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## **The problem of developing the green economy as a tool of sustainable development in Kazakhstan**

The article examines the development of the green economy in Kazakhstan as a key factor in achieving the country's sustainable development goals. An analysis of the current state of the green economy is presented, identifying the main challenges faced during its formation. The authors emphasize the need to strengthen government support and regulatory frameworks in the green economy sector. They also highlight the importance of education and training in green technologies and innovations, as well as the promotion of environmentally friendly practices among the population and the business community. Currently, Kazakhstan is actively developing eco-friendly technologies and striving for sustainable economic growth. In this context, government support, human capital development, innovation, and effective regulation play a crucial role in enhancing the country's competitiveness and creating favorable environmental conditions for life and development. The article concludes with recommendations for advancing the green economy, including the introduction of new policies, programs, and investments. The research underscores the significance of developing a green economy in Kazakhstan to ensure sustainable growth, environmental protection, and the social well-being of the population.

*Keywords:* green economy, sustainable development, concept, social development, economic sector, environment, environmentally friendly technologies, innovation.

### *Introduction*

In recent decades, public consciousness has realized the importance of preserving nature and the environment. Lack of stability in economic development leads to negative consequences for the planet and humanity as a whole. In this regard, the development of the green economy is becoming a topical issue, as it is the main means of achieving sustainable development.

Green economy is an economic model that strives to minimize the negative impact on the environment, as well as increase resource efficiency and reduce pollutant emissions. The main principles of the green economy include eliminating the use of unsustainable materials, increasing energy efficiency, developing renewable energy sources, reducing greenhouse gas emissions, and supporting sustainable economic activity.

Currently, one of the main aspects of the development of the green economy is the transition to clean energy sources. This includes the development of solar, wind, hydropower and other renewable energy sources that help reduce dependence on fossil fuels and reduce greenhouse gas emissions [1].

The second important aspect is the promotion of environmentally responsible production and consumption. This includes encouraging the use of environmentally friendly technologies, reducing waste and sustainable use of natural resources.

In addition, the development of a green economy will help create new jobs in the renewable energy sector, clean technologies and other areas, which will contribute to economic growth and improve the quality of life.

Thus, the development of a green economy plays a crucial role in achieving sustainable development, maintaining a balance between economic, social and environmental aspects. The adoption and implementation of green technologies and practices contribute to environmental protection, climate change mitigation, and the well-being of future generations.

### *Methods and materials*

Green economy is an economic system aimed at sustainable use of resources and reduction of negative impact on the environment. It strives for a balance between economic growth, social welfare and environmental responsibility [2].

From this point of view, the main principles of green economy can be noted:

- Increase energy efficiency and use of renewable energy sources to reduce greenhouse gas emissions.
- Stimulation of innovations and development of environmentally friendly technologies.
- Promote sustainable production and consumption, including waste reduction and material reuse.
- Support sustainable economic activities such as ecotourism, agroecology and green investments.
- Involving society and the business sector in the process of environmentally responsible decision-making.

Developing a green economy has many benefits, including:

- Reducing environmental pollution and improving air and water quality.
- Reducing dependence on unstable resources and reducing risks for the economy.
- Creation of new jobs in the sector of renewable energy sources and clean technologies.
- To promote sustainable economic growth and increase the competitiveness of countries.

In general, the green economy plays an important role in achieving sustainable development and preserving the environment for future generations. Its principles and methods are becoming increasingly relevant in the face of a changing climate and the growing demand for sustainable solutions.

In Kazakhstan, sustainable development is one of the priorities of the national development strategy. In our country, active work is being carried out on the implementation of sustainable development goals set within the framework of the 2030 global sustainable development goal [3].

The main directions of sustainable development in Kazakhstan include:

1. Environmental sustainability: Kazakhstan strives to reduce greenhouse gas emissions and increase energy efficiency. There is a program for the development of renewable energy sources and the promotion of environmentally friendly technologies.

2. Social sustainability: Government programs aim to improve access to education, healthcare, housing and social protection. A system of social support for the population is being developed, including measures to combat poverty and inequality.

3. Economic stability: Kazakhstan seeks to diversify the economy, develop infrastructure and attract investment. The country is actively developing the green economy and encouraging innovation in the clean technology sector.

4. Resource management: Kazakhstan is actively working to improve the management of natural resources, including water resources, forests and biodiversity. Measures are being taken to protect natural ecosystems and fight against environmental pollution.

5. Sustainable use of natural resources: Kazakhstan has oil, gas, coal, mineral resources, etc. developing strategies for sustainable use of natural resources. The country strives for a balanced approach to the production and use of resources, taking into account their future preservation.

First of all, the list of leading tasks aimed at reforming the designated sectors of the economy in the concept of sustainable development is reviewed.

As part of transition to “green” economy:

- *increasing the efficiency of resources;*
- *improvement of Kazakh infrastructure;*
- *increasing the wealth of the people [4].*

The figure below presents statistical data on the green economy in Kazakhstan.

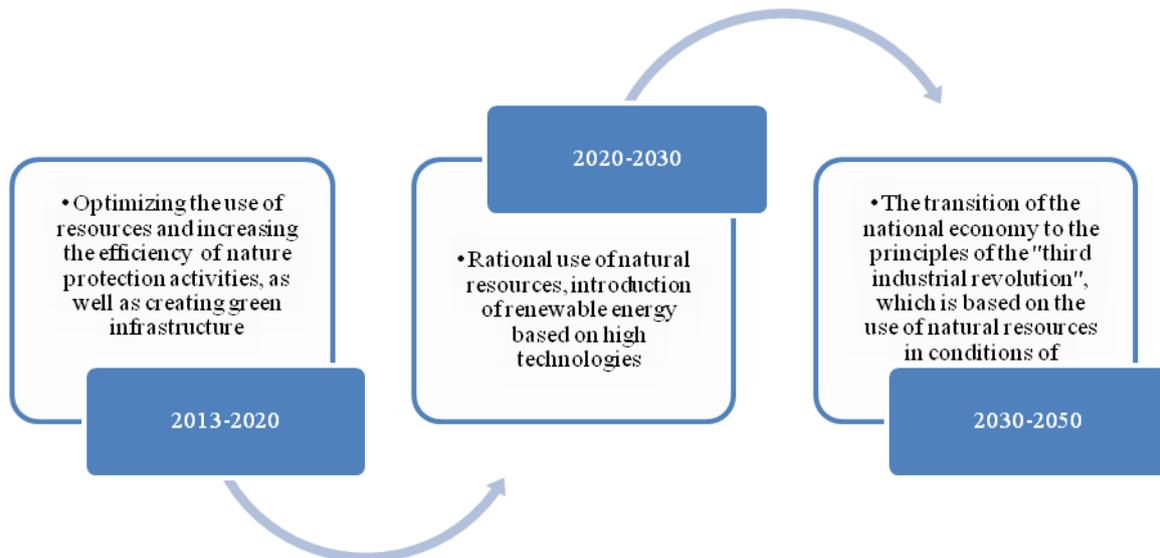


Figure 1. Green economy in Kazakhstan (by years)

The main goals set in this concept and the 2050 Strategy are:

- Revitalization of hydrophytic and agrarian resources, comparison with OECD countries with the level of productivity of natural capital use;
- By 2030, to reach the European level in terms of emissions into the atmosphere;
- To achieve a 50 % reduction in the energy consumption of GDP by 2050;
- increase the share in the total production of alternative and renewable energy sources to 50 % by 2050;
- organization of household and industrial waste utilization industry;
- to guarantee the gas service structure with good infrastructure[5].

#### *Results and their discussion*

The implementation of the concept is established in three stages, during which the transition of the economy of the Republic of Kazakhstan to the principles of the third industrial revolution based on the use of natural resources should be ensured in a renewable and sustainable manner:

Green economy plays an important role in the development of sustainable development in Kazakhstan. It represents an economic model based on energy-efficient technologies, renewable energy sources, sustainable use of natural resources and reduced environmental impact.

Kazakhstan's economy is very energy intensive, it needs two to three times more energy than the average OECD countries. Most of the power equipment (65 %) has been in operation for more than 20 years, and about 31 % of it has been used for more than 30 years. Depreciation of electricity generating equipment and network is 70 % and 65 %, respectively. Therefore, as of 2014, electricity transmission and distribution system costs are estimated at 6.7 % in total.

At the same time, indicators on the efficiency of electricity production and distribution are shown below.

Kazakhstan, as a country with vast natural resources and rich biodiversity, sets itself the task of ensuring sustainable development, balanced socio-economic progress and environmental protection. To achieve these goals, the concept of a green economy is being actively developed, which combines economic growth with concern for the environment.

One of the key areas for the development of a green economy in Kazakhstan is the use of renewable energy sources. The country has significant potential for the development of solar and wind energy, which can reduce dependence on fossil fuels and reduce greenhouse gas emissions. As part of the national plan for the development of renewable energy until 2030, Kazakhstan intends to increase the share of renewable sources in total energy production.

Another important aspect of the green economy in Kazakhstan is the environmentally responsible use of natural resources. The country is actively implementing energy efficiency programs, promoting waste

recycling and developing green agriculture. Such measures help reduce environmental pollution and improve the quality of life of the population.

An important step towards sustainable development in Kazakhstan is the signing of the Paris Climate Agreement, under which the country pledged to reduce greenhouse gas emissions and take measures to adapt to climate change. This indicates a serious strategic orientation of Kazakhstan towards a green economy and sustainable development.

However, despite positive steps in developing a green economy, Kazakhstan still faces a number of challenges, such as the need to modernize infrastructure, improve environmental legislation, and increase environmental awareness among the population. Only an integrated approach and joint efforts of the state, the business sector and the public will achieve success in creating a sustainable and green economy in Kazakhstan.

Thus, sustainable development and a green economy in Kazakhstan represent not only a path to environmental responsibility, but also an opportunity to create new jobs, increase the competitiveness of the economy and ensure the well-being of future generations. It is important to continue efforts to develop a green economy and strive to achieve global sustainable development goals in the interests of preserving nature and society (Fig. 2).

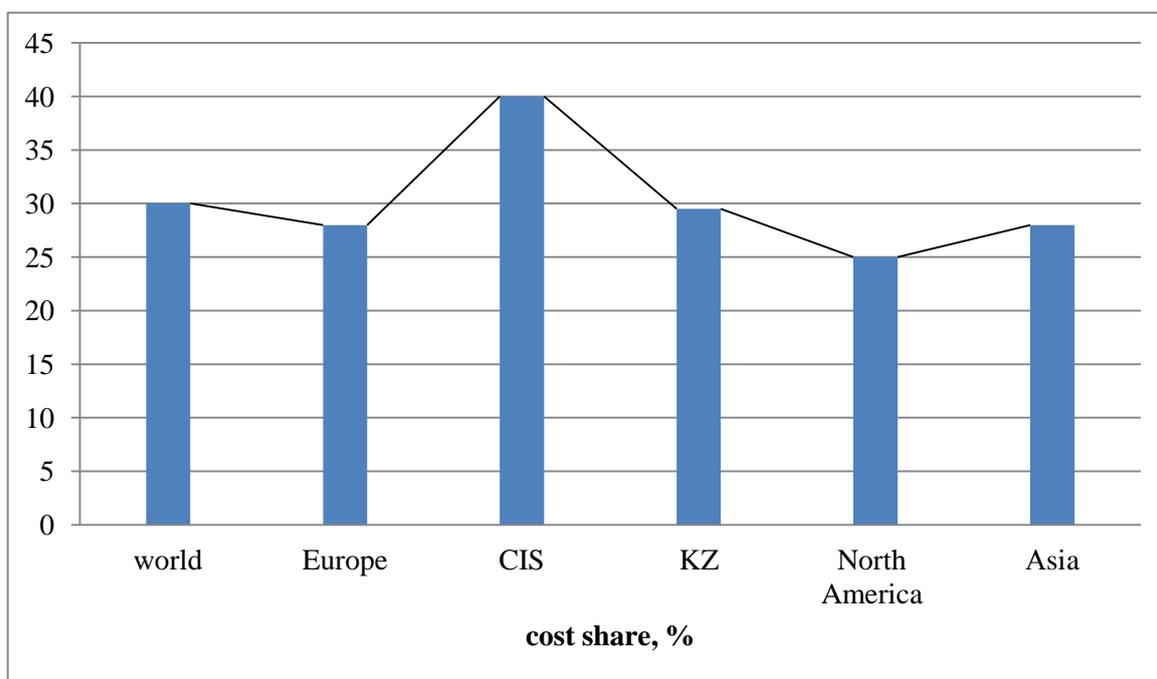


Figure 2. Electricity generation and distribution efficiency (2015)

It should be noted that the industrial production of the Republic accounts for more than 50 % of the total energy consumption, while the residential and communal economy and the transport sector consume 30 % and 20 %, respectively. The amount of economic losses caused by inefficient use of resources is estimated at 4–8 billion US dollars per year. This figure may increase to 14 billion dollars by 2030. At the same time, the economic benefit from energy saving is expected to be 3-4 billion US dollars per year (up to 10 billion US dollars by 2030).

In Kazakhstan, the green economy is actively developing thanks to the support of the government and the adoption of relevant strategies and programs. There are some key aspects of the green economy in Kazakhstan.

1. Development of renewable energy sources: Kazakhstan has a huge potential for energy production from solar, wind, hydropower and other renewable sources. Solar and wind energy is actively developing in the country, and new power stations are being built based on renewable sources.

2. Energy efficiency: The introduction of energy-efficient technologies and practices in industry, construction, transportation and other sectors of the economy can help reduce energy costs and reduce greenhouse gas emissions.

3. Green infrastructure: Development of green infrastructure, including eco-cities, eco-parks, bicycle paths and public transport, will help create a comfortable and environmentally friendly environment for residents.

4. Sustainable use of natural resources: Kazakhstan uses water, forest, mineral resources, etc. to preserve them for future generations working in the direction of sustainable use of natural resources.

5. Innovations and development of green technologies: Support of innovations and development of green technologies contributes to the development of environmentally friendly sectors of the economy and creation of new jobs.

In recent decades, the world community has become increasingly aware of the need to transition to sustainable development, environmental protection and efficient use of natural resources. The concept of a green economy is becoming a key tool to achieve these goals, combining economic growth with environmental responsibility. Many countries in the world are actively implementing the principles of a green economy and demonstrating successful practices in this area.

One of the striking examples of the successful development of a green economy is Denmark. This Scandinavian country has long been searching for alternative energy sources and introducing energy-efficient technologies. Thanks to strong government support and broad involvement from the business sector, Denmark has become a leader in wind energy production and the reduction of greenhouse gas emissions.

Another successful example is Germany, which, thanks to the Energy Revolution program (Energiewende), is actively developing renewable energy sources, increasing energy efficiency and reducing dependence on fossil fuels. This German experience shows that the transition to a green economy can be successful and beneficial for the country's economy.

Sweden also has positive experience in developing a green economy. The country is actively introducing waste processing technologies, developing biofuel production and stimulating the use of public transport. These measures help reduce environmental pollution and improve the quality of life of the population.

In general, the global experience of the green economy shows that the transition to sustainable development is possible subject to an integrated approach that includes the active participation of the state, the business sector and the public. The development of a green economy helps create new jobs, reduce energy consumption, improve environmental quality and ensure sustainable economic growth.

Therefore, countries striving for sustainable development and conservation of natural resources should pay attention to the successful experience of the green economy in the world and put it into practice to ensure the well-being of future generations.

### *Conclusion*

In conclusion, the development of the green economy in Kazakhstan plays a crucial role in achieving sustainable development of the country. This economic model helps reduce greenhouse gas emissions, increase energy efficiency, create new jobs and foster innovation. A green economy not only contributes to the protection of the environment and biological diversity, but also ensures sustainable economic growth and social welfare of the population.

The transition to a green economy can create new employment opportunities in sectors such as renewable energy, energy efficiency and waste management. By investing in green sectors, Kazakhstan can solve the problem of unemployment and contribute to social and economic development.

The development of a green economy in Kazakhstan as a tool for sustainable development presents both challenges and opportunities. By addressing issues of awareness, investment, regulation and capacity building, Kazakhstan can use its natural resources and international partnerships to promote environmental protection, economic diversification and job creation. Through strategic planning and collaboration, Kazakhstan can successfully transition to a green economy and achieve long-term sustainability for future generations.

The Government of Kazakhstan continues to actively support the development of the green economy by introducing new strategies, programs and investments in relevant projects. Further development of the green economy will help strengthen Kazakhstan's position as a leader in sustainable development in the region and the world, as well as create favorable conditions for future generations.

Thus, the development of the green economy is the main means of achieving sustainable development of Kazakhstan and creating favorable conditions for the life and well-being of all its citizens.

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### Қазақстандағы тұрақты даму құралы ретіндегі жасыл экономиканы дамыту мәселесі

Мақалада еліміздің тұрақты дамуына қол жеткізудің негізгі құралы ретінде Қазақстандағы жасыл экономиканы дамыту мәселесі қарастырылған. Жасыл экономиканың қазіргі жағдайына талдау жүргізілді, содан кейін оның қалыптасу процесінде туындаған негізгі проблемалар анықталды. Авторлар жасыл экономика саласында мемлекеттік қолдау мен реттеуді күшейту қажеттігін атап көрсетеді. Сонымен қатар, жасыл технологиялар мен инновациялар саласындағы білім беру мен оқытудың маңыздылығына, сондай-ақ халық пен бизнес-қоғамдастық арасында экологиялық таза шешімдерді ілгерілетуге баса назар аударылады. Бүгінгі таңда Қазақстан Республикасы экологиялық таза технологияларды белсенді дамытуда және өз экономикасының тұрақты дамуына ұмтылуда. Бұл бағытта елдің бәсекеге қабілеттілігін арттыруға және өмір сүру мен даму үшін қолайлы экологиялық жағдайлар жасауға ықпал ететін мемлекеттік қолдау, кадрлар даярлау, инновациялар мен реттеу шешуші рөл атқарады. Сонымен қатар жаңа саясатты, бағдарламаларды және инвестицияларды енгізуді қоса алғанда, «жасыл» экономикадағы күш-жігерді күшейту бойынша ұсыныстар берілген. Жұмыс тұрақты экономикалық өсуді, қоршаған ортаны қорғауды және халықтың әлеуметтік әлауқатын қамтамасыз ету үшін Қазақстанда жасыл экономиканы дамытудың маңыздылығын атап көрсетеді.

*Кілт сөздер:* жасыл экономика, тұрақты даму, тұжырымдама, әлеуметтік даму, экономикалық сектор, қоршаған орта.

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### Проблема развития зеленой экономики как инструмента устойчивого развития в Казахстане

В статье рассматривается проблема развития зеленой экономики в Казахстане как ключевого средства достижения устойчивого развития страны. Был проведен анализ текущего состояния зеленой экономики с последующим выявлением основных проблем, возникших в процессе ее становления. Авторы подчеркивают необходимость усиления государственной поддержки и регулирования в сфере зеленой экономики. Кроме того, делается акцент на важности образования и обучения в области зеленых технологий и инноваций, а также на продвижении экологически чистых решений среди населения и бизнес-сообщества. На сегодняшний день Республика Казахстан активно развивает экологически чистые технологии и стремится к устойчивому развитию своей экономики. В данном направлении ключевую роль играют государственная поддержка, подготовка кадров, инновации и регулирование, способствующие повышению конкурентоспособности страны и созданию благоприятных экологических условий для жизни и развития. В статье также даются рекомендации по усилению усилий в области «зеленой» экономики, включая внедрение новой политики, программ и инвестиций. Наша работа подчеркивает важность развития зеленой экономики в Казахстане для обеспечения устойчивого экономического роста, защиты окружающей среды и социального благополучия населения.

*Ключевые слова:* зеленая экономика, устойчивое развитие, концепция, социальное развитие, сектор экономики, окружающая среда.

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