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# THE EU COHESION POLICY AND HEALTHY NATIONAL DEVELOPMENT: MANAGEMENT AND PROMOTION IN UKRAINE

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## Editors

Nataliia Letunovska,  
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**THE EU COHESION POLICY AND  
HEALTHY NATIONAL  
DEVELOPMENT: MANAGEMENT AND  
PROMOTION IN UKRAINE**

**Monograph**

Edited by Nataliia Letunovska, Liudmyla Saher, Anna Rosokhata

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The monograph focused on the specifics of the principles of the EU Cohesion Policy implementation. The authors conducted an analysis of the economic, ecological and social aspects of the integration of the EU experience into the state policy of Ukraine. The monograph summarizes approaches to the restoration of the country and healthy development. Particular attention is paid to the issues of health care system management, the trends and prospects of achieving the state of resilience of the medical and social provision system of the population in the context of the impact of COVID-19 on the national economy. The experience of using marketing and innovative technologies in the context of healthy national development is summarized.

The monograph is generally intended for government officials, entrepreneurs, researchers, graduate students, students of economic, medical, and other specialties.

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## Introduction

Health is the most important need of a person, which determines ability to work effectively and ensures the harmonious development of the personality. The availability of European experience in solving issues of healthy development at the level of countries and regions, which significantly improves the socio-economic situation, determined the nature and subject of research in this collective monograph, which includes consideration of such issues as reforms in Ukraine, taking into account developments in the EU cohesion policy, analysis of the economic, environmental and social aspects of Ukraine's integration into the EU, recovery and cohesion in the conditions of martial law, issues of managing the health care system in Ukraine and abroad, and aspects of marketing and innovative technologies in the context of healthy development.

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networks" due to the adoption of the developed and implemented series of IEC SRD 62913 standards, which are devoted to issues of comprehensive formation of general requirements for intelligent networks.

5) taking measures to develop the standardization system in the field of electric power and Smart Grid by ensuring the participation of technical standardization committees in the work of IEC and CENELEC standardization technical committees.

6) development and approval of a plan of measures for the implementation of modern European and international standards in the field of development of "smart networks" for the development of the electric power system of Ukraine.

According to results of analysis of state of affairs regarding implementation of international and European standards in the field of Smart Grid in Ukraine, the need to create a Strategy for the implementation of such standards substantiated. A group of standards has been identified that describe the main principles of the application of Smart Grid systems, which are unifying and allow eliminate inconsistencies between other existing standards, to ensure their coordination. Implementation state analysis of basic and particularly important standards in Ukraine performed. The purpose of the Strategy formulated and its main tasks defined. The main directions of the implementation of the Strategy defined, among which the implementation of groups of standards for the normative is of primary importance ensuring the operation of Smart Grid functional systems, which is the basis of managing electric energy systems and electric energy markets. The implementation of such a Strategy will make it possible to create a national regulatory framework in Ukraine, which contains a complete list of national standards to ensure the reliable and efficient functioning and development of Ukraine's transmission and distribution systems based on the SmartGrid concept.

#### 1.4. Conceptual basis for improving the methodology of environmental audit in the context of European integration

At the beginning of the twentieth century, accounting was detached from environmental issues. Accounting information posed a threat to the process of establishing an industrial society. The industrialisation policy led to a significant increase in the number of heavy industry enterprises, which increased the burden on the natural environment (Boichenko and others,

2017). It can be argued that today a large territory of Ukraine is characterised as an environmental hazard zone. Analysis of the literature shows that the anthropogenic impact on the territory of Ukraine exceeds the level of European countries.

Environmental audit has become the subject of research by many domestic and foreign scientists. Among domestic scientists, a great scientific contribution to the process of forming the theoretical and methodological foundations of ecoaudit was made by V.A. Borisova, T.P. Galushkina, N.V. Honcharenko, Ya.V. Meh, V.M. Navrotskyi, U.P. Novak, O.F. Savchenko, Yu.M. Satalkin, V.Ya. Shevchuk, Ya.O. Yakovenchuk, and others. Among foreign ones, it is necessary to note the scientific contribution of A. Endres, N.V. Pakhomova, I.M. Potravny, K. Richter, H.P. Serova, S.S. Timofeeva and others. However, despite numerous works in the field of environmental audit, there are still a number of unresolved issues that require attention.

The purpose of the study is to analyse scientific publications on the problems in the field of environmental audit in Ukraine and to summarise the need for its application at enterprises.

The assessment by business entities of environmental aspects related to their activities began to be actively used in Europe and the United States in the early 1970s. In the United States, due to the high rate of environmental accidents and disasters, the US federal law "On the National Environmental Policy" was adopted. After that, companies began to be held legally liable for environmental damage. The procedures for conducting these assessments resembled financial audits in terms of their external features and form and were therefore called audits, but only environmental audits.

Considering the environment as an increasingly important factor, large industrial corporations have placed their enterprises under internal control to assess whether they are a source of negative environmental impact. The task of the environmental audit was to inform the corporation's management board and shareholders about measures to comply with applicable environmental legislation and the risk of possible accidents, in terms of environmental impact.

In the 1980s, environmental audits became widespread and became a common practice in industrialised countries (the UK, the Netherlands, Sweden, and others). In 1989, the International Chamber of Commerce published a document that laid the foundations for internal environmental audit as a self-control procedure and an internal management tool. Internal

environmental audit is an element of the system of environmental protection measures at an enterprise and includes systematic inspections, supplemented by analyses, tests and control of the environmental impact of industrial processes. It defined environmental auditing as an in-depth, ongoing analysis of an enterprise's environmental activities, emphasising its voluntary nature. The approach proposed by the International Chamber of Commerce was recognised by industrialists, as it allowed managers to ensure control over the state of the environment at the enterprise, as well as to monitor the enterprise's performance in terms of environmental standards.

In 1990, the Commission of the European Communities issued the first draft of mandatory rules for environmental audits. The draft was criticised by the International Chamber of Commerce, some EU member states, and various international and national organisations. The criticisms included the possibility of interference in the organisation of the industrial sector, the mandatory nature of environmental audits, and the disclosure of environmental audit results to the public. In 1991, the Commission of the European Communities came up with new proposals and in October 1991, the final version of the rules for mandatory environmental audits was created. It provides for the creation of a system of environmental protection measures based on the conclusion on the environmental status of the enterprise.

This system of environmental protection measures includes a programme and plan of environmental protection measures, a system of impact monitoring of the environment, a system of environmental documentation, and the frequency of environmental monitoring. Documentation on the organisation of the environmental management system is approved by an official auditor.

In 1993, EU Directive 1836/93 approved the Environmental Management and Audit Regulations, which allow for the voluntary participation of industrial enterprises in the European Union's Environmental Management and Audit System. Companies that implement this system are entitled to use a special environmental emblem. Along with the Environmental Management and Audit Regulations, the UK has developed and implemented the BS 7750 Standard for Environmental Management Systems. The International Organisation for Standardisation has developed ISO 14000 international standards for environmental management of an enterprise. While Western countries already have

theoretical and practical experience in the use of environmental audits, Ukraine is just beginning to implement them.

Pollution of Ukraine's environment, including the air, water and land resources, has become critical. For example, about 1.5 billion tonnes of natural resources are used annually in the production process, which is almost 30 tonnes per capita. Such large volumes of resource use can be explained by the extensive nature of the exploitation of natural resource potential.

The quality of atmospheric air is determined by 22 indicators, including 8 heavy metals. The second most extensive system for monitoring the state of atmospheric air is the territorial units of the Ministry of Health of Ukraine with a preventive focus - regional centres for disease control and prevention.

As of 2021, according to monitoring observations, in urban areas, 4.2% of samples (7121 out of 170546) of atmospheric air contain pollutants in concentrations exceeding the maximum permissible concentrations (4.2% - 7684 out of 180913 in 2020, 4.0% - 8148 out of 204311 in 2019, vs. 3.8% - 9076 out of 240989 in 2018), in rural settlements - 05% (vs. 0.9% in 2020, 1.3% in 2019, 1.1% in 2018) (Natsionalna, 2021).

The data for the last 10 years on the share of studies of urban air exceeding the maximum permissible concentrations are shown in Table 1.5.

Table 1.5 – Share of studies of atmospheric air in urban settlements exceeding the maximum permissible concentrations, in %

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
of atmospheric air (total pollution index)	5,8	5,4	3,3	3,6	3,0	3,4	3,8	4,0	4,2	4,2
of atmospheric air for dust	10,2	6,6	6,5	5,2	5,1	5,0	5,8	6,5	6,7	6,5
of atmospheric air for carbon monoxide	5,5	2,7	3,3	4,6	4,0	5,5	6,2	5,6	5,2	5,8

Source: (Natsionalna, 2021)

Thus, the main threat to biodiversity is posed by human activity and the lack of effective environmental control, which leads to the destruction of the natural environment and threats to the existence of flora and fauna. An environmental tax is one of the most effective economic instruments of environmental policy that helps to address urgent issues, as well as to

stimulate the reduction of pollutant emissions and to make polluters more conscious of natural resources.

This raises the problem of administering the environmental tax, its distribution among budgets of different levels, as well as the efficient allocation of funds and their use for the relevant purposes.

Since the issue of reducing pollution in the environment is becoming more and more urgent every year, it is worth analysing the revenues accumulated by EU countries as a result of environmental taxation (Fig. 1.12).

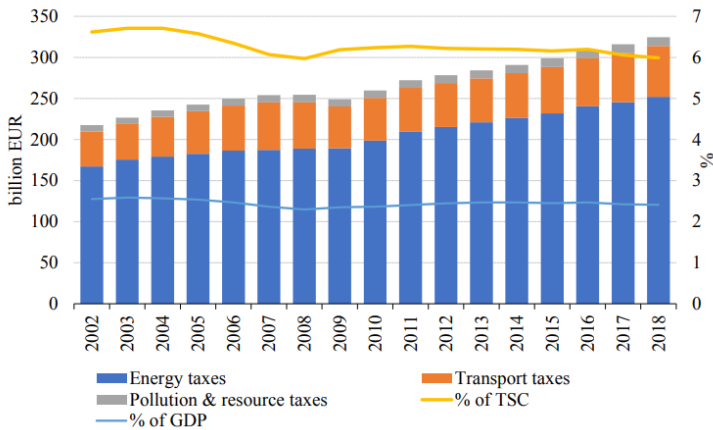


Figure 1.12 – Environmental tax revenues by type and total environmental taxes as a share of TSC and GDP, EU27, 2002-2018 (EUR billion, %) Sorse: Environmental, 2021

The figure confirms the fact that the level of environmental pollution is rising, which proportionally affects the increase in environmental revenues. Thus, as of 2018, the total amount of environmental revenues was EUR 325.2 billion, while as of 2008, the amount of environmental payments was EUR 70.2 billion less. It is worth noting that energy taxes account for the largest share of the EU's environmental revenues, accounting for about 77.7% of the total as of 2018. In 2017, the share of such revenues was 77.4%, although the amount of energy tax revenues decreased by €7 billion in value compared to 2018. This situation is an indication that the number of industrial enterprises and power plants in the EU is increasing. As for the transport tax, its increase in the dynamics is not

significant, and the share of this tax in the total amount of environmental payments for 2002-2018 ranges from 18.9-22.1%. The pollution tax is the smallest share of total environmental revenues. Thus, its revenues amount to about EUR 10 billion annually, and this figure is expected to grow due to the development of the agricultural sector, which is the largest payer of this type of tax. The share of environmental revenues in GDP ranged from 2.3-2.6% in 2002-2018 (Environmental, 2021).

A detailed analysis also requires a comparison of the changes in the share of environmental taxes in GDP and the total amount of taxes and social contributions accumulated by EU countries (Fig. 1.13).

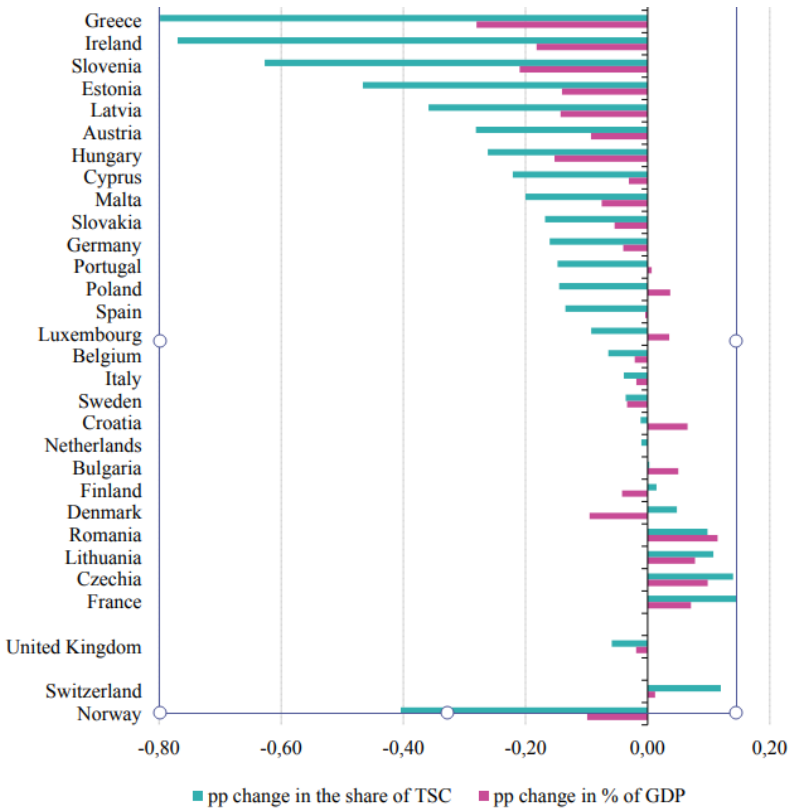


Figure 1.13 – Environmental tax revenues - change between 2017 and 2018 (in per cent)  
 Sorse: (Environmental, 2021)

Thus, the overall dynamics in the EU countries shows that the amount of environmental payments in 2017 was higher than in 2018, although in percentage terms this difference is not even 1%, but this fact may indicate either imperfections in the administrative mechanism or a reduction in anthropogenic impact on the environment.

This situation can be observed in such countries as Greece, Ireland, Slovenia, Estonia, Latvia, Austria, Hungary, Cyprus, Malta, Slovakia, Germany, Belgium, Italy, Sweden, the United Kingdom and Norway.

Countries such as: Romania, Lithuania, the Czech Republic, and France, there was an increase in environmental revenues in 2018 compared to 2017.

Particular attention should also be paid to those EU countries that have reduced the share of environmental revenues in GDP but increased it in the total amount of taxes and social contributions. These include Denmark and Finland. These countries are leaders in waste recycling and the reuse of raw materials. There are also those EU countries that, on the contrary, have reduced the level of environmental payments in the total amount of tax revenues but increased their share in the country's GDP, including: Portugal, Poland, Spain, Luxembourg, Croatia, the Netherlands, and Bulgaria (Environmental, 2021).

To date, Ukraine has developed and implemented the main elements of the economic mechanism for natural resources management and environmental protection. The most important of these are: environmental tax; environmental pollution charges; a system of fees for special use of natural resources (mineral, water, land, forest, biological); and compensation for damages caused by violations of environmental legislation. In 2010, the Tax Code of Ukraine was adopted. The Tax Code of Ukraine regulates relations arising in the field of collection of taxes and duties, in particular, defines an exhaustive list of taxes and duties levied in Ukraine and the procedure for their administration, taxpayers and duties, their rights and obligations, competence of controlling authorities, powers and duties of their officials in the administration of taxes and duties, as well as liability for violation of tax legislation. Environmental tax is a nationwide mandatory payment levied on the actual amount of emissions into the atmosphere, discharges of pollutants into water bodies, waste disposal, and the actual amount of radioactive waste temporarily stored by their producers.

In 2021, the environmental tax rates for all types of operations with pollutants have been increased by 10.1% in line with the inflation index

(consumer price index). The Tax Code of Ukraine was amended accordingly. The increased eco-tax rates were applied by taxpayers from 1 January 2021. The Taxpayers shall transfer the amounts of the Tax levied for emissions, pollutant discharges and waste disposal in the ratio determined by the Budget Code of Ukraine: 20% to the general fund of the State Budget (except for the environmental tax levied on carbon dioxide emissions from stationary sources of pollution, which is credited to the general fund of the State Budget in full) 80% to the special fund of local budgets 55% to village, town and city budgets, budgets of united territorial communities, 25% to regional budgets and the budget of the Autonomous Republic of Crimea 80% - to the budgets of Kyiv and Sevastopol.

Table 1.6 shows the dynamics of revenues by components of the environmental tax in Ukraine in 2016-2021, which shows an upward trend.

Table 1.6 – Indicators of environmental tax revenues for 2016-2021, billion UAH

	2016	2017	2018	2019	2020	2021
Environmental tax - total	4,7	4,4	4,6	5,5	5,1	5,4
emissions of pollutants into the atmosphere	2,99	2,41	2,40	2,47	1,92	2,07
Discharges of pollutants into water bodies	0,14	0,14	0,15	0,15	0,15	0,15
Waste disposal	0,79	0,86	1,06	1,02	1,05	1,13
Generation and/or temporary storage of radioactive waste	0,78	0,98	1,02	1,07	1,02	1,04
Emissions of carbon dioxide into the atmosphere	0,00	0,00	0,00	0,84	1,04	1,05

Source: (Environmental, 2021)

Thus, the table shows that a total of UAH 5,435,566,210 was paid in environmental taxes from 1 January to 31 December 2021. In 2016, the state budget received UAH 5 billion from environmental taxes. In particular, UAH 3.1 billion from the air emission tax, UAH 0.1 billion from the water pollution tax, UAH 0.9 billion from the waste disposal tax, and



UAH 0.8 billion from the tax on the creation and temporary storage of radioactive waste.

In 2017-2018, revenues from environmental taxes were lower - UAH 4.7 billion and UAH 4.9 billion, respectively.

In 2019, the state budget received UAH 6.1 billion from environmental taxes: UAH 2.7 billion for air emissions, UAH 0.2 billion for water pollution, UAH 1.3 billion for waste disposal, UAH 1.1 billion for radioactive waste generation and storage, and UAH 1 billion for carbon dioxide emissions.

In 2020, revenues from environmental taxes decreased again to UAH 5.1 billion. In January-November last year, the state budget received UAH 5.9 billion: UAH 2.2 billion for air emissions, UAH 0.2 billion for water pollution, UAH 1.4 billion for waste disposal, UAH 1 billion for the generation and storage of radioactive waste, and UAH 1.2 billion for CO<sub>2</sub> emissions.

In 2021, revenues from environmental taxes decreased again to UAH 5.4 billion. In January-November last year, the state budget received UAH 5.4 billion: UAH 2.07 billion for air emissions, UAH 0.2 billion for water pollution, UAH 1.13 billion for waste disposal, UAH 1 billion for the generation and storage of radioactive waste, and UAH 1.05 billion for CO<sub>2</sub> emissions. In January-October 2021, Energoatom paid the largest amount of environmental tax - UAH 782.9 million, which is 19.2% of the total amount of environmental taxes paid in Ukraine.

DTEK Zakhidenergo paid significantly less taxes - UAH 518.2 million (12.7% of the total). Centrenergo paid 9.6% of the total amount of taxes - UAH 392.3 million.

DTEK Dniproenergo paid UAH 301.4 million in environmental taxes, which is 7.4% of the total amount. DTEK Vostokenergo paid a little less - UAH 281.5 million (6.9%). In total, in January-October 2021, companies paid UAH 4 billion 85 million in environmental taxes across Ukraine. The record was set in Kyiv, where companies transferred UAH 1 billion 399.4 million to the state treasury. The largest share, i.e. 55.9%, was paid by Energoatom (UAH 782.9 million).

Dnipropetrovs'k region was ranked second, with companies paying UAH 611.6 million in environmental tax. The largest share was paid by ArcelorMittal Kryvyi Rih - UAH 251.3 million (41.1%). The least amount of environmental tax was paid by companies in Chernihiv (UAH 2.6 million) and Zakarpattia (UAH 3.9 million) regions [Skilky, 2022].

The established practice of EU countries and international environmental organisations is to review (adjust) the strategic objectives of environmental policies every five to six years based on the results of an analysis of the effectiveness of their implementation. In view of the above, the Ministry of Ecology and Natural Resources has developed a draft Law of Ukraine "On the Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the Period up to 2030". The Law of Ukraine No. 2697-VIII dated 28 February 2019 approved the Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the Period up to 2030 (hereinafter referred to as the Environmental Policy Strategy), which entered into force on 31 March 2019 and was put into effect on 1 January 2020.

The mechanism for implementing the Environmental Policy Strategy is the National Environmental Action Plan for 2021-2025 (hereinafter referred to as the National Plan) developed by the Ministry of Ecology and approved by the Cabinet of Ministers of Ukraine dated 24.03.2022 No 276-p, the implementation of which will stabilise and improve the state of the environment and create a natural environment that is safer for the life and health of the population.

The National Plan defines measures to implement the state environmental policy in order to preserve natural ecosystems, maintain their integrity, improve the quality of life and health of the population, ensure environmental safety, and implement a balanced system of nature management for sustainable development of society. These measures are aimed at implementing the goals and objectives of the state environmental policy, namely: formation of environmental values and principles of sustainable consumption and production in society; ensuring sustainable development of Ukraine's natural resource potential; ensuring integration of environmental policy in the decision-making process on social and economic development of Ukraine; reducing environmental risks to ecosystems and public health to a socially acceptable level; improvement and development of the state environmental management system. The Resolution of the Verkhovna Rada of Ukraine № 457-IX dated 14.01.2020 approved the Recommendations of the parliamentary hearings on the topic: "Priorities of the Environmental Policy of the Verkhovna Rada of Ukraine for the Next Five Years", which entrusted the Ministry of Ecology together with the central executive authorities, whose activities are directed and coordinated by the Minister of Environmental Protection and Natural Resources of Ukraine:

Order of the Ministry of Environment № 621 dated 27.09.2021, registered with the Ministry of Justice of Ukraine on 13 October 2021 under № 1343/36965, approved the Instruction on electronic timber accounting, which establishes the procedure for electronic timber accounting by forest owners and permanent forest users.

Order of the Ministry of Ecology № 153 dated 15.03.2021 approved the General Methodological Recommendations on the Content and Procedure for Preparing Environmental Impact Assessment Reports.

One of the most important strategic documents in the implementation of environmental policy was the Decree of the President of Ukraine № 111/2021 On the Decision of the National Security and Defence Council of Ukraine of 23 March 2021 "On Challenges and Threats to the National Security of Ukraine in the Environmental Sphere and Priority Measures to Neutralise Them".

The legal framework for environmental audits in Ukraine is set out in the Law of Ukraine "On Environmental Audit". According to Article 1 of this Law, "environmental audit is a documented, systematic, independent process of assessing the object of environmental audit, including the collection and objective evaluation of evidence to determine whether certain activities, measures, conditions, environmental management system and information on these issues comply with the requirements of Ukrainian legislation on environmental protection and other criteria of environmental audit" [About the environmental, 2004]. Prior to the adoption of this Law, despite the fact that eco-audit activities were actually carried out, there was no such term in Ukrainian legislation.

According to Art. 1 of the Law, "environmental audit is a documented systematic independent process of assessing the object of environmental audit, including the collection and objective evaluation of evidence to determine the compliance of certain activities, measures, conditions, environmental management system and information on these issues with the requirements of Ukrainian legislation on environmental protection and other environmental audit criteria" [Pro ekolohichnyi, 2004].

Other regulatory documents governing environmental audits include;

The Law of Ukraine "On Environmental Protection" dated 25 June 1991, № 1264-XII (the "Law № 1264");

The Law of Ukraine "On Privatisation of State and Communal Property" dated 18 January 2018 № 2269-VIII (hereinafter referred to as the Law № 2269);

State Standards of Ukraine DSTU ISO 19011- 2003 "Guidelines for the Audit of Quality Management Systems and (or) Environmental Management";

DSTU ISO 14001:2015 "Environmental management system";

ISO 14015:2005 "Environmental Assessment of Production Facilities and Organisations", taking into account the recommendations of the World Bank and the provisions of the Environmental Audit Protocol of the European Bank for Reconstruction and Development.

Studying the works of domestic and foreign scholars, we distinguish two main areas of understanding the essence of environmental audit: - as a type of environmental control; - as a legal mechanism for ensuring safety in the environmental sphere.

T., Poltavets F., Tulina E. note that environmental audit is a process of assessing the compliance of the audited object with the requirements of environmental legislation [Bigun and others, 2020].

Kulyk R.R. believes that the prerequisites for the emergence of environmental audit in Ukraine are primarily

- Firstly, awareness of global environmental problems and recognition of the priority of their solution along with economic and social problems;

- secondly, the process of Ukraine's integration into the global community.

Another relevant reason for the introduction of environmental audits, according to Kulyk, is the tightening of requirements for the design and assessment of pre-design and design materials that Ukrainian companies have faced in connection with the enactment of the Law of Ukraine "On Environmental Protection". Namely, any pre-design and design decisions should be considered in the context of the actual environmental situation in the area of the planned activity. "Isolated" decisions cannot be favourably assessed by an environmental impact assessment. An appropriate environmental audit programme can provide the necessary information to the project owner or designer [Kulyk, 2007].

A number of authors provide an interpretation of the concept under study based on the relevant definition in the Law of Ukraine "On Environmental Audit", namely "environmental audit is a documented systematic independent process of assessing an object to determine the compliance of certain activities, measures, conditions, environmental management systems and information on these issues with the requirements

of the legislation of Ukraine on environmental protection and other environmental audit criteria" [Sahaidak, 2007; Shram, 2013].

Thus, summarising the above, we believe that environmental audit is the process of establishing compliance of the audited object with the requirements of the environmental legislation of Ukraine and other environmental audit criteria.

Article 8 of the Law sets out the purpose and main objectives of environmental audit. The goal is to ensure compliance with environmental legislation in the course of economic and other activities. However, according to some scholars, Article 12 of the Law contains a provision that prevents the achievement of the above goal: environmental audit in Ukraine exists in two forms - voluntary and mandatory. A mandatory audit is carried out at the request of the concerned executive authorities or local self-government bodies in respect of objects or activities that pose an increased environmental hazard, in accordance with the list approved by the Cabinet of Ministers of Ukraine, in cases of bankruptcy; privatisation, concession of objects of increased environmental hazard; transfer or acquisition of state or municipal property; transfer of state or municipal property for long-term lease; creation of a new company on the basis of objects of increased environmental hazard. Although this list is not exhaustive, it should be noted that it is rather narrow and cannot cover all enterprises that cause or may cause environmental damage [Bigun and others, 2020].

Most of the enterprises that cause the greatest environmental damage are privatised. These include mining, metallurgical, chemical and energy companies. It is economically more profitable for business owners to pay for environmental pollution and waste disposal than to comply with all environmental legislation.

According to the legal framework, voluntary environmental audits are carried out in respect of any facilities at the request of the business entity concerned with the consent of the manager or owner of the environmental audit object.

A mandatory environmental audit is carried out in the following cases:

- bankruptcy;
- privatisation, concession of objects of high environmental hazard, except in cases specified by law;
- transfer or acquisition of state or municipal property;
- transfer of state or municipal property for long-term lease;

- establishment of joint ventures on the basis of state and municipal property;
- environmental insurance of facilities;
- termination of a production sharing agreement in accordance with the law;
- in other cases provided for by law.

Environmental audits at such enterprises can only be carried out on a voluntary basis with the consent of the head of the enterprise, according to Article 12 of the Law. Even if the company has agreed to such an audit, Article 8 still restricts the procedure. Article 8 stipulates that "specific tasks of the environmental audit shall be determined by the customer in each individual case based on its needs". And according to Article 3, the customers may be interested central and local executive authorities, local self-government bodies, other legal entities, as well as individuals. In other words, they can also be the owners of enterprises or their managers and other organisations, not just government agencies. Thus, it is the customers who determine the scope of the audit, which may make the environmental audit incomplete and limited

According to many scholars, the experience of environmental audit proves that its effectiveness depends on three main factors:

- the depth of interest of the management and owners of the enterprise in conducting the audit;
- transparency, openness and integrity of the company's specialists in analysing all environmental aspects;
- joint, coordinated work of the audit team and the company's specialists.

In other words, the effectiveness depends on the interest of the company's management, not on the interest of the state. We support the opinion of scientists that this is one of the "weaknesses" of the legislation on environmental audit and propose to amend it to make mandatory environmental audit possible at enterprises that threaten or may pose a threat to the environment, regardless of ownership, and the conclusions of such an audit should be binding on the heads of enterprises. In case of failure to comply with such conclusions, the managers should be held liable in accordance with the law [Bigun and others, 2020].

We also support the opinion of scientists that the legislation does not contain a list of specialities, after mastering which a person can apply for an environmental auditor certificate, leaving the decision on this issue to the discretion of the Ministry of Environmental Protection of Ukraine,

which does not contribute to an objective resolution of the case. There are a number of other issues that need to be addressed, including what can be considered a "related" area to environmental protection and others. In order for a legal entity to qualify for inclusion in the Register of Environmental Auditors and Legal Entities entitled to conduct environmental audits, it is sufficient, firstly, to provide for the relevant type of activity in its charter, and secondly, to have at least one environmental auditor on staff. Ukrainian legislation also contains certain prohibitions on conducting environmental audits. They apply to executive authorities, local self-government bodies, and persons who are prohibited by law from carrying out business activities. Environmental auditors are prohibited from conducting environmental audits of business entities if they hold shares in these entities or otherwise have a direct relationship with them [Shram, 2013].

We have analysed the existing standard methodology for conducting an environmental audit and identified a number of tasks that need to be addressed. The main task, the solution of which will allow environmental audit to become an effective integrated mechanism for managing environmental and economic activities of an enterprise and the risks associated with them, is to improve the methodological framework for conducting environmental audit, since it is currently outdated and at some stages is absent altogether.

Another task is to automate the environmental audit procedure, i.e. to present it in a more understandable and accessible form for both automation and human users. Solving this task will maximise the objectivity and reliability of decisions based on the audit results, i.e. reduce the influence of subjective factors of the auditor (his/her knowledge and experience, as well as personal relations with the audit client and the company itself). To this end, the scheme of the environmental audit model should be presented in the form of an algorithm in which each stage is carried out sequentially, and if necessary, it is possible to return to the previous ones and repeat the actions.

An algorithm is an organised sequence of actions permissible for a certain performer that leads to a certain result. In this case, the model of environmental audit should include the solution of not only environmental, but also economic and social tasks. These objectives should be addressed inseparably and closely interconnected, since human economic activity cannot be viewed as something isolated from the environment.

In order to make environmentally sound management decisions, it is necessary to take into account all key aspects of business activities.

Therefore, environmental audit should be integrated into the programmes and methods of existing types of audit (production audit, financial audit, compliance audit), combining them into a single complex. Based on this, we propose to expand the content of the environmental audit procedure (Fig. 1.14).

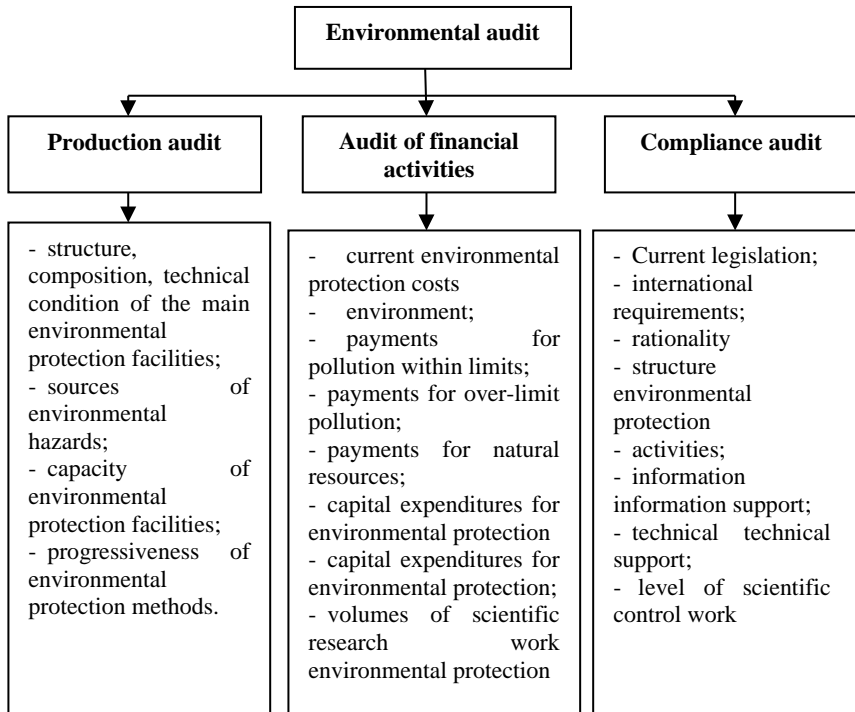


Figure 1.14 – The expanded content of economic activity  
Source: author's development

The main objectives of the integrated environmental audit model we propose are to collect reliable input information on the business activities of the object, make environmentally sound business decisions and compensation measures on its basis, aimed at reducing environmental, social, economic and environmental risks.

The model allows solving a number of functional tasks, such as corrective actions, operational control and development strategy. Corrective action tasks determine the need to issue recommendations aimed



at eliminating the shortcomings in the company's operations identified in the course of the environmental audit. Operational control involves ongoing, internal audit directly in the course of the facility's business operations in order to avoid "environmental mistakes" and costs, as well as to develop and select environmentally sound solutions. On this basis, the auditor makes recommendations on the optimal solution or alternative solutions. The strategic objectives of environmental audit are to substantiate the company's environmentally friendly development strategy (its policy) in accordance with development plans based on the data obtained during the audit ) (Kuzmenko, 2013).

The scheme of the environmental audit model includes 4 main blocks:

**1. Block of initial data.** In the process of conducting an environmental audit, baseline data is collected in two areas: environmental and financial.

The eco-auditor receives data on the environmental area from the main environmental documentation, which allows to assess the negative impact of the business entity on the environment. If there is a lack of information, the eco-auditor may use additional methods of data collection (employee surveys, visual inspection of the area, etc.).

Financial data is collected from the main accounting documentation (accounting reports, salaries, accounts, funds, cost estimates), which allows to assess the facility's costs for environmental protection measures. Taking into account the need to process large amounts of diverse information, the model has formed databases that use an operating management system as a means of accumulating and further processing it, which allows to ensure the objectivity and complexity of the process of making sound management decisions. We offer databases of source data in three areas:

– social – social parameters in the surrounding area (number of employees who fell ill in the surrounding area as a result of the impact of the economic entity; number of employees receiving sickness benefits; amount of benefits, etc;)

– economic – economic parameters of the economic entity (environmental protection costs, pollution damage, payments for negative impact);

– environmental – parameters that characterise the economic activity of the facility (pollutants generated, demand for raw materials and supplies, types of finished products, etc.), as well as characteristics of the air, water and soil conditions in the area where the facility is located.

**2. Calculation block.** Initially, the environmental auditor specifies the object of the integrated environmental audit, its goals and objectives. The scope, type of impact and types of pollution sources for each environmental component should be taken into account. This block also includes working with the criteria for assessing the effectiveness of the environmental audit.

To simplify the work with the criteria, it is necessary to solve the problem of their optimisation. There are two ways to solve this problem:

- the single-criteria optimisation task is to develop a comprehensive environmental and economic criterion on the basis of which decisions on environmental audit will be made;

- a multi-criteria optimisation task involves working with an unlimited number of criteria, but another task arises - making a decision on environmental audit. Therefore, it is necessary to develop methodological support for the task of selecting the main criterion by which the assessment will be carried out.

Obviously, when conducting an environmental audit, the absence of restrictions on the number and presentation of (quantitative, heuristic) criteria is preferable, as it allows for systematic and objective assessment of possible financial, environmental and social impacts of business activities. However, this, in turn, creates basic conditions for further information processing, including parametric multifactoriality and the impossibility of reducing parameters to a one-dimensional form. At the same time, work with the criteria for assessing the effectiveness of environmental audit is carried out separately for each of the business areas of the business entity. Each area of activity has its own set of criteria for assessing the effectiveness of environmental audit, and this set may also vary depending on the goals, objectives and objects of the audit.

At this stage, it is necessary to solve a multi-criteria task, which is reduced to working with an unlimited number of criteria. The proposed methodology for conducting an environmental audit allows analysing the environmental and economic activities of an enterprise. In view of this, it is proposed to divide the criteria for assessing the effectiveness of environmental audit into two areas: environmental and financial. The financial area will include economic, environmental and economic, as well as social criteria, since social damage is assessed by economic indicators. The environmental area includes environmental criteria that characterise the state of the environment in the area of the enterprise under review. All criteria can be systematised as follows (Fig. 1.15).

The acquired set of criteria for assessing the effectiveness of an environmental audit is a basic one that takes into account all aspects of the company's business activities. This set of criteria can be simplified or supplemented by the environmental auditor in each case, depending on the goals, objectives and objects of the audit (refined set of criteria). Taking into account the entire variety of criteria is a rather complicated process. One of the most effective methods of risk assessment in these conditions is a matrix data aggregation scheme using the theory of fuzzy sets.

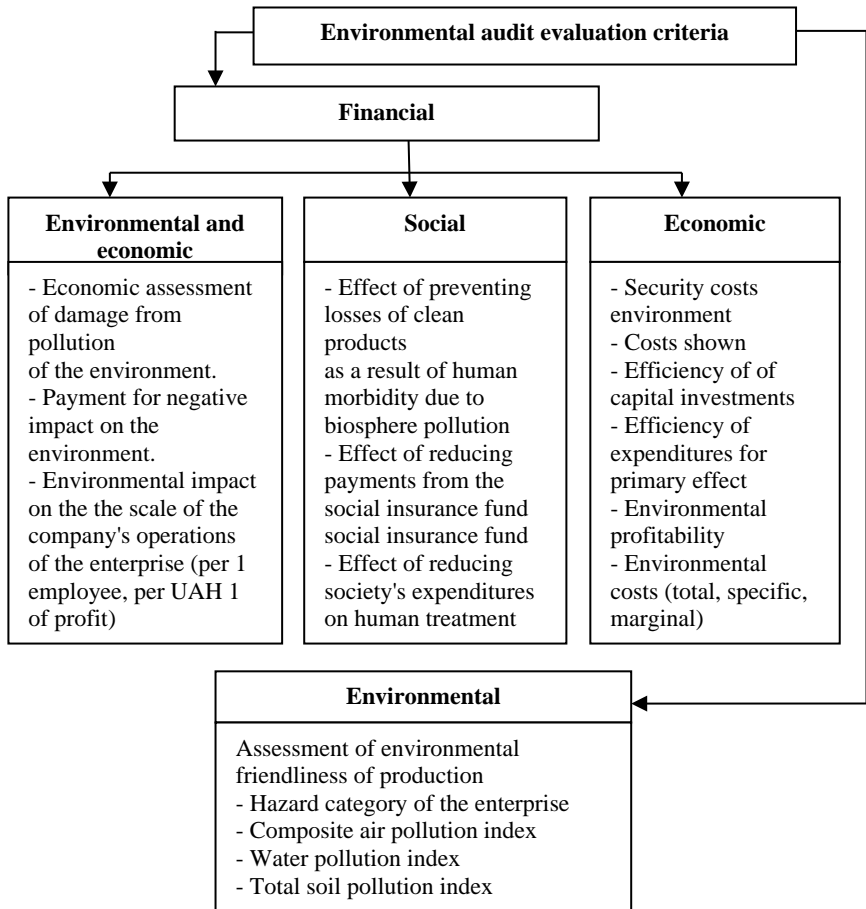


Figure 1.15 – Groups of criteria that characterise the consequences of economic activity within the framework of an environmental audit.

Source: author's development

It will allow for the most effective assessment of the criteria that characterise the consequences of economic activity within the framework of environmental audit and bottlenecks in the company's economic activity, as well as take into account the opinion of stakeholders when drawing up objective conclusions on environmental audit and compensation measures. At the same time, the main criterion for the assessment will remain environmental.

**3. Determination of significance.** At this stage, the methods of environmental and financial aspects of environmental audit are considered jointly.

In this block, taking into account the previously systematised set of criteria, the quantitative assessment of the levels of relevant types of risks of negative consequences of economic activity is carried out. The significance can be determined by any method known to the environmental auditor, for example, comparison with averages, ranking by significance scales, etc. However, a comparison with environmental standards, such as quality standards, permissible impact standards, and DSTUs, must be made.

**4. Data output block.** Based on the obtained values of risk indicators, the eco-auditor determines the level of financial, environmental and social consequences of economic activity and develops a strategy for their management, based on the principle: as low as reasonably achievable. The results of risk control (scaling) include a variable choice between their preservation, reduction (development of compensatory measures) or transfer (insurance). This implies the maximum possible reduction of the risk level, which is achieved at the expense of the actual, but often limited resources of the enterprise. The peculiarity of the proposed approach is that it focuses not only on strict environmental standards, but also on solutions that are reasonable from a social and economic point of view. At the same time, the form of presentation of the data obtained should ensure comprehensive knowledge of the information and, if necessary, allow for clarification of some of it, as well as be accessible for understanding.

Improving the methodological framework for conducting an environmental audit will allow it to become an effective and reliable integrated mechanism for managing the environmental and economic activities of an enterprise and the risks associated with them, as well as to choose the best option for compensation measures within the framework of production and environmental management.

## References to Chapter 1

Abrahams, G. (2014). What “is” territorial cohesion? What does it “do”? Essentialist versus pragmatic approaches to using concepts. *European Planning Studies*, 22(10), 2134-2155.

Abuselidze, G., Talavyria, M., Vyshnivska, B., Bondarenko, L., Makedon, H., Kniazieva, T., & Salkova, I. (2023) The economic mechanism of marketing activity management of food enterprises. E3S Web of Conferences. Les Ulis: EDP Sciences 371, 1-10 Retrieved from <https://www.econstor.eu/bitstream/10419/268842/1/Published.pdf>

AER responds to EC’s Green Paper on Territorial Cohesion (2009). Retrieved from <https://aer.eu/aer-responds-to-ecs-green-paper-on-territorial-cohesion/>.

Akademie für Raumforschung und Landesplanung (Ed.) (2008). The Territorial Cohesion Principles: Position Paper to the EU Green Paper on Territorial Cohesion, Position Paper from the ARL, 78, Verlag der ARL – Akademie für Raumforschung und Landesplanung, Hannover, <https://nbn-resolving.de/urn:nbn:de:0156-00786> Retrieved from [https://www.econstor.eu/bitstream/10419/102791/1/pospaper\\_78.pdf](https://www.econstor.eu/bitstream/10419/102791/1/pospaper_78.pdf)

Alekseieva, K.A. (2008). Udoskonalennia orhanizatsiino-ekonomichnoho mekhanizmu derzhavnoho rehuliuвання innovatsiinoi diialnosti. *Ekonomika ta derzhava*, 9, 30-35.

Bachtler, J. & Mendez, C. (2007),”Who Governs EU Cohesion Policy? Deconstructing the Reforms of the Structural Funds”, Oxford: Blackwell Publishing *JCMS* 2007 Volume 45. Number 3. pp. 535–564.

Baranov, G., Komisarenko, O., Zaitsev, I.O. & Chernytska, I. (2021) SMART technologies for transport test networks, exploitation and repair tools. International Conference Artificial Intelligence and Smart Systems. Pichanur: India, 621-625. doi: 10.1109/ICAIS50930.2021.9396055.

Bihun, T., Poltavets, F., & Tulina, E. (2020). Ekolohichniy audyt v Ukraini: shliakhy vyrishennia deiakyykh problem. *Ekolohichne pravo*. 2020, 11. 92-87.

Bilorus, O., Pakhomov, Y., Guzenko, I., Skalenko, O., & Gavrilyuk, O. (2007). Global competitive space.

Blinov, I. & Tankevych, S. (2016) The harmonized role model of electricity market in Ukraine. 2nd International conference on intelligent energy and power systems. Kyiv: Ukraine, 1-3, doi: 10.1109/IEPS.2016.7521861.

Blinov, I.V. (2021) Problems of functioning and development of the electric energy market of Ukraine. *Bulletin of the National Academy of Sciences of Ukraine*, 3, 20-28. doi: 10.15407/publishing2019.54.005.

Böhme, K. & Gløersen, E. (2011). *Territorial Cohesion Storylines: Understanding a Policy Concept Spatial Foresight Brief No. 1*). Heisdorf: Spatial Foresight.

Boichenko, N.V., Kovalevska, N.S., & Naumova, T.A. (2017). Ekolohichniy audyt: sutnist i neobkhidnist. *Ekonomichna stratehiia i perspektyvy rozvytku sfery torhivli ta posluh*. Vyp. 1. S. 28-36. URL: Rezhym dostupu: [http://nbuv.gov.ua/UJRN/esprstp\\_2017\\_1\\_5](http://nbuv.gov.ua/UJRN/esprstp_2017_1_5)

Boleiko, Yu.O. (2014). Otsinka investytsiinoho klimatu rehion. *Finansy Ukrainy*, 7, 85-89.

Bondarenko, V. Mazur, A., & Mazur, S. (2018). Organizational reformation of agribusiness entities in Ukraine. *Baltic Journal of Economic Studies*, 4(2), 126-133. Retrieved from <https://www.webofscience.com/wos/woscc/full-record/WOS:000439864300019> <https://doi.org/10.30525/2256-0742/2018-4-2-126-133>.

Bondarenko, V., Martynova, L., Chorna, N., Sukhorebra, T., Segeda, S. (2019). Evaluation system formation of development of enterprise's innovative potential. *Academy of Strategic Management Journal*, 18(1). Retrieved from <https://www.scopus.com/record/display.uri?eid=2-s2.0-85062414505&origin=resultslist&sort=plf-f> SNIP 0,684.

Budkin, V.S. (2013). Osnovni etapy ta rehionalni osoblyvosti zaluchennia priamykh investytsii v ekonomiku Ukrainy. *Rehionalna ekonomika*, 2, 59-66.

Camagni, R. (2008). *Regional Competitiveness: towards a concept of territorial capital*. Cappello, R., Camagni R., Chizzolini, B., Fratesi, U. (Eds.). *Modeling Scenarios for the Enlarged Europe*. Springer, Berlin.

Carsaniga, G. (2022). Lincklaen, Arriëns E.N., Dogger, J., van Assen, M., & Cecconi, G. (2022). *Open data maturity report*.

CEC (2004). *Third Report on Economic and Social Cohesion. A New Partnership for Cohesion: Convergence, Competitiveness, Cooperation*. European Commission, Brussels.

CEC (2007). *Fourth Report on Economic and Social Cohesion: Growing Regions, Growing Europe*. European Commission, Brussels.

CEC (2008). *Green Paper on territorial cohesion—turning territorial diversity into strength*. Communication from the Commission to the

Council, the European Parliament, the Committee of the Regions and the European Economic and Social Committee. CEC, Brussels.

CEC (2010). Fifth report on economic, social and territorial cohesion: investing in Europe's future. Reports from the Commission. EC, Brussels.

CEC (2014). Sixth report on economic, social and territorial cohesion: investment for jobs and growth. Promoting development and good governance in EU regions and cities. Reports from the Commission. EC, Brussels.

CEC (2017). Seventh report on economic, social and territorial cohesion: My Region, My Europe, Our Future. Reports from the Commission. EC, Brussels.

CEC (2022). Eighth report on economic, social and territorial cohesion: Cohesion in Europe towards 2050 Reports from the Commission. EC, Brussels.

CEC (Commission of European Communities) (2001). Unity, Solidarity, Diversity for Europe, Its People and Its Territory: Second Report on Economic and Social Cohesion. Luxembourg Office for Official Publications of the European Communities.

Clean energy for all Europeans. (2016) Brussels: Belgium.

Davimuka, S.A., Kuybida, V.S., & Fedulova, L.I. (2019). Trends in the development of the new regional policy of the European Union member states. *Regionalna ekonomika*, 1, 76-87 [in Ukrainian].

Denysiuk, S.P. (2019). Energy transition – requirements for qualitative changes in energy development. *Power engineering: economics, technique, ecology*, 1, 7-28.

Denysyuk, S.P. & Stsheletskyi, R. (2019) Formation of components of an intelligent platform for managing energy systems and networks. *Power engineering: economics, technique, ecology*, 3, 7–22.

Deyneko, O. (2021). Social cohesion as a category of a public policy: peculiarities of embedding in Ukrainian legislation. "Visnik NYuU imeni Yaroslava Mudrogo". *Seriia: Filosofiia, filosofiia prava, politologiia, sotsiologiia*, 2(49). <https://doi.org/10.21564/2663-5704.49.229332> [in Ukrainian].

Drevet, J. (2007). Chasing a moving target: territorial cohesion policy in a Europe with uncertain borders. A. Faludi (Ed.). *Territorial cohesion and the European model of society*, Lincoln Institute of Land Policy, Cambridge, MA.

Dymchenko, O.V., Smachylo, V.V., Rudachenko, O.O., Khailo, Ya.M. (2023). Problems and prospects of post-war development of enterprises in the sphere of utility of cities, taking into account the entrepreneurial component. *Business Inform*, 1, 108–115.

EBRD, What We Do. <https://www.ebrd.com/what-we-do.html>

Ekolohichni podatky Ukrainy. URL: <https://www.saveecobot.com/analytics/ecotaxes/>

Environmental tax revenues Eurostat. Official web site. URL: [http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env\\_ac\\_tax&lang=en](http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_tax&lang=en)

ESPON (2006) ESPON Project 3.2: Spatial Scenarios and Orientations in Relation to the ESDP and Cohesion Policy, Final Report: October, ESPON

ESPON (2007) ESPON 2013 Programme: Adopted Operational Programme, Final Version 7 November 2007. Available at [http://www.espon.eu/main/Menu\\_Programme/](http://www.espon.eu/main/Menu_Programme/) (accessed 3 June 2022).

ESPON. (2010). Future orientations for cities. Luxembourg: ESPON.

ESPON. (2012). Second tier cities and territorial development in Europe: Performance, policies and prospects. Final Report. Luxembourg: ESPON.

ESPON. (2014). Growth Poles in South-East Europe. Final Report. Luxembourg: ESPON.

ESPON. (2018). ESPON COMPASS – Comparative analysis of territorial governance and spatial planning systems in Europe. Final Report. Luxembourg: ESPON.

EU (European Union) (2009). Treaty of Lisbon. Amending the treaty on European Union and the treaty establishing the European Community, 2007/C 306/01.

European Commission- EC (1999). Office for Official Publications of the European Communities, - Competition, International - 82 p. <https://territorialagenda.eu/wp-content/uploads/ESDP.pdf>

European Investment Bank – EIB. <https://www.investopedia.com/terms/e/europeaninvestmentbank.asp>

Faludi, A. (2004). Territorial Cohesion: Old (French) Wine in New Bottles. *Urban Studies*, 41 (7), 1349-1363.

Faludi, A. (2006) From European spatial development to territorial cohesion policy. *Regional Studies*, 40(6), pp. 667–678.

Faludi, A. (2013). Territory: An Unknown Quantity in Debates on Territorial Cohesion, Refereed article No. 51. *European Journal of Spatial*



Development. Retrieved from [http://www.nordregio.se/Global/EJSD/Refereed articles/refereed51.pdf](http://www.nordregio.se/Global/EJSD/Refereed%20articles/refereed51.pdf).

Government portal – the Unified web portal of executive authorities of Ukraine. 2023. <https://www.kmu.gov.ua/news/174-mln-ievro-natsyfrovu-transformatsiiu-ievrosoiuz-zapuskaie-proekt-pidtrymky-ukrainy-u-sferi-didzhital>

Government portal. The annual Report on the implementation of the Ukraine-EU Association Agreement has been published. 2023. <https://www.kmu.gov.ua/news/opryliudneno-shchorichnyi-zvit-pro-vykonannia-uhody-pro-asotsiatsiiu-ukraina-ies>

Hailo, J M. (2023). Methodological foundations of entrepreneurial strategy of urban communal complex: monograph / J.M. Hailo; Kharkiv. nats. Univ. of City. Hosp-va them. A. M. Beketov. Kharkov : KNUMG them. A. M. Beketov. 157 p.

Hauff, J., Bode, A., Neumann, D., & Haslauer, F. Global (2014) Energy Transitions. World Energy Council. 32 p.

Hrytsiak, I. (2009). Legal and institutional systems of the European Union.

International Electrotechnical Commission (n.d.). Communication networks and systems in substations. (IEC 61850).

International Electrotechnical Commission. Application Integration at Electric Utilities System Interfaces for Distribution Management (n.d.). (IEC 61968).

International Electrotechnical Commission. Cyber Security Series for the Smart Grid. (IEC 62351).

International Electrotechnical Commission. Electropedia: The World's Online Electrotechnical Vocabulary. (IEC 60050).

International Electrotechnical Commission. Functional safety of electrical/electronic/programmable electronic safety-related systems. Parts 1 to 7. (IEC 61508).

International Electrotechnical Commission. Generic smart grid requirements. Parts 1 and 2. (IEC SRD 62913).

Karakai, Yu.V. (2009) Derzhavne rehuliuвання innovatsiinoho rozvytku Ekonomichniy visnyk NTUU «KPI». Retrieved from [http://www.nbu.gov.ua/portal/Soc\\_Gum/Evkpi/2009/49](http://www.nbu.gov.ua/portal/Soc_Gum/Evkpi/2009/49).

Key facts about the energy transition in Germany. (2019). Berlin: Germany.

Kolosova, V. (2014). Cooperation of Ukraine with international financial organizations: current state and prospects for expansion. *Finances of Ukraine*.

Kosychenko, O. & Rybalchenko, L. (2022). Peculiarities of using visual means of information and analytical activity in legal and law enforcement sphere / *Philosophy, Economics and Law Review*. Vol. 2 (2), 162-169

Kovalova, T.M. Analiz stanu ta perspektyv rozvytku innovatsiinoho potentsialu v konteksti promyslovo - investytsiinoi polityky Ukrainy. Retrieved from [http://www.iee.org.ua/files/conf/conf\\_article10.pdf](http://www.iee.org.ua/files/conf/conf_article10.pdf)

Kovbasiuk, Y. (2002). European Bank for Reconstruction and Development: aspects of activity. Monograph.

Kravchenko, S. (2019). Theoretical understanding of reforms as a form of social change. *NAPA Bulletin*. P. 14–21.

Kulyk, R.R. Ekolohichniy audyt: zarubizhnyi dosvid i neobkhidnist vprovadzhennia v Ukraini. *Проблемы финансов, бухгалтерского учета и аудита в современных условиях – экономические науки*. 2007. S.230-233.

URL: <http://dspace.nbuv.gov.ua/bitstream/handle/123456789/97987/67Kulik.pdf?sequence=1>

Kuzmenko O. B. , Andrieiev V. I. Protsedura ekolohichnoho audytu v systemi ekomenedzhmentu pidpriemstva : navchalnyi posibnyk. Mykolaiv : Vyd-vo ChDU im. Petra Mohyly, 2013. 184 s.

Kyrylenko, O., Blinov, I., Denysiuk, S., Zaitsev, Ie. & Vasylychenko, V. (2022) Vprovadzhennya bazovykh mizhnarodnykh standartiv smart grid v ukrayini: suchasnyy stan sprav [Implementation of basic international smart grid standards in ukraine: current state of affairs]. *Power engineering: economics, technique, ecology*, 4, 27-36.

Kyrylenko, O.V. (2016). *Intelektual'ni elektrychni merezhi: elementy ta rezhymy* [Intelligent electrical networks: elements and modes]. Kyiv: Institute of Electrodynamics of the National Academy of Sciences of Ukraine. (in Ukr)

Kyzym, M., Dymchenko, O., Smachylo, V., Rudachenko, O., Dril, N. (2023). Cluster Analysis Usage as Prerequisite for Implementing Strategies of Countries Startup Ecosystems Development. In: Arsenyeva, O., Romanova, T., Sukhonos, M., Tsegelnyk, Y. (eds) *Smart Technologies in Urban Engineering*. STUE 2022. Lecture Notes in Networks and Systems, vol 536. Springer, Cham. Pp. 290-301. [https://doi.org/10.1007/978-3-031-20141-7\\_27](https://doi.org/10.1007/978-3-031-20141-7_27)

Maslak, O.O., Zhezhukha, V.I., Hryhorenko, O.V. (2008). Osnovni problemy innovatsiinoi diialnosti promyslovykh pidpriemstv rehionu. *Rehionalna ekonomika*, № 2 (48), pp. 261–269.

Misiura, V.Ya. (2015). Service essence of public policy as a basis for modernization of public administration. *Public administration: improvement and development*. 2015. № 12.

Mokienko, A.V. (2021). The current state of water supply to the rural population of Ukraine. *Water supply and sanitation. Special issue*. P.26-33.

National Bank of Ukraine. European integration. 2023. <https://bank.gov.ua/ua/about/international/euro-integration>

Natsionalna dopovid pro stan navkolyshnoho pryrodnoho seredovyscha v Ukraini u 2021 rotsi (n.d.). 514. Retrieved from <https://mepr.gov.ua/wp-content/uploads/2023/01/Natsdopovid-2021-n.pdf>

Novitsky, D. (2021). We know how to move forward. *Water supply and sanitation. Special issue*. P.4-5.

Peltek L. V. (2009). Kontseptualni pidkhody realizatsii derzhavnoi pidtrymky innovatsiinykh protsesiv v Ukraini. *Naukovyi visnyk Akademii munitsypalnoho upravlinnia. Seriiia "Upravlinnia": zbirnyk naukovykh prats "Derzhavne upravlinnia ta mistseve samovriaduvannia"*, 7, pp. 49-62.

Pro ekolohichniy audyt: Zakon Ukrainy vid 24.06.2004 r. № 1862-IV. URL: <http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=1862-15> (data zvernennia: 01.05.2023).

Pryshliak, N., Bondarenko, V., Sokoliuk, S., & Brovarets, O. (2022). The formation of a bioenergy cluster for the production of biofuels from agricultural crops and waste: the experience of Ukraine. *Polityka Energetyczna-Energy Policy Journal. Instytut Gospodarki Surowcami Mineralnymi i Energią PAN*. pp. 149-164. Retrieved from <https://journals.pan.pl/Content/125730/PDF/09-PE-07-Pryshliak-i-inni.pdf>

Rybalchenko L., Kosychenko O. (2022). Peculiarities Of Using Visual Means Of Information And Analytical Activity In Legal And Law Enforcement Sphere. *Scientific journal "Philosophy, Economics and Law Review"*, 2(2), 25-36.

Rybalchenko, L., Kosychenko, O., Klinytskyi, I. (2022). Ensuring economic security of enterprises taking into account the peculiarities of information security. *Scientific journal «Philosophy, Economics and Law Review»*, 2 (1), 71-81.

Sahaidak, Yu.A. & Kharchenko, T.B. (2012). Problemy ta perspektyvy vprovadzhennia ekolohichnoho audytu v Ukraini. Retrieved from <https://jrnل.nau.edu.ua/index.php/PPEI/article/view/330/319>

Salikhova, O.B. (2011) Adresna derzhavna pidtrymka yak chynnyk stymuliuвання rozvytku vysokotekhnolohichnykh vyrobnytstv v Ukraini. *Ekonomika i prohozuvannya*, № 2, pp. 9 – 23.

SGCG/M490/G\_Smart Grid Set of Standards 25 Version 3.1. (2014). CEN-CENELEC-ETSI Smart Grid Coordination Group.

Shram, T.V. Problemy ta perspektyvy vprovadzhennia ekolohichnoho audytu v Ukraini (2013). *Biznes-navihator*. №1 (30), 292-296 <http://www.mubip.org.ua/wp-content/uploads/2015/11/57.pdf>

Skilky nadkhodyt koshtiv vid splaty ekolohichnykh podatkov (n.d). Retrieved from <https://www.slovoidilo.ua/2022/01/19/infografika/finansy/skilky-nadxodyt-koshtiv-splaty-ekolohichnyx-podatkov>

Tankevich, S.E., Blinov I.V. & Kyrylenko V.V. (2014) Ukraine and the world: regulatory support for intelligent electric power systems based on the Smart Grid concept. *Standardization, certification, quality*, 4, 38-44.

The conceptual model and its relation to market models for Smart Grids. (2014). SG-CG/M490/J\_ General Market Model Development // CEN-CENELEC-ETSI Smart Grid Coordination Group.

Vyshnivska, B. (2022). Product image in the enterprise's marketing product policy. *Three Seas Economic Journal*, 7-14. Retrieved from <http://www.baltijapublishing.lv/index.php/threeseas/article/view/1965>

Vyshnivska B., Dursenova R. (2021) Formuvannya marketynhovoї stratehii innovatsiinoho rozvytku pidpriumstva. DVNZ «Kyivskiy natsionalnyi ekonomichnyi universytet imeni Vadyma Hetmana». pp. 380-381 Retrieved from [http://projects.dune-hd.com/bitstream/handle/2010/36778/Mou\\_21-111.pdf?sequence=3&isAllowed=y](http://projects.dune-hd.com/bitstream/handle/2010/36778/Mou_21-111.pdf?sequence=3&isAllowed=y)

Vyshnivska, B. & Mitenko, V. (2021). Mekhanizmy upravlinnia innovatsiinoiu diialnistiu pidpriumstv. DVNZ «Kyivskiy natsionalnyi ekonomichnyi universytet imeni Vadyma Hetmana». pp.382-383 Retrieved from [http://projects.dune-hd.com/bitstream/handle/2010/36779/Mou\\_21-112.pdf?sequence=1&isAllowed=y](http://projects.dune-hd.com/bitstream/handle/2010/36779/Mou_21-112.pdf?sequence=1&isAllowed=y)

Vyshnivska, B.V. (2017). Otsinka zalezhnosti konkurentospromozhnosti pidpriumstva vid innovatsiinoi diialnosti. *Ekonomika APK*, Vol. 8, pp. 33-37

# **The EU Cohesion policy and healthy national development: Management and promotion in Ukraine:**

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