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EUROPEAN EXPERIENCE IN IMPLEMENTATION OF ECO-INNOVATIONS AS PART OF THE GENERAL STRATEGY OF ENTERPRISE DEVELOPMENT

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Introduction. In today's realities, crisis phenomena, such as a pandemic and a full-scale war, have caused huge losses to enterprises, including the food industry. Therefore, in view of the negative factors that, as of the beginning of 2023, continue to affect the investment attractiveness of enterprises, destroying not only the infrastructure, fixed assets and business, natural resources, relationships with partners, the customer base developed over many years, are noticeably hit on the investment attractiveness of business entities. Thus, enterprises remain without external financial resources, which affects their competitiveness in the market. This significantly affects the decrease in profitability and leaves enterprises alone with crisis phenomena. Therefore, in view of the difficulties, the issue of effective implementation of eco-innovations in the production sphere for the recovery of resources, business, increasing the interest of investors and increasing the amount of cash infusions is becoming more urgent for enterprises.

Analysis of recent research and publications. Eco-innovations are the subject of research by such foreign and domestic scientists as: Fussler K. [1], James P. [1], Kemp R. [1], Arundel E. [1], Kopishinska K.O. [9, p. 174–175], Ostrovsky I.A. [9], Prasol V.M. [9], Mozhaikina N.V. [9], McKinney F. [10], etc.

Objectives of the article. The task of the article is to compare the popularity of eco-innovative technologies in foreign countries and in Ukraine; determination of types of eco-innovations for further implementation at the enterprise; analysis of examples of implementation of eco-innovations by foreign enterprises; research of technologies that could improve the production activity of enterprises and contribute to its environmentalization.

The main material of the study. The current ecological situation in Ukraine can be characterized as a crisis, since the specific weight of resource-intensive and energy-intensive technologies in the economy of Ukraine, the low level of environmental awareness of society has led to significant environmental degradation, excessive pollution of surface and underground water, air and land. Added to this was the devastating impact of the military actions of the aggressor country and their large-scale consequences. Therefore, as of 2023, Ukraine faces an urgent need to introduce modern technology to reduce the level of environmental pollution and further eliminate eco-destructive consequences.

One of the main ways to solve environmental problems is seen in the transition to an innovative model of the development of the national economy as the main means of environmentally safe modernization of production and the implementation of resource-saving processes. The implementation of ecological innovations in Ukraine plays an important role in the development of the country's economy as a whole. For a better understanding, consider the essence of the concept of ecological innovation.

The concept of eco-innovation was first proposed by Claude Fussler and Peter James in 1996. It was associated with a double effect that significantly reduces the negative impact on the environment and brings business value to enterprises [1].

In 1998, Rene Kemp and Anthony Arundel proposed the following interpretation of the term "eco-innovation". They believed that it can be achieved at the level of technology or organization related to an eco-product or an eco-organization [1].

Eco-innovation is the development of products and processes that contribute to sustainable development, applying the commercial application of knowledge to obtain direct or indirect environmental improvements. This includes a range of related ideas, from environmentally friendly technological advances to socially acceptable innovative pathways to sustainable development. The field of research that seeks to explain how, why, and at what speed new "environmental" ideas and technologies spread is called the diffusion of environmental innovations [2].

Eco-innovation is a new business approach that promotes sustainable development throughout the entire product life cycle, and also increases the company's productivity and competitiveness [3].

In our opinion, ecological innovations are modified or newly created products, services, processes, systems and procedures, which are aimed at reducing the use of natural resources and gradually increasing the share of rapidly renewable materials in order to reduce the costs of manufacturing goods, software systems or providing services, procedures with the highest profitability for the company. Klaus Rennings uses the term eco-innovation to describe three types of change associated with sustainable development: technological, social and institutional innovation.

Table 1

Types of eco-innovations that are related to sustainable development: technological, social and institutional innovations

Name	Interpretation	Scientists	Examples
Technological innovations	innovations aimed at obtaining and applying new knowledge to solve technological and engineering problems in the field of ensuring the functioning of equipment and production in the organization as a single system.	Kopishinska K.O.	– Knopka medical device; – technology that uses fallen leaves and recycled fiber to make paper from Releaf; – "Smart House" system.
Social innovations	drastic changes in the global educational environment under the influence of the corona crisis, including cross-border provision education.	Ostrovsky I.A., Prasol V.M., Mozhaykina N.V.	– educational grant program "Social innovations of communities".
Institutional innovations	innovations that affect organizations, teams, companies, industries and governments. This variety can have multiple applications in different industries and opportunities for co-innovation across multiple industries.	McKinney F.	– the project "POP! Ways of participation"; – the third financing project "Youth Governance in the Alpine Space (GAYA)"; – COST action "Constitutional and deliberative democracy" (CA17135).

Source: compiled by the authors based on data [8, p. 174–175; 13]

The Russian war caused incredible damage to Ukraine's environment, so today the issues of implementing eco-innovations are among the most urgent for the country, including for food industry enterprises. As of the beginning of 2023, damage to the Ukrainian environment was caused to the amount of 46 billion dollars. USA [5]. The losses of the processing industry are estimated at 7.9 billion dollars. USA (96.9% of total industrial losses), and most businesses, especially in occupied cities and war zones, were completely destroyed. The food industry was among the most affected industries. For example, production of food products, beverages and tobacco products – 1.0 billion dollars. USA (12.8% – the share of affected enterprises from the total amount of losses incurred). This category mainly includes warehouses with significant food stocks. Only the Kyiv region lost a fifth of its warehouse space due to the war, which is about 364,000 square meters, including office space and other buildings on the territory of the complexes [6].

Against the background of the integration processes of Ukraine in the EU, we will consider the level of innovative development in such countries as the Czech Republic, Germany and France.

The Czech Republic is an average producer of environmental innovation and has never exceeded the EU average (European Commission, 2022). The country is relatively strong in eco-innovation, but the presence of

weaknesses is reflected in the eco-innovation index. One reason may be that R&D strategic plans are too general in their aims. In Figure 1, you can see the indicators of eco-innovation of the Czech Republic in comparison with the indicators of the EU for the period 2013–2022.

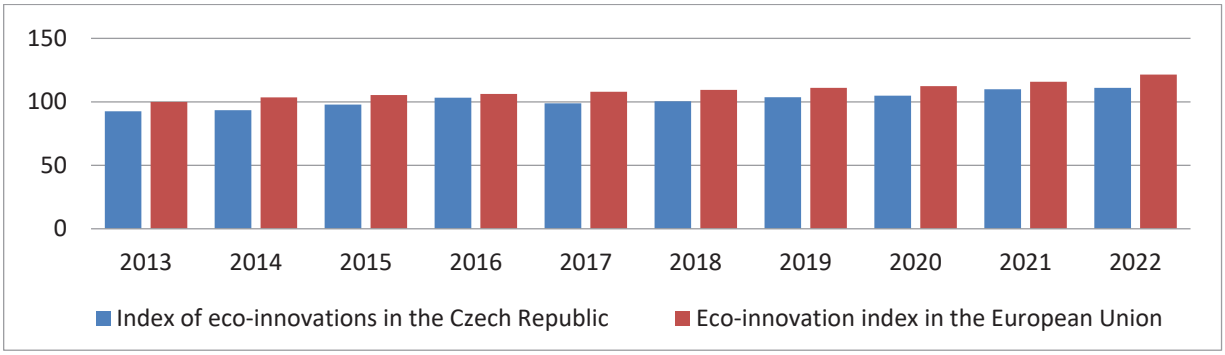

Figure 1. Indices of ecological innovations in the Czech Republic 2013–2022

Source: compiled by the authors based on data [4]

If the Czech Republic is an average producer, then Germany belongs to the group of leaders in environmental innovation. The main advantage of Germany is the efficiency of the use of financial resources, however, its relative weaknesses lie in the development of eco-innovation activities. This index consists of the following indicators that highlight the following trends: the highest indicators are material and water productivity, while the lowest are employment in the field of environmental protection, management resources and ISO 14001 certification. 2, it can be seen that the indicators of Germany in the period 2013–2022 increased significantly from 110 to 141.

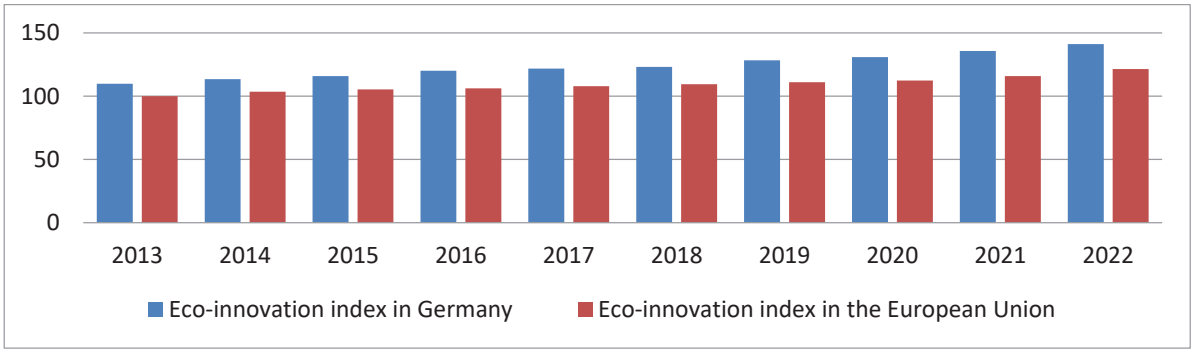

Figure 2. Indices of ecological innovations in Germany 2013–2022

Source: compiled by the authors based on data [4]

France, like Germany, belongs to the group of leaders in environmental innovation. In Figure 3, it can be seen that in the period 2013–2022, compared to the EU, the indicator increased by 20 units from 110 to 131. The positive point of France is the ability to effectively use financial resources, but at the same time, the area of eco-innovation still remains a disadvantage. This index consists of the following indicators that highlight the following trends: the most effective indicators are GHG emissions productivity and productivity material, but the worst as of 2022 are the volume of ISO 14001 certificates and added value in environmental protection and resource management activities.

If you compare the indicators of eco-innovations in the Czech Republic, Germany, France and Ukraine for 2022 (Figure 4), you can see that Ukraine occupies the lowest rung.

The analysis of the GII global innovation index in 2022 shows that Ukraine took 57th place, that is, there is a deterioration of innovative activity in the country compared to 2020 (45th place) and 2021 (49th place).

In general, the global innovation index includes the following components: institutions, human capital and research, infrastructure, general infrastructure, market, business. In addition, it is possible to take into account the sub-index of innovative products, which consists of the following indicators: results of knowledge and technologies and creative results.

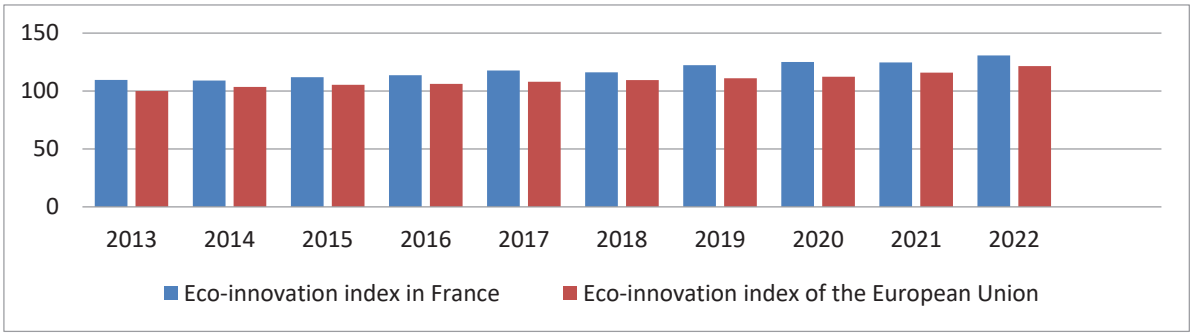

Figure 3. Indices of ecological innovations in France 2013–2022

Source: compiled by the authors based on data [4]

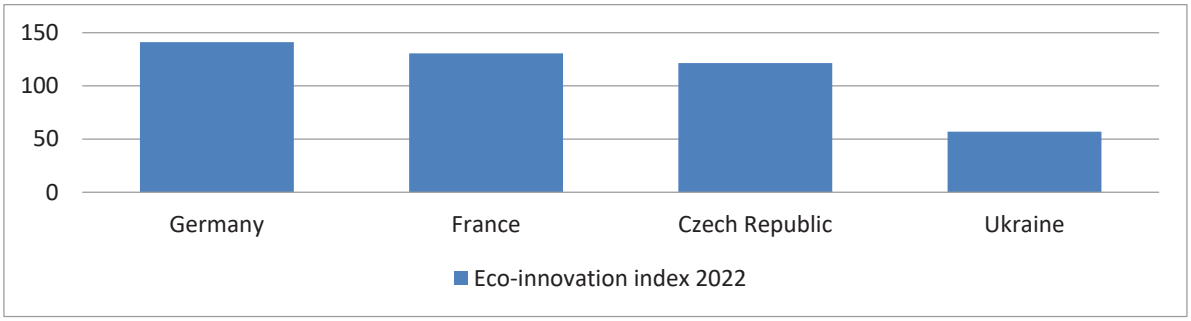

Figure 4 Indices of ecological innovations Germany, France, the Czech Republic and Ukraine in 2022

Source: compiled by the authors based on data [4; 7]

Among all the indicators that are grouped into strengths and weaknesses of Ukraine, indicators of ecological sustainability are in the rank of weak indicators. The GII in 2020 had the following dynamics: institutions reached 94th place, human capital and research – 39th place, infrastructure – 99th place, market – 93rd place, business – 54th place, knowledge and technology results sub-index – 25th place, creative results sub-index – 44 place. At that time, in 2021, some indicators increased, among them the indicator of the institution increased by 3 positions and reached 91st place, infrastructure increased by 5 positions to 94th place, the market indicator – 88th place, business cut only by 1 step – 53rd place. Other indicators decreased, including the indicator of human capital and research decreased by 5 positions to 44th place, the sub-index of the result of knowledge and technology to 33rd place, the sub-index of creative results was in 48th place. As of 2022, almost all components of the GII Ukrainian innovation index have significantly decreased, namely: institutions took 97th place, human capital and research – 48th place, infrastructure – 102nd place, market – 82nd place, business – 63rd place, knowledge and technology results sub-index – 36th place, creative results sub-index – 49th place. However, it should be noted that such indicators as knowledge and technological releases, business and market indicators have greatly influenced the level of innovative development of Ukraine in the direction of promoting a clean environment and fighting pollution, which, among other things, is caused by the production of products of the domestic food industry.

From the above, it can be concluded that the eco-innovation index in Ukraine is low today. Therefore, in order to intensify the implementation of environmental innovations in the entire structure of economic activity, attention should be paid to innovations in the field of research and technology, to create partnerships and mutual cooperation between business and research institutions. In addition, it is advisable for Ukraine to borrow the experience of European countries in this direction.

Eco-innovations are closely related to the investment activities of the enterprise. The innovations themselves play the role of a powerful driver of the company's development: increasing profitability, modernizing production, developing new sales channels, ensuring a successful advertising company, expanding the circle of consumers and entering foreign markets.

However, the enterprise must inspire confidence among potential investors, forming a positive reputation among the population for the quality of products, creditors and partners, with the help of constant monitoring

of economic indicators that best reflect the firm's ability to attract external resources for further innovative development and greening of production facilities, thus, reducing the negative impact on the environment.

Consider the example of the implementation of eco-innovations by the company Mondelēz International in the Czech Republic, where, as in the entire European Union, the production of food products is one of the key sectors of the processing industry. The importance of the food industry is primarily given to the provision of food to the population through the production and sale of healthy and safe food products [14].

Mondelēz International is part of a multinational company, located in more than 150 countries around the world. With the goal of introducing ecological packaging that protects products, delights consumers and does not harm the environment, in 2021 the company introduced a strategic approach to continuous improvement of packaging, focusing on three key areas: less packaging, better packaging and improved systems (Table 2). Mondelēz International's goal is to achieve zero waste emissions and support the development of a circular bag economy by 2050. The overriding principle is to make packaging easy and right by working together, innovating and investing in improved systems to increase recycling worldwide. In general, it can be noted that the amount of extracted materials from 2018 to 2021 reached the mark of 72,100 metric tons. This is a positive trend and indicates the reduction of plastic in the packaging of Mondelēz International products. In turn, there was an increase in the following types of packaging: packaging designed for recycling (from 92.5% to 95%) and paper packaging from environmentally friendly sources (from 90% to 98%).

Table 2

Goals and progress of Mondelēz International until 2025

Goal	Progress	Productivity in 2021
5% recycled plastic content by 2025	In progress	The amount of recycled plastic decreased by 0.5% from 5%
Reduction of primary plastic by 5% by 2025	Under development	Reduction of primary plastic occurred by 4% from 5%
Reduction of hard primary plastic by 25% by 2025	In progress	There was an increase in the volume of rigid primary plastic by 4%
100% packaging designed for recycling until 2025	In progress	Achieved 95% production of packaging volumes for processing out of a possible 100%

Source: compiled by the authors based on data [15]

The packaging greening program began in 2013 and continues to this day. In general, investments increased 7.4 times over the period 2013-2022, i.e. from 662 million dollars. USA up to 4,879 million dollars. USA. Such sums were achieved thanks to cooperation with social entrepreneurs. For example, in 2021, Mondelēz International partnered with The Plastic Flamingo (PLAF), a social organization in the Philippines that collects and recycles plastic waste into sustainable building materials. Thanks to this partnership, 42,000 kilograms of post-consumer plastic waste was collected and recycled into outdoor furniture. In 2022, the company supported PLAF and expanded its range of recycled plastic products.

The experience of Mondelēz International would be appropriate for Ukrainian companies to consider as well. For example, Ukrainian enterprises can take advantage of the technology of using fallen leaves and recycled fiber for paper production from the Releaf company and the educational grant program "Social Innovations of Communities". For the effective implementation of eco-innovations, small enterprises can take part in various grant programs (for example, the "Kusanone" program for the implementation of projects in 2024, a grant program for 1 million USD for creative entrepreneurs from MKIP and the Kyiv School of Economics) and crowdfunding platforms (My City, Spilnokosht, KUB, Na-Starte, Kickstarter), attract venture capital (AVentures Capital, Noosphere Venture Partners funds) or use bank credit products related to the financing of innovative activities of Ukrainian enterprises.

It is these programs that will ensure the technological development of enterprises and contribute to the greening of production, which will allow companies to eliminate the negative consequences of crisis phenomena in the future, will allow to increase the number of ecologically clean food packaging products, will contribute to the growth of awareness, communication and implementation of interest by heads of various departments of project management, crisis management in eco-oriented organization of team work, fundraising and partnership, implementation of joint environmental programs with the authorities and management of the region.

Conclusion. So, it can be concluded that for the introduction of eco-innovations, eco-innovation and investment activity should be part of the overall strategy of the enterprise's development. So, for example,

eco-innovations can be implemented in the production sphere in the form of eco-design of products, ecological raw materials and materials, ecological marketing, introduction of technical, technological, social and institutional innovations. These measures will affect both the preservation of Ukraine's natural resources and the further increase of the investment attractiveness of enterprises, including the food industry. In our opinion, the introduction of eco-innovations will help to reduce the negative consequences of the previous negative effects of the pandemic and war, as well as contribute to the development of enterprises in Ukraine against the background of EU integration processes.

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Svitlana Kushnir, Doctor of Economics, Associate Professor, Professor. **Nataliia Kairachka,** Student, Zaporizhzhia National University. **European experience of implementing eco-innovations as part of the general strategy of the company's development.**

The article examines the essence and significance of eco-innovations for Ukraine in 2023. Their varieties (technical, social and institutional eco-innovations) are also characterized with the aim of their further successful implementation and use in various spheres of activity. The main reason for the relevance of this issue was the damage caused to the environment as a result of the destructive influence of the military actions of the aggressor country, therefore there is an urgent need to green the production facilities of enterprises. The food industry suffered great losses, for example, the production of food products, beverages and tobacco products disappeared completely or decreased. In the Kyiv region alone, a fifth of warehouse space was lost, which is about 364,000 square meters, including office space and other buildings on the territory of the complexes. For these reasons, the level of availability of eco-innovations in foreign countries, such as: France, Germany, the Czech Republic for the period 2013–2022, and their structural component indicators (material and water productivity, employment in the field of environmen-

tal protection, management resources and certification). The elements of the Global Innovation Index (GII) and the dynamics of its development in Ukraine for the period 2018–2022 were studied. Environmental innovations are considered and analyzed on the example of the improvement of the own packaging of the American multinational company Mondelez international in the Czech Republic to overcome the consequences of economic crisis processes. Recommendations were given to Ukrainian enterprises to improve the environmental situation in production, such as: using the technology of using fallen leaves and recycled fiber for paper production from the Releaf company, participating in the educational grant program "Social Innovations of Communities" and on crowdfunding platforms (My City, Spilnokosht, KUB, Na-Starte, Kickstarter), attracting foreign grant programs, venture capital (AVentures Capital, Noosphere Venture Partners funds) and bank loans related to the financing of innovative activities of Ukrainian enterprises.

Key words: innovations, eco-innovations, greening of production, foreign experience, innovation strategy, investments.

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Кушнір Світлана Олександрівна, доктор економічних наук, доцент, професор. **Кайрачка Наталія Василівна,** студентка, Запорізький національний університет. **Європейський досвід впровадження еко-інновацій як частина загальної стратегії розвитку підприємства.**

У статті розглядається сутність та значення еко-інновацій для України у 2023 році. Також охарактеризовано їхні різновиди (технічні, соціальні та інституційні еко-інновації) з метою в подальшого вдалого їх впровадження та використання в різних сферах діяльності. Основною причиною актуальності даного питання стала шкода, яку завдало довкіллю внаслідок руйнівного впливу військових дій країни-агресора, тому існує є нагальна необхідність екологізації виробничих потужностей підприємств. Великих збитків зазнала харчова галузь, наприклад, зникло зовсім або зменшилося виробництво харчових продуктів, напоїв і тютюнових виробів. Тільки в Київській області було втрачено п'яту частину складських площ, а це близько 364 тисяч квадратних метрів, включаючи офісні приміщення та інші будівлі на території комплексів. З цих причин охарактеризовано рівень доступності еко-інновацій у зарубіжних країнах, таких як: Франція, Німеччина, Чехія на період 2013–2022 рр., та їх структурні складові показники (матеріало- та водопродуктивність, зайнятість у сфері охорони навколишнього середовища, ресурсів управління та сертифікації). Досліджено елементи Глобального індексу інновацій (GII) та динаміку його розвитку в Україні на період 2018–2022 рр. Розглянуто та проаналізовано екологічні інновації на прикладі удосконалення власної упаковки американської транснаціональної компанії Mondelez international у Чеській Республіці для подолання наслідків економічних кризових процесів. Надано рекомендації українським підприємствам для поліпшення екологічної ситуації на виробництві такі як: скористання технологією використання опалого листя та переробленого волокна для виготовлення паперу від компанії Releaf, участь в освітньо-грантовій програмі «Соціальні інновації громад» та на краудфандингових платформах (Моє місто, Спільнокошт, КУБ, Na-Starte, Kickstarter), залучення грантових зарубіжних програм, венчурного капіталу (фонди AVentures Capital, Noosphere Venture Partners) і банківських кредитів, пов'язаних з фінансуванням інноваційної діяльності підприємств України.

Ключові слова: інновації, еко-інновації, екологізація виробництва, зарубіжний досвід, інноваційна стратегія, інвестиційні вкладення.