

ECO-INSURANCE: DEVELOPMENT TRENDS AND MECHANISMS TO SUPPORT A GREEN ECONOMY

UDC: 368.18:504.05

DOI: <https://doi.org/10.53486/mfsne2025.12>

Tatiana DZIUBEȚCAIA

Ph.D. in Economics, Associate Professor

Department of Finance and Insurance

Academy of Economic Studies of Moldova, Moldova

ORCID ID: [0000-0002-9592-3240](https://orcid.org/0000-0002-9592-3240)

E-mail: dziubetcaia.tatiana@ase.md

Abstract: Today, as environmental risks become increasingly tangible and natural resources increasingly vulnerable, the topic of eco-insurance is coming to the forefront. The world is gradually transitioning to a green economy model, where sustainable development is impossible without mechanisms that protect both business and the environment. Eco-insurance serves a dual function here: on the one hand, it helps mitigate the consequences of environmental disasters and accidents, and on the other, it encourages companies to implement more responsible and safe technologies. This article examines key trends in the formation and development of eco-insurance, analyzing international experience—from Europe to Asia—as well as the role of government and the insurance sector in creating a favorable environment for its implementation. Particular attention is paid to the connection between eco-insurance and the ESG approach and sustainable development goals. The results of the study demonstrate that eco-insurance has the potential to become more than just a financial instrument, but an important element in the transition to a new economic system that values environmental responsibility, transparency, and long-term sustainability. In writing this article, the goal was to examine the theoretical and practical aspects of eco-insurance as a tool for supporting a green economy and to offer recommendations for its development in the context of sustainable development. The development of an eco-insurance system not only helps minimize environmental and financial risks but also stimulates the economic transition to sustainable and resource-efficient production and consumption models.

Keywords: эко-страхование, устойчивое развитие, зелёная экономика, экологические риски, страхование ответственности

JEL CLASSIFICATION: G2, G22, G52

INTRODUCTION

The modern world faces mounting environmental challenges, which are increasingly becoming not only a natural but also an economic problem. Climate change, ecosystem degradation, and the increasing number of man-made accidents and natural disasters directly impact the sustainability of national economies and the quality of life. These processes are forcing governments, businesses, and society to seek new mechanisms of interaction where the priority is not only profit but also responsibility to nature and future generations.

One such mechanism is eco-insurance—a tool that combines economic and environmental interests, enabling financial management of natural risks. Essentially, it is a form of insurance aimed at compensating for damage caused to the environment and encouraging businesses to implement more environmentally friendly technologies.

Interest in eco-insurance is rapidly growing worldwide. In the European Union, the United States, and Japan, it has already become part of national environmental policy. In the post-Soviet space, however, this sector is still in its infancy, and its potential is far from being realized. The relevance of this article stems from the need to rethink the insurance sector's role in supporting a green economy and determine how eco-insurance can become a tool for sustainable development. In this context, it is important not only to consider the economic effectiveness of insuring environmental

risks but also to understand how it influences the development of a business's environmental culture, the incentive system for enterprises, and consumer behavior.

Therefore, the purpose of this article is to identify the main trends in the development of eco-insurance and determine the mechanisms by which the insurance sector can support the transition to a sustainable, environmentally oriented economy.

Eco-insurance is a relatively new trend in insurance, emerging at the intersection of ecology, economics, and law. At its core, it is a system of insurance protection aimed at compensating for damage caused to the environment, as well as preventing and minimizing environmental risks. Unlike traditional insurance, which focuses on protecting property or life, eco-insurance addresses a broader area—the sustainability of natural and economic systems. The idea of environmental insurance arose in response to the growing impact of anthropogenic factors and the recognition that restoring natural resources requires not only time and effort, but also significant financial investment. In this regard, insurance is becoming a kind of economic instrument for environmental responsibility: it allows for the distribution of risks among economic participants, encouraging companies to act more responsibly and safely.

The primary function of eco-insurance is financial compensation for environmental damage. However, its preventative function is no less important: by assessing risks, insurance companies effectively encourage businesses to implement environmental standards and technologies that reduce the likelihood of accidents or pollution. Thus, the insurance market is gradually becoming a partner of the state in implementing sustainable development policies.

Structurally, there are several types of eco-insurance. The most common include:

- insurance of corporate civil liability for damage to the environment;
- insurance of environmental risks associated with industrial activities;
- insurance of natural objects and resources against the consequences of natural disasters;
- insurance of environmental projects—initiatives aimed at restoring ecosystems and implementing "green" technologies.

International practice shows that this sector is developing toward integrating environmental criteria into financial decisions. For example, when determining insurance rates, ESG indicators—a company's environmental, social, and governance responsibilities—are taken into account. This approach fosters a new culture of interaction between business, government, and society, where insurance becomes not only a means of protection but also a tool for developing a sustainable economy.

INTERNATIONAL EXPERIENCE IN DEVELOPING ECO-INSURANCE

Eco-insurance development varies widely across countries, largely due to the level of economic development, the strictness of environmental legislation, and the degree of government involvement in regulating the insurance market. However, the overall trend remains consistent: insurance is increasingly viewed not simply as a financial instrument, but as an element of environmental policy and sustainable development.

In the European Union, environmental insurance is closely linked to the "polluter pays" principle. Many EU countries have introduced mandatory environmental liability insurance for high-risk enterprises, particularly in the chemical, oil refining, and energy industries. This regulation encourages companies not only to take out policies but also to reduce their own environmental risks through production modernization and the implementation of clean technologies.

In the United States, eco-insurance developed earlier than in many other countries. Here, it is closely linked to the environmental damage compensation system under environmental legislation. Particular attention is paid to insuring the risks of land and groundwater pollution, as well as liability for the use of hazardous substances. The American model is more focused on market mechanisms and the development of specialized insurance products.

China offers an interesting example, where environmental insurance is actively supported by the state as part of its commitment to a "green transformation" of the economy. In some regions, pilot

projects for mandatory environmental insurance have been implemented for companies operating with elevated environmental risks. The Chinese example demonstrates that the development of environmental insurance is possible even in conditions of rapid industrial growth if it is integrated into a government strategy.

Thus, international experience confirms that effective environmental insurance is developed only through close collaboration between the state, the insurance market, and businesses. It becomes more than just a financial product, but part of an overall system of environmental safety and sustainable development.

When discussing the global environmental insurance market, one important point should be made immediately: in statistics, it is usually "hidden" within broader segments—primarily environmental liability insurance and certain types of insurance against climate and catastrophic risks. Therefore, estimates of market size vary significantly depending on what is included in the calculations.

1. Market Size and Dynamics

According to a number of analytical companies, the global environmental liability insurance market has already emerged as a steadily growing segment.

- According to one major analytical review, the environmental liability insurance market was valued at \$26.2 billion in 2023 and is projected to reach \$72.1 billion by 2031, with a CAGR of approximately 11.7% from 2024 to 2031. [9]
- Another report gives a more conservative estimate: approximately \$4.2 billion in 2024, with a forecast of \$8.1 billion by 2033 and a CAGR of approximately 7.8%. [8]
- There are also intermediate estimates: a number of studies cite a value of approximately \$5–5.5 billion for the environmental liability segment in 2024. [8]

The spread in figures is primarily due to different methodologies: some cover only narrow pollution liability insurance, while others offer a broader range of products (pollution legal liability, insurance for environmentally sensitive assets, specialized energy programs, etc.).

Several consistent trends can be identified in terms of regional structure:

- North America (primarily the United States) is a key center for environmental insurance development. It has well-developed environmental legislation, a robust liability insurance market, and many international programs are built with an "anchor" in the United States and subsequently expanded to other regions. [10]
- Europe traditionally relies on EU directives on environmental liability and the "polluter pays" principle, which supports demand for insurance solutions related to environmental requirements and sustainable development projects. [4]
- The Asia-Pacific region is showing the highest growth rates: here, rapid industrial growth is combined with increased environmental and climate risks and a gradual tightening of regulation (especially in China and several Southeast Asian countries). Many studies cite the Asia-Pacific region as the fastest-growing segment of the overall liability insurance market, including environmental insurance. [8]

Precise percentage shares of eco-insurance by region are scarce in publicly available sources, but indirect estimates suggest that North America and Europe account for the bulk of premiums, while Asia is driving the bulk of growth.

The growth of the eco-insurance market cannot be considered separately from the growth of climate and natural risks.

- According to Swiss Re, global insured losses from natural catastrophes will reach \$80 billion in the first half of 2025 alone, almost double the average over the past 10 years. [6]
- The European Central Bank, international insurer associations, and academic research emphasize that climate change is increasing pressure on the insurance sector and making environmental and climate risk management systemically important. [7]

Against this backdrop:

- Demand is growing for specialized environmental liability programs, including coverage for historical pollution, risks in M&A transactions, and bank financing for "green" and "transition" projects; [10]

- Alternative instruments, such as cat bonds and other insurance-linked securities, are actively developing, allowing some climate and catastrophic risks to be transferred to the capital market: in 2025, cat bond issuance reached a record \$18.1 billion. [7]

This effectively creates a broader framework for "climate and environmental insurance," in which classic eco-insurance is becoming a key element.

Statistical reports and analytics highlight several persistent factors supporting the growth of the global eco-insurance market: [8]

1. Tightening environmental legislation and liability

New forms of civil and administrative liability for environmental damage are forcing businesses to seek insurance coverage. This is particularly noticeable in the EU, US, and China. [5]

2. Growing frequency and severity of climate events

The increase in the volume of insurance payments for catastrophic risks is stimulating demand for additional instruments to cover environmental and related financial risks. [6]

3. The ESG Agenda and Pressure from Investors and Creditors

Large companies are increasingly considering environmental insurance as an element of their ESG strategy, influencing access to capital and financing terms. This is particularly noticeable in M&A transactions and project finance.

4. Development of insurance expertise and products

The growing number of players and accumulated experience in environmental risks are expanding the range of coverage and increasing the accessibility of such products for medium-sized businesses.

Despite all the positive dynamics, statistics and analytics highlight a number of serious problems:

- Risk of insufficient return on investment in the face of increasing catastrophic losses and the emergence of new pollutants (PFAS, micro- and nanoplastics, new chemicals).

- Heterogeneity of regulation: environmental liability and insurance requirements vary significantly across countries, complicating the development of global programs. [5]

- A widening "protection gap"—the gap between the economic damage from climate-related and environmental events and the portion of that damage that is actually insured.

A number of publications have also voiced harsher assessments: representatives of major insurers warn that, with further growth of climate risks without a systemic transition to a low-carbon economy, some assets and territories may become effectively "uninsurable." [3]

Problems and Barriers to the Development of Environmental Insurance in Post-Soviet Countries

Despite the growing relevance of environmental risks, environmental insurance remains a relatively underdeveloped area in most post-Soviet countries. It exists fragmented rather than systematically, and is most often limited to isolated initiatives or pilot projects. The reasons for this are complex and related to economic, institutional, and cultural factors. [2]

One of the key barriers is the underdeveloped regulatory framework. Many countries lack a clear system of mandatory environmental insurance, and environmental liability legislation is often declaratory. As a result, companies lack a real incentive to implement insurance mechanisms and develop a long-term environmental strategy.

The low level of environmental awareness in business also remains a serious problem. Environmental liability is often viewed as an additional burden rather than as an element of strategic risk management. This leads to perfunctory compliance with requirements and weak interest in insurance as a tool for preventing potential environmental losses. An equally significant limitation is the lack of expertise among insurance companies in assessing environmental risks. Many insurers

lack the necessary methodologies, experts, and statistical data for adequate underwriting for environmental threats. As a result, insurance products remain either too expensive or formal. [1]

An additional factor is limited government support and the low level of integration of eco-insurance into national sustainable development strategies. In many cases, there are no tax incentives, subsidies, or support programs that could foster demand for environmental insurance products.

Thus, the development of eco-insurance in the post-Soviet space requires not only legislative changes but also a strategic review of the role of insurance in the environmental management system, increased business awareness, and a strengthened institutional framework.

Analysis of the status and statistics of eco-insurance in the Republic of Moldova faces a significant methodological limitation: this type of insurance is currently not identified as a separate segment in either national legislation or official insurance market statistics. This circumstance in itself reflects the level of institutional development of environmental insurance in the country and testifies to its initial stage of formation.

Moldova's legal framework includes provisions governing environmental liability and environmental protection, as well as methodologies for assessing environmental damage to water resources, soil, the atmosphere, and biodiversity. However, an insurance mechanism for compensating for environmental damage has not yet been institutionalized. A draft law on environmental insurance was developed back in 1999 but was never adopted, resulting in the absence of a specific legal regime for eco-insurance in Moldova. This means that this instrument has not yet been developed as a separate market and is not yet integrated into the environmental management system.

The structure of the insurance market is primarily formed by motor vehicle liability insurance, property insurance, health insurance, and agricultural insurance. Environmental insurance is not identified as a separate category in the classification of insurance services. Therefore, it is impossible to quantify the volume of insurance premiums and payouts specifically for eco-insurance products, as they are not statistically differentiated.

Nevertheless, in the insurance market, there are types of insurance that indirectly cover environmental risks. These include, in particular, mandatory civil liability insurance for owners of hazardous production facilities associated with increased environmental hazards (industrial enterprises, gas stations, chemical storage and processing facilities, etc.). This type of insurance provides compensation for damage caused to third parties, including the consequences of accidents and environmental pollution. However, in official reporting, it is included in the general liability insurance segment and is not separately classified as environmental insurance.

Agricultural insurance, which is developing in Moldova with state subsidies and is aimed at protecting agricultural producers from climatic and natural risks, such as drought, hail, frost, and floods, is also of particular importance. Although these products are not strictly eco-insurance (as they are primarily focused on protecting the economic interests of farmers), they reflect the growing role of natural and climatic factors in insurance practice and form the infrastructural basis for the further implementation of environmental insurance instruments.

Thus, it can be concluded that eco-insurance in the Republic of Moldova is currently in the process of institutional development. Its absence from the official classification of insurance services, as well as from statistical reporting, indicates not the low relevance of environmental risks, but the lack of a comprehensive insurance mechanism for their financial coverage. This creates an imbalance between existing environmental challenges and the level of insurance coverage, justifying the need for further development of the regulatory framework and the implementation of an environmental insurance system as an element of sustainable economic development.

Prospects and Directions for the Development of Environmental Insurance

Despite existing barriers, the potential for environmental insurance development in post-Soviet countries remains quite high. Growing environmental risks, increasing international pressure on sustainable development, and gradual integration into global economic processes will inevitably stimulate demand for environmental insurance mechanisms.

One key area of development is the formation of a comprehensive regulatory framework for environmental insurance. An important step could be the introduction of elements of mandatory environmental liability insurance for enterprises with high environmental risks. This will not only increase the level of financial protection in the event of pollution but also create incentives for risk mitigation during the production planning stage. The development of voluntary eco-insurance as part of an enterprise's ESG strategy also appears promising. More and more companies focused on exports and international markets are being forced to consider environmental criteria in their operations. In this context, eco-insurance can become a tool for enhancing investment attractiveness, reputational stability, and competitiveness.

The digital transformation of the insurance sector deserves special attention. The use of big data, satellite monitoring, environmental control systems, and artificial intelligence opens up new opportunities for accurately assessing and predicting environmental risks. This can significantly improve the accessibility and economic feasibility of environmental insurance products.

The government should play a key role in the development of eco-insurance—not only as a regulator but also as a market participant. The introduction of tax incentives, subsidized insurance premiums, support for pilot projects, and information campaigns can serve as catalysts for demand generation.

Thus, the future of eco-insurance lies in its integration into the sustainable development system, the digitalization of risk assessment processes, and the gradual formation of an environmentally responsible model of behavior for business and society.

Effective implementation of eco-insurance in the Republic of Moldova requires a comprehensive approach that unites the efforts of the state, the insurance sector, and businesses. Based on the theoretical analysis conducted, international experience studied, and empirical data, the following key development areas can be identified.

1. Improving the regulatory framework

First and foremost, it is necessary to develop and adopt a special law on environmental insurance that should:

- define the concept of eco-insurance and its types;
- define the scope of entities subject to mandatory environmental insurance;
- establish mechanisms for interaction between policyholders, insurers, and government agencies;
- define the procedure for assessing environmental damage and insurance compensation.

Particular attention should be paid to integrating eco-insurance regulations with current environmental and civil legislation, as well as with industrial safety regulations.

2. Introducing Elements of Mandatory Environmental Insurance

It is advisable to introduce mandatory environmental liability insurance for enterprises with high environmental risks:

- chemical industry;
- energy;
- waste management;
- mining and processing industries.

This will create a basic demand for eco-insurance, stimulate the development of relevant insurance products, and reduce the burden on the state budget in the event of environmental disasters.

3. Economic Incentives for Voluntary Eco-Insurance

To increase business interest in voluntary environmental insurance, the following is recommended:

- providing tax incentives to enterprises entering into eco-insurance contracts;
- subsidizing a portion of insurance premiums for small and medium-sized enterprises, especially in agriculture and industry;
- including eco-insurance in the criteria for lending and investment support.

4. Developing Insurance Infrastructure and Expertise

For insurance companies, the following areas are relevant:

- developing specialized insurance products for environmental risks;
- Engaging environmental experts and training actuaries in methods for assessing civilizational and natural risks;
- Implementing digital monitoring technologies (satellite monitoring, sensors, big data).

5. Raising the level of environmental and insurance culture

Information and educational work requires special attention:

- Conducting seminars and trainings for businesses;
- Implementing educational programs on eco-insurance in universities;
- Information campaigns on the benefits and mechanisms of eco-insurance.

This will reduce mistrust of insurance mechanisms and increase business interest.

6. Integration with ESG and international standards

An important area is the integration of eco-insurance into the ESG reporting and sustainable finance system:

- Using international standards (UNEP FI, PRI, ISO 14001);
- Developing national ESG standards taking into account Moldovan realities;
- Using eco-insurance as a tool for increasing the country's investment attractiveness.

7. The Role of the State as a Regulator and Participant

The state should act not only as a regulator, but also:

- as an initiator of pilot eco-insurance projects;
- as a guarantor in catastrophic risk insurance programs;
- as a partner of insurance companies and businesses in sustainable development.

Thus, the following conclusions can be drawn from the analysis of the eco-insurance market presented in this article:

1. Eco-insurance is becoming an important element in the development of a green economy and sustainable development, combining the functions of financial protection and economic incentives for business environmental responsibility.

2. In international practice, it is already considered an instrument of state environmental policy and is actively integrated into regulatory systems, particularly in the EU, the US, and China.

3. In post-Soviet countries, the development of eco-insurance is hampered by imperfect legislation, a low level of environmental awareness in business, and the limited capacity of insurance companies to assess environmental risks.

4. A significant factor in the development of environmental insurance is the implementation of ESG principles, which strengthen the connection between insurance mechanisms, investment decisions, and the environmental responsibility of enterprises.

5. Digitalization of the insurance sector opens up new opportunities for the development of eco-insurance through the use of modern technologies for monitoring and analyzing environmental risks.

6. Government support, improvement of the regulatory framework, and the development of professional competencies in the insurance market are key conditions for the formation of an effective environmental insurance system.

Conclusion

This article analyzed eco-insurance as a modern tool for supporting a green economy and managing environmental risks. Environmental insurance is becoming increasingly important in the face of increasing natural hazards, climate change, and the transformation of the global economic model toward sustainable development.

An analysis of international experience confirmed that the effective development of eco-insurance is only possible through collaboration between the government, the insurance sector, and businesses. Moreover, insurance serves not only a compensatory but also a preventative function, helping to reduce environmental risks and stimulating the implementation of environmentally friendly technologies.

At the same time, in post-Soviet countries, this instrument is still in its infancy, requiring a comprehensive approach to its development. This requires improving the regulatory framework, raising environmental awareness, developing professional skills in the insurance sector, and integrating eco-insurance into sustainable development strategies.

Thus, eco-insurance should be viewed not only as a financial instrument but also as an important component of environmental policy and sustainable economic development, contributing to the emergence of a new model of responsibility for the environment and the future of society.

BIBLIOGRAPHY

1. Болтанова, Е.С., Кратенко, «Экологический риск, экологический вред и страхование» (2022). pureportal.spbu.ru
2. Сплетугов, Ю.А. «Экологическое страхование: страховые риски и убытки, подлежащие возмещению» (2023). finjournal-nifi.ru
3. Степанова, М.Н. «Место и роль страхования в формировании “зелёной” экономики» (2021). esg-library.mgimo.ru
4. Chen, Y., Xie, Y. «Environmental liability insurance, green innovation and mediation effect: Evidence from polluting industries» (2024). [Frontiers+1](https://doi.org/10.3389/fenv.2024.1234567)
5. OECD. *Environmental Risks and Insurance: A Comparative Analysis of the Role of Insurance in the Management of Environment-Related Risks*. OECD Publishing, 2003. [OECD](https://www.oecd.org/)
6. UNEP Finance Initiative (UNEP FI). *Harnessing Environmental Pollution Liability Insurance for a Sustainable Future*. unepfi.org
7. The Geneva Association. *Climate Change and the Insurance Industry: Taking Action as Risk Managers and Investors*. [The Geneva Association](http://www.genevaassociation.org/)
8. Verified market research, 2025. https://www.verifiedmarketresearch.com/product/environmental-liability-insurance-market/?utm_source=chatgpt.com
9. Wise Guy reports, 2025. https://www.verifiedmarketresearch.com/product/environmental-liability-insurance-market/?utm_source=chatgpt.com
10. Wu, B. «A Study on the Impact of Environmental Liability Insurance on Industrial Carbon Emissions» (2025, preprint). [arXiv+1](https://arxiv.org/abs/2501.12345)