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Policy of an industrial enterprise on the implementation of environmental innovations in the transition to a green economy

Abstract. The relevance of this research is determined by the need for the economic transformation of industrial enterprises on the principles of environmental sustainability in the face of global environmental challenges, resource constraints, and increasing regulatory pressure. This situation necessitates the formation of an effective economic policy for implementing environmental innovations. The purpose of the study was to substantiate the theoretical and methodological foundations for developing an effective environmental policy for industrial enterprises in the context of integrating environmental innovations into strategic planning, aimed at achieving sustainable development, enhancing competitiveness, and ensuring socio-economic resilience. To achieve this goal, a set of general scientific and special methods was applied, including: analysis and synthesis for systematising scientific approaches; induction and deduction for logical generalisation; a systems approach for evaluating policy interconnections; structural-functional analysis for identifying the components of environmental policy; and a graphical method for visualising the integration of environmental objectives. The main goals of the environmental policy of industrial enterprises have been substantiated, including: minimising technogenic impact, rational use of resources, introduction of "green" technologies, compliance with environmental standards, and fostering an environmental corporate culture. The theoretical principles for integrating environmental objectives into the strategic planning of industrial enterprises have been substantiated. A policy for industrial enterprises to implement environmental innovations has been proposed, encompassing: strategic planning that considers environmental objectives; investment policy to support environmental innovations; development of human capital and competencies; the "quintuple helix" model for organising cooperation among various stakeholders; a monitoring and evaluation system for the effectiveness of implemented innovations to ensure compliance with environmental standards and to adjust development strategies; and corporate social responsibility aimed at building a positive image and promoting sustainable environmental practices. The research results can be applied to enhance the economic resilience of enterprises and facilitate their adaptation to the requirements of the green economy

Keywords: environmental policy; sustainable development economy; circular economy; environmental innovations; technological changes in industry

INTRODUCTION

Modern industrial enterprises operate amid growing global environmental pressure, rising demands for resource efficiency, and the need to align with sustainable development goals. In this context, ecological innovations become not only a technological or ethical necessity but a key economic driver of competitiveness and resilience within strict regulatory and societal frameworks. However, many enterprises still approach "green" innovation reactively and

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without strategic coherence, limiting large-scale impact. The effectiveness of ecological innovation depends on the synergy between national economic policy, research initiatives, and institutional mechanisms within firms. Moreover, shifts toward electromobility and production digitalisation require economic adaptation of industrial processes to new technological realities.

Formulating an effective industrial policy for implementing ecological innovations requires a solid scientific foundation that integrates sustainable development principles and fosters systemic collaboration among key stakeholders. In the context of the green economy, innovation policy becomes a vital tool for achieving low-carbon growth, resource efficiency, and environmental resilience, while responding to global challenges such as climate change. According to V. Döme *et al*. (2025), economies with well-coordinated green policy instruments show greater success in promoting sustainable innovation across sectors. A crucial economic factor in shaping green innovation policy lies in the connection between research and development (R&D) investment and the reduction of carbon emissions. Y. Fernández *et al*. (2018) demonstrated that both public and corporate funding of ecological innovation contribute directly to lowering environmental pressure. Similarly, P. Naruetharadhol *et al*. (2024) highlighted that public policy plays a decisive role in creating global green innovation ecosystems, particularly in economies engaged in international cooperation.

M. Kucheriava & I. Bychykhin (2024) explored the implementation of green and circular economy concepts as tools for achieving sustainable development goals (and ensuring state economic security. The authors argued that the successful implementation of these economic models requires not only technological changes but also institutional adjustments, including improvements in legislation, financial mechanisms, and support for innovation. They emphasised that the transition to a circular economy can not only reduce the environmental impact but also strengthen national economic security by decreasing dependency on imported resources and enhancing resilience to external economic shocks. The article also proposed a model for integrating green and circular principles at the national level, along with policy recommendations to stimulate ecological investments and develop the corresponding infrastructure.

The evolution of the "triple", "quadruple", and "quintuple helix" models provides a conceptual framework for the green economy by linking science, industry, government, civil society, and the natural environment. Such systemic approaches enable industrial enterprises to integrate environmental goals into their economic strategies and innovation ecosystems. M. Roman & K. Fellnhofer (2022) stressed the value of public participation in regional planning for decentralised and transparent decision-making, while H. Zakaria *et al*. (2024) noted that these models continue to evolve toward deeper interdisciplinarity within green transition research. The advancement of a green economy also depends on the effective combination of policy instruments supporting the sustainable transition.

F. Kern *et al*. (2019) emphasised the need to balance direct economic incentives (subsidies, tax benefits) with softer tools such as education, certification, and advisory programmes. Furthermore, modern predictive models based on grey analysis (Duan & Pang, 2023) enhance decision-making efficiency in energy-saving innovation, a core component of green industrial transformation. Overall, contemporary research confirms the importance of a comprehensive, interdisciplinary approach to developing enterprise-level green innovation policies that integrate sustainability objectives into strategic planning, strengthen competitiveness, and contribute to long-term socio-economic stability. Therefore, the aim of this research was to substantiate the theoretical and methodological foundations for developing an effective green innovation policy for industrial enterprises.

MATERIALS AND METHODS

To achieve the stated research goal, a comprehensive set of general scientific and specialised methods was applied. The methodological framework integrates principles of sustainable development, the green economy, and systemic analysis of industrial transformation processes. The analytical and synthetic methods were used to examine and generalise scientific approaches to forming environmental and innovation policies within the context of a green economy. These methods enabled the identification of structural components that determine the efficiency of integrating ecological innovations into enterprise's strategy. Induction and deduction were employed to logically formulate conclusions regarding the relationship between environmental innovations, competitiveness, and economic resilience, thus outlining causal links between investment in green technologies and sustainable industrial growth.

A system approach served as the core methodological principle, allowing for the evaluation of interconnections between innovation, environmental, resource, and personnel policies. This approach provided a holistic understanding of how ecological objectives can be embedded in the economic and operational systems of industrial enterprises. The structural-functional analysis was applied to define the key elements of environmental policy that ensure its effective implementation within circular economy frameworks, including waste minimisation, energy efficiency, and low-carbon production strategies. To visualise and systematise the findings, a graphical method was used to construct conceptual models illustrating the integration of environmental goals into strategic planning processes. The stakeholder analysis was conducted within the framework of the "quintuple helix" innovation model, which served as a methodological basis for evaluating the interaction between business, government, academia, civil society, and the natural environment in shaping green innovation policy.

The research also relied on comparative analysis, applied to assess national and international practices of green innovation policy implementation, with reference to studies by OECD (2019a; 2019b; 2021; 2023; 2024a; 2024b), P. Naruetharadhol *et al*. (2024), and V. Döme *et al*. (2025). This made it possible to identify effective policy instruments and mechanisms for stimulating sustainable technological development. Statistical methods were used to generalise data from secondary sources, including corporate sustainability reports and international environmental standards (ISO 14001:2015, 2015), to determine the level of ecological integration in industrial enterprises. The

systematisation and modelling methods were applied to develop a conceptual framework for enterprise-level green innovation policy. This framework combines strategic planning, investments, human capital development, and environmental performance monitoring, ensuring coherence between economic objectives and sustainability priorities. Through the integration of these methodological tools, the study provides a scientifically grounded foundation for designing adaptive, innovation-driven strategies for industrial enterprises transitioning toward a green economy.

RESULTS AND DISCUSSION

Modern conditions of the global environmental crisis and the growing need for a transition towards a green economy model necessitate profound industrial transformation aimed at minimising negative environmental impacts and ensuring sustainable economic growth. Industrial enterprises seeking long-term competitiveness increasingly implement innovative technologies that not only reduce energy consumption and pollutant emissions but also create new economic opportunities within the green economy – including the development of renewable energy, resource reuse, and environmentally oriented products. In this context, a need arises for the formation of an integrated approach to the development and implementation of industrial policy in the field of environmental innovations that directly contribute to the establishment of a green economy.

The environmental policy of industrial enterprises should be considered an instrument for the transition to a green economy, encompassing a set of measures, strategies, and principles aimed at minimising the negative environmental impact of production, ensuring efficient use of natural resources, and implementing environmentally safe technologies. The primary objectives of such a policy include:

- reducing anthropogenic pressure on the environment through the implementation of low-carbon processes, energy-efficient technologies, and the "zero-waste" concept;
- rational utilisation of natural resources, in particular through the adoption of resource-saving technologies and transition to renewable energy sources;
- active application of environmentally safe innovations and "green" technologies, especially within the framework of the circular economy;
- compliance with international and national environmental standards and transparency of environmental reporting;
- formation of a corporate culture focused on sustainable development, environmental awareness, and social responsibility.

Such a multifaceted environmental policy ensures long-term competitiveness and socio-economic resilience of industrial enterprises. For this reason, integration of the above-mentioned environmental policy objectives into corporate strategic planning becomes a prerequisite for achieving sustainable development and enhancing competitiveness in the international market. Integration of environmental goals into strategic planning should include the development of sustainability policies, identification of environmental performance indicators, and establishment of greenhouse gas emission reduction targets (Döme *et al.*, 2025). This approach enables enterprises not only to respond to contemporary environmental challenges but also to ensure long-term economic stability.

An innovation policy aimed at sustainable development should focus innovation efforts not only on technological progress but also on ecological efficiency, contributing to the formation of a green economy. This involves support for low-carbon and environmentally clean technologies, as well as "smart city" initiatives that promote reduced resource consumption and lower emissions of harmful substances (OECD, 2019a; 2019b). To achieve these objectives, enterprises are required to implement environmental regulations such as ISO 14001:2015 (2015), which provide a structured framework for setting environmental goals, monitoring their attainment, and continuously improving environmental performance. At the same time, it is essential to establish partnerships among enterprises, stakeholders, research institutions, government bodies, and local communities, engaging them in the development and implementation of environmental strategies.

However, such integration should also encompass the transformation of economic models towards a green economy. The transition to a green economy involves adapting business models to the principles of circularity – minimising waste and maximising resource use (OECD, 2021). This entails shifting production towards renewable energy sources, developing environmentally friendly products, and implementing systems for recycling and material reuse. Circular models contribute to the creation of new market opportunities while simultaneously ensuring both economic and environmental efficiency. Therefore, the effective integration of environmental objectives into the strategic planning of industrial enterprises requires a comprehensive revision of internal corporate policies, particularly in the areas of innovation, resource allocation, and value chain formation (Fig. 1).

Integration of environmental objectives represents a key factor in the economic transition towards a green growth model. This process involves not only technical but also socio-economic transformations across all levels of enterprise functioning – from production organisation to interactions with markets and regulatory institutions. Such integration contributes to emission reduction, more efficient resource use, and the creation of new economic activities focused on environmental value. Implementation of environmental innovations within industrial enterprises requires substantial investment in R&D, as such innovations involve the creation of new technologies and processes aimed at reducing negative environmental impacts. In particular, the development of clean technologies supports the reduction of greenhouse gas emissions, improvement of energy efficiency, and utilisation of renewable energy sources. Investment in R&D provides the scientific foundation necessary for the design of innovative solutions (Fernández *et al.*, 2018).

Therefore, industrial enterprises should allocate resources to the development and implementation of clean technologies, energy-efficient processes, and renewable energy sources. The study by P. Naruetharadhol *et al.* (2024), devoted to promoting the adoption of environmental innovations, emphasises the necessity of a comprehensive approach to establishing mechanisms that support innovation activities aimed at achieving sustainable

development. The authors highlight that effective policy in the field of environmental innovation must combine both financial incentives and infrastructural support, which should function synergistically to maximise outcomes. The authors of the current study concur with this perspective (Fig. 2).

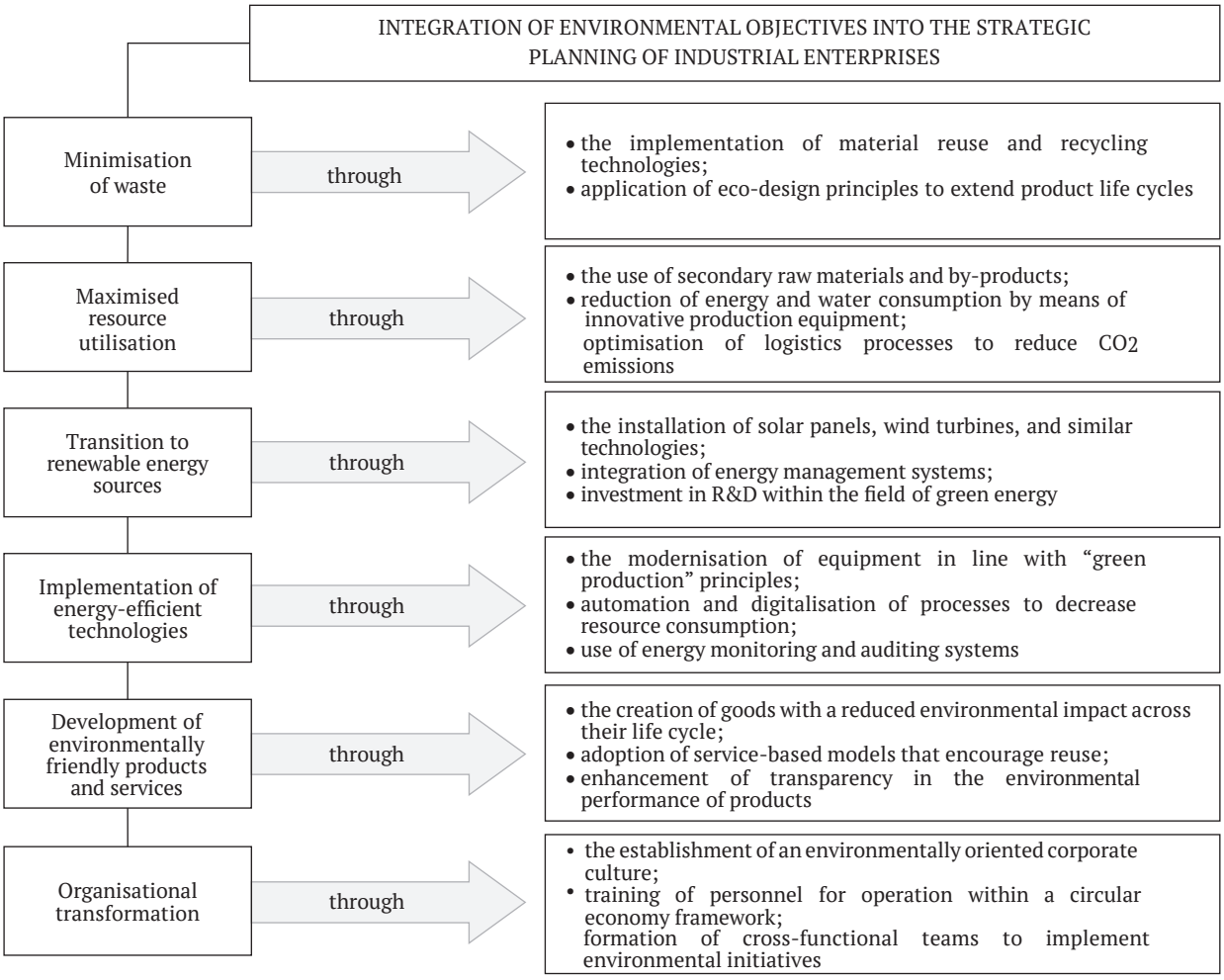

Figure 1. Integration of environmental objectives into the strategic planning of industrial enterprises
Source: developed by author

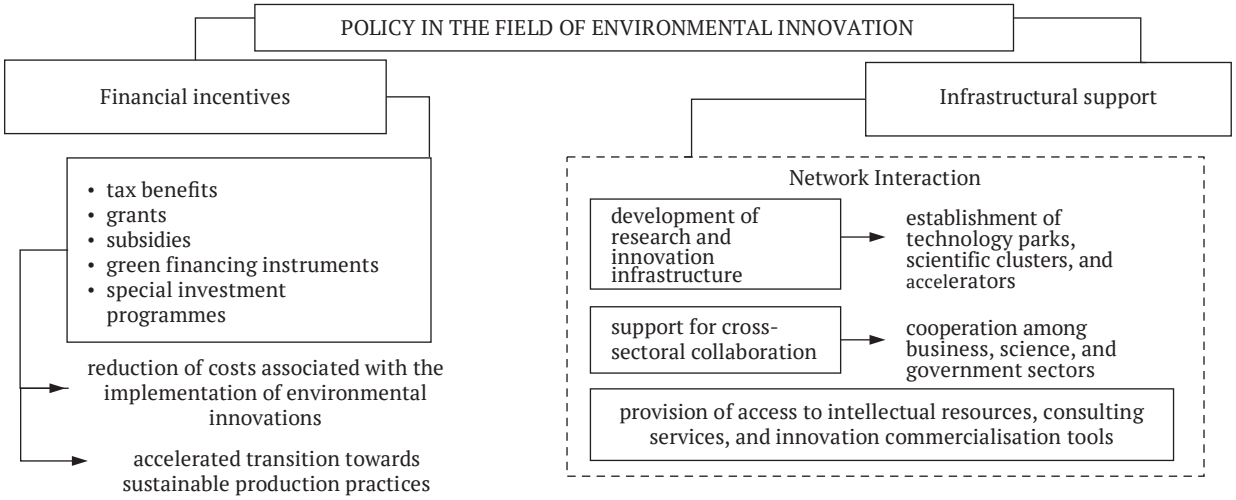

Figure 2. Components of policy in the field of environmental innovation
Source: created by author based on P. Naruetharadhol *et al*. (2024)

The introduction of financial incentives outlined in Figure 2 contributes to the stimulation of investment activity, development of green markets, and transition towards sustainable production practices. Such financial mechanisms are particularly effective for small and medium-sized enterprises, which typically possess limited resources for innovation but demonstrate high flexibility and capacity for rapid scaling of new solutions. It is also appropriate to emphasise the role of strategic planning at the national level, aimed at integrating environmental priorities into general innovation programmes. This approach fosters the creation of a supportive institutional environment in which environmental innovation is viewed not only as a tool for ecological modernisation but also as a driver of economic competitiveness amid global transformation towards a circular and green economy.

The transition of industrial enterprises towards a green economy requires the systematic implementation of environmental innovations, which serve as a key instrument of economic transformation, competitiveness enhancement, and the establishment of sustainable production practices. A crucial element of this process is the development of human capital, as investment in environmental education, awareness raising, and acquisition of green skills by employees fosters a culture of sustainable development and ensures the effective implementation of innovations. Research conducted by the OECD (2023) has demonstrated that the shift to a green economy is accompanied by changes in employment structure and professional competency requirements. In this context, industrial enterprises should prioritise the development of green skills, which include environmental awareness, understanding of sustainable development principles, and the ability to operate environmentally friendly technologies (OECD, 2024a; 2024b). Therefore, author agrees that such an approach not only enhances the efficiency of innovation implementation but also lays the foundation for structural economic transformation and the formation of a corporate culture oriented towards sustainable development.

Governments and industrial enterprises across various countries are actively investing in the development of environmental competencies. In the automotive industry of the United States and Europe, programmes for personnel retraining are being implemented to prepare workers for employment with electric vehicles and automated systems. In particular, the United States has invested USD 23.6 million in the "Battery Workforce Challenge" initiative, while Europe has established the "European Battery Academy" with the goal of training 800,000 workers by the end of 2025. Leading car manufacturers – including Jaguar, Land Rover, BMW, and Peugeot – are implementing extensive training programmes to develop new competencies among employees (Mehta, 2024).

Within the framework of the transition to a green economy, it is advisable for industrial enterprises to integrate training programmes on environmental awareness and sustainable development into internal professional development systems. Cooperation with educational institutions and governmental organisations is essential for the creation of specialised training programmes, ensuring employee access to modern learning resources and technologies, and establishing incentives for participation in education and skill development initiatives. The necessity of developing environmental competencies among personnel in forming an effective corporate policy for implementing environmental innovations is indisputable, as investment in employee training fosters a culture of sustainable development, enhances the efficiency of innovation implementation, and ensures enterprise competitiveness during the transition to a green economy.

Moreover, the successful implementation of environmental innovations in industrial enterprises requires active collaboration with various stakeholders, including enterprises themselves, governmental authorities, research institutions, and civil society organisations. Such cooperation facilitates knowledge exchange, supports the development of joint strategies, and ensures compliance with regulatory requirements. In the context of analysing stakeholders within the innovation process, particular relevance is attributed to the "triple helix" model, formulated by L. Leydesdorff & H. Etzkowitz (2000) and L. Leydesdorff (2013). This model serves as an effective theoretical foundation for innovation policy formation, based on close interaction among universities, industry, and government. Its practical implementation has demonstrated high effectiveness in technologically advanced countries, such as the United States, China, and others (Etzkowitz & Zhou, 2017).

Further development of this concept has led to the emergence of the "quadruple helix" model, which integrates civil society as a legitimate actor within the innovation system (Carayannis & Campbell, 2010; Roman & Fellnhofer, 2022). Subsequently, the "quintuple helix" model was introduced, incorporating the natural environment as a crucial element of sustainable development (Carayannis & Campbell, 2010; Carayannis *et al.*, 2012; Zakaria *et al.*, 2024). Practical implementation of the "quadruple" and "quintuple helix" models in Sweden and Germany has demonstrated significant achievements in the environmentalisation of the economy and the development of sustainable innovations (Wiesmeth, 2018; Kern *et al.*, 2019). These results confirm the relevance of a comprehensive approach to innovation policy formation that combines scientific progress, industrial application, governmental support, societal engagement, and environmental responsibility.

Accordingly, within the framework of developing an effective industrial policy for the implementation of environmental innovations, the "quintuple helix" model is considered the most appropriate. This model facilitates extended interaction among five key components and, unlike the "triple" and "quadruple" models, provides a systemic perspective on innovation activities under environmental challenges and economic transformation towards sustainable development. The application of this model offers a number of important advantages within the context of the current study. It enables the integration of the environmental dimension into enterprise activities by recognising the natural environment as a full-fledged element of the system. Such an approach helps align economic objectives with environmental priorities, ensuring their balanced and harmonious development.

The model also stimulates the implementation of environmental innovations through close collaboration among

different sectors. Cooperation with research institutions provides access to cutting-edge "green" technologies; interaction with government ensures support through policy mechanisms and incentives; and partnerships with civil society enhance corporate reputation and strengthen public trust. Furthermore, the model contributes to the creation of an innovation ecosystem in which industrial enterprises become active participants in regional development, generating solutions that foster sustainable growth. Through broad stakeholder engagement, it also enhances enterprise resilience to external challenges, making operations more adaptive, accountable, and inclusive.

At the same time, to achieve the expected outcomes from environmental initiatives, industrial enterprises must integrate clear mechanisms for monitoring and evaluating the effectiveness of environmental measures. Monitoring and evaluation function as feedback instruments that allow for identifying gaps in policy implementation, adjusting decisions, and adapting approaches to a rapidly changing regulatory and technological environment. At this stage, strategic information obtained through stakeholder interaction is integrated into the decision-making system, thereby ensuring the comprehensiveness and dynamism of the environmental transformation of industrial enterprises.

Under current conditions of globalisation and increasing environmental requirements – particularly in the context of the European Green Deal – monitoring and evaluation have become key sources of institutional trust from governments, investors, and society. Monitoring of environmental innovations involves the systematic collection and analysis of quantitative and qualitative data related to the implementation of innovative technologies, changes in production processes, resource consumption, levels of energy efficiency, and emission volumes. Simultaneously, evaluation not only records the progress of policy implementation but also interprets its impact – economic, environmental, and social. Moreover, the monitoring process must be fully integrated into the enterprise's strategy and involve stakeholder participation, including governmental bodies, civil society institutions, and scientific organisations (OECD, 2024a; 2024b).

H. Duan & X. Pang (2023) indicated that effective assessment systems should be constructed on the basis of relevant indicators adapted to the industry-specific characteristics of an enterprise and its strategic objectives. Consequently, the use of integrated monitoring systems is essential, enabling enterprises to record outcomes while simultaneously facilitating strategic planning of subsequent actions, taking into account both internal resources and external challenges. The authors propose recommendations for monitoring the implementation of environmental innovations by industrial enterprises, which hold practical value and may be integrated into sustainable development strategies within the industrial sector.

Integration of environmental indicators into both strategic and operational planning enhances alignment between environmental and business objectives of a company. Involvement of stakeholders in the process of developing and evaluating environmental policy – including representatives of the public, the scientific community, governmental institutions, and suppliers – contributes to better adaptation of innovations to regional conditions and strengthens the social legitimacy of entrepreneurial activity. Application of digital tools for data collection and analysis, such as the Internet of Things, artificial intelligence-based systems, blockchain, and big data technologies, enables accurate and timely monitoring of environmental parameters. Regular review of performance indicators remains essential, as in a dynamic context of evolving regulatory frameworks and technological change, periodic updates of the system of environmental indicators ensure the continued relevance of monitoring while incorporating new scientific achievements and practical challenges. Development of human capital in the fields of environmental monitoring, digital tool utilisation, and interpretation of environmental data constitutes a prerequisite for the effective functioning of monitoring and evaluation systems, since a well-educated workforce significantly enhances the quality of reporting and strategic planning.

Within the context of implementing environmental innovations, the issue of social responsibility of industrial enterprises acquires particular significance. Environmental transformation cannot occur in isolation from the social environment, as any change in production processes, technologies, or corporate policies directly or indirectly affects all stakeholders. Consequently, social responsibility in the implementation of environmental policy by industrial enterprises serves as a critical factor in achieving sustainable economic development. Enterprises that actively introduce environmental initiatives gain not only economic benefits but also a positive public image, contributing to the creation of an environmentally conscious future. An effective policy of an industrial enterprise within the framework of the green economy should be based on an integrated approach that unites environmental objectives with strategic planning, investment decisions, human capital development, cross-sectoral cooperation, performance monitoring, and social responsibility. A substantiated model of such a policy must incorporate contemporary concepts of sustainable development, including the principles of the circular economy, inclusive growth, and ESG orientation (Fig. 3).

The principal advantage of the proposed policy lies in its systemic nature and adaptability, enabling industrial enterprises to respond promptly to external challenges, regulatory changes, and increasing stakeholder expectations. Through the integration of the "quintuple helix" model, enterprises gain enhanced opportunities for collaboration with the scientific community, governmental institutions, and the public. Implementation of environmental innovations within the framework of the green economy contributes to the creation of new markets, reduction of environmental risks, and alignment with ESG principles. Monitoring and evaluation systems ensure feedback and accountability, allowing timely adjustments and enhancing the effectiveness of implemented policies, while guaranteeing transparency and investor confidence.

Implementation of a well-grounded, comprehensive, and responsible environmental policy represents not merely a tool of ecological modernisation for industrial enterprises but a strategic condition for long-term economic viability and social responsibility amid the global transformation

towards sustainable development. The conducted research confirmed the relevance and necessity of integrating environmental goals into the strategic planning of industrial enterprises, aligning with current trends in sustainable development and the growing environmental demands of society. The analysis revealed key vectors for the development of environmental policy, with a focus on the implementation of clean technologies, resource efficiency, circular economy, and raising environmental awareness among employees.

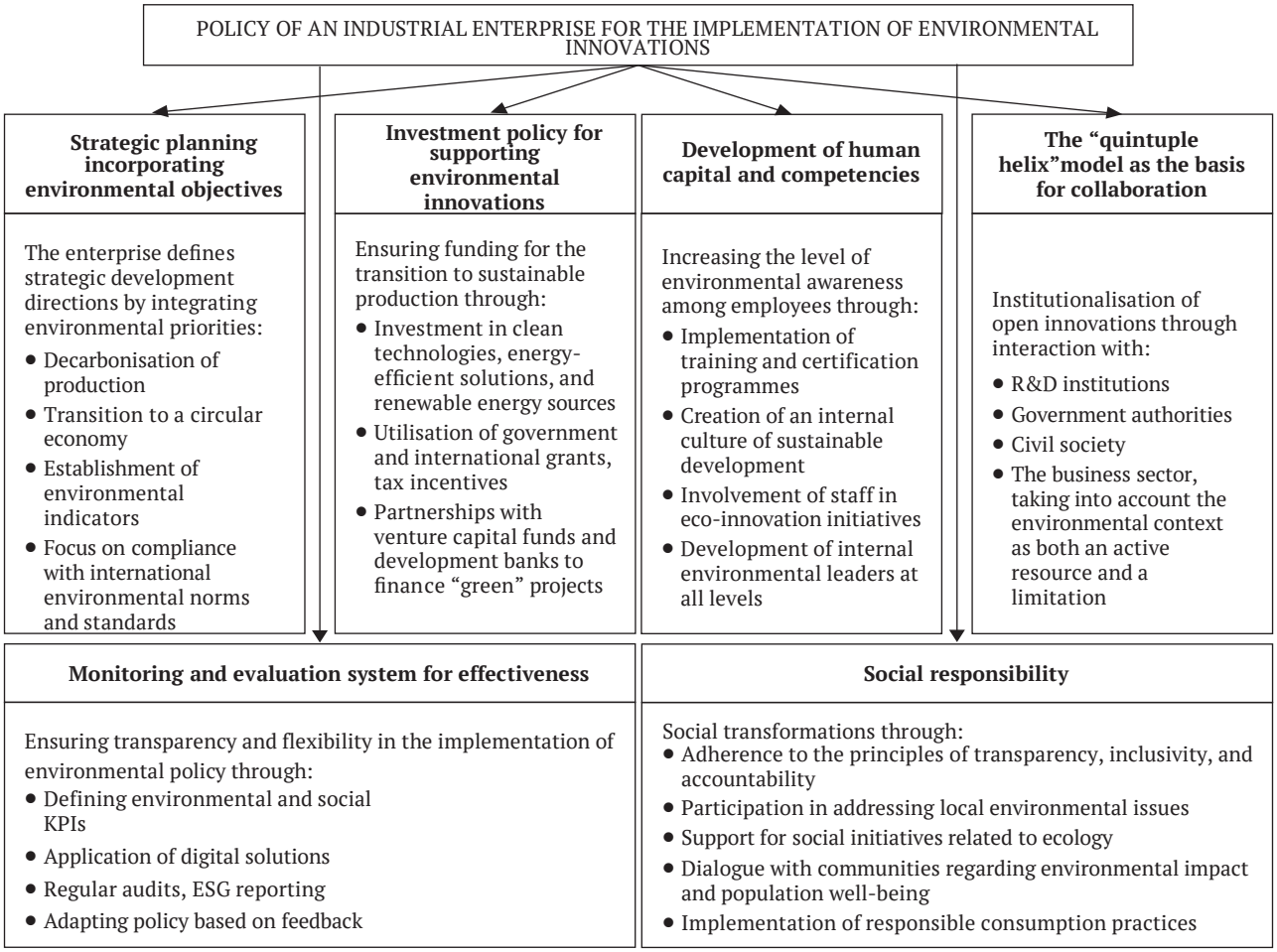

Figure 3. Policy of an industrial enterprise for the implementation of environmental innovations
Source: developed by the author

The results align with studies highlighting the importance of a strategic approach to forming environmentally-oriented business models. For instance, as shown in the work of Y. Li & F. Wang (2023), digital tools can significantly enhance the effectiveness of implementing green innovations, a trend also observed in the current research, where the role of digital technologies is emphasised as a key factor in the ecological transformation of enterprises. At the same time, unlike many theoretical concepts that focus solely on the regulatory aspect of environmental policy, the current study highlights the need for institutionalising environmental innovations as part of the overall competitiveness strategy. This is also emphasised in the work of Z. Zhu & Y. Tan (2022), which points to the importance of government incentives and green industrial policies in supporting green innovations within enterprises.

There is no consensus among scholars regarding which tools are most effective in driving the environmental transformations of enterprises. Specifically, some authors highlight the priority of technological innovations (Fernández *et al*., 2018), while others emphasise the role of regulatory influence and the green finance market (Naruetharadhol *et al*., 2024). The approach in the current study suggests a synergistic combination of both financial and infrastructural incentives, providing systemic support for environmental modernisation. A significant advantage of the proposed policy is its focus on the development of human capital, which, unlike most previous studies, plays a key role in driving environmental innovations. This is confirmed by the study of H. Sun *et al*. (2023), which stresses that investments in human capital are crucial for supporting environmental transformations in industry. The results of the current work show that environmental competencies among employees are critical for the successful implementation of environmental initiatives within enterprises.

At the same time, the issue of the balance between voluntary initiatives by enterprises and regulatory pressure remains debatable. As noted by H. Yu *et al*. (2025), digital

transformation and investments in green technologies can be powerful catalysts for enterprises seeking "green" transformation. However, in the author's view, without a proper regulatory environment and government support, enterprises may remain at the stage of declarations rather than real changes. For instance, the study by H. Shao *et al*. (2024) confirms that environmental regulation, alongside green investments, has a significant impact on "green transformation" in developing countries. At the same time, current results indicate that this process can be considerably slowed down by weak legal norms and insufficient government support at the local level, as noted by B. Zhang & Y. Li (2025) in the context of cooperation between central and local authorities.

It is advisable to explore the application of quantitative models for assessing the effectiveness of green innovations, such as DEA models (Chen & Xu, 2024), to more precisely determine which environmental policy tools are most effective in the context of different economies and types of enterprises. Thus, the study outlines the need for a multi-level approach to the implementation of environmental innovations, which involves a combination of strategic planning, institutional support, financial incentives, human capital development, and technological base modernisation.

CONCLUSIONS

It has been proven that an effective environmental policy for enterprises must be multifaceted and should incorporate systematic measures aimed at reducing the negative environmental impact of production, enhancing the efficient use of natural resources, implementing "green" technologies, and ensuring compliance with environmental standards. The study underscores that the industrial innovation policy for the implementation of environmental innovations stands out for its high degree of systematisation and adaptability, allowing enterprises to respond promptly to dynamic challenges of the external environment, changes in the regulatory framework, and growing stakeholder expectations. Notably, the integration of the "quintuple helix" model will foster enhanced collaboration between enterprises, the scientific community, governmental institutions, and civil society, significantly boosting innovation potential and the legitimacy of environmental initiatives. This approach ensures a comprehensive strategy for environmental innovation that facilitates a sustainable, green transition.

Implementation of such policies will mitigate environmental risks, guarantee adherence to ESG principles, and create new market opportunities while reducing ecological impacts. Investment in human capital development, along with the promotion of environmental competencies, will cultivate an organisational culture focused on sustainable development. Furthermore, the introduction of monitoring and evaluation systems will ensure effective feedback mechanisms, accountability, and the capacity for timely adjustments. These mechanisms, integrated within the enterprise, will support the continuous alignment of business and environmental objectives, driving forward the transition to a green economy.

Thus, the proposed policy for implementing environmental innovations provides a robust framework for the sustainable development of industrial enterprises, aligning their activities with contemporary environmental priorities and the global shift towards sustainable, circular economic models. This holistic approach ensures long-term economic viability, compliance with environmental norms, and responsiveness to the evolving demands of stakeholders, thereby facilitating the achievement of both business and environmental objectives in the context of global transformation towards sustainability. The issue requires further research, particularly in terms of evaluating the effectiveness of implemented measures, developing monitoring indicators for environmental performance, and studying the impact of environmental policy on the competitiveness of enterprises.

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Політика промислового підприємства з впровадження екологічних інновацій в умовах переходу до зеленої економіки

Анотація. Актуальність дослідження зумовлена необхідністю економічної трансформації промислових підприємств на засадах екологічної сталості в умовах глобальних екологічних викликів, ресурсних обмежень і посилення регуляторного тиску, що потребує формування ефективної економічної політики впровадження екологічних інновацій. Мета дослідження полягала в обґрунтуванні теоретико-методичних засад щодо формування ефективної екологічної політики промислових підприємств у контексті впровадження екологічних інновацій в стратегічне планування з метою досягнення сталого розвитку, підвищення конкурентоспроможності та соціально-економічної стійкості. Для досягнення поставленої мети використано комплекс загальнонаукових і спеціальних методів, зокрема: аналіз і синтез для систематизації наукових підходів; індукцію та дедукцію для логічного узагальнення; системний підхід для оцінки взаємозв'язку політик; структурно-функціональний аналіз для визначення складових екологічної політики; графічний метод для візуалізації інтеграції екологічних цілей. Обґрунтовано основні цілі екологічної політики промислових підприємств, зокрема: мінімізація техногенного навантаження, раціональне використання ресурсів, впровадження «зелених» технологій, дотримання екологічних стандартів та формування екологічної корпоративної культури. Обґрунтовано теоретичні засади інтеграції екологічних цілей у стратегічне планування промислових підприємств. Запропоновано політику промислового підприємства з впровадження екологічних інновацій, що охоплює стратегічне планування з урахуванням екологічних цілей, інвестиційну політику для підтримки екологічних інновацій, розвиток людського капіталу та компетенцій, модель «п'ятірної спіралі» для організації співпраці між різними зацікавленими сторонами, систему моніторингу та оцінки ефективності впроваджених інновацій для контроля за дотриманням екологічних стандартів та коригування стратегій розвитку, соціальну відповідальність підприємства для формуванню позитивного іміджу та сталих екологічних практик. Результати дослідження можуть бути використані для підвищення економічної стійкості підприємств та їх адаптації до вимог зеленої економіки

Ключові слова: екологічна політика; економіка сталого розвитку; циркулярна економіка; екологічні інновації; технологічні зміни в промисловості