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THE ENVIRONMENTAL COMPONENT IN THE SYSTEM OF ENSURING SUSTAINABLE DEVELOPMENT UNDER THE PRISM OF MODERN CHALLENGES

Mariia Dykha
Doctor of Economics, Professor,
Professor at the Department of Economics, Analytics, Modeling and Information Technologies in Business
Khmelnytskyi National University
ORCID: http://orcid.org/0000-0003-4405-9429

Valerii Dykha
Assistant at the Department of Economics, Analytics, Modeling and Information Technologies in Business,
PhD Student (Economics)
Khmelnytskyi National University
ORCID: https://orcid.org/0009-0004-2398-3692

Summary. The article substantiates the importance of the ecological component in the system of sustainable development goals. The powerful potential of Ukraine's ecosystem and environmental problems, problems of ensuring an ecologically safe environment for people's life and health are outlined. Global challenges for ecosystems are characterized (destruction of the ozone layer of the atmosphere, global climate changes, melting of glaciers, rising sea levels, harmful emissions, air and ocean pollution, drinking water problems, etc.). The significant negative impact of the Russian Federation's war against Ukraine on the environment is described. Environmental threats from nuclear energy manipulations are singled out; from waste storage facilities, coal mines, chemical plants and other branches of heavy industry, especially those located in the zone of active hostilities. It is noted that the destruction/damage of water supply systems, sewage and waste storage facilities, etc. provoke significant damage with long-term consequences for the environment and human health. It is founded that most problems of environmental direction are problems of a global level. Directions for achieving climate neutrality within the framework of the European Green Course are indicated. The results of Ukraine in achieving climate neutrality are analyzed. The state and problems of environmental protection financing are analyzed. It was found that in the structure of expenditures from the state budget of Ukraine for all types of financing of environmental protection measures, current expenditures significantly prevail over capital investments. In the structure of current expenses, the largest share is spent on waste management. It is noted that since the beginning of the full-scale war of the Russian Federation on the territory of Ukraine, the amount of funding for environmental protection has significantly decreased, which is justified by the great need for defense funding. It is founded that the transition to a climate-neutral economy is a challenge for the modernization of economic sectors, requires a rethinking of the role of each member of society, but is at the same time an opportunity to ensure development based on the principles of sustainability. A system of measures to protect the environment and ensure environmental safety is outlined.

Key words: sustainable development, ecology, global challenges, European Green Course, financing, modernization, energy efficiency, environmentally friendly technologies.

Relevance of the issue. Environmental issues have always been and will be relevant for humanity. The global goals of sustainable development and the national goals of sustainable development determined on their basis [1] provide for the implementation of tasks in four key areas: 1) fair social security; 2) sustainable economic growth and employment; 3) effective management; 4) ecological balance and development of sustainability. In the context of the research topic, we note that 6 of the 17 goals of sustainable development in one

way or another relate to issues of ecology, environmental safety, and environmental protection (Goal 6; Goal 7; Goal 12; Goal 13; Goal 14 and Goal 15), Figure 1.

Ukraine is characterized by a powerful potential of ecosystem, landscape and species diversity. The topography of the country is formed by mountain ranges (5% of the territory), highlands (25% of the territory), plains and lowlands (70%), which are the habitats of living organisms and the territories of human economic activity. Human economic activity has a significant impact on the state of the environment. At the beginning of the 20th century, 40% of the country's territory was covered by steppes. In the 21st century, most of these lands were already used for agricultural activities (more than 70%). The remnants of natural steppe ecosystems accounted for 3.0-3.5% of the territory of Ukraine, where 30% of all species of flora and fauna that are under threat of extinction and listed in the Red Book of Ukraine were concentrated [1]. The issue of protecting ecosystems, ensuring an ecologically safe environment for the life and health of people is extremely urgent, because today we can state that the war of the Russian Federation against Ukraine negatively affected every component of the environment (animal and plant life, water, air, soil). Cause-and-effect relationships of ecosystems cause long-term negative impacts not only of a local, but also of a global nature.

Analysis of recent research and publications. The ecological component of sustainable development is actively discussed at the level of global institutions, countries, public organizations, etc. Environmental conditions, parameters of ecology are classified by the World Health Organization as a number of the most important factors affecting human health, which actualizes the issue of the development of all branches of the economy and the organization of people's life activities based on the principles of sustainability. A number of factors that affect human health as a basic component of human potential in the system of sustainable development goals are more thoroughly described in the publication [2].

Arguing threats to ecosystems, scientists draw attention to the fact that the consequences of climate change are no longer linear. A further increase in temperature will lead to an increase in the number of negative natural phenomena, increasing the intensity of heat waves and floods, fires, ocean heating and inundation of certain parts of the land. Greenhouse gas emissions during 2010-2019 were higher than in any previous decade, but the average annual growth rate during 2010-2019 (1.3% / year) was lower than during 2000-2009 (2,1%/year). The Intergovernmental Panel on Climate Change in a published report [3] states that the global temperature increased by approximately 1.1°C in 2011-2020 compared to 1850-1900. The increase in temperature was (1.09 [0, 95–1.20]°C) with a greater temperature increase over land (1.59 [1.34–1.83]°C) than over ocean (0.88 [0.68 to 1.01]°C). Experts note that global warming is caused by human activity, greenhouse gases, which are dominated by CO_2 and methane (CH_4). At current trends in greenhouse gas emissions, the world is

Figure 1 – The Global Goals of Sustainable Development

Source: [1]

expected to pass the 1.5°C temperature threshold by the 2030s.

Among important decisions aimed at protecting ecosystems, we note the adoption in 2015 of the Paris climate agreement within the framework of the UN Framework Convention on Climate Change (UNFCCC) regarding the regulation of measures to reduce carbon dioxin emissions from 2020 [4]. Unlike the Kyoto Protocol, the Paris Climate Agreement stipulates that obligations to reduce harmful emissions into the atmosphere are assumed by all states, regardless of their level of economic development.

Systemic measures to achieve climate neutrality of the continent by 2050 are provided by the road map within the framework of the European Green Course [5].

At the national level, Article 16 of the Constitution of Ukraine stipulates that "ensuring ecological security and maintaining ecological balance on the territory of Ukraine, overcoming the consequences of the Chernobyl disaster - a catastrophe of a planetary scale, preserving the gene pool of the Ukrainian people is the duty of the state" [6]. The main aspects of environmental protection are prescribed in the Law of Ukraine "On Environmental Protection" [7]. Among the principles of environmental protection, the following are defined [7]:

– the priority of environmental safety requirements, the obligation to comply with environmental standards and limits on the use of natural resources when carrying out economic, managerial and other activities;

– guaranteeing an ecologically safe environment for people's life and health;

– the precautionary nature of measures regarding the protection of the natural environment, etc.; and other principles regarding the greening of production and the introduction of environmentally friendly technologies.

Unfortunately, preservation of the environment, compliance with environmental safety requirements, guarantees of a safe environment for human life and health are not fully ensured due to objective and subjective reasons. Various aspects of environmental problems have been covered by scientists in publications. In particular, the problems of financing environmental protection are highlighted in the publication [8], the justification of the importance of decarbonization in the system of sustainable development goals is described in the publication [9], and the ecological component in the modern paradigm of the development of the energy system based on the principles of sustainability was reflected in the study [10]. A wide range of issues related to world security, including and ecological, described in the publication [11]. In view of the need for modernization, effective post-war reconstruction, introduction of environmentally friendly, resource-saving and energy-efficient technologies, the results of the study also deserve attention [12; 13].

The modern world is faced with numerous environmental problems that lead to serious consequences, including climate change, depletion of natural resources, loss of biodiversity and environmental pollution, threats to safe living. Therefore, it is advisable to analyze the main aspects of the ecological component in view of its importance in the system of ensuring sustainable development in the context of modern realities.

The purpose of the article. Analyze the role of ecosystems and environmental problems in the system of ensuring sustainable development; threats to environmental security under the prism of modern realities; the state of environmental protection financing, prospects for achieving climate neutrality and ensuring development based on the principles of sustainability.

Research results. Humanity is an integral part of nature, completely dependent on the environment, therefore the protection and restoration of ecosystems as a living environment is extremely important; implementation of measures regarding the rational use of natural resources, regarding the use of resource-saving , energy-saving technologies, implementation of preventive bans/restrictions on the use of natural resources in cases of expediency of environmental protection long before their depletion or indirect destruction. Environmental safety is characterized by the existing state of the environment, the natural resource potential of the Earth and its individual regions.

Among the global challenges for ensuring environmental security are the destruction of the ozone layer of the atmosphere, the strengthening of the greenhouse effect as a result of the increase in the level of emissions of methane, aerosols, radioactive gases, an increase in air temperature, etc.; global climate changes, melting of the Arctic glaciers, rise in the level of the World Ocean, changes in the frequency and intensity of precipitation, irreversible changes in eco- and biosystems. Sea levels around the world are rising by an average of 3.2 mm per year.

One of the most traditional environmental problems is air pollution. Data from the

World Health Organization indicate that 9 out of 10 people breathe air that contains high levels of pollutants; and as a result, 4.2 to 7 million people worldwide die each year due to air pollution. For the most part, the air is polluted by industrial facilities and various types of transport. Therefore, the issue of treatment systems is extremely important. Industrial and uncontrolled deforestation is a serious environmental problem. An area of 300 football fields is cut down every hour. If the pace and approach to deforestation and forest restoration does not change, then by 2030 the planet may have only 10% of existing forests.

Pollution of the World Ocean due to extensive activities, including pollution by poisonous and radioactive substances, anthropogenic oil products, heavy metals and complex organic compounds; saturation of water with carbon dioxide from the atmosphere. The world's oceans absorb about 30% of the carbon dioxide emitted into the Earth's atmosphere. The release of carbon dioxide is an inevitable consequence of both anthropogenic activity and many natural processes, in particular, forest fires. Even the smallest change in the pH scale can have a significant impact on marine ecosystems, causing the death of some of their species (especially coral reefs, because they have a low tolerance to changes in environmental conditions) and, as a result, an increasingly rapid loss of biodiversity. More than 8 million tons of plastic enter the ocean every year. And according to the latest studies [14], this figure can reach up to 14 million tons per year. In the ocean, as well as on land, under the influence of external factors, plastic breaks down into small particles – microplastic, which has already polluted the entire planet. In 2022, microplastics were first discovered in snow in Antarctica. If no action is taken, plastic pollution will grow exponentially, and new unforeseen consequences of such pollution may arise.

According to the results of the study [15], 33 countries face an extremely high level of water shortage. Fourteen of the 33 countries are in the Middle East, including nine of them have extremely high levels of water stress in the world and rely heavily on groundwater and seawater desalination in the future; Figure 2. The problem of limited water resources is an important aspect of the multi-year conflict between Palestine and Israel, the spread of diarrhea and malaria in Yemen, as 80% of the country's population has limited access to clean water.

In the global context, the results of a study on the volume of greenhouse gas emissions are informative in the cross-section of industries, which are presented in Figure 3.

As we can see, most emissions are carried out by the fuel and energy complex. In this context, the conceptual vision of the development of the energy generation market, which is substantiated by the authors in the publication [17], deserves attention. The authors present a Meta-vision of the energy market, which should be characterized by features, including environmental friendliness.

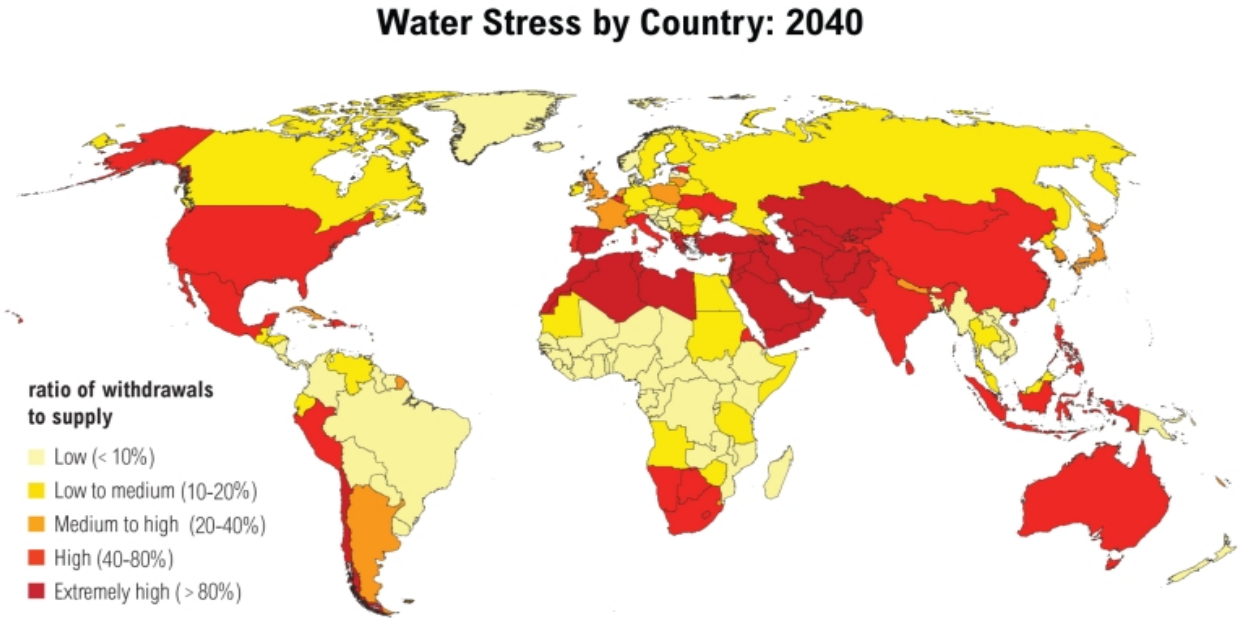
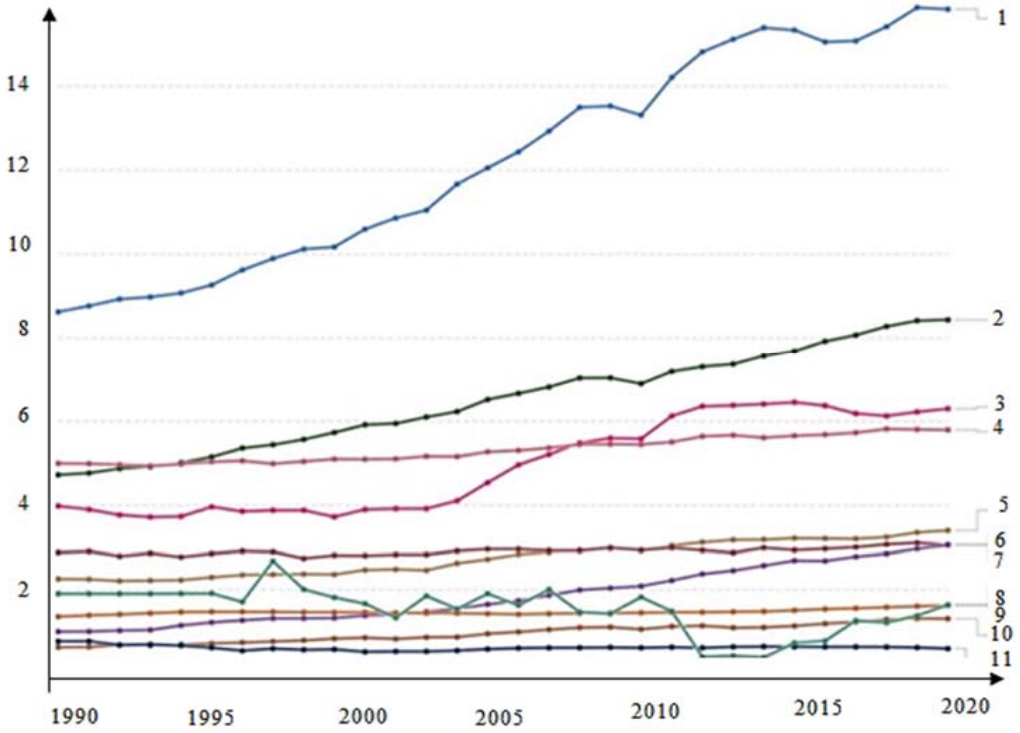


Figure 2 – Water Shortage by Country: 2040

Source: [15]



*1 – electricity and heat; 2 – transport; 3 – production and construction; 4 – agriculture; 5 – uncontrolled emissions; 6 – buildings; 7 – industry; 8 – land use change and forestry; 9 – waste; 10 – aviation and shipping; 11 – burning other fuel.

Figure 3 – Greenhouse gas emissions by economic sectors in the world, CO_2, billion tons

Source: [16]

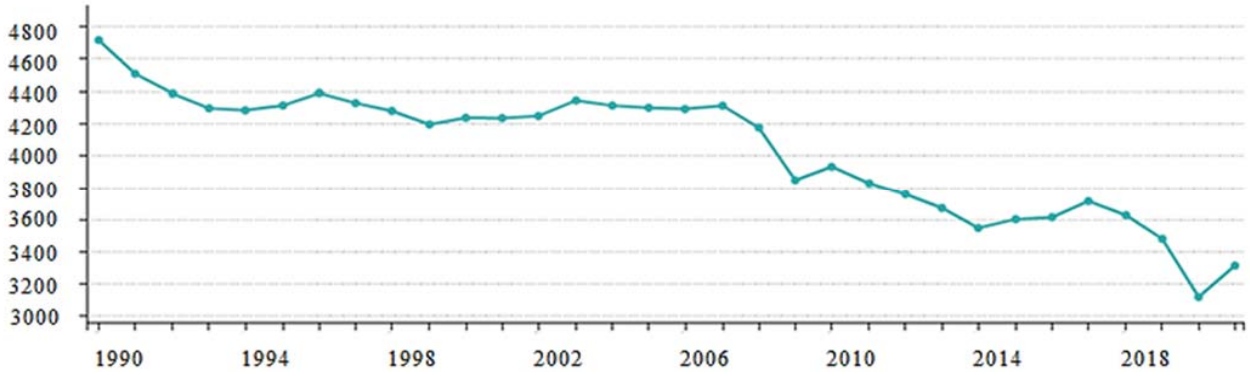
We draw attention to increased attention to the discussion of decarbonization issues, the implementation of effective measures to reduce emissions in many countries. The consistent implementation of the EU's climate-neutral economy policy has already led to a 27% reduction in greenhouse gas emissions in 2020 compared to 2005 [18] (the year the Emissions Trading System began operating in the EU). The dynamics of net emissions of greenhouse gases in the EU is shown in Figure 4. At the same time, the EU economy in 2020 grew by 23% over 15 years, and the GDP increased from 11.9 trillion dollars in 2005 to 15.4 trillion dollars in 2020 [19]. However, we should note that the reduction of the emissions of individual countries in the global dimension is taking place against the background of the increase in emissions throughout the world.

Unfortunately, today we can state. significant negative impact on the environment due to shelling of land and sea ecosystems, forests, industrial facilities and transport infrastructure, and damage to water supply systems, sewage and waste storage facilities provoke large-scale and serious damage with long-term consequences for the environment and human health. The ecological consequences of the war, which is being fought in one of the most industrialized and polluted areas in the world, will be felt by future generations.

The largest nuclear power plant in Europe (Zaporizka NPP) is occupied. The occupiers have already created repeated disruptions in its work, and further manipulations with the nuclear power plant may lead to irreparable consequences.

Luhansk CHP is also a potential environmental threat. As far back as 2014, there have been cases of power plants being set on fire, damaged and shut down. Power plants can contain high levels of polychlorinated diphenyls, so damage to such facilities can lead to contamination of local soil and water.

One of the high-risk threats to ecosystems is tailings (waste repositories). They store liquid industrial waste, because the industry of Ukraine created almost 29% of its gross domestic product. There are 465 waste storage facilities in Ukraine (which store more than 6 billion tons of waste); 200 of them are located in the east of Ukraine, that is, in the territory of active hostilities.



* Index of 1990 = 100

Figure 4 – The trend of net EU greenhouse gas emissions (including international aviation, including LULUCF) for the period 1990-2021

Source: [18]

Soil and water pollution is increasing day by day as the war continues. Coal mines, which have stopped working since the beginning of military operations in Donbas (since 2014), fill the environment (soil and drinking water) with toxic, and in some places, radioactive substances. Risks for the environment also arise from sudden failures in the operation of mines, because mine water must be continuously pumped out. In addition, polluted water from one mine overflows into others, because many mine tunnels are interconnected. The toxic danger is evident due to the constant shelling of areas where coal mines, chemical plants, and other heavy industries are concentrated. Donbas is a region where the presence of heavy industry increases the risk of an environmental threat, and therefore a threat to the civilian population. In particular, the Mykytiv mercury plant, whose work has been suspended since the beginning of 2014 due to hostilities in eastern Ukraine, is a potentially toxic point in Donbas. A number of abandoned mercury mines and landfills are a category 1 hazard for soil and water.

Military operations are associated with constant fires and explosions, so millions of tons of emissions enter the atmosphere (fine dust, nitrogen oxides, sulfur oxides, aldehydes, anhydrides, etc.). As of May 2023, about 1.2 million tons of pollutants, including 430 thousand tons of carbon monoxide, 700 thousand tons of dust, and 40 thousand tons of non-methane volatile organic compounds, were released into the atmosphere as a result of hostilities, as well as significant amount of heavy metals and other harmful substances [20].

Forest and grass fires caused by hostilities were the main source of emissions. Their volumes are 46.6 thousand hectares and more than 471 thousand hectares, respectively. In large areas of Ukraine, there is significant damage to the surface layer of soils as a result of the construction of fortifications, explosions and burning of ammunition, military maneuvers, etc. 186 thousand km^2 of land is at risk of damage and pollution, which is almost 31% of the territory of Ukraine. Of these, over 20 thousand km^2 of land has been damaged by more than 75%. The territories of Donetsk, Kharkiv and Zaporizhzhia regions suffered the greatest damage. As of May 2023, the consequences of the emissions described above are estimated at $4.2 billion. In particular, in $1.8 billion estimated damage from forest fires, $1.6 billion – from grass fires and $752 million. – from the burning of oil and oil products. The total damages from the damage to the territories and disturbance of the soil as a result of military operations are estimated at $9.8 billion. These calculations do not take into account the direct damage caused by the Russian occupiers blowing up the Kakhovskaya HPP in the Kherson region on June 6, 2023 [20].

In general, we note that the scale of the destruction and damages associated with the war of the Russian Federation against Ukraine are obvious, as well as many derivative negative consequences of a local and global economic, socio-cultural, ecological and other direction.

Most of the problems of environmental direction are problems of a global level. There are no "local consequences/effects" of carbon dioxide emissions. These are always global consequences/effects. War also provokes emissions of greenhouse gases, in particular methane from damage to gas pipelines. In this context, the emission of one ton of methane is equivalent to the emission of more than 30 tons of carbon dioxide. Therefore, all emissions into the environment change reality. If today we

emit gas into the atmosphere as a result of our activities (operation of industrial, civil facilities, etc.), then in a month it will be over Antarctica. Therefore, threats to ecology in one place are threats to the entire global world.

The EU, implementing the European Green Deal [5] and global climate measures under the Paris Agreement [4], aims to achieve climate neutrality by 2050, which will consist in the absorption by ecosystems and carbon capture and storage technologies of all greenhouse gas emissions caused by human activity. The European Green Course envisages increasing the efficiency of resource use, restoring biodiversity and reducing pollution, transitioning to a circular economy, implementing a system of measures aimed at economic development, which covers sectors, in particular, transport, energy, agriculture, construction and industry (Figure 5).

According to the EU Action Plan until 2030 within the framework of the European Green Course, the goal is to reduce emissions by 55% compared to 1990 levels. The package "Fit for 55" includes bills in the following areas [21]:

– emissions trading system (EU ETS);
– regulating the distribution of efforts to reduce emissions;
– land use and forestry (LULUCF);
– infrastructure of alternative types of fuel;
– carbon emission border adjustment mechanism (CBAM);
– social climate fund;
– ecological aviation fuel (RefuelEU) and more ecological fuel in shipping (FuelEU Maritime);
– reduction of methane emissions;
– CO_2 emission standards for passenger cars and minibuses;
– taxation of energy carriers;
– renewable energy sources (energy efficiency, energy efficiency of buildings).

Ukraine announced its intention to achieve climate neutrality by 2060. As of 2021, Ukraine has reduced emissions by 62.5% from their 1990 level, however, this result was due primarily to a significant decrease in industrial production relative to 1990. By 2030 it is planned to reduce greenhouse gas emissions to the level of 35% compared to 1990 [22]. Achieving climate neutrality requires the implementation of energy efficiency measures, the development of renewable energy sources, the modernization of enterprises, and the reduction of greenhouse gas emissions.

Despite the priority of ensuring environmental safety defined in the Law of Ukraine [7], underfunding of the sphere of environmental protection was observed; non-fulfillment of planned indicators of budget programs. In addition, it is important to note the low

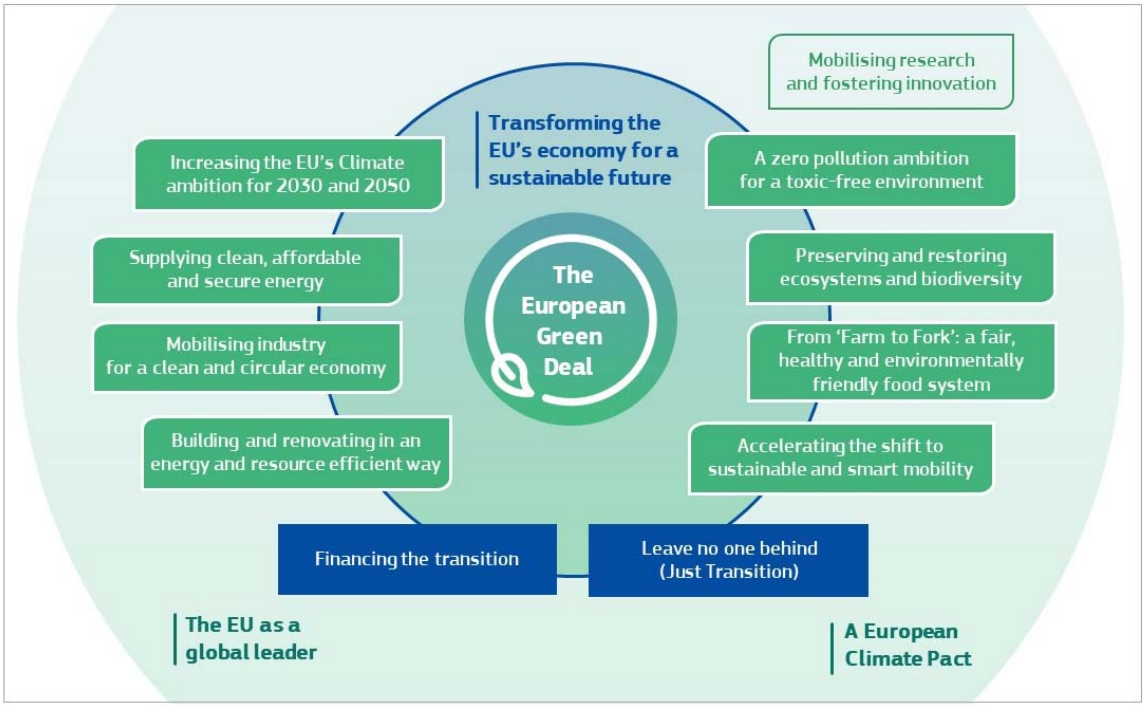


Figure 5 – The European Green Deal

Source: [5]

efficiency of the use of funds for environmental protection measures. The war in Ukraine created additional challenges and changes in the field of environmental financing and environmental protection measures.

We note that the dynamics of the growth of costs and capital investments for environmental protection, which we observe according to the data of the State Statistics Service of Ukraine [23], is due to the presentation of data in actual prices. Since 2015, the growth rate of expenditure has been approximately 20% per year compared to the previous year (capital investment is less, but also showed an upward trend). In the study [8], the same assessment was carried out in prices for the beginning of 2002. The author of the study notes the absence of positive changes in the dynamics of the real amount of expenditures on nature protection by all sources of financing, as well as the decrease in the actual amount of investments in environmental protection that arose due to redistribution of financial resources of public funds.

The negative thing is that in the structure of expenses for all types of financing of environmental protection measures, current expenses significantly prevail over capital investments. In particular, in 2020, capital investments made up 32%, and current investments made up 68% [23]. This distribution of expenses indicates the solution of short-term tasks, the insignificant amounts of financing for innovation and the introduction of new technologies, the low priority of "green" initiatives, the lack of profitable incentives for investing in environmentally friendly projects, as well as the low level of public awareness in the field of environmental protection. In addition, in the structure of current expenses, the largest share is spent on waste management, which may indicate the growth of their volumes, the complexity and improper level of organization of their disposal, etc.

We believe that the development of nature protection projects will be an investment-profitable type of business activity in the future.

Today, the low level of spending on environmental protection is primarily related to the difficult socio-economic situation and military operations, the need to finance the country's defense. The structure of expenditures of the state budget of Ukraine is presented in Table 1.

Today, defense expenditures account for more than 50% of the state budget of Ukraine, and there is still a need for additional financing. It is worth noting that the funds of macro-financial international aid are directed to the general fund of the budget, from where all expenses are financed. It should be noted that according to information publicly announced by officials, there is an agreement with donors that certain funds cannot be spent on financing the security and defense spheres, but must be directed to humanitarian and social needs.

As we can see, according to the data in the table 1, the volume of expenses for financing environmental protection has significantly decreased (from 0.55% in 2021 to 0.13% in 2023 in the structure of the state budget of Ukraine). At the same time, we note that despite the challenges of the war, some initiatives regarding decarbonization are being implemented at the national level. In particular, in 2023, the State Fund for Decarbonization

Table 1 – Structure of state budget expenditures of Ukraine (functional classification)

Expenses	in 2021	in 2022	in 2023	in 2024 (as of April 1, 2024)
State functions	13.87%	7.47%	7.38%	6.61%
Defense	8.56%	42.24%	52.25%	50.37%
Public order, security, judiciary	11.70%	16.39%	14.31%	16.65%
Economic activity	12.14%	3.53%	3.35%	1.58%
Environmental protection	0.55%	0.17%	0.13%	0.20%
Utilities	0.01%	0.02%	0.21%	0.00%
Health care	11.44%	6.81%	4.47%	4.91%
Spiritual and physical development	1.07%	0.41%	0.29%	0.30%
Education	4.28%	2.16%	1.51%	1.61%
Social protection and social security	22.77%	15.75%	11.69%	13.45%
Interbudgetary transfers	13.6%	5.06%	4.42%	4.31%
That's all	100% (1490258.9 million UAH)	100% (2705423.3 million UAH)	100% (4014418.1 million UAH)	100% (841145.5 million UAH)

Source: compiled by the authors based on data [24]

and Energy-Efficient Transformation was created, the accumulated funds of which are expected to be directed to the development of renewable energy sources, alternative fuels and measures to reduce greenhouse gas emissions. Revenues to the Fund come primarily from large industrial enterprises that pay a tax on CO_2 emissions, it is planned to attract international loans and grants [22].

It is imperative that the war, which is causing regression in the achievement of all sustainable development goals, ends as soon as possible. The transition to a climate-neutral economy is a challenge for the modernization of economic sectors, it requires a rethinking of the role of each member of society, which should be expressed in appropriate decisions and actions, but is at the same time an opportunity to ensure development based on the principles of sustainability. It is necessary to implement a system of measures to ensure an ecologically safe environment for the life and health of people, environmental protection. The system of measures aimed at environmental protection and ecological safety should be implemented on the basis of a systemic approach to ensuring sustainable development in social, economic and ecological dimensions. More detailed justification of the system of measures and mechanisms of their implementation will be the subject of further research.

Conclusions. So, the war of the Russian Federation against Ukraine led to human casualties, caused large-scale destruction of industrial and civil infrastructure, visible and still invisible consequences of an ecological nature that will be felt for years. Therefore, it is important to withdraw Russian troops from the territory of Ukraine as soon as possible, establish peace, ensure the territorial integrity and sovereignty of Ukraine. In the context of ensuring environmental safety and environmental protection, the primary task will be the implementation of comprehensive measures to demining the territories of Ukraine and the implementation of a system of measures to protect and restore ecosystems.

To ensure harmonious development, it is necessary to intensify the implementation of "green" initiatives and projects, to develop environmentally friendly technologies, environmental protection measures, waste processing, etc. It is necessary to implement systematic actions regarding: reduction of greenhouse gas emissions; effective use of natural resources; conservation of biodiversity; leveling of environmental pollution, etc. Environmental security requires the joint efforts of nations and institutions, all people to ensure a balanced approach to solving global environmental problems and preserving nature for future generations.

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ЕКОЛОГІЧНА СКЛАДОВА У СИСТЕМІ ЗАБЕЗПЕЧЕННЯ СТАЛОГО РОЗВИТКУ ПІД ПРИЗМОЮ СУЧАСНИХ ВИКЛИКІВ

Диха Марія Василівна
доктор економічних наук, професор,
професор кафедри економіки, аналітики, моделювання
та інформаційних технологій в бізнесі
Хмельницький національний університет

Диха Валерій Валерійович
асистент кафедри економіки, аналітики, моделювання
та інформаційних технологій в бізнесі,
здобувач PhD за спеціальністю 051 «Економіка»
Хмельницький національний університет

Анотація. У статті обґрунтовано важливість екологічної складової у системі цілей сталого розвитку. Окреслено потужний потенціал екосистеми України та проблеми навколишнього середовища, проблеми забезпечення екологічно безпечного середовища для життя і здоров'я людей. Охарактеризовано глобальні виклики для екосистем (руйнування озонованого шару атмосфери, глобальні зміни клімату, танення льодовиків, підняття рівня Світового океану, шкідливі викиди, забруднення повітря та Світового океану, проблеми питної води тощо). Описано значний негативний вплив війни РФ проти України на навколишнє середовище. Виокремлено екологічні загрози від маніпуляцій із атомною енергетикою; від сховищ відходів, вугільних шахт, підприємств хімічної та інших галузей важкої промисловості, особливо тих, які знаходяться в зоні активних бойових дій. Зазначено, що руйнування / пошкодження систем водопостачання, каналізації та об'єктів зберігання відходів тощо провокують значну шкоду з довгостроковими наслідками для довкілля та здоров'я людей. Обґрунтовано, що більшість проблем екологічного спрямування є проблемами глобального рівня. Зазначено напрями досягнення кліматичної нейтральності в рамках Європейського зеленого курсу. Проаналізовано результати України в досягненні кліматичної нейтральності. Проаналізовано стан та проблеми фінансування охорони навколишнього середовища.

З’ясовано, що у структурі витрат з державного бюджету України за всіма видами фінансування природоохоронних заходів суттєво переважають поточні видатки над капітальними інвестиціями. У структурі поточних видатків найбільшу частку займають видатки на поводження з відходами. Констатується, що від початку повномасштабної війни РФ на території України обсяги фінансування охорони навколишнього середовища суттєво скоротилися, що аргументовано великими потребами фінансування оборони. Обгрунтовано, що перехід до кліматично нейтральної економіки є викликом для модернізації галузей економіки, потребує переосмислення ролі кожного члена суспільства, але є одночасно й можливістю забезпечення розвитку на принципах сталості. Окреслено систему заходів щодо захисту навколишнього середовища та забезпечення екологічної безпеки.

Ключові слова: сталий розвиток, екологія, глобальні виклики, Європейський зелений курс, фінансування, модернізація, енергоефективність, екологічно чисті технології.

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