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Poland's experience in the formation and management of a green economy

Abstract. *One of the key goals of the economic development of any country is to achieve and maintain high-quality and sustainable economic growth, as well as to use a competitive advantage. The global financial and energy crises determine the search for new models of economic growth aimed at sustainable development while simultaneously stabilizing the consumption of material goods that do not expose the future generation to significant environmental risk.*

The article presented for discussion reveals the features of the relationship and interdependence of the green economy and sustainable development. These issues are of relevance today for both developed and developing countries.

In this regard, the experience of the formation and management of a green economy in ensuring sustainable development of the EU countries, in particular Poland, and Kazakhstan is of great interest.

Keywords: *green economy, green technologies, sustainable development, ecological state, crisis.*

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Introduction

Currently, the problems of the ecological state of the environment are becoming global problems. The popularization of the concept of «green economy» is largely associated with numerous crises in recent years, primarily with the climatic, environmental, food, financial and economic. The development of a green economy implies solving environmental problems while ensuring economic security, social stability and creating additional conditions for sustainable economic growth.

Methodology

The main methods for the study were the methods of multivariate statistical analysis. The

calculations were carried out in the Statistica and Excel packages. The research consists of the following stages: formation of a system of indicators and preliminary data analysis; construction of an integral indicator using the method of principal components of factor analysis (highlighting the main factors; calculating the integral indicator); ranking of observations (building a rating) and analysis of the results.

Discussion

In many sectors of the economy, there is a real need to modernize technological processes, introduce innovative green technologies that will improve the environmental sustainability of the economy, and increase employment by improving working conditions and innovation.

The transition to a green economy is an inevitable direction of development that requires intensified efforts aimed at improving the environmental friendliness of the economies of all countries of the world. Here it is necessary to consider the national interests and capabilities of individual economies. Green protectionism and green standards should not become an obstacle in solving current socio-economic problems, as well as contribute to rather than oppose the achievement of the goals of sustainable development of the world economy.

The aggravation of environmental problems in developed countries has led to a sharp change in state policy in the field of environmental protection. First, government spending on environmental protection has risen sharply. Secondly, the production of cleaning equipment has been established, which has led to the emergence of an «eco-industry», «eco-business» – international market for environmentally-friendly equipment and environmentally pure products. Thirdly, a system of laws and organizations for the protection of the environment has been formed. Environmental development programs have been developed for individual countries and regions. Fourth, the coordination of international actions in the field of environmental protection has been strengthened [1]. The developed countries spend on average about 1.7% of their gross domestic product (GDP) for environmental needs, but this is not enough, since the annual damage to the natural environment is equal to 6% of GDP. In many countries, there are a huge number of unresolved interrelated environmental and economic problems, including climate change, waste generation, and accumulation, degradation of ecological systems, pollution of atmospheric air and surface water bodies, reduction of biological diversity.

Most countries in the world have recently intensified their environmental policies with the aim of moving from the traditional model, in which nature conservation is considered a burden on the economy, to a model in which the environment is the “engine of development”, that is, to a green economy.

The United States of America is targeting an 80% reduction in emissions by 2050. Solar installations will generate 65% of the country's energy and 35% of the heat. Mexico plans to construct energy-efficient buildings, halve the reduction in hydrocarbon emissions by 2050, and introduce a program to assist households to replace old household appliances with new models with higher efficiency [2]. South Korea, with the chosen concept of green growth as a public policy strategy, focuses on green industry, energy and investment, green modes of transport, alternative sources of freshwater, waste recycling technologies, development of parks, and river development within the city. Almost all countries of the European Union (EU) have developed programs of these topics in the field of energy, public transport and infrastructure development, the construction of eco-cities, as well as the development of car recycling systems [3].

In the United States and Europe, the growth rate of investments in green energy, as one of the promising sectors of the green economy, is ahead of other sectors. Support for green technologies, including renewable energy sources, has become an important tool for stimulating the economy of many countries. In the future, the improvement of renewable wind, solar thermal, and hydropower will help replace environmentally unsafe and inefficient production.

The creation and implementation of the concept of a green economy require appropriate institutional conditions, measures of economic incentives for the modernization of enterprises, and the attraction of technologies, as well as the demand for environmental services. The solution to this fundamental problem is aimed at developing a green economy, creating universal mechanisms and methods for managing the functioning of the market for environmental goods and services, identifying development constraints and institutional conditions for a green economy, which is of great theoretical and practical importance.

Theoretical issues of the essence of the mechanism, methods, and forms that ensure the sustainable development of border regions, considering the conditions of their environmental

policy, are far from fully disclosed, and practical issues related to the development of a green economy are considered mainly at the macro level and in the industrial sectors of the national economy.

Achieving the goals of socio-economic development of any country cannot be realized without a significant reduction in environmental risk and the rate of environmental degradation. Therefore, in the strategic documents of the EU countries and the Republic of Kazakhstan, great attention is paid to compliance with the regulations of the Eurasian Economic Union and the Customs Union on the use of methods, methods, technologies for both production and consumption. It is important to formulate the tasks for bringing the processes of production of eco-products and their consumption at all stages of the life cycle, as well as the impact of these processes on the environment. As the main goal, it is necessary to consider the transition to the high-quality and sustainable economic growth of the economy through structural and institutional transformation, considering the introduction of the principles of a green economy, the priority development of high-tech industries, which will become the basis for increasing the country's competitiveness and the quality of life of the population.

A system of measures is being consistently implemented to strengthen the technological potential of national economies in order to fulfill international commitments on the transition to a green economy, which were formulated in the Declaration «Environment for Europe» and its final document «Rio + 20» [4].

International organizations consider the green economy as a strategic method for solving problems related to environmental degradation, as well as target tasks aimed at ensuring the safety of the use of natural resources, employment of the population, and the competitiveness of organizations. The green economy is decisive for several states, including Germany, Denmark, Sweden, South Korea, Kazakhstan, and the Russian Federation.

The development of a green economy requires the formation of a unified assessment system,

which will determine the degree of compliance of economic activity, both at the micro and macro levels, with the principles of a green economy. The criteria on which such an assessment is based should be developed considering the international experience and be related to the goals of sustainable development and serve as the basis for creating an integrated system for accounting for environmental and economic risk in each country [5].

Kazakhstan has enormous potential for the use of renewable energy sources while being the state with the highest greenhouse gas emissions in Central Asia. Despite significant economic, social and environmental benefits, the share of renewables in electricity generation in Kazakhstan remains low, at just over 1% in 2020. The country's government intends to increase this figure to 50% by 2050. While Kazakhstan is experiencing some difficulties in diversifying its economy and energy resources, and inclusive green growth concept is especially important for the country.

In line with the global desire for inclusive and sustainable growth, Kazakhstan has adopted national and regulated development programs and strategies to create the preconditions for sustainable development. Kazakhstan became the first state in Central Asia to create an organizational and legal basis for the transition to «green growth» through the adoption of several legislative documents, including the Environmental Code (2007), the Law on Supporting the Use of Renewable Energy Sources (2009), and the Transition Concept towards a “green economy” (2013). The authorities have established effective relationships with numerous international financial institutions and strategic partners regarding the promotion and development of renewable energy, clean technologies and infrastructure. Moreover, Kazakhstan promotes international cooperation for sustainable development through the Green Bridge Partnership Program (GBPP) [6].

Kazakhstan faces structural imbalances, socio-economic and environmental challenges such as overdependence on commodity exports, unequal distribution of wealth, low living standards, and

Timeline for Kazakhstan's transition to a green economy (2013 – 2050)

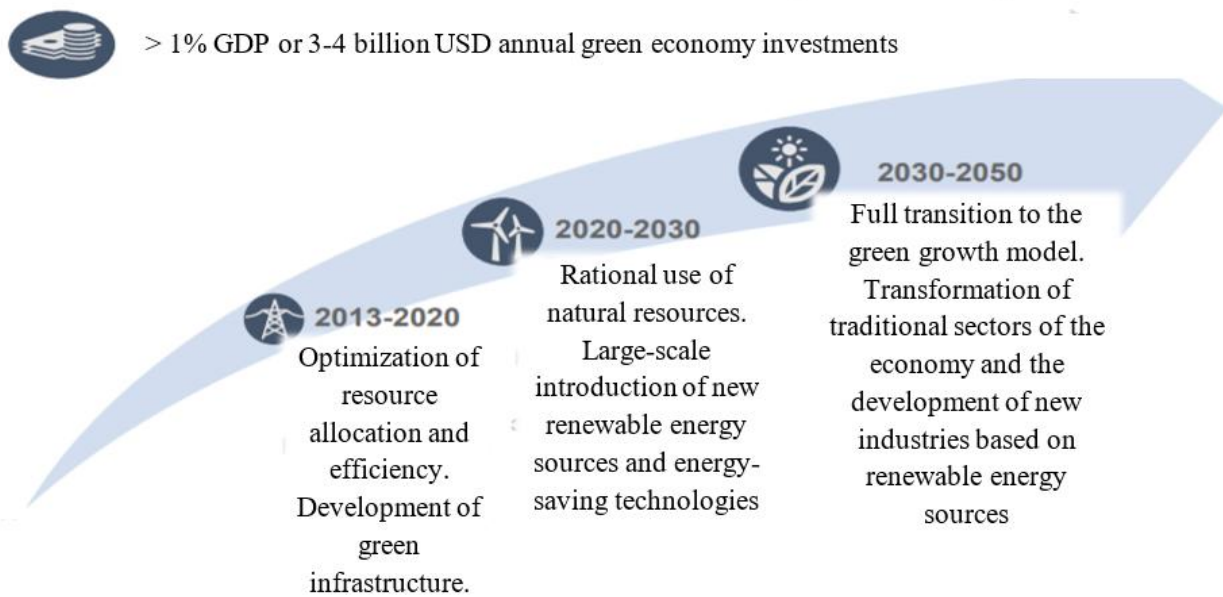


Figure 1 – Timeline for Kazakhstan's transition to a green economy (2013-2050)

limited access to basic services. Environmental issues include scarcity of water resources, inefficient use of natural resources, high energy consumption, unsustainable agricultural practices and food security issues, and poor waste management.

To date, the government of Kazakhstan has adopted several development strategies and programs and action plans aimed at sustainable growth, but fundamental problems remain unresolved, while efforts for regional cooperation in terms of their effectiveness are limited. Addressing and overcoming environmental, social, and economic issues and challenges will require the adoption and implementation of comprehensive government policies and cooperation between regional authorities.

Kazakhstan has significant potential for the use of renewable energy sources that can contribute to sustainable economic development and growth.

Wind energy potential in Kazakhstan is 10 times higher than the country's projected electricity demand by 2030. Kazakhstan has adopted primary renewable energy legislation and established support measures such as access to the electricity system and feed-in tariffs.

Nevertheless, Kazakhstan is the only state in the region that has the capacity to generate both solar and wind energy, which contributes to the pursuit of renewable energy development. The development and large-scale implementation of the principles of using renewable energy sources (RES) in Kazakhstan is constrained by the following factors [7]:

- High subsidies for conventional energy sources
- Low electricity prices
- Limited long-term funding
- High initial investment costs due to the import of the technologies used
- Limited expertise in the field of renewable energy
- Lack of knowledge

The transition to green growth is a necessary priority for Kazakhstan, as the country's economic development is now largely focused on extractive industries and commodity exports. At the same time, most sectors of the economy have relatively high levels of energy intensity and pollution, as well as low energy efficiency. The concept of a "green economy" in Kazakhstan is aimed at increasing the efficiency of resource use and promoting new technologies to ensure sustainable growth for future generations.

The Concept addresses seven key areas:

- Development of renewable energy sources
- Energy-saving and energy efficiency
- Waste management
- Rational use of water resources
- Development of «green transport»
- Conservation and effective management of ecosystems

It is expected that the introduction of green technologies will increase the energy efficiency of the economy of Kazakhstan by 40-60% and reduce water consumption by 50%. Moreover, the transition to a green growth model will create more than 500,000 new jobs in traditional and new industries, improve living conditions and ensure a high quality of life for the entire population of the country (Concept for Kazakhstan's transition to a «green economy», 2013).

The European Union is undoubtedly a supporter of sustainable development. Numerous targets oblige to tackle them in accordance with the letter of the SDGs. Environmental pollution, climate change, environmental debt, migration, adverse demographic changes, financial problems, emerging isolationism, and nationalism require the most perfect environmental standards, climate agreements, and an economy that minimizes pollution.

Sustainable Europe 2030 is a key policy framework (including circular economy, stable food system, energy balance, caring for future generations), horizontal factors (innovation, science, research, appropriate pricing, corporate social responsibility, new technologies and business models, policy coherence) and three scenarios (superiority of the EU strategy, continuation of the SDGs, external actions and their consolidation), which is in line with Agenda 2030, its 17 core goals and 169 specific targets.

On December 10, 2019, the Council of the European Union adopted a conclusion on the implementation of 17 goals of the resolution «We are transforming our world: the 2030 Agenda for Sustainable Development», indicating that action should be accelerated globally, and a comprehensive cross-cutting implementation strategy should be developed SDGs [8].

The main strategic document of regional policy in Poland is currently the National Strategy for Regional Development (NSRD), presented by the Minister for Investment and Development to the Council of Ministers, which adopts it by decree [National 2019]. The main goal of the regional policy is the effective use of the endogenous potentials of territories and their specializations to achieve sustainable development of the country, which will create conditions for increasing the incomes of the inhabitants of Poland while at the same time achieving unity in the social, economic, environmental and spatial spheres.

Recorded as detailed goals:

- increasing the cohesion of the country's development;
- strengthening of regional competitive advantages;
- improving the quality of management and implementing territorially oriented policies.

The National Strategy for Regional Development contains detailed provisions of the Strategy for Responsible Development (with a perspective up to 2030) included in the area of socially sensitive and territorially sustainable development. Responsible development creates a competitive force using new factors and benefits all citizens of our country, as well as develops and effectively uses local resources and the potential of all territories, supports territories that are less resistant to crisis phenomena. In NSRD 2030, the concentration on agglomerations (the polarization and diffusion model) was replaced by the concentration of support on economically weaker regions (the territorially balanced development model). Eastern Poland and Silesia were designated as a zone of strategic intervention.

Results

Podlaskie Voivodeship Development Strategy until 2020 (SRWP 2020), [Strategy 2013] adopted by the Sejm of Podlaskie Voivodeship on September 9, 2013. On 17 January 2015, the Voivodeship Council adopted a Monitoring System for the Podlaskie Voivodeship Development Strategy

until 2020, which sets out detailed assumptions for monitoring the Strategy and strategic and operational goals.

The current strategy monitoring system, enriched in 2018 with 11 indicators, consists of 56 indicators (6 indicators for the implementation of strategic goals and 50 indicators for the implementation of operational goals). The strategy monitoring system provides for the regular annual preparation of a report on the implementation of the Strategy. The ongoing process of updating SRWP 2020 is aimed at revising and adopting the strategic prerequisites for the development of the region by 2030.

The baseline characteristics consider the situation in the region, which belongs to the strategic prerequisites: Podlaskie Green, Open, and Enterprising.

Podlaskie Voivodeship is perceived as one of the cleanest and richest in natural values in Polish regions. Among all voivodeships in Podlaskie Voivodeship, the most protected areas in the form of national parks and the Natura 2000 network. There are four national parks in Podlaskie Voivodeship: Bialowieza National Park, Biebrzyne National Park, Narew National Park and Vygri National Park, as well as three landscape parks: Omrzyn Park Landscape of the Narew Valley, Landscape Park of Knyszyn Forest, Landscape Park of Suwalski. The NATURA 2000 Special Protected Areas for Birds occupy 28.7% of the voivodeship's area, while the NATURA 2000 Special Protected Areas occupy 26.9% of the voivodeship's area. The region is rich in agricultural land and has a high level of forest cover in the country of 30.8% [9].

Podlaskie Voivodeship is one of the least developed regions in Poland in terms of economic development. The Podlaskie Voivodeship Smart Specialization Business Development Plan 2015 - 2020 + (RIS3) aims to stimulate the development of innovation in Podlaskie enterprises. The result of the activity should be the acceleration of economic growth in the region. The plan considers the "smart specializations" of the Podlaskie Voivodeship, which includes: agri-food and value chain sectors; metallurgy, shipbuilding

and value chain industries; medical, life sciences and value chain sectors; eco-innovation, science and environment and value chain sectors. The above specializations have been identified due to the general characteristics of the region and the high level of LQ employment (LQ location quotient). In Podlaskie Voivodeship, significant academic potential has been identified, which directly affects the formation of the level of human capital. More than 34 thousand students studied in the region, which is 2.5% of all students in Poland (in 2016). In Bialystok there are scientific-didactic and scientific departments classified in the following places in national rankings: Medical University of Bialystok - 29th place in the ranking of universities in Poland in 2018, Bialystok University of Technology - 42nd in the ranking, University of Bialystok 46th in the ranking. In 2018, 23.2% of the inhabitants of Podlaskie Voivodeship had a higher education, the national average was 23.7%. Podlaskie Voivodeship is also characterized by one of the highest in the country (fourth place in 2017) percentages of the working-age population - 62.2% [10].

In the process of updating the Strategy, special attention should be paid to the issues of entrepreneurship, innovation, and improving the quality of human capital, which should be considered as priorities to stimulate and support development. Thus, the process of updating the Strategy should consider:

- revision, addition, and updating of the goal;
- adjusting indicators appropriately to monitor the regional development vision.

Thus, a preliminary analysis of the initial data showed an ambiguous situation, both in the dynamics of indicators and in comparing average indicators, which once again confirms the need to obtain an integral indicator of the ecological and economic state of the region, which will make it possible to unambiguously judge its level and change.

Analysis of the data indicates the need to revise the monitoring system of the Strategy and better match the set of indicators to monitor change. However, no specific recommendations have been formulated regarding the indicators

Table 1

Dynamics of indicators of the ecological and economic state of the Lubelskie and Podlaskie Voivodeships in 2008-2017

Indicator	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈
<i>Lublin Voivodeship</i>								
Growth rate 2017 to 2008 [%]	50,6	103,4	113,9	93,3	145,2	88,6	96,0	102,0
Average value	0,0918	202,1	0,0078	0,04476	2,82	0,1556	82,8	197,0
<i>Podlaskie Voivodeship</i>								
Growth rate 2017 to 2008 [%]	52,9	128,8	99,6	52,1	128,4	105,9	113,7	100,4
Average value	0,0481	90,0	0,0098	0,00075	0,8527	0,0698	33,7	163,5
Ration of average values	1,91	2,24	0,80	59,84	3,32	2,23	2,46	1,20

chosen for the monitoring system due to the ongoing process of updating the Strategy. When creating a monitoring system for the updated Strategy, it is necessary to consider the following: an indicator of investment attractiveness and an indicator of the number of companies included in the Global Compact.

Analysis of the implementation of the concept of sustainable development in the border regions of Poland made it possible to assess the opportunities and threats affecting the achievement of strategic goals. The Strategy should pay particular attention to the issues of entrepreneurship, innovation and improving the quality of human capital, which should be

considered as priorities to stimulate and support development. Thus, the procedure for updating the Strategy should consider the timely process of supplementing and updating the goals, as well as contain a proper adjustment of indicators for monitoring regional development.

Conclusion

Sustainable economic growth ensures an increase in the standard of living of the population, accordingly, there is a relative increase in society's demand for environmental benefits, and the development of markets for environmentally friendly products, environmentally friendly

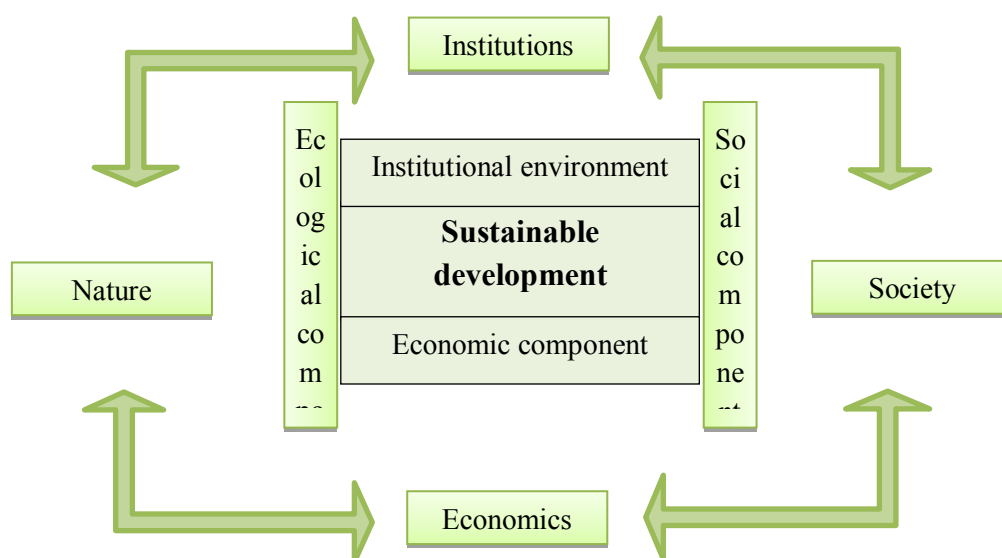


Figure 2 – Interaction of components of sustainable development

technologies, and markets for environmental services, in turn, contributes to improving the quality of the environment, which determines the environmental and social factors of economic growth. Achieving sustainable development goals is possible considering current trends in the institutional environment, including a wide range of formal and informal institutions that ensure the solution of environmental, economic, and social problems.

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Польский опыт формирования и управления зеленой экономикой

Аннотация. Одной из ключевых целей экономического развития любой страны является достижение и поддержание качественного и устойчивого экономического роста, а также использование конкурентоспособного преимущества. Глобальные финансовые и энергетические кризисы обуславливают поиск новых моделей экономического роста, направленных на устойчивое развитие при одновременной стабилизации потреблений материальных благ, не подвергающих будущее поколение значительному экологическому риску.

В представленной для обсуждения статье раскрываются особенности взаимосвязи и взаимозависимости зеленой экономики и устойчивого развития. Эти вопросы на сегодняшний день особо актуальны как для развитых стран, так и развивающихся.

В связи с этим большой интерес представляет опыт формирования и управления зеленой экономикой в обеспечении устойчивого развития стран ЕС, в частности Польши, и Казахстана.

Ключевые слова: зеленая экономика, зеленые технологии, устойчивое развитие, экологическое состояние, кризис.

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Польшаның жасыл экономиканы қалыптастыру және басқарудағы тәжірибесі

Аннотация. Кез-келген елдің экономикалық дамуының негізгі мақсаттарының бірі – жоғары сапалы және тұрақты экономикалық өсуге қол жеткізу, оны қолдау, сонымен қатар, бәсекелестік артықшылықты пайдалану. Жаһандық қаржылық және энергетикалық дағдарыстар болашақ ұрпақты елеулі экологиялық тәуекелге ұшыратпайтын материалдық игіліктерді тұтынуды тұрақтандыру кезінде тұрақты дамуға бағытталған экономикалық өсудің жаңа үлгілерін іздеуді анықтайды.

Талқылауға ұсынылған мақала жасыл экономика мен тұрақты дамудың өзара байланысы мен өзара тәуелділігінің ерекшеліктерін ашады. Бұл мәселелер бүгінде дамыған елдер үшін де, дамушы елдер үшін де ерекше өзекті болып табылады.

Осыған байланысты ЕО елдерінің, атап айтқанда, Польша мен Қазақстанның тұрақты дамуын қамтамасыз етудегі жасыл экономиканы қалыптастыру және басқару тәжірибесі үлкен қызығушылық тудырады.

Түйін сөздер: жасыл экономика, жасыл технологиялар, тұрақты даму, экологиялық жағдай, дағдарыс.

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