

**Миколенко Інна Григорівна**,  
доктор економічних наук, доцент, доцент  
кафедри економіки та міжнародних  
економічних відносин, Полтавський  
державний аграрний університет  
**Кононенко Жанна Андріївна**,  
кандидат економічних наук, доцент  
Полтавський університет економіки і  
торгівлі  
**Бурба Кирил Володимирович**,  
Полтавський університет економіки і  
торгівлі  
**Таволжанський Микола  
Володимирович**, Полтавський  
університет економіки і торгівлі

**Mykolenko Inna**,  
Doctor of Economic, Associate Professor,  
Poltava State Agrarian University  
<https://orcid.org/0000-0003-3800-6136>

**Kononenko Zhanna**,  
Ph.D. in Economics, Associate Professor,  
Poltava University of Economics and Trade,  
<https://orcid.org/0000-0003-0074-8249>

**Burba Kyryl**,  
Poltava University of Economics and Trade

**Tavolzhanskyi Mykola**,  
Poltava University of Economics and Trade

### ІНВАЙРОМЕНТАЛЬНИЙ ПІДХІД ЩОДО ЗАБЕЗПЕЧЕННЯ ДОТРИМАННЯ БЕЗПЕКИ СУЧАСНИХ ПІДПРИЄМСТВ

#### ENVIRONMENTAL APPROACH TO ENSURING THE SECURITY OF MODERN ENTERPRISES

Миколенко І. Г., Кононенко Ж. А., Бурба К. В.,  
Таволжанський М. В. Інвайроментальний  
підхід щодо забезпечення дотримання  
безпеки сучасних підприємств. *Український  
журнал прикладної економіки та техніки*.  
2023. Том 8. № 4. С. 87 – 92.

Mykolenko I., Kononenko Z., Burba K.,  
Tavolzhanskyi M. Environmental approach to  
ensuring the security of modern enterprises.  
*Ukrainian Journal of  
Applied Economics and Technology*.  
2023. Volume 8. №4, pp. 87 – 92.

*Розвиток інтеграційних процесів та глобалізації вимагає підвищення рівня безпеки підприємств та стає необхідною умовою їх функціонування. Питання, пов'язані з еколого-економічною безпекою підприємств зокрема, набувають актуальності в сучасних умовах швидкого розвитку виробництва і зовнішньоекономічних зв'язків та потребують подальших досліджень не тільки на рівні країни, а й на рівні регіонів і підприємств. Тому для підприємств важливим моментом в роботі є забезпечення екологічної безпеки без негативного впливу на економічну безпеку. Указано що питання забезпечення економічної безпеки підприємства завжди є важливим моментом, адже визначає його здатність до стійкості на ринку та гнучкості. Якщо підприємство не приділяє уваги заходам протидії екологічних загроз, в майбутньому це може призвести до суттєвих фінансових втрат і навіть зупинки роботи. Наголошено що екологічна складова економічної безпеки підприємства має гарантувати безпеку суспільству від суб'єктів господарювання, що здійснюють виробничо-комерційну діяльність. З цією метою товаровиробник повинен ретельно дотримуватись національних норм мінімально допустимого вмісту шкідливих речовин, що потрапляють у навколишнє середовище, та екологічних параметрів продукції, яка виготовляється. Доведено що ефективне використання підприємствами природних ресурсів сприятиме виробництву якісної продукції, підвищить її конкурентоспроможність і головне, вона буде екологічно безпечною для здоров'я людей. Зазначено що важливою проблемою забезпечення контролю за системою управління екологічною складовою безпеки є достовірність звітних даних підприємств-користувачів природних ресурсів. Наголошено про необхідність запровадження більш жорстких вимог до звітності підприємств за екологічною складовою, що має призвести до суворого дотримання норм та вимог законодавства у сфері екології, а отже, підвищення екологічної та економічної безпеки підприємства. Управління підприємством будується на основі збалансованого розв'язку як екологічних так і економічних проблем; знаходження оптимального співвідношення між забезпеченням екологічної безпеки та доцільності діяльності підприємств.*

**Ключові слова:** екологічна складова, підприємство, безпека, інвайроментальна економіка, ресурси.

*The development of integration processes and globalization requires an increase in enterprises' level of security. It becomes a necessary condition for their functioning. Issues related to the environmental and economic security of enterprises become relevant in modern conditions of rapid development of production and foreign economic relations and require further research not only at the level of the country but also at the level of regions and enterprises. Therefore, for enterprises, an essential point in their work is ensuring environmental safety without negatively impacting economic safety. Ensuring the enterprise's economic security is always important because it determines its ability to be stable on the market and flexible. Suppose the enterprise needs to pay attention to measures to counter environmental threats. In that case, it may lead to significant financial losses and even stop work. It is emphasized that the ecological component of the enterprise's economic security must guarantee the society's safety from business entities carrying out industrial and commercial activities. For this purpose, the manufacturer must carefully comply*

---

*with the national norms of the minimum permissible content of harmful substances entering the environment and the ecological parameters of the manufactured products. It has been proven that enterprises' effective use of natural resources will contribute to producing quality products, increase competitiveness, and, most importantly, be environmentally safe for people's health. It is noted that an essential problem in ensuring control over the management system of the ecological component of safety is the reliability of the reported data of the enterprises' users of natural resources. It emphasized the need to introduce stricter requirements for environmental reporting by enterprises, which should lead to strict compliance with the norms and requirements of legislation in the field of ecology and, therefore, increase the environmental and economic security of the enterprise. Enterprise management is built on a balanced solution to environmental and economic problems, finding the optimal relationship between ensuring environmental safety and the expediency of enterprise activity.*

**Keywords:** *ecological component, enterprise, safety, environmental economy, resources.*

---

### **Statement of the problem**

The effectiveness of management of the environmental component of safety at all levels depends on many factors, among which the most important are the specifics of objects that negatively affect the environment, the territorial location of enterprises taking into account the natural and ecological component, a whole range of laws, orders, standards, and requirements aimed at improving the environmental situation, and the presence of close and rational interaction between all environmental management structures, enterprises of the real sector of the economy and other participants of the system. Decisions made by the world community, individual states, and territorial entities indicate that environmental safety at the present stage of society development is becoming the most essential condition for economic activity.

Analysis of recent research and publications. Economists V.A. Golyan, B.M. Danylyshyn, M.Z. Zgurovsky, O.M. Klimenko, Y. Klisinski, S.V. Knyaz, V. Kozyuk, P.I. Korenyuk, A. Krysovaty, V.Y. Kutsenko, M.A. Mashchenko, O.V. Ostrovska, V. Palamarchuk, E. Savelyeva, V.G. Trynysa, M.A. Khvesyuk, I.G. Chervanov paid considerable attention to the study of the problem of solving the issues of environmental economics, environmental and economic security. Scientists Chubukova O.Y., Lipkan V.A., Vasilyev O.V., Vergun A.M., Cherchyk L.M., and others investigated the problem of ecological and economic security in scientific developments. Scientists offer different approaches to solving the problem, and depending on this, different mechanisms for ensuring environmental and economic security.

Despite the large number of researchers' works in the economic and environmental security theory of enterprises, we consider it necessary to research further the environmental component of enterprise security and its place in the enterprise management system.

### **The purpose of the research**

The article aims to substantiate the essence of the environmental component of enterprise security.

### **Presentation of the main research material**

At present, the importance of environmental protection, as well as the number of environmental problems in society, is increasing. However, unlike in previous years, only aspects at the intersection of social and economic development in terms of their impact on living conditions and human activities are prioritized.

There are different approaches to the integration of ecology and economics, including, according to the work [1], neoclassical and ecological reductionism. "Greening" of the economy takes place within the framework of methods and approaches of environmental and ecological economics.

Environmental economics is:

- a branch of neoclassical economics that deals with the study of environmental problems such as pollution and negative externalities [2];
- a concept that tries to find the cause of environmental problems and propose a policy to prevent them from the point of view of economics [3];
- is related to the efficient distribution of environmental resources and determines the interdependence of the environment and the economy [4].

Based on the research results, the basic methodological approaches used by researchers dealing with the problems of environmental economics [5] have been established: sustainability, value of natural resources, and interdisciplinarity.

Environmental economics considers the main contradictions and determines the rational relationship between consumption, production development, and environmental factors. This science solves the problem of rational economic management, considering environmental factors and the economic interests of society, using limited natural resources to meet human needs [6].

The object of the environmental economy is socio-ecological-economic systems of different scales and levels (country, region, enterprise, natural complex, and the relationship between them), that is, the entire ecological and economic system and ecological and economic relations within this system.

---

The world economic system is developing dynamically. The scale and parameters of interaction between economically developed countries increase the uncertainty of political, economic, and social systems in the planetary dimension. The contradictions that arise are destabilizing and unpredictable, which complicates the management processes of all economic systems, including at the micro level – the enterprise.

Today, the issue of enterprises' environmental safety is quite acute. Stable functioning growth of any enterprise's economic potential in market relations largely depends on the availability of a reliable environmental safety system.

M.V. Shulga in his scientific work "Enterprise Life Safety Management" classifies the types of enterprise security depending on the degree of vulnerability to risks into the following categories [7]:

- Technogenic safety – risks that arise from the enterprise's technical activities and may negatively impact human life and health, the environment, property, and other material values.

- Environmental safety – risks arising from the company's environmental impact may negatively affect natural resources, human health, and other living organisms.

- Financial and economic security – risks arising from the enterprise's financial and economic activities that may negatively impact the financial position of the enterprise, its investors, partners, and other stakeholders.

The ecological functional component of enterprise safety is a set of measures to ensure an acceptable level of the environmental condition of the enterprise with minimal resource costs. It is based on environmental safety, which can be described as the state of protection of the interests of the enterprise, ensuring its everyday life while reducing threats from natural objects, the typical properties of which have been changed because of pollution, man-made accidents, disasters, as well as due to a lack of natural resources due to the destruction and depletion of natural objects.

The environmental safety of an enterprise is understood as ensuring the compliance of its environmental activities with regulatory requirements. In the light of increasing the level of environmental responsibility of the enterprise, its environmental safety for the environment and the population largely determines its competitiveness and is ensured by the compliance of the organization's environmental activities with regulatory requirements, through the developed measures of both organizational and technical nature, which make up the whole complex. It should be noted that the competitiveness of the enterprise is largely determined from the point of view of this organization's environmental activities. The introduction of environmental technologies helps to conserve energy and other resources, which affects the profitability of production, labor productivity, and attractiveness for foreign investors.

The environmental safety of enterprises is also affected by environmental protection costs. The synergistic effect of various factors with many combinatorial variations complicates the difficulties of forecasting and objective threats to safety.

Sometimes, there are situations when it is impossible to determine precisely what level of environmental safety in a particular case. An example is environmental safety management in the example of a large corporation or company subject to the international market. In such situations, we can talk about the existence of an intermediate level of environmental safety at the intersection of regional and local levels. It is necessary to adhere to the principle of transmitting information on the state of the environment from local to regional and global centers to achieve the goal of environmental safety management at both the regional and global levels.

Considering any economic entity as a system that operates in a market economy and has a variety of socio-economic parameters, it can be said that the management of environmental aspects of the organization's activities can be assessed only through a particular set of criteria that reveal the most significant aspects of the process.

The level of the environmental component of safety is interpreted as a complex or integral indicator that characterizes the environmental and economic safety management system used at the enterprise. The level of such safety is determined based on the probability of functioning of the enterprise without the formation of environmental accidents (mass emissions and discharges of pollutants, significant excess of the limits for the generation of production and consumption waste, etc.).

Assessment of the environmental safety of an enterprise requires an integrated approach, which necessitates a new understanding of the principles of building a system of indicators. The primary purpose of any scorecard is to transform an array of information (regulatory, planning, financial, legal, accounting) into a set of formalized and non-formalized criteria that allow you to understand the essence of a phenomenon (or process) and assess the size of changes occurring in it. To form an effective system of assessment tools for the environmental safety of an enterprise, the indicators and criteria included in this system must meet the following mandatory conditions:

1. Be usable, i.e. simple, understandable. At the same time, they must have a physical content and be expressed in a quantitative form or have a logical content and be expressed through a qualitative characteristic.

2. Be inherently efficient (the usefulness of the indicator is greater than the cost of obtaining it). Some criteria that have a statistical basis (for example, the probability of achieving a specific goal) are impeccable from the point of view of theory but require lengthy and expensive experiments and complex calculations, which makes them of little use for practice.

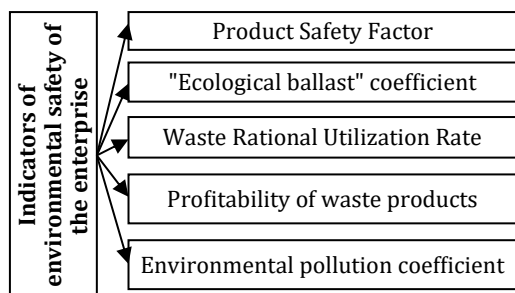
3. Be available for receiving. This implies the availability of an information base for further analysis. Quantitative indicators should be calculated based on specific forms of accounting or statistical reporting, internal management, and operational accounting data, facts of economic activity, and available external information.

Information on the costs of achieving the values of the environmental component of safety should be provided by enterprises as an element of reporting on the state of the safety management system at the enterprise.

An essential problem in ensuring control over the management system of the environmental component of safety is the reliability of reporting data of enterprises using natural resources. Reliability should be ensured based on the mechanism for managing the environmental safety management system at the enterprise, which essentially corresponds to the current organizational and economic mechanism of environmental management, which includes the following elements: fines, increase in tax deductions, pollution fees, and others.

Safe operation of the enterprise and reduction of negative impact on the environment are the main directions of the environmental course of the enterprise's management. For a practical assessment of the environmental component of enterprises' economic security, the indicators are presented in Fig. 1.

At the first stage of the assessment of the environmental safety of the enterprise, it is advisable to give a general quantitative assessment of the impact of the enterprise on the environment. To do this,



**Fig. 1. Indicators for assessing the environmental safety of the enterprise**

Source: compiled from [8]

de  $K_{efproduct}$  - coefficient of environmental friendliness of products;

$V_s$  - the volume of products certified for environmental friendliness and safety;

$V_t$  - the total volume of manufactured products.

The company will have an advantage in the competition for buyers and customers if the products produced are better from an environmental point of view.

3. Environmental efficiency of the enterprise. Many corporations in the West have adopted the concept of sustainable development, in which the state of the environment at the end of the reporting period remains at least the same as at its beginning.

The term "eco-efficiency" was first coined by the World Economic Forum on Sustainable Development. Eco-efficient operation reduces the environmental impact of the plant while increasing its profitability. Eco-efficiency can be accurately measured through environmental record-keeping and analysis, i.e., providing accurate information on environmental costs, savings, and analysis of the impact of economic activities on the environment:

$$K_{ee} = \frac{F_r}{E_r} \quad (3)$$

$K_{ee}$  - coefficient of environmental efficiency;

$F_r$  - financial result achieved in production activities, i.e. available profit from sales (you can take not financial, but production result - proceeds from the sale of products);

$E_r$  - the environmental result of the production process (amount of energy consumed, gas emissions into the atmosphere, water consumption, etc.).

you can use the following indicators:

1. The degree of environmental friendliness of production

$$K_{efproduction} = \frac{C_e}{C_t} \quad (1)$$

where  $K_{efp}$  - coefficient of environmental friendliness of production;

$C_e$  - environmental costs of the company (costs for the protection of atmospheric air, water resources, and land);

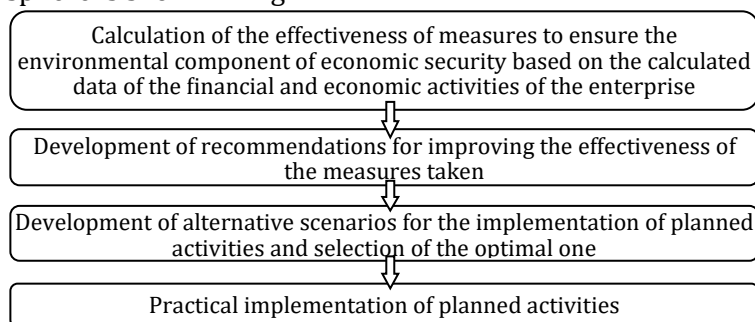
$C_t$  - total expenses for the period.

2. The degree of environmental friendliness of products:

$$K_{efproduct} = \frac{V_s}{V_t} \quad (2)$$

The environmental component consists of complying with current environmental standards and minimizing losses from environmental pollution.

The sequence of ensuring the functional component of economic security in the environmental sphere is shown in Fig. 2.



**Fig. 2. Sequence of the process of ensuring the functional component of economic security**

*Source: developed by the authors*

The problem of ensuring the environmental safety of society from business entities engaged in production and commercial activities can be solved only by the development and careful observance of national (international) norms of maximum permissible concentration (MPC) of harmful substances that enter the environment, as well as compliance with the environmental parameters of manufactured products. Enterprises will not voluntarily do this because such measures require additional costs for

treatment plants and appropriate, efficient, environmentally friendly technologies. The only factor that encourages enterprises to properly ecologies production is applying significant fines for violating state environmental legislation.

The organizational structure of management of the environmental component of enterprise safety should include the following levels:

- territorial governing body;
- grassroots level of enterprise management;
- management of a top and middle-level enterprise.

The territorial management body determines enterprises' requirements for environmental and economic safety management systems. It controls their implementation (such requirements provide all necessary permits to enterprises).

The management of the lower level of the enterprise implements the requirements of environmental and economic safety in specific production workshops, sites, and production facilities about existing processes and equipment.

The middle level (Department of Environmental Protection, Process Management, and Quality Management Systems) adapts the requirements for ensuring environmental safety to the divisions of the enterprise (sites, workshops, production units).

The management of the enterprise at the highest level (board of directors, general director, chief engineer) develops strategic or tactical (annual) management plans depending on the department's requirements.

The company's compliance with environmental and sanitary-epidemiological requirements during product and service production can increase competitiveness in the domestic and international markets. For example, in the European Union, special requirements are imposed on environmentally friendly production; market entry may be limited and impossible if the production and its products are dangerous for the physical or psychological well-being of the consumer. Moreover, products produced in an environmentally friendly and safe area are the most popular on the market.

The environmental image influences the economic security of the enterprise. The higher the level of environmental safety of the enterprise, the greater the market share can be occupied by a particular manufacturer, using the image of "environmentally friendly product" or "environmentally friendly production".

A significant impact on the environmental component of economic security is caused by damage due to the depreciation of fixed assets (obsolete technological lines, treatment facilities, and ventilation equipment that are out of order, etc.). Depreciation (including moral) of production technologies affects the energy consumption and energy intensity of production, including water, air, and environmental production of the territory, which can lead to significant financial costs.

Environmental threats negatively impact an enterprise's economic security system, and reducing this impact should be one of the main strategic tasks of every enterprise that seeks to work long-term and effectively in the market. Paying attention to ensuring measures to counter environmental threats can lead to significant financial losses and suspension of activities and even production.

---

Summing up, the ecological functional component as an element of the system of economic security of enterprise has recently become very relevant since it directly affects consumers of products, the health of those near production facilities, and the economic result of enterprises.

It can be concluded that it is necessary to introduce more stringent requirements for reporting enterprises on the environmental component, which should lead to strict compliance with the norms and requirements of legislation in the field of ecology and, therefore, increase the environmental and economic safety of the enterprise.

Ensuring environmental safety is only possible with an appropriate regulatory framework, which can be formed based on international environmental standards, legislation, and regulatory and technical documentation in force at the enterprise.

### Conclusions and prospects for further research

Currently, the role of environmental factors and indicators in the work of enterprises is growing. Environmental safety is an essential component of the economic security of the enterprise, which affects all organizational activities. One of the essential conditions for the development of the environmental component is the organization and implementation of environmental control, which is the constant monitoring of the state of natural resources at all stages of the life cycle of the enterprise. Continuous monitoring allows you to make various kinds of additions and changes to the environmental policy of the enterprise in order to reduce damage to the environment. It is worth noting that environmental regulation is part of the world economy, and many international economic and other aspects are aimed at protecting the environment.

### Література

1. Daly H.E. Valuing the earth: economics, ecology, ethics. Cambridge: The MIT Press. 1993, 387 p.
2. Costanza R., Cumberland J., Daly H. An Introduction to Ecological Economics: St. Lucie Press. 1997, 288 p.
3. Kitzes J. Answers to common questions in Ecological Footprint accounting. *Ecological Indicators*. 2009. Vol. 9 (4). P. 812.
4. Barry C. Environmental Economics. New York. 2012, 458 p.
5. Ilge L., Schwarze R. A matter of opinion How ecological and neoclassical environmental economists and think about sustainability and economics. *Ecological Economics*. 2009. Vol. 68 (3). P. 59.
6. Клименко О.М., Машенко М.А. Інвайронментальна економіка: навчальний посібник для студентів напряму підготовки 6.030501 "Економічна теорія". Харків: ХНЕУ ім. С. Кузнеця, 2015. 176 с.
7. Шульга М.В. Управління безпекою життєдіяльності підприємства. Київ: Центр учбової літератури, 2015.
8. Іванюта Т.М. Методичні підходи до аналізу економічної безпеки підприємств. *Вісник ОНУ імені І. І. Мечнікова*. 2013. Том 18. Випуск 1/1. С. 137-141. URL: [http://www.visnyk-onu.od.ua/journal/2013\\_18\\_1\\_1/31.pdf](http://www.visnyk-onu.od.ua/journal/2013_18_1_1/31.pdf).
9. Gardner M.-M., Riley C.-B., Bommarco R, Öckinger E. Rights-of-way: a potential conservation resource. *Frontiers in Ecology and the Environment*. 2018. Vol. 16. Issue 2. P. 54-65.

### References

1. Daly, H.E. (1993). Valuing the earth: economics, ecology, ethics. The MIT Press. Cambridge. England.
2. Costanza, R., Cumberland, J., Daly, H. (1997). An Introduction to Ecological Economics: St. Lucie Press.
3. Kitzes, J. (2009). «Answers to common questions in Ecological Footprint accounting». *Ecological Indicators*. Vol. 9 (4). pp. 812.
4. Barry, C. (2012). Environmental Economics. New York. USA.
5. Ilge, L., Schwarze, R. (2009). «A matter of opinion How ecological and neoclassical environmental economists and think about sustainability and economics». *Ecological Economics*. Vol. 68 (3). pp. 59.
6. Klimentenko, O.M., Maschenko, M.A. (2015). *Invajronmental'na ekonomika: navchal'nyj posibnyk dlia studentiv napriamu pidhotovky 6.030501 "Ekonomichna teoriia"*. [Environmental economics: a study guide for students of the training direction 6.030501 "Economic theory"]. KhNEU im. S. Kuznetsia. Kharkyv. Ukraine.
7. Shul'ha, M.V. (2015). *Upravlinnia bezpekoiu zhyttiediial'nosti pidpriemstva*. [Management of the life safety of the enterprise]. Tsentru uchbovoi literatury. Kyiv. Ukraine.
8. Ivaniuta, T.M. (2013). «Methodical approaches to the analysis of the economic security of enterprises». *Visnyk ONU imeni I.I.Mechnikova*. Vol. 18. Issue 1/1. pp. 137-141. Available at: [http://www.visnyk-onu.od.ua/journal/2013\\_18\\_1\\_1/31.pdf](http://www.visnyk-onu.od.ua/journal/2013_18_1_1/31.pdf).
9. Gardner, M.-M., Riley, C.-B., Bommarco, R, Öckinger, E. (2018). «Rights-of-way: a potential conservation resource». *Frontiers in Ecology and the Environment*. Vol. 16. Issue 2. pp. 54-65.

Стаття надійшла до редакції 08.09.2023 р.