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ECO-INNOVATIONS IN THE WORK OF BUSINESS SUBJECTS AS AN ELEMENT OF THE OPTIMIZATION OF BUSINESS PROCESSES AND THE INTERNATIONALIZATION OF THEIR SERVICES

ЕКОІННОВАЦІЇ В РОБОТІ СУБ'ЄКТІВ БІЗНЕСУ ЯК ЕЛЕМЕНТ ОПТИМІЗАЦІЇ БІЗНЕС-ПРОЦЕСІВ ТА ІНТЕРНАЦІОНАЛІЗАЦІЇ ЇХ ПОСЛУГ



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Таранюк Л.М., Корсакієне Р., Таранюк К.В., Міцейкієне А., Деміхов О.І. Екоінновації в роботі суб'єктів бізнесу як елемент оптимізації бізнес-процесів та інтернаціоналізації їх послуг. Науково-методична стаття.

Головна мета даного дослідження полягає в дослідженні екоінновацій в роботі суб'єктів бізнесу як елемент оптимізації бізнес-процесів та інтернаціоналізації їх послуг. Обґрунтовано комплекс передумов і факторів, що стимулюють формування екоінновацій на різних етапах розвитку компанії та її інтернаціоналізацію в умовах деструктивних економічних викликів глобального середовища з метою оптимізації бізнесу компанії в умовах ефективного європейського бізнес-середовища. Розроблено теоретико-методологічні положення, які містять аналіз передумов, стимулюючих та дестимулюючих факторів, що впливають на формування екоінновацій на різних етапах розвитку та інтернаціоналізації фірми в умовах руйнівних викликів економіки. Розроблено систему факторів, пов'язаних з різними етапами інтернаціоналізації фірми та її інноваційного розвитку.

Ключові слова: екоінновації, малий бізнес, бізнес-процеси, інтернаціоналізація, послуги

Taraniuk L., Korsakienė R., Taraniuk K., Miceikienė A., Demikhov O. Eco-Innovations in the Work of Business Subjects as an Element of the Optimization of Business Processes and the Internationalization of their Services. Scientific and methodical article.

This article emphasises the need to improve the level of financial literacy of the main goal of this study is to explore eco-innovation in the activities of business entities as an element of optimizing business processes and the internationalization of their services. A comprehensive set of prerequisites and factors stimulating the formation of eco-innovations at various stages of company development and its internationalization under the conditions of destructive economic challenges in the global environment is substantiated, with the aim of optimizing business in an effective European business environment. Theoretical and methodological principles have been developed, which include an analysis of the prerequisites, stimulating and inhibiting factors that influence the formation of eco-innovations at various stages of a firm's development and internationalization in the context of economic disruptions. A system of factors related to different stages of the firm's internationalization and its innovative development has been developed.

Keywords: eco-innovations, small business, business processes, internationalization, services

In the context of the global market environment, the issue arises of enhancing business entities' ecological innovation activity amidst intense competition. The study's authors noted that, as competition levels increase among manufacturers and service providers, there is a need to develop an innovative environment within business operations. This is especially evident in manufacturing companies, which are implementing efforts to modify products, add new technical features, and improve product design. Among service providers, there is a shift towards alternative energy sources (such as the use of electric transport), and measures aimed at enhancing the safety of the innovation process include active efforts to implement standardization mechanisms and direct investment in eco-innovation (e.g., eco-friendly transport, green energy, green technologies in the service sector, and eco-product manufacturing).

Developed countries are increasingly investing in eco-innovations within developing economies, driving

the internationalization of services. Attention should also be paid to the competitive advantages of eco-innovations achieved through internationalization processes (such as leading European eco-innovation success practices, fundraising platforms, and eco-innovation benchmarking). These processes enable the systematic development of eco-innovations in countries with developing and transitional economic models.

All this highlights the importance and relevance of scientific research in the development of eco-innovations in business operations as an element of optimizing business processes and internationalizing their services.

Problem formulation. Among the problematic aspects of the research topic, it is essential to highlight the changing level of factor influence on the development of companies' eco-innovations and their internationalization due to global political, economic, and social tensions worldwide. When forming effective management decisions at various levels, with an emphasis on a scenario-based approach, it is necessary to consider the dynamic factor influence on a company's eco-innovations under conditions of internationalization. This approach drives the development of benchmarking technologies and their transfer from economically developed countries to those with transitional and developing economic systems.

Analysis of recent research and publications

We examine the primary academic works related to research on eco-innovations among business entities and their internationalization. Scholars López Pérez G., García Sánchez I.M., and Zafra Gómez J.L. [1] investigated the use of bibliometric analysis on eco-innovations in financial characteristics, as well as the analysis of barriers and drivers of development as an element in forming effective business solutions in companies' green innovation sectors. Research on the economies of G7 countries within the framework of sustainable eco-innovation development was conducted by researcher Zhang Y [2].

Scholars Alka T.A., Raman R., and Sures M. [3] studied contemporary trends in innovation, ecosystems, and the circular economy. Economists Ali Y., Uddin A., and Petrillo A. [4] examined issues related to government support for eco-innovation and the circular economy within the context of organizational culture and government policy for innovation development.

Researchers Peters A., Schuster A.S., Kraus S., Kanbach D.K., and Meyer N. [5] explored ecoinnovation entities and their communication within the sustainable development system. Scientists Koech D.K., Degago E., Kipkorir C.S.S., Szabó A.P., and Molnár E. [6] studied the effects of internationalization processes within Hungary's higher education innovation system.

Scholars Zheng Q. and Choi T.-H. [7] examined the factor influence of internationalization processes on service providers in China. Economist Zucker-

Marques M. [8] investigated current internationalization processes in the banking sector.

Experts Sayed S. and Gherissi Labben T. [9] studied errors in innovation internationalization within the sustainable development framework of business entities. Researchers Partala T., Jantunen S., Kuukkanen T., and Merikoski H. [10] explored the factor influence of internationalization effects on small businesses in Finland.

Unsolved aspects of the problem

Among the previously unresolved aspects of the scientific problem, and based on the analyzed academic works, the authors of this study argue that scientific schools have not systematically examined the factor influence on business entities' eco-innovations within the framework of their internationalization. This aspect is a crucial component of optimizing business processes amidst transformational transitions and fulfilling the Sustainable Development Goals in the area of green innovation development.

The aim of the article is to analyze the factor influence of eco-innovation in business operations as an element of optimizing business processes and internationalizing their services. The primary tasks of the research include: substantiating a set of prerequisites and factors that stimulate the formation of eco-innovations at various stages of a company's development and its internationalization under the destructive economic challenges of the global environment; developing theoretical and methodological principles, including an analysis of prerequisites and stimulating and deterring factors influencing the formation of eco-innovations at various stages of development; and designing a system of factors related to the different stages of a firm's internationalization and its innovative development.

The main part

Research methods. The following research methods were used in the study. The systemic method was applied to formulate the relevance of the research topic; bibliometric analysis was employed to identify leading scientific schools working on eco-innovation issues in the context of company internationalization; factor analysis was used to identify the stimulating and deterring factors influencing companies' eco-innovations during their internationalization; economic analysis was used to assess options for implementing eco-innovations by service-providing companies in the course of their internationalization; and the synthesis method was applied in forming the conclusions of the research.

Presentation of the main research material. To scientifically substantiate a set of prerequisites and factors that stimulate the formation of eco-innovations at various stages of a company's development and its internationalization under the destructive economic challenges of the global environment, it is necessary to conduct a bibliometric analysis of the scientific schools that address the topics relevant to this research (Fig. 1).

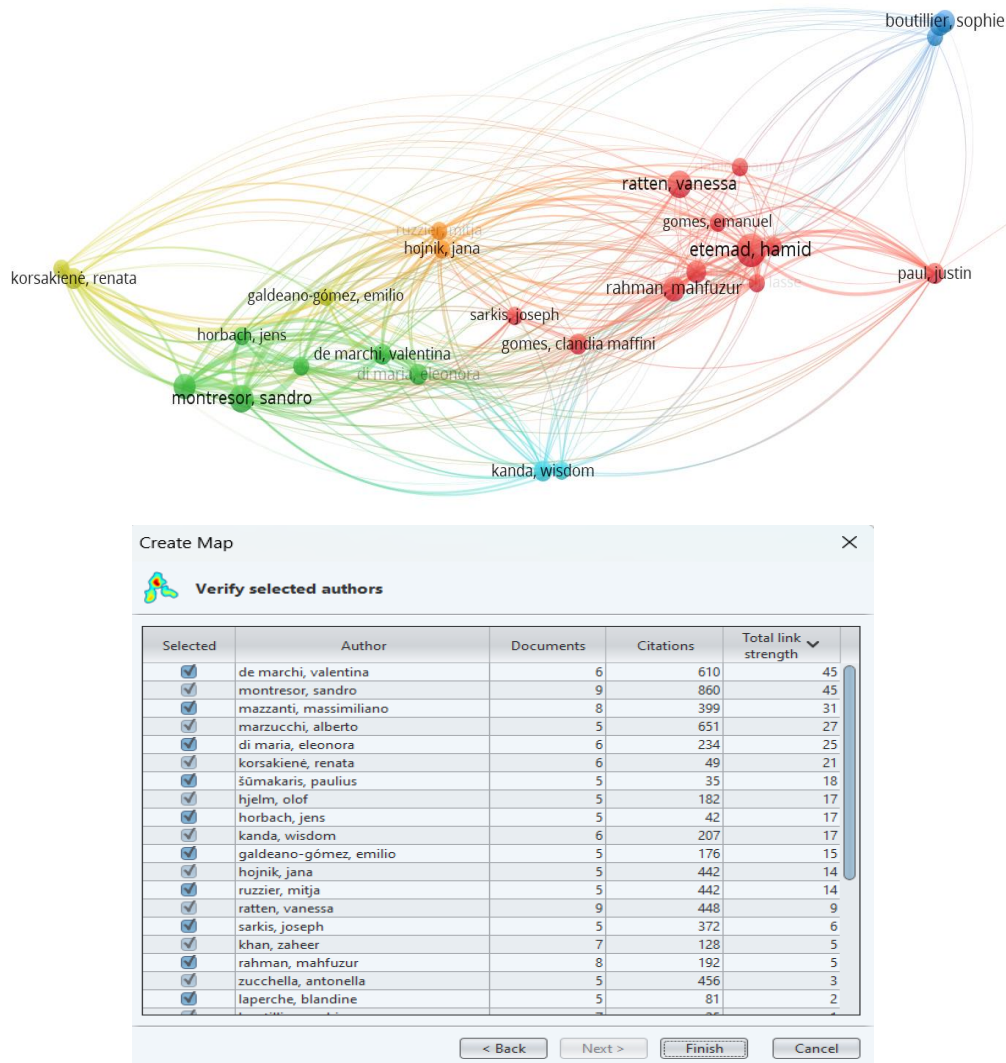
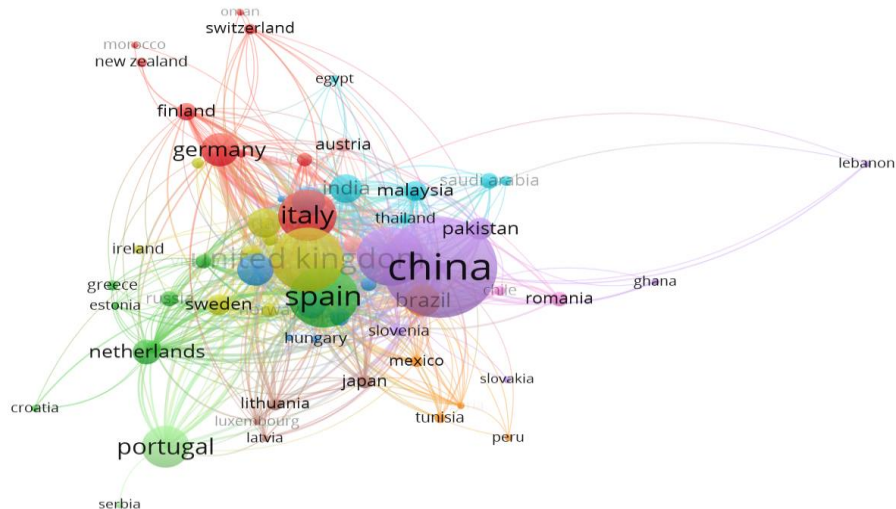


Figure 1. Bibliometric analysis of citation frequency for works by authors from global scientific schools researching companies' eco-innovations within the framework of their internationalization
 Source: author's research based on the Dimensions.ai database [11] and using the VOSviewer 1.19 program

Let's move on to the bibliometric analysis of the scientific schools of countries researching eco-innovation within the internationalization system. This analysis allows us to identify the leading

scientific schools of top countries that hold leading positions based on the citation of scientific papers (Fig. 2).



Create Map ×

 **Verify selected countries**

Selected	Country	Documents	Citations	Total link strength
<input checked="" type="checkbox"/>	spain	201	8208	899
<input checked="" type="checkbox"/>	china	414	10182	743
<input checked="" type="checkbox"/>	italy	154	5613	601
<input checked="" type="checkbox"/>	united kingdom	211	7768	580
<input checked="" type="checkbox"/>	united states	187	7449	415
<input checked="" type="checkbox"/>	germany	83	3036	213
<input checked="" type="checkbox"/>	brazil	76	2649	188
<input checked="" type="checkbox"/>	slovenia	10	610	137
<input checked="" type="checkbox"/>	canada	69	2630	130
<input checked="" type="checkbox"/>	france	77	1995	130
<input checked="" type="checkbox"/>	sweden	41	2094	126
<input checked="" type="checkbox"/>	australia	69	2331	122
<input checked="" type="checkbox"/>	pakistan	44	1182	119
<input checked="" type="checkbox"/>	india	66	1835	118
<input checked="" type="checkbox"/>	portugal	114	3641	108
<input checked="" type="checkbox"/>	belgium	21	849	106
<input checked="" type="checkbox"/>	colombia	31	678	105
<input checked="" type="checkbox"/>	taiwan	21	646	105
<input checked="" type="checkbox"/>	finland	32	677	88

Figure 2. Bibliometric analysis of scientific schools worldwide researching eco-innovation within the internationalization system

Source: author's research based on the Dimensions.ai database [11] and using the VOSviewer 1.19 program

The results of the bibliometric analysis highlight the leading authors from scientific schools and the citation frequency of their works on eco-innovation within the framework of companies' internationalization. This emphasizes the relevance of this article's topic and illustrates the development trajectory of ecological innovations in scientific research worldwide, particularly in leading countries such as the United Kingdom, China, Spain, Italy, Germany, Portugal, the Netherlands, Lithuania, and Brazil.

In conducting this bibliometric analysis, it is also essential to identify the names of the primary scientific institutions and universities associated with eco-innovation within the internationalization system. This enables us to determine the key scientific institutions and universities that lead in the publication activity of research results and project applications in the field of eco-innovation and internationalization. The analysis results are presented (Fig. 3).

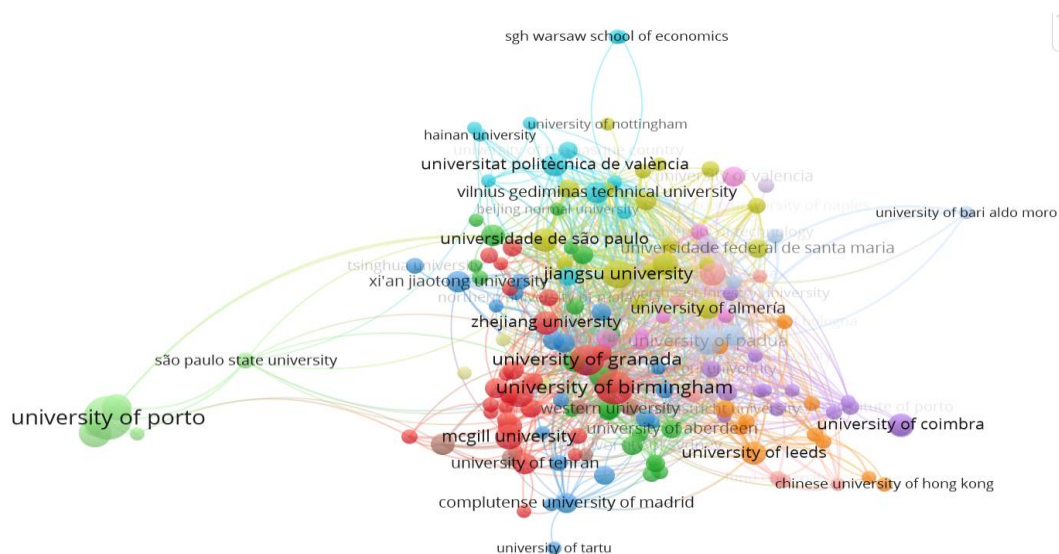


Figure 3. Bibliometric analysis of the primary scientific institutions and universities associated with eco-innovation within the internationalization system

Source: author's research based on the Dimensions.ai database [11] and using the VOSviewer 1.19 program

Regarding the set of prerequisites and factors that stimulate the formation of eco-innovations at different stages of a company's development and its internationalization amidst the destructive economic

challenges of the global environment, the main prerequisites and factors include: the political influence of business elites, globalization of economic processes, changes in global security systems due to a

multipolar world, financial market destabilization due to rising fuel prices, de-carbonization in production and consumption, the growing importance of green technologies, and alternative energy sources. All these prerequisites necessitate the implementation of eco-innovations for economic development on both local and global scales.

Let us examine the stimulating and deterring factors influencing the formation of eco-innovations at various stages of development.

Stimulating factors for service-providing companies include: cost optimization through identifying opportunities for cost reduction (e.g., implementing eco-friendly transport, switching to cheaper energy sources such as wind, solar, or geothermal energy, producing eco-friendly products by avoiding concentrates and colorants in food production); offering eco-services (e.g., renting electric vehicles such as scooters, bikes, or cars); organizational environmental incentives (e.g., allowing gasoline and diesel cars to operate on certain days of the week, which helps reduce emissions); and transitioning to eco-transport when providing services (e.g., courier platforms actively adopting eco-transport such as electric scooters, e-bikes, electric motorcycles, and electric cars to reduce transportation costs). These factors are characteristic of the growth, stable development, and decline stages.

Deterring factors for service-providing companies include: changes in fuel pricing policies, which lead to increased transportation costs and the overall cost of services; changes in government policies that raise taxes for small businesses, which result in higher service prices and reduced competitiveness of small businesses in the domestic service market; concentration of business into medium and large companies (the formation of concentrated business may push small companies out of the market due to their inability to compete with medium and large enterprises); inflationary processes in the economy, which have a destructive impact on service pricing, as the devaluation of national currencies leads to a sharp increase in service prices and a decrease in purchasing power; and force majeure factors, such as military conflicts and natural or man-made disasters, which can cause business operations to halt in affected regions and cities. These factors are characteristic of the growth, stable development, and decline stages. Let's move on to the development of a system of factors related to different stages of a firm's internationalization and its innovative development based on the works of scholars from scientific schools on eco-innovation and company internationalization [1-10] (Table 1).

Table 1. System of factors related to different stages of a firm's internationalization and its innovative development

Stages of internationalization [12]	Eco-innovation technologies	Stimulating factor (+), de-stimulating factor (-)
<i>Domestic market.</i> The implementation of goods and services in the domestic market.	Production of environmentally oriented goods and their sale on the domestic market (green energy products, eco-friendly food industry products, electric transport).	+ Economic (payment of taxes); + Social (new job opportunities); + Managerial (management and organizational improvements).
<i>Export of goods.</i> The export of goods and services, with a priority given to the domestic market.	Implementation of export-oriented strategies and tactics for promoting eco-innovations in foreign markets, scaling the company through the competitive advantages of eco-innovations.	+ Economic (increase in profits); + Innovative (advantages of technologies).
<i>International market.</i> Expansion of domestic business processes into international markets.	Opening subsidiaries abroad, primarily trade houses, and implementing strategies for the advantages of eco-innovations.	- Normative (national firms protection policy).
<i>Globalization.</i> Globalization of processes and establishment of production facilities in other countries (transformation of the company's business processes into an international corporation).	The creation of eco-innovation production in different countries with the aim of optimizing the cost structure of technological processes in the production of eco-innovations.	+ Economic (cost optimization); + Innovative (advantages of technologies); + Managerial (management benefits).
<i>Transnational company.</i> Transnational business processes of the company (independence in production and investment worldwide).	An independent process of production and distribution of eco-innovations through sales channels worldwide and investment in eco-innovations in international innovation projects.	+ Economic (increase in investments); + Innovative (advantages of technologies).

Source: compiled by authors on materials [12]

As seen in Table 1, everything depends on the company's internationalization policy and the promotion of eco-innovations in external markets, taking into account the stimulating and deterring factors.

Let us now explore the economic analysis using a scenario approach to the implementation of eco-

innovations within the framework of company internationalization, incorporating best practices from European Union countries to countries with transitional economies. The basis will be the use of the courier service platform "Wolt" by a self-employed individual, considering three different scenarios for transitioning to eco-innovative services

in Finland, with the same gross income volume. The authors of the study define eco-innovations in this context as the transition from traditional energy sources to alternative ones when using vehicles in the

process of providing courier services. The objective of this economic analysis is to demonstrate the economic effect of switching to alternative energy sources in the provision of courier services (Table 2).

Table 2. Economic analysis using a scenario approach to the implementation of eco-innovations in the company's internationalization system (monthly period), Euro

Scenarios	Cost of 100 km travel	Fuel type	Transport costs	Other costs	Gross income	Gross profit	Economic effect
Pessimistic	13.2	Gasoline	400.0	58.0	1580.0	1122.0	0.0
Realistic	6.6	Diesel	200.0	58.0	1580.0	1322.0	200.0
Optimistic	4.6	Electricity	140.0	58.0	1580.0	1382.0	260.0

Source: compiled by the authors based on the business model of entrepreneurial operations

In Table 2, other expenses include costs for engine oil, equipment depreciation, and internet provisioning. It should be summarized that in 2024, the inhibiting factors at this stage of courier services implementation with the involvement of electric vehicles are the relatively high cost of electric transport (from €35,000), which slows down the processes of rapid transition to the use of alternative fuel (electricity) in the short term. However, in the medium-term perspective, scaling up courier services and their internationalization to countries with transitional economies may lead to a quick shift to electric transport, with the entry of large companies (taxi fleets) into the courier services market and further reduction in the cost of electricity compared to the rising prices of gasoline and diesel fuel. The internationalization of the service sector involves globalization and the formation of transnational companies in countries with transitional economies, based on the experience of companies in developed economies.

Conclusions

The main conclusions of the study are as follows. A complex of preconditions and factors that stimulate the formation of eco-innovations at different stages of company development and its internationalization in the context of destructive economic challenges in the global environment with the aim of optimizing business in an effective European business environment has been substantiated. These factors include political influence of business elites, globalization of economic processes, changes in the world security system due to the multipolarity of the world, destabilization of financial markets due to rising fuel prices, de-carbonization of production and consumption processes, and the actualization of green technologies and alternative energy.

Theoretical and methodological provisions have been developed, which include an analysis of the preconditions, stimulating and inhibiting factors affecting the formation of eco-innovations at different stages of development and internationalization of firms in the face of destructive economic challenges. Stimulating factors for service companies include cost optimization by seeking opportunities to reduce them, the production of eco-friendly goods, providing eco-services, organizational and ecological stimulation, and transitioning to eco-transport in service provision. Inhibiting factors include changes in fuel price policies, changes in government tax policies for small businesses, the concentration of business in medium and large companies, inflationary processes negatively affecting service pricing, and force majeure factors.

A system of factors related to different stages of a firm's internationalization and its innovation development has been developed. These factors include economic, social, managerial, innovation, and regulatory aspects at different stages of company internationalization, taking into account the analysis of different scenarios for implementing eco-innovation policies in the service sector.

Further research should focus on developing a system for assessing the economic efficiency of eco-innovation measures by companies during their internationalization, specifically the adoption of best practices in innovative development in line with the Sustainable Development Goals. Additionally, addressing the need for the development of organizational and economic support for eco-innovations in the context of post-war and post-conflict country development should also be a priority.

Abstract

Introduction. In the context of the global market environment, the issue of activating business entities to enhance their ecological innovative activity in a highly competitive environment arises. The main objective of this study is to analyze the factor influence of eco-innovations in the operations of business entities as an element of business process optimization and the internationalization of their services. The primary tasks of the research include: substantiating a set of preconditions and factors that stimulate the formation of eco-innovations at different stages of company development and its internationalization under the destructive economic challenges of the global environment; developing theoretical and methodological provisions, which include the analysis of preconditions, stimulating and inhibiting factors influencing the formation of eco-innovations at different stages

of development; and developing a system of factors related to various stages of firm internationalization and its innovative development.

Research Results. Research methods: systematic method; bibliometric analysis method; factor analysis; economic analysis method; synthesis method. A comprehensive set of preconditions and factors stimulating the formation of eco-innovations at different stages of company development and its internationalization under the destructive economic challenges of the global environment has been substantiated, with the aim of optimizing the company's business in the context of an effective European business environment. Theoretical and methodological provisions have been developed, containing an analysis of the preconditions, stimulating and inhibiting factors that influence the formation of eco-innovations at various stages of development and the internationalization of the firm under economic challenges. A system of factors related to the various stages of firm internationalization and its innovative development has been developed.

Conclusion. The main conclusion is the scientific justification of the factor influence on the eco-innovation processes of business entities during their internationalization. Further scientific research should focus on the development of a system for assessing the economic effectiveness of measures for implementing eco-innovations by companies during their internationalization, particularly the involvement of advanced practices of innovative development in achieving sustainable development goals. Additionally, solving the issue of developing organizational and economic support for eco-innovations in the context of post-war and post-conflict country development is required.

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