). Retrieved from <https://eur-lex.europa.eu/eli/reg/2021/1119/oj>.

⁵ Directive No. 2010/75/EU of the European Parliament and of the Council “On Industrial Emissions (Integrated Pollution Prevention and Control) (Recast) (Text with EEA Relevance)”. (2010, November). Retrieved from <https://eur-lex.europa.eu/legal-content/EN/ TXT/?uri=CELEX%3A32010L0075>.

⁶ Directive No. 2007/2/EC of the European Parliament and of the Council “Establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)”. (2007, March). Retrieved from <https://eur-lex.europa.eu/legal-content/EN/ TXT/?uri=CELEX%3A32007L0002>.

⁷ Directive (EU) No. 2024/1203 of the European Parliament and of the Council “On the Protection of the Environment Through Criminal Law and Replacing Directives 2008/99/EC and 2009/123/EC”. (2024, April). Retrieved from <https://eur-lex.europa.eu/eli/ dir/2024/1203/oj>.

The institutional approach was applied to examine the system of division of powers and coordination of activities between the European Commission, the Directorate-General for the Environment, the European Environment Agency, the European Environment Information and Observation Network, the Ministry of Economy, Environment and Agriculture of Ukraine, the State Environmental Inspectorate of Ukraine, the State Agency for Water Resources of Ukraine and the State Agency for Forest Resources of Ukraine in the field of environmental monitoring and control. The research drew on the following analytical documents: the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, “Environmental Implementation Review 2022: Turning the Tide Through Environmental Compliance”¹ and “Environmental Implementation Review 2025” (Directorate-General for the Environment, 2025), which were used to analyse mechanisms for coordinating environmental policy, ensuring compliance with environmental legislation, and the interaction between EU institutions and Member States in the field of environmental governance. The analytical report “Europe’s Environment 2025” (European Environment Agency, 2025) was used to examine the institutional mechanisms for environmental monitoring, the digitalisation of environmental information and trends in the development of EU environmental policy.

The comparative legal method has been applied to compare the regulatory and institutional models of environmental monitoring and control in the European Union and Ukraine according to the following criteria: the regulatory model of environmental regulation, the functional purpose of environmental monitoring, the institutional structure of environmental governance, the digitalisation of environmental monitoring, the system for monitoring, reporting and verifying greenhouse gas emissions, mechanisms for ensuring compliance with environmental legislation, and the integration of environmental information into the public administration system. The research materials used to analyse the legal framework

for environmental regulation in Ukraine were Law of Ukraine No. 1264-XII “On Environmental Protection”² and Law of Ukraine No. 2059-VIII “On Environmental Impact Assessment”³, which were used to examine the legal mechanisms of environmental control, environmental impact assessment and the functioning of the environmental monitoring system. To analyse the integration of environmental procedures into the strategic planning system, Law of Ukraine No. 2354-VIII “On Strategic Environmental Assessment”⁴ was applied; its provisions were used to examine the mechanisms for incorporating environmental criteria into state planning processes and management decision-making. The study of the system for monitoring, reporting and verifying greenhouse gas emissions was conducted based on Law of Ukraine No. 377-IX “On the Principles of Monitoring, Reporting and Verification of Greenhouse Gas Emissions”⁵, which stipulates the legal framework for the operation of the Monitoring, Reporting and Verification (MRV) system in Ukraine and its adaptation to the European Union’s climate mechanisms. To develop practical recommendations, the legal modelling method was applied; this was used to identify opportunities for adapting specific elements of environmental governance in EU Member States to the national environmental monitoring and control system.

■ Results

Institutional and legal mechanisms for implementing EU environmental policy within the framework of the European Green Deal. The European Green Deal initiated a shift in approaches to shaping the European Union’s environmental policy by integrating climate and environmental requirements into the EU’s economic and legal regulatory framework. An analysis of the content of the European Green Deal⁶, shows that, within the framework of this strategy, environmental policy is viewed not as a separate sector of public administration, but as a cross-sectoral regulatory mechanism covering industry, energy, transport, agriculture, the financial system and the EU’s digital infrastructure. The document defines the achievement

¹ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions “Environmental Implementation Review 2022: Turning the Tide Through Environmental Compliance”. (2022, September). Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52022DC0438>.

² Law of Ukraine No. 1264-XII “On Environmental Protection”. (1991, June). Retrieved from <https://zakon.rada.gov.ua/laws/show/en/1264-12#Text>.

³ Law of Ukraine No. 2059-VIII “On Environmental Impact Assessment”. (2017, May). Retrieved from <https://zakon.rada.gov.ua/laws/show/en/2059-19#Text>.

⁴ Law of Ukraine No. 2354-VIII “On Strategic Environmental Assessment”. (2018, March). Retrieved from <https://zakon.rada.gov.ua/laws/show/en/2354-19#Text>.

⁵ Law of Ukraine No. 377-IX “On the Principles of Monitoring, Reporting and Verification of Greenhouse Gas Emissions”. (2019, December). Retrieved from <https://zakon.rada.gov.ua/laws/show/377-20#Text>.

⁶ Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions “The European Green Deal”. (2019, December). Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52019DC0640>.

of climate neutrality by 2050 as a legally and institutionally mandated direction for the Union's development, the implementation of which requires a restructuring of the mechanisms for monitoring, controlling and evaluating Member States' fulfilment of their environmental obligations.

Following the adoption of the European Green Deal, environmental regulation in the EU has become more integrated, as evidenced by the combination of climate policy with mechanisms for regulating industry, energy, transport and agriculture (Hereu-Morales *et al.*, 2024; Sandri *et al.*, 2025). This transformation is related to the enshrinement of the concept of climate regulation in EU law and the transition to a model of economic decarbonisation, which envisages a systematic reduction in greenhouse gas emissions across all sectors of economic activity. The European Green Deal has shaped a new regulatory model, within which environmental objectives are integrated into the EU's financial, industrial and investment policies, whilst environmental legislation is beginning to serve as a structural framework for economic transformation (Olczyk & Kuc-Czarnecka, 2025; Calliess, 2026).

An analysis of the regulatory framework of the European Green Deal shows that the EU's environmental monitoring and control system is shaped by a combination of regulations, directives, reporting mechanisms and procedures for verifying compliance with climate commitments. The relationship between the provisions of Regulation (EU) No 2021/1119 of the European Parliament and of the Council¹ and the climate reporting mechanisms demonstrate a shift in the function of environmental monitoring under EU law: the collection of environmental data is being integrated into the mechanism for assessing Member States' compliance with their climate commitments. The Regulation establishes not only a legally binding target of climate neutrality, but also procedures for periodically assessing Member States' progress in reducing greenhouse gas emissions. Consequently, environmental reporting is used by the European Commission as a regulatory compliance tool, ensuring that national policies align with the EU's decarbonisation targets.

The interplay between monitoring mechanisms and industrial regulation is evident in the provisions

of Directive No. 2010/75/EU of the European Parliament and of the Council². The combination of authorisation procedures, standardised monitoring methods, automated emission measurement and regular environmental reporting demonstrates the integration of environmental control into the system of ongoing regulatory oversight of industrial activities. This regulatory framework transforms the function of environmental control: its application is geared not only towards identifying breaches of environmental legislation, but also towards the continuous monitoring of the extent to which production impacts the environment. As a result, the monitoring of industrial emissions has become an integral part of the mechanism for managing environmental risks in the EU's industrial sector (Dupont *et al.*, 2020).

Operation of the MRV system demonstrates the integration of procedures for monitoring, reporting and verifying environmental indicators into a supranational climate governance mechanism. The use of uniform standards for the collection and verification of data on greenhouse gas emissions ensures the comparability of climate indicators between Member States and the standardisation of procedures for assessing compliance with climate commitments. The interconnection between the Monitoring Mechanism Regulation and the MRV system indicates that environmental information, within the framework of the Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions "The European Green Deal"³, is used not only for statistical purposes but also as a tool for assessing the effectiveness of national climate policy. This forms a model for ensuring compliance with environmental requirements, within which monitoring results directly influence the mechanisms for monitoring Member States' fulfilment of their environmental commitments.

Transformation of the environmental governance system in the EU is accompanied by the integration of digital mechanisms for managing environmental information. The provisions of Directive No. 2007/2/EC of the European Parliament and of the Council⁴ have established the legal framework for the harmonisation of spatial environmental data

¹ Regulation (EU) No. 2021/1119 of the European Parliament and of the Council "Establishing the Framework for Achieving Climate Neutrality and Amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ("European Climate Law"). (2021, June). Retrieved from <https://eur-lex.europa.eu/eli/reg/2021/1119/oj>.

² Directive No. 2010/75/EU of the European Parliament and of the Council "On Industrial Emissions (Integrated Pollution Prevention and Control) (Recast) (Text with EEA Relevance)". (2010, November). Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32010L0075>.

³ Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions "The European Green Deal". (2019, December). Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52019DC0640>.

⁴ Directive No. 2007/2/EC of the European Parliament and of the Council "Establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)". (2007, March). Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32007L0002>.

and for ensuring the interoperability of Member States' national information systems. The interrelation between mechanisms for the digital exchange of environmental information and environmental monitoring procedures indicates the emergence of an integrated environmental governance system based on the use of environmental data. Within this model, digital environmental data is used in procedures for environmental risk assessment, climate planning, ensuring compliance with environmental legislation, and verifying adherence to environmental obligations. This highlights a shift in the functional significance of environmental information within the EU legal system: environmental data is being integrated into mechanisms for regulatory decision-making and supranational oversight.

An analysis of the provisions of Directive (EU) No. 2024/1203 of the European Parliament and of the Council¹ reveals a strengthening of the link between the environmental monitoring system and the mechanisms of legal liability under EU law. The expansion of the list of environmental offences is accompanied by an increased emphasis on procedures for identifying, documenting and recording environmental infringements, which integrates mechanisms for ensuring compliance with environmental legislation with digital monitoring and environmental reporting systems. The combination of control procedures, environmental data verification, digital monitoring and liability mechanisms forms a comprehensive system for ensuring environmental compliance, within which legal, digital and institutional tools are used to achieve the European Union's climate and environmental objectives.

The institutional framework for implementing the EU's environmental policy is based on the division of coordination, monitoring and enforcement powers between supranational and national bodies (Rivas *et al.*, 2021). This model ensures a combination of centralised monitoring of the implementation of climate and environmental targets with a decentralised mechanism for the practical application of environmental legislation by Member States. The balance of powers between EU institutions in the field of environmental oversight reflects the development of a system of multi-level environmental governance, within which mechanisms for monitoring, reporting and evaluating the fulfilment of environmental obligations are integrated into supranational regulatory oversight procedures.

The European Commission (n.d.a) coordinates the EU's environmental governance system, overseeing the implementation of the EU's environmental

acquis and assessing the compliance of Member States' national policies with the Union's climate and environmental objectives. The European Commission's powers are exercised through the Environmental Implementation Review mechanism, infringement proceedings for breaches of EU law, and a system of periodic assessments of the implementation of environmental legislation. The interaction of these instruments demonstrates that the Commission's functions extend beyond the coordination of environmental policy and include elements of ongoing supranational oversight of Member States' compliance with their environmental obligations.

The Directorate-General for Environment is responsible for coordinating environmental policy; its activities ensure coordination between the legislative, enforcement and analytical mechanisms of EU environmental regulation (European Commission, n.d.b). The relationship between the powers of the Directorate-General for Environment and the mechanisms for ensuring compliance with environmental legislation indicates that environmental oversight within the EU functions not merely as a system for responding to infringements, but as a mechanism for the ongoing monitoring of environmental policy implementation. The Directorate-General for Environment coordinates the processes of drafting environmental legislation, establishing monitoring criteria, assessing the state of implementation of environmental acts, and facilitating interaction between EU institutions and the national authorities of Member States. This approach ensures the integration of monitoring and environmental reporting procedures into the regulatory decision-making process at EU level.

Operation of the environmental monitoring system in the EU is based on the work of the European Environment Agency (n.d.) and the European Environment Information and Observation Network (n.d.), which ensure the collection, organisation, standardisation and dissemination of environmental information amongst Member States. The European Environment Agency's interaction with national information networks demonstrates that environmental data in EU law serves not only an informational but also a regulatory function. The European Environment Information and Observation Network ensures the harmonisation of environmental indicators, the standardisation of data collection procedures and the interoperability of national monitoring systems, thereby enabling supranational comparisons of environmental indicators. This forms a unified digital infrastructure for environmental monitoring, within which the results of environmental monitoring are integrated into procedures

¹ Directive (EU) No. 2024/1203 of the European Parliament and of the Council "On the Protection of the Environment Through Criminal Law and Replacing Directives 2008/99/EC and 2009/123/EC". (2024, April). Retrieved from <https://eur-lex.europa.eu/eli/dir/2024/1203/oj>.

for climate planning, environmental reporting and the assessment of the effectiveness of Member States' environmental policies (Gløersen *et al.*, 2022; Wang, 2022).

Mechanisms of interaction between supranational and national institutions in the field of environmental control operate based on the principle of multi-level governance. This model provides for a division of coordination and supervisory functions between EU institutions and the authorities of Member States (Leshchukh *et al.*, 2025). Supranational bodies ensure the establishment of uniform standards for monitoring, environmental reporting and the assessment of compliance with environmental legislation, whilst national environmental inspectorates conduct direct monitoring of compliance with environmental protection requirements by economic operators. The balance of these powers reflects the integration of national environmental control mechanisms into a single EU environmental compliance system, within which the results of national monitoring are used for supranational assessment of the effectiveness of environmental governance.

An overview of the regulatory, legal and institutional mechanisms for implementing EU environmental policy shows that, within the framework of the European Green Deal, a comprehensive model of environmental governance has emerged, in which mechanisms for monitoring, reporting, control and enforcement are integrated into the system for achieving the European Union's climate and environmental objectives. The analysis demonstrated that the functioning of this model is based on a combination of legally binding climate targets, the digitalisation of environmental monitoring, multi-level institutional coordination and procedures to ensure compliance with environmental legislation. As a result, environmental control in the EU is becoming a form of continuous regulatory oversight, within which environmental information is used not only to record the state of the environment, but also to assess the effectiveness of public policy, verify compliance with climate commitments and apply mechanisms of legal liability (Table 1).

Table 1. Structural characteristics of the EU's environmental governance model within the framework of the European Green Deal

Structural element of the model	Features of how EU operates	Mechanism for integration into the environmental governance system	Regulatory outcome
Climate legislation	Climate targets are established in legally binding European Union legislation and integrated into industrial, energy, transport and agricultural policies	Combination of the European Climate Law, the MRV system, and climate reporting mechanisms	Transformation of environmental monitoring into assessment of Member States' compliance with their climate commitments
Industrial environmental monitoring	Control of industrial emissions is based on continuous monitoring, automated measurement of emissions and regular environmental reporting	Integration of licensing procedures, standardised monitoring methods and digital environmental control systems	Shift from responding to environmental breaches to a system of continuous regulatory oversight
Digitalisation of environmental governance	Environmental data is used in procedures relating to planning, monitoring, environmental risk assessment and verification of compliance with environmental obligations	Operation of the Infrastructure for Spatial Information in the European Community (INSPIRE) and the European Environment Information and Observation Network (EIONET)	Development of an environmental governance system based on the integrated use of digital environmental data
Institutional coordination	Supranational and national bodies operate within a multi-level system of environmental control	Cooperation between the European Commission, the Directorate-General for the Environment, the European Environment Agency and national environmental inspectorates	Combination of centralised monitoring with decentralised law enforcement
Implementation of environmental legislation	Compliance with environmental requirements is ensured through a combination of monitoring, reporting, verification and legal liability mechanisms	Integration of the Environmental Implementation Review, infringement proceedings under EU law and the Environmental Crime Directive	Strengthening supranational oversight of the implementation of the European Union's environmental acquis

Source: compiled by the authors

Analysis of the structural elements of the EU's environmental governance model leads to the conclusion that its functioning is based on the integration of legal, institutional and digital mechanisms for environmental control. In contrast to sectoral models of environmental regulation, the EU system focuses on the continuous combination of monitoring procedures, environmental reporting, data

verification and enforcement mechanisms within a single regulatory oversight system. The analysis demonstrated that the European model is characterised by a high level of regulatory detail, the operation of a multi-level coordination system, the digitalisation of environmental monitoring and the integration of environmental information into management decision-making procedures. Despite the

existence of a single regulatory framework within the European Union, the practical implementation of environmental legislation varies across Member States. This is due to differences in administrative

and territorial organisation, the level of digitalisation of environmental monitoring, the organisation of control procedures, and the institutional capacity of public administration bodies (Table 2).

Table 2. Comparative analysis of the implementation of environmental legislation in EU Member States

Comparison criteria	Germany	France	The Netherlands	Poland
Organisation of an environmental monitoring system	Supervision is performed by authorities of the federal states within the framework of a decentralised management model	Coordination is ensured by central government bodies through environmental and climate planning system	Monitoring is conducted at national and regional levels, with involvement of specialised water and environmental protection agencies	Monitoring is conducted by central and provincial environmental supervision authorities
Integration of digital monitoring tools	Integrated federal and state environmental monitoring information systems are used	Digital systems are used to monitor climate indicators, industrial emissions and implement environmental programmes	Some environmental data is collected and transmitted automatically via integrated digital platforms	Digitalisation processes are progressing at varying rates depending on the region and the area of environmental monitoring
Implementation of requirements of Directive No. 2010/75/EU of the European Parliament and of the Council ¹	Monitoring emphasises large industrial plants using standardised monitoring procedures	Requirements of the directive were incorporated into the system of environmental permits and climate regulation	Monitoring of industrial emissions is combined with the management of natural resource use and spatial planning	Attention is devoted to modernisation of procedures for monitoring industrial emissions in line with EU requirements
Use of environmental data in management decision-making	Monitoring data are used at federal and state levels in environmental planning	Results of monitoring are incorporated into national and regional climate programmes	Data is used to assess environmental risks, manage water resources and conduct spatial planning	Use of data is expanding as the national system is adapted to meet EU requirements
Areas of concern identified by the Environmental Implementation Review	Reduction of emissions in the transport sector and restoration of biodiversity	Waste management and biodiversity conservation	Reduction of nitrogen load on ecosystems and achievement of climate targets	Air quality, waste management and institutional coordination
Features of engagement with the EU's supranational mechanisms	Integration of federal bodies with the EU's environmental reporting systems	Use of EU climate planning and reporting mechanisms	Integration of national information systems with EIONET and INSPIRE	Strengthening the integration of national monitoring procedures with EU requirements as part of the ongoing implementation of the Union's environmental acquis

Source: compiled by the authors based on Directorate-General for Environment (2025), Organisation for Economic Co-operation and Development (2025), European Environment Information and Observation Network (n.d.)

A comparative analysis shows that environmental legislation in EU Member States is implemented within a single regulatory framework; however, the practical mechanisms for its implementation vary depending on the specific features of each country's model of public administration. Differences can be observed in the organisation of environmental oversight and the level of digitalisation of monitoring procedures. Germany operates a decentralised model of environmental governance, under which supervisory powers are vested in the authorities of the

federal states. France, by contrast, is characterised by a centralised system of environmental policy coordination, which ensures a link between climate planning and environmental control mechanisms. The Netherlands demonstrates a high level of integration of environmental monitoring with digital platforms for natural resource management, whilst Poland continues to adapt its national environmental control system to the requirements of the European Union's environmental acquis. The comparison also showed that the effectiveness of environmental policy

¹ Directive No. 2010/75/EU of the European Parliament and of the Council "On Industrial Emissions (Integrated Pollution Prevention and Control) (Recast) (Text with EEA Relevance)". (2010, November). Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32010L0075>.

implementation is determined not so much by the content of environmental legislation – which is common to all Member States – as by the institutional capacity of public authorities to ensure its enforcement. A comparative analysis has shown that the countries studied differ in terms of the level of digitalisation of monitoring procedures, the nature of inter-agency coordination, the degree of integration of national information systems with European environmental data exchange networks, and the practice of using monitoring results in the management decision-making process. These factors determine the speed at which environmental risks are identified, the effectiveness of monitoring compliance with environmental protection requirements, and the extent to which climate targets are met.

At the same time, the findings of the Environmental Implementation Review 2025 (Directorate-General for the Environment, 2025) confirm that there is no one-size-fits-all model of environmental governance within the European Union. Each of the countries studied is characterised by specific challenges in implementing environmental policy, linked to the particularities of its economic structure, natural resource potential and the administrative organisation of public governance. This indicates that the effective implementation of environmental legislation requires a combination of standardised EU legal requirements with national institutional mechanisms for their implementation. The experience of Germany, France, the Netherlands and Poland demonstrates that the key conditions for an effective environmental policy are the integration of digital technologies into the monitoring system, proper coordination between levels of government, and the use of environmental data as a tool for ongoing regulatory oversight.

Implementation of European environmental standards in Ukraine's environmental monitoring and control system. The transformation of Ukraine's environmental policy is linked to the fulfilment of the obligations stipulated in the Association Agreement between the European Union and the European Atomic Energy Community and their Member States, of the one part, and Ukraine, of the other part¹. An analysis of the provisions of Chapter 6, "Environment", of the Association Agreement shows that the implementation of European environmental standards encompasses not only the

harmonisation of environmental legislation, but also the reform of mechanisms for environmental monitoring, environmental reporting and state control. Among the areas of cooperation, specific attention is given to air quality, waste management, industrial pollution, climate change and access to environmental information, which entails adapting national monitoring procedures to EU approaches. As a result, environmental monitoring is being integrated into the system for fulfilling Ukraine's international and European integration commitments.

An analysis of the regulatory framework for environmental control established following the adoption of Law of Ukraine No. 1264-XII² shows that the system of state environmental control was geared towards conducting inspections, recording breaches of environmental legislation and imposing administrative sanctions. This model is evident in the structure of the supervisory powers of state bodies and the mechanisms of legal liability for breaches of environmental legislation. Following the conclusion of the Association Agreement between Ukraine and the EU, the implementation of environmental impact assessment procedures, strategic environmental assessment and the MRV system has expanded the functions of environmental monitoring beyond administrative and supervisory activities. Differences between the EU and Ukrainian models can be seen in the functional significance of environmental information within the environmental governance system. In the EU, the results of environmental monitoring are integrated into mechanisms for climate planning, environmental risk assessment and supranational regulatory control. In Ukraine, environmental information is used within the framework of permitting procedures, state reporting and the supervisory activities of individual executive bodies, which results in fragmented environmental monitoring mechanisms and limits the integration of environmental data into the strategic planning system (Kornieiev, 2021).

The transposition of EU environmental law procedures into Ukrainian legislation has been accompanied by a partial expansion of environmental monitoring functions and the gradual use of environmental information in state planning and environmental risk assessment procedures. The adoption of Law of Ukraine No. 2059-VIII³ and Law of Ukraine No. 2354-VIII⁴ has integrated into national legislation

¹ Association Agreement between the European Union and the European Atomic Energy Community and their Member States, of the one part, and Ukraine, of the other part. (2014, June). Retrieved from <https://www.consilium.europa.eu/en/documents/treaties-agreements/agreement/?id=2014045>.

² Law of Ukraine No. 1264-XII "On Environmental Protection". (1991, June). Retrieved from <https://zakon.rada.gov.ua/laws/show/en/1264-12#Text>.

³ Law of Ukraine No. 2059-VIII "On Environmental Impact Assessment". (2017, May). Retrieved from <https://zakon.rada.gov.ua/laws/show/en/2059-19#Text>.

⁴ Law of Ukraine No. 2354-VIII "On Strategic Environmental Assessment". (2018, March). Retrieved from <https://zakon.rada.gov.ua/laws/show/en/2354-19#Text>.

mechanisms for environmental risk assessment, analysis of the impact of planned activities on the environment, and the consideration of environmental factors during the preparation of public planning documents. In contrast to a model of environmental control focused primarily on identifying breaches after economic activities have commenced, the procedures for environmental impact assessment and strategic environmental assessment provide for the use of environmental monitoring results at the stage of management decision-making. This alters the functional significance of environmental information within the system of state regulation and partially integrates the preventive mechanisms of environmental control characteristic of EU law. At the same time, an analysis of regulatory frameworks shows that procedures for environmental impact assessment, strategic environmental assessment, state environmental monitoring and the permitting process operate within different administrative mechanisms. Lack of a unified coordination system between these procedures limits the integration of environmental monitoring results into strategic planning and state environmental control mechanisms. This is associated with the division of powers amongst government bodies responsible for environmental protection. The Ministry of Economy, Environment and Agriculture of Ukraine (n.d.) and the State Environmental Inspectorate of Ukraine (n.d.) are responsible for formulating and implementing state environmental policy, as well as conducting supervisory functions. Monitoring of specific environmental components is entrusted to specialised bodies, in particular the State Agency of Water Resources of Ukraine (n.d.) and the State Forest Resources Agency of Ukraine (n.d.).

Differences between the EU and Ukrainian models are also evident in climate regulation. In the European Union, the MRV system is used for the standardised collection, verification and comparison of data on greenhouse gas emissions from Member States and is integrated into procedures for assessing compliance with climate commitments, preparing national energy and climate plans, and supranational climate monitoring. In Ukraine, mechanisms for monitoring, reporting and verifying greenhouse gas emissions were introduced by Law of Ukraine No. 377-IX¹ as part of the adaptation of national legislation to the EU's climate acquis. An analysis of the provisions of this Law shows that the functioning of the Ukrainian MRV system focuses on administering reporting by installation operators, verifying emissions data and establishing a national database on greenhouse gases. In contrast to EU model, the results of the Ukrainian MRV system have not yet been integrated into

mechanisms for assessing the effectiveness of climate policy, strategic planning procedures or the state environmental control system. This highlights differences in the functional significance of climate monitoring within the environmental governance systems of the EU and Ukraine.

A comparative analysis of the digitalisation of environmental monitoring highlights differences in the functional significance of digital environmental data within the environmental governance systems of the EU and Ukraine. In the EU, digital platforms for environmental information are used in procedures for assessing environmental risks, monitoring compliance with climate commitments, preparing regulatory decisions and verifying Member States' environmental reporting. This ensures interconnectivity between monitoring systems, climate planning and regulatory control mechanisms.

In Ukraine, digitalisation of environmental monitoring is related to the operation of the EcoSystem Environmental Platform (n.d.), the Unified Register for Environmental Impact Assessment (n.d.), electronic services in the field of waste management, and environmental reporting systems. An analysis of how these information resources operate shows that their purpose centres on the electronic administration of environmental procedures, ensuring access to environmental information and the compilation of state registers. The use of digital environmental data in environmental risk assessment, strategic planning and state environmental control procedures is sector-specific and takes place within the framework of individual administrative mechanisms. This indicates varying degrees of integration of digital monitoring systems into the environmental governance mechanisms of the EU and Ukraine.

A comparison of environmental policy implementation practices in Germany, France, the Netherlands and Poland revealed differences in the organisation of environmental control, the use of digital monitoring tools and the integration of environmental information into public administration processes. At the same time, the results of the analysis indicate that certain elements of national environmental governance models could be utilised in the further improvement of the environmental monitoring and control system in Ukraine. Therefore, it is advisable to identify the institutional and legal mechanisms that may be of practical interest for adaptation to the Ukrainian environmental governance system (Table 3). An analysis of environmental monitoring and control mechanisms in the EU and Ukraine shows that the differences between these models lie not only in the structure of

¹ Law of Ukraine No. 377-IX "On the Principles of Monitoring, Reporting and Verification of Greenhouse Gas Emissions". (2019, December). Retrieved from <https://zakon.rada.gov.ua/laws/show/377-20#Text>.

regulatory frameworks or the organisation of control procedures, but also in the functional significance of environmental monitoring within the system of environmental governance. In the European Union, mechanisms for monitoring, environmental reporting, digital data exchange and the enforcement of environmental obligations are integrated into a single

regulatory governance system geared towards achieving climate and environmental objectives. In this model, environmental information is used as a tool for assessing environmental risks, preparing regulatory decisions, verifying compliance with climate commitments and ensuring adherence to the EU's environmental acquis.

Table 3. Elements of the experience of EU Member States that could be used to improve the environmental monitoring and control system in Ukraine

Country	Identified characteristics of environmental governance	Potential for use in Ukraine
Germany	Exercise of supervisory powers at the level of the federal states and the integration of regional monitoring systems into the national environmental management system	Extension of the powers of regional authorities in environmental monitoring and the development of coordination mechanisms between central and local authorities
France	Integration of environmental monitoring with climate planning procedures and the implementation of national environmental programmes	Strengthening connections between environmental monitoring system, climate policy and strategic planning documents
Netherlands	Use of integrated digital platforms for the collection, processing and exchange of environmental data between public authorities	Further development of the EcoSystem Environmental Platform (n.d.) and the integration of environmental registers into a single digital environment
Poland	Aligning national environmental control mechanisms with the requirements of EU environmental legislation and the gradual modernisation of monitoring systems	Use of experience in adapting environmental legislation and the activities of environmental regulatory bodies to the requirements of EU law

Source: compiled by the authors

Ukrainian environmental monitoring and control system is undergoing regulatory and institutional transformation as part of its adaptation to EU environmental legislation. The implementation of environmental impact assessment procedures, strategic environmental assessment, mechanisms for monitoring, reporting and verifying greenhouse gas emissions, as well as the development of digital environmental platforms, indicate an expansion of the functions of environmental monitoring within the public administration system. At the same time, the analysis shows that mechanisms for environmental control, digital monitoring, environmental reporting and public planning continue to operate within the framework of separate administrative procedures. This is reflected in the fragmented distribution of regulatory powers, insufficient integration of environmental data across information systems, limited use of monitoring results in strategic planning procedures, and the absence of a single coordination mechanism for environmental governance.

The study found that the alignment of Ukrainian legislation with the EU's environmental acquis is primarily characterised by the implementation of specific procedural mechanisms, whilst the functional integration of environmental monitoring into the regulatory management system remains incomplete. This is evident in the separate operation of the systems for state environmental monitoring, licensing, environmental impact assessment, strategic environmental assessment and climate reporting. Unlike the EU model, under which the results of environmental

monitoring are used to assess compliance with climate commitments, verify the effectiveness of environmental policy and inform regulatory decisions, in Ukraine environmental information is predominantly used within the framework of monitoring, reporting and permitting procedures conducted by individual government bodies.

The results of the cross-country comparison indicate that improving the environmental monitoring and control system in Ukraine does not require the direct adoption of a specific national model of environmental governance. The experience of the countries studied demonstrates various approaches to organising environmental control, the digitalisation of monitoring procedures and the integration of environmental data into public administration processes. In this regard, it is advisable to adopt specific institutional and organisational solutions that meet the needs of the national environmental governance system. For Ukraine, experience of Germany regarding the coordination of regional environmental monitoring bodies is relevant, as is that of France regarding the interconnection of environmental monitoring with climate planning, that of the Netherlands regarding the integration of digital environmental data into unified information systems, and Poland's experience in adapting national institutions to the requirements of European Union environmental legislation. Application of these approaches could be addressed during the further improvement of the regulatory and organisational framework for the functioning of the environmental monitoring system in Ukraine.

■ Discussion

The study has shown that, within the framework of the European Green Deal, a comprehensive model of environmental governance has emerged in the EU, in which mechanisms for monitoring, reporting, verification and enforcement are integrated into the system for achieving the European Union's climate and environmental objectives. The study established that, in the current model of EU law, environmental monitoring serves not only an informational function but is also used as a tool for ongoing regulatory oversight of Member States' compliance with their climate commitments. The findings indicate a strengthening of the supranational nature of environmental control through the combination of climate reporting mechanisms, the digital exchange of environmental data, and procedures for assessing the alignment of national policies with decarbonisation targets. Furthermore, the study established that the EU's environmental governance system operates based on multi-level coordination between EU institutions and national authorities, ensuring the integration of environmental control into industrial, energy, transport and climate policies.

The results obtained are generally consistent with the findings of E. Derkenbaeva *et al.* (2026), who established that the implementation of EU environmental policy depends on a multi-level model of coordination between supranational and local institutions. The researchers demonstrated that, within the framework of the Positive Energy Areas initiative, mechanisms of Europeanisation are combined with local characteristics of administrative decision-making, resulting in heterogeneity in the practical implementation of environmental policy across different Member States. In contrast to this approach, the present study focused not on local differences in environmental governance, but on the transformation of regulatory and institutional mechanisms for environmental monitoring within the framework of the European Green Deal. At the same time, the findings of both studies concur in the conclusion that the role of coordination mechanisms and the digital exchange of environmental information is growing within the EU's environmental policy implementation system. The study found that the existing model of EU environmental governance is characterised by the integration of environmental control into the system of economic and industrial regulation, as a result of which environmental legislation is beginning to fulfil the function of structural regulation of decarbonisation processes. The study determined that the MRV mechanisms, the Environmental Implementation Review system and the INSPIRE digital infrastructure form a unified system of supranational oversight of the implementation of climate targets. These findings are consistent with those of G. Dominioni *et al.* (2025), who concluded that the European Green

Deal is gradually becoming a global regulatory model capable of influencing not only EU Member States but also the Union's external partners. The researchers found that dissemination of EU climate standards through trade, financial and investment mechanisms contribute to the extraterritorial expansion of the European Union's environmental regulation. In contrast to this approach, the present study focused primarily on internal mechanisms for environmental monitoring and control within the EU; however, both studies confirm the growing supranational nature of the European Union's environmental policy. The analysis also showed that the implementation of the European Green Deal is accompanied by a transformation in the functions of environmental control, which is shifting from responding to individual breaches of environmental legislation to a model of continuous regulatory oversight. The study established that the results of environmental monitoring are used in procedures to assess the effectiveness of public policy, verify compliance with climate commitments and apply mechanisms of legal liability. S. Filipović *et al.* (2022) substantiated the interconnection between the European Green Deal, the concept of a just transition and the Sustainable Development Goals. The study found that achieving climate neutrality in the EU is impossible without integrating environmental regulation with social and economic mechanisms to support transformational processes. Furthermore, the researchers emphasised that the implementation of EU climate policy requires the establishment of systems for the ongoing assessment of the effectiveness of environmental reforms and the monitoring of their socio-economic impact. These conclusions are consistent with the findings of a study which established that environmental monitoring in the EU is used not only to assess the state of the environment, but also to ensure the achievement of strategic climate transition objectives.

This study analysed the integration of digital mechanisms for managing environmental information into the EU's environmental governance system. The study established that the operation of the European Environment Information and Observation Network, INSPIRE and automated industrial emissions monitoring systems ensures the standardisation of environmental indicators and the interoperability of Member States' national information systems. As a result, environmental data is integrated into procedures for planning, monitoring, assessing environmental risks and verifying compliance with environmental obligations. Similar conclusions were reached by B. Li *et al.* (2025), who found that achieving climate neutrality in European industrial economies depends directly on a combination of environmental governance mechanisms, "green" financing and emission-reduction technologies. The researchers demonstrated that the digitalisation of environmental

monitoring and the use of environmental data in management decision-making contribute to improving the effectiveness of climate policy and environmental control. At the same time, this study focused primarily on the legal and institutional mechanisms underpinning the functioning of the environmental monitoring system, rather than on the economic instruments of environmental transformation.

The study has shown that the implementation of European environmental standards within Ukraine's environmental monitoring and control system is characterised by a gradual transition from a fragmented approach to environmental regulation towards an integrated model of environmental governance, aligned with the requirements of the EU acquis. It has been established that the adaptation of Ukrainian legislation is accompanied by the expansion of environmental reporting mechanisms, the digitalisation of monitoring procedures, the harmonisation of environmental assessment standards, and the integration of climate targets into the system of public administration. At the same time, the study's findings indicate that the implementation of European environmental standards remains uneven due to the fragmentation of institutional powers, insufficient coordination between public authorities and a limited level of digital integration of environmental information systems. It has also been established that the Ukrainian environmental control system remains predominantly reactive in nature, whereas the EU model is geared towards continuous regulatory oversight and preventive management of environmental risks. I. Dir (2025) found that the harmonisation of Ukrainian legislation with EU law, within the framework of implementing the environmental acquis, is characterised by uneven adaptation across individual sectors of legal regulation. The study demonstrated that areas relating to the institutional framework for enforcing environmental legislation and the establishment of an effective system of administrative control remain challenging for Ukraine. The author also emphasised that the formal alignment of regulatory acts with EU standards does not automatically ensure effective environmental governance without a transformation of the institutional mechanisms for their implementation. This study found that the problem with implementing European environmental standards in Ukraine lies not only in the adaptation of legislation, but also in the insufficient integration of monitoring, reporting and control mechanisms into the system of public administration.

The study also found that environmental monitoring in Ukraine is gradually being integrated into the mechanisms for implementing climate and energy policy in line with the objectives of the European Green Deal. The study determined that the development of environmental reporting systems, the

introduction of procedures for assessing industrial emissions and the expansion of climate regulation mechanisms are accompanied using financial instruments to incentivise environmental transformation. These findings correlate with the conclusions of I. Nazarkevych & O. Sych (2023), who concluded that environmental taxation in Ukraine is gradually beginning to function as a tool for implementing the European Green Deal. The researchers found that harmonising tax policy with the EU's climate objectives facilitates the integration of environmental criteria into economic regulation mechanisms and stimulates the development of "green" transformation. At the same time, aforementioned authors focused primarily on the financial and economic mechanisms of environmental policy, whereas the present study emphasised the legal and institutional mechanisms governing the functioning of the environmental monitoring and control system.

Study results indicate that the adaptation of the Ukrainian environmental control system to EU standards is accompanied by a gradual expansion of environmental impact assessment procedures, stricter requirements for environmental reporting, and the development of mechanisms for the digital exchange of environmental information. At the same time, the study established that, in practice, the effectiveness of these mechanisms is limited by a lack of coordination between central and regional environmental management bodies, as well as by the fragmented nature of information systems. O. Uliutina & A. Starokin (2024) found that the legal framework for environmental protection in Ukraine remains less systematic compared to the EU model. The researchers demonstrated that in European countries, environmental legislation operates in conjunction with mechanisms for state control, digital monitoring and a system for ensuring compliance with environmental requirements. The authors also emphasised that Ukraine continues to face problems of insufficient institutional coordination and the incomplete integration of environmental monitoring into the management decision-making system. These conclusions are consistent with the findings of the study, which established that the implementation of EU environmental standards in Ukraine has not been accompanied by the full development of an integrated system of environmental governance. The study also found that the process of harmonising the Ukrainian environmental monitoring system with EU requirements is characterised by a gradual transition towards the use of digital mechanisms for collecting and processing environmental information. The study established that the introduction of European standards for environmental reporting and data verification procedures creates the conditions for ensuring the compatibility of

Ukrainian environmental information systems with European digital platforms. At the same time, the study's findings showed that the level of digitalisation of environmental monitoring in Ukraine lags significantly behind EU practices, particularly in the areas of automated monitoring of industrial emissions and the integrated exchange of environmental data between government bodies.

Consequently, implementation of European environmental standards in Ukraine is accompanied by a gradual transformation of the environmental monitoring and control system in line with the principles of the European Green Deal. At the same time, it has been established that the effectiveness of this process is hampered by insufficient institutional coordination, the fragmented nature of the digital infrastructure, and the incomplete integration of monitoring, reporting and control procedures into the environmental governance system. In contrast to most of the analysed studies, which primarily address individual aspects of the harmonisation of environmental legislation or the financial mechanisms of the "green" transition, this study characterised the interrelationship between legal, institutional and digital mechanisms for the implementation of European environmental standards within Ukraine's environmental monitoring and control system.

■ Conclusions

The study has shown that the implementation of the European Union's environmental policy within the framework of the European Green Deal is accompanied by the development of an integrated system of environmental governance, in which climate, industrial, energy and digital mechanisms operate within a single regulatory framework. In contrast to the sectoral approach to environmental protection, which has long prevailed in environmental regulation, the current EU model envisages the interconnected use of mechanisms for environmental monitoring, climate planning, environmental risk assessment, digital data management and the monitoring of compliance with environmental obligations. An analysis of EU legislation identified the main structural elements of this model: climate regulation, industrial environmental control, the digitalisation of environmental governance, multi-level institutional coordination, and mechanisms to ensure compliance with environmental legislation. The study established that environmental monitoring in the EU is integrated into the procedures for assessing Member States' fulfilment of climate commitments, and that

■ References

- [1] Bondarenko, V., Pokynchereda, V., Pidvalna, O., Kolesnyk, T., & Sokoliuk, S. (2023). Green economy as a prerequisite for sustainable development: Analysis of international and Ukrainian experience. *European Journal of Sustainable Development*, 12(1), 221-234. [doi: 10.14207/ejsd.2023.v12n1p221](https://doi.org/10.14207/ejsd.2023.v12n1p221).

environmental reporting is used not only to gather environmental information but also as a component of the system of regulatory control and management decision-making.

Analysis of institutional mechanisms has shown that the coordination of EU environmental policy is based on cooperation between the European Commission, the Directorate-General for the Environment, the European Environment Agency, the European Environment Information and Observation Network, and the national authorities of the Member States. A comparison of practices in Germany, France, the Netherlands and Poland revealed differences in the organisation of environmental control, the use of digital monitoring tools and the integration of environmental data into public administration processes. The study established that in Ukraine, the implementation of European environmental standards is accompanied by the development of environmental impact assessment procedures, strategic environmental assessment and a system for monitoring, reporting and verifying greenhouse gas emissions. At the same time, environmental monitoring, state control, environmental reporting and permitting procedures continue to operate within separate administrative mechanisms. A comparative analysis has revealed differences between the EU and Ukrainian models in the areas of institutional coordination, the digitalisation of environmental monitoring, the use of environmental data and mechanisms for ensuring compliance with environmental legislation. The limitations of the study are related to the analysis of predominantly regulatory and institutional aspects of environmental governance, without an assessment of the actual effectiveness of environmental policy implementation at the level of individual states. Further research should analyse practical outcomes of the operation of greenhouse gas emissions MRV systems in Ukraine and EU Member States.

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■ Conflict of Interest

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- [2] Bruch, N., Knodt, M., & Ringel, M. (2024). Advocating harder soft governance for the European Green Deal. Stakeholder perspectives on the revision of the EU governance regulation. *Energy Policy*, 192, article number 114255. doi: [10.1016/j.enpol.2024.114255](https://doi.org/10.1016/j.enpol.2024.114255).
- [3] Calliess, C. (2026). The European Green Deal and Its “Constitutional” implications: Need for a “Greening of the Treaties”? In M. Reese, R. Schaller, T. Markus & K. Faßbender (Eds.), *Legal implementation and impacts of the European Green Deal* (pp. 3-55). Cham: Springer. doi: [10.1007/978-3-032-17197-9_1](https://doi.org/10.1007/978-3-032-17197-9_1).
- [4] Derkenbaeva, E., Yoo, H.K., Hofstede, G.J., Galanakis, K., & Ackrill, R. (2026) Europeanisation and cultural variation in policy-making: The case of the EU positive energy districts initiative. *JCMS: Journal of Common Market Studies*, 64(2), 762-786. doi: [10.1111/jcms.13769](https://doi.org/10.1111/jcms.13769).
- [5] Dir, I. (2025). Legal harmonisation of Ukraine with European Union law: Institutional and normative analysis of the implementation of 33 chapters of the *acquis communautaire*. *Visegrad Journal on Human Rights*, 4, 16-29. doi: [10.61345/1339-7915.2025.4.3](https://doi.org/10.61345/1339-7915.2025.4.3).
- [6] Directorate-General for Environment. (2025). *2025 environmental implementation review*. Retrieved from <https://environment.ec.europa.eu/publications/2025-environmental-implementation-review-en>.
- [7] Dominioni, G., Parks, L. & Pauli, M. (2025). The external dimensions of the European Green Deal. *International Environmental Agreements: Politics, Law and Economics*, 25, 171-176. doi: [10.1007/s10784-025-09682-0](https://doi.org/10.1007/s10784-025-09682-0).
- [8] Dupont, C., Oberthür, S., & von Homeyer, I. (2020). The Covid-19 crisis: a critical juncture for EU climate policy development? *Journal of European Integration*, 42(8), 1095-1110. doi: [10.1080/07036337.2020.1853117](https://doi.org/10.1080/07036337.2020.1853117).
- [9] EcoSystem Environmental Platform. (n.d.). Retrieved from <https://eco.gov.ua/>.
- [10] European Commission. (n.d.a). *Ethics and good administration*. Retrieved from <https://commission.europa.eu/about/service-standards-and-principles/ethics-and-good-administration-en>.
- [11] European Commission. (n.d.b). *Environment*. Retrieved from <https://commission.europa.eu/about/departments-and-executive-agencies/environment-en>.
- [12] European Environment Agency. (2025). *Europe’s environment 2025*. Retrieved from <https://www.eea.europa.eu/en/europe-environment-2025>.
- [13] European Environment Agency. (n.d.). *Publications*. Retrieved from https://www.eea.europa.eu/en/analysis/publications?size=n_10.
- [14] European Environment Information and Observation Network. (n.d.). About the Eionet. Retrieved from <https://www.eionet.europa.eu/about/about-eionet>.
- [15] Filipović, S., Lior, N., & Radovanović, M. (2022). The green deal – just transition and sustainable development goals Nexus. *Renewable and Sustainable Energy Reviews*, 168, article number 112759. doi: [10.1016/j.rser.2022.112759](https://doi.org/10.1016/j.rser.2022.112759).
- [16] Gløersen, E., Furtado, M.M., Gorny, H., Münch, A., Alessandrini, M., & Bettini, C. (2022). *Implementing the European Green Deal: Handbook for local and regional governments*. Brussels: European Committee of the Regions. doi: [10.2863/359336](https://doi.org/10.2863/359336).
- [17] Graziano, P. (2024). The politics of the EU eco-social policies. *European Political Science*, 23(1), 27-38. doi: [10.1057/s41304-023-00455-4](https://doi.org/10.1057/s41304-023-00455-4).
- [18] Hereu-Morales, J., Segarra, A., & Valderrama, C. (2024). The European (Green?) Deal: A systematic analysis of environmental sustainability. *Sustainable Development*, 32(1), 647-661. doi: [10.1002/sd.2671](https://doi.org/10.1002/sd.2671).
- [19] Ivanchuk, O. (2025). Main directions of harmonization of Ukraine’s environmental legislation with EU law. *Actual Problems of Improving Current Legislation of Ukraine*, 69. doi: [10.15330/apiclu.69.3.1-3.11](https://doi.org/10.15330/apiclu.69.3.1-3.11).
- [20] Kornieiev, Yu. (2021). The concept and legal regulation of environmental safety in Ukraine. *Scientific Bulletin of the International Humanitarian University. Series: Jurisprudence: A Collection of Scientific Papers*, 49, 122-125. doi: [10.32841/2307-1745.2021.49.26](https://doi.org/10.32841/2307-1745.2021.49.26).
- [21] Leshchukh, I., Patytska, K., Bashynska, Y., Nestor, O., & Kvak, S. (2025). Integrating the European Green Deal into local governance: administrative capacities and institutional challenges for territorial communities. *Agricultural and Resource Economics: International Scientific E-Journal*, 11(4), 196-226. doi: [10.51599/are.2025.11.04.07](https://doi.org/10.51599/are.2025.11.04.07).
- [22] Li, B., Wang, X., Khurshid, A., & Saleem, S.F. (2025). Environmental governance, green finance, and mitigation technologies: pathways to carbon neutrality in European industrial economies. *International Journal of Environmental Science and Technology*, 22, 14899-14912. doi: [10.1007/s13762-025-06608-w](https://doi.org/10.1007/s13762-025-06608-w).
- [23] Ministry of Economy, Environment and Agriculture of Ukraine. (n.d.). *Plans and reports*. Retrieved from <https://surl.lt/gtjvfw>.
- [24] Nazarkevych, I., & Sych, O. (2023). Taxation as a tool of implementation of the EU Green Deal in Ukraine. *Regional Science Policy & Practice*, 15(1), 144-161. doi: [10.1111/rsp3.12596](https://doi.org/10.1111/rsp3.12596).

- [25] Olczyk, M., & Kuc-Czarnecka, M. (2025). European Green Deal Index: A new composite tool for monitoring European Union's Green Deal strategy. *Journal of Cleaner Production*, 495, article number 145077. doi: [10.1016/j.jclepro.2025.145077](https://doi.org/10.1016/j.jclepro.2025.145077).
- [26] Organisation for Economic Co-operation and Development. (2025). *Environment at a glance: France*. Retrieved from <https://surl.li/uudpef>.
- [27] Rivas, S., Urraca, R., Bertoldi, P., & Thiel, C. (2021). Towards the EU Green Deal: Local key factors to achieve ambitious 2030 climate targets. *Journal of Cleaner Production*, 320, article number 128878. doi: [10.1016/j.jclepro.2021.128878](https://doi.org/10.1016/j.jclepro.2021.128878).
- [28] Sandmann, L., Bülbül, E., Castaño-Rosa, R., Hanke, F., Großmann, K., Guyet, R., Jiglau, G., Laakso, S., Nuorivaara, E., & Vornicu, A. (2024). The European Green Deal and its translation into action: Multilevel governance perspectives on just transition. *Energy Research & Social Science*, 115, article number 103659. doi: [10.1016/j.erss.2024.103659](https://doi.org/10.1016/j.erss.2024.103659).
- [29] Sandri, S., Hussein, H., Alshyab, N., & Sagatowski, J. (2025). The European Green Deal: Challenges and opportunities for the Southern Mediterranean. *Mediterranean Politics*, 30(1), 196-207. doi: [10.1080/13629395.2023.2237295](https://doi.org/10.1080/13629395.2023.2237295).
- [30] State Agency of Water Resources of Ukraine. (n.d.). *Activity*. Retrieved from <https://davr.gov.ua/diyalnist>.
- [31] State Environmental Inspectorate of Ukraine. (n.d.). *Reports*. Retrieved from https://dei.gov.ua/post?category_id=19&post_type_id=2.
- [32] State Forest Resources Agency of Ukraine. (n.d.). *Plans and reports on the work of the State Forestry Agency*. Retrieved from <https://forest.gov.ua/agentstvo/plani-ta-zviti-shchodo-roboti-derzhlisagentstva>.
- [33] Testi, A., Zetti, I., Tarsi, E., Fontana, C., Gisotti, M.R., & Rossi, M. (2023). Supporting local implementation of the European Green Deal through a place-based, participatory approach: Methodology for a comprehensive analytical framework. *Sustainability*, 15(20), article number 15098. doi: [10.3390/su152015098](https://doi.org/10.3390/su152015098).
- [34] Uliutina, O., & Starokin, A. (2024). Legal support for environmental protection in Ukraine and EU countries. *Law. Human. Environment*, 15(4), 124-143. doi: [10.31548/law/4.2024.124](https://doi.org/10.31548/law/4.2024.124).
- [35] Unified Register for Environmental Impact Assessment. (n.d.). *Legislative framework*. Retrieved from <https://eia.menr.gov.ua/en#legislation>.
- [36] Wang, Y. (2022). The impact of the EU Green New Deal on EU climate leadership: The implementation of European Green Deal as an example. *BCP Social Sciences & Humanities*, 17, 79-84. doi: [10.54691/bcpssh.v17i.622](https://doi.org/10.54691/bcpssh.v17i.622).
- [37] Witajewska-Baltvilka, B., Helepciuc, F.-E., Mangalagiu, D., & Todor, A. (2024). Politicization of climate change and Central and Eastern European countries' stance towards the European Green Deal. *Global Environmental Change*, 89, article number 102932. doi: [10.1016/j.gloenvcha.2024.102932](https://doi.org/10.1016/j.gloenvcha.2024.102932).
- [38] Yakushev, I., Hlamazda, P., Shevchuk, L., Starchuk, O., & Novosad, I. (2026). Legal aspects of Ukraine's energy transition during war and European integration: Implications for sustainable development. *European Journal of Sustainable Development Research*, 10(1), article number em0356. doi: [10.29333/ejosdr/17496](https://doi.org/10.29333/ejosdr/17496).

Інституційно-правові механізми екологічного моніторингу та контролю в межах Європейського зеленого курсу: порівняльний аналіз політики ЄС та України

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■ **Анотація.** Метою дослідження був порівняльний аналіз механізмів екологічного моніторингу та контролю Європейського Союзу й України з огляду на сучасні вимоги Європейського зеленого курсу. У дослідженні застосовано формально-юридичний, інституційний та порівняльно-правовий методи, використання яких дало змогу проаналізувати нормативно-правові засади екологічного моніторингу та контролю, особливості інституційної координації екологічного врядування, а також порівняти моделі екологічного регулювання Європейського Союзу й України. Доведено, що в межах Європейського зеленого курсу сформувалася інтегрована модель екологічного врядування, яка поєднує механізми кліматичного регулювання, промислового екологічного контролю, цифровізації екологічної інформації, багаторівневої інституційної координації та забезпечення виконання екологічного законодавства. Виокремлено п'ять структурних елементів цієї моделі та встановлено, що системи моніторингу, звітності й верифікації викидів парникових газів, а також Європейська мережа екологічної інформації та спостереження забезпечують інтеграцію екологічних даних у процедури кліматичного планування, оцінки екологічних ризиків і наднаціонального контролю за виконанням кліматичних зобов'язань. Визначено, що екологічний моніторинг у Європейському Союзі трансформувався з механізму фіксації порушень природоохоронного законодавства в систему постійного регуляторного нагляду й оцінювання ефективності екологічної політики. У процесі дослідження також встановлено, що імплементація європейських екологічних стандартів в Україні супроводжується розширенням функцій екологічного моніторингу через інтеграцію процедур оцінювання впливу на довкілля, стратегічного екологічного оцінювання та системи моніторингу, звітності й верифікації викидів парникових газів. Виявлено, що в Україні екологічний моніторинг

переважно використовують у межах контрольних, звітних і дозвільних процедур, натомість у Європейському Союзі результати моніторингу інтегруються в механізми стратегічного планування, оцінювання екологічних ризиків і перевірки виконання кліматичних зобов'язань. Практичне значення отриманих результатів полягає в можливості використання виявлених структурних і функціональних відмінностей між моделями Європейського Союзу й України для подальшої гармонізації української системи екологічного моніторингу та контролю з правовим доробком Європейського Союзу у сфері охорони навколишнього природного середовища

■ **Ключові слова:** екологічне право; кліматичне право; екологічна політика; кліматичне планування; оцінка екологічних ризиків; виконання кліматичних зобов'язань; гармонізація законодавства