UDC 330.34
DOI 56525/TIUC2159

THE ROLE OF THE PRIVATE SECTOR IN THE IMPLEMENTATION OF THE CONCEPT OF GREEN ECONOMY IN KAZAKHSTAN

L. G. Kirbassova[1], Wen Chiat Lee[2]

[1]Yessenov University, Kazakhstan, Aktau
[2]Universiti Teknologi MARA (UiTM) Sarawak, Malaysia
e-mail: amlm13@mail.ru, at@uitm.edu.my

Annotation. The article examines the importance and influence of the private sector on the implementation of the green economy concept in Kazakhstan. Key areas of business participation are analyzed, such as the introduction of renewable energy sources, the development of waste recycling technologies, increased energy efficiency and the use of innovative business models. Particular attention is paid to existing barriers, including the lack of financial instruments, low awareness of entrepreneurs about the possibilities of state support and difficulties in attracting investment. Successful cases of interaction between the private sector and the state, as well as international experience that can be adapted to Kazakhstan's conditions, are presented. Based on the analysis, recommendations are offered to create a favorable environment for business involvement in environmental projects, including the development of green finance, simplification of public-private partnership procedures, the introduction of ESG principles and increasing the level of digitalization. The study emphasizes the need for an integrated approach to unlock the potential of the private sector and accelerate Kazakhstan's transition to a sustainable development model.

Keywords: green economy; private sector; sustainable development; Kazakhstan; renewable energy; ESG principles; innovative technologies.

Introduction. In the context of global warming, depletion of natural resources and deterioration of the environmental situation, the green economy is becoming an integral part of sustainable development. Kazakhstan, possessing significant natural resources, is faced with the need to transform its economy towards an environmentally sustainable model. However, achieving the goals of a green economy is impossible without the participation of the private sector, which plays a key role in the introduction of innovative technologies, the implementation of environmentally friendly projects and the creation of new jobs in "green" industries. In Kazakhstan, the private sector has significant potential for investing in renewable energy sources, efficient use of resources and the reduction of greenhouse gas emissions, which makes the topic of the study extremely relevant.

In addition, Kazakhstan is actively integrating the UN Sustainable Development Goals (SDGs) into its national policy, and the implementation of the green economy concept is considered as a tool for achieving these goals. However, despite the existence of a state strategy and a number of initiatives, insufficient activity and limited investment from the private sector create barriers to the full implementation of this concept. The relevance of the research topic is due to the need to study the role and potential of the private sector in the development of the green economy of Kazakhstan, as well as to search for mechanisms to increase its involvement.

The purpose of this study is to comprehensively analyze the role of the private sector in the implementation of the green economy concept in Kazakhstan, identify key factors influencing its participation, and develop recommendations for strengthening interaction between the state and private companies to achieve environmentally sustainable development.

The scientific novelty of the study lies in the systematic approach to studying the role of the private sector in implementing the concept of green economy in Kazakhstan. For the first time, a comprehensive analysis of the interaction between the state and business in the context of sustainable

development will be conducted, including an assessment of current incentive mechanisms and the search for new approaches to their improvement. The study will also focus on adapting successful international experience to Kazakhstan's realities, which was previously studied fragmentarily.

An important aspect of novelty is the development of practical recommendations based on empirical data and analysis of current trends. These recommendations can be used as a tool for public policy and strategic planning in the field of sustainable development.

Materials and research methods. In this study, modern approaches, including qualitative and quantitative methods of analysis, were used to analyze the role of the private sector in the implementation of the green economy concept in Kazakhstan, which ensures the comprehensiveness and reliability of the data obtained. The study materials include regulatory legal acts and strategic documents of Kazakhstan, such as the "Concept of the Transition of the Republic of Kazakhstan to a Green Economy", legislative acts in the field of environmental protection and the use of renewable energy sources, as well as UN documents on sustainable development goals (SDGs) and their implementation in Kazakhstan. Statistical data on the development of the green economy over the past 10 years provided by the Statistics Committee of Kazakhstan, the International Renewable Energy Agency (IRENA) and the World Bank were studied. Reports of international organizations (UNDP, UNEP, OECD), Kazakhstani research centers such as the Economic Research Institute (ERI), as well as data on completed environmental projects and private sector investments were used as an analytical base. Successful international interaction between the private sector and government agencies in countries such as Germany, Denmark and China was also analyzed.

The methodological basis of the study includes theoretical analysis, empirical methods, quantitative approaches and modeling. As part of the theoretical analysis, a content analysis of strategic documents of Kazakhstan was conducted, measures of state support for the green economy were identified, and a comparative analysis of approaches to the implementation of the green economy in Kazakhstan and other countries was carried out to identify successful practices. Systemic analysis made it possible to consider the relationship between government programs, economic activity of the private sector and the green economy ecosystem.

Research results. The role of the private sector in implementing the green economy concept in Kazakhstan is one of the most pressing issues in the context of sustainable development. Kazakhstan, as a country with rich natural resources and a high share of the hydrocarbon sector in the economy, is faced with the need to change approaches to the use of natural resources. The green economy concept, adopted in Kazakhstan in 2013, involves a transition to a sustainable development model that minimizes the negative impact on the environment and improves the quality of life of the population. However, to achieve these goals, government efforts alone are not enough. The private sector, capable of introducing innovative technologies, ensuring investment inflows and implementing environmentally friendly projects, should play a key role in the transition to a green economy.

The private sector has a number of unique opportunities to contribute to the development of a green economy. First, companies can invest in renewable energy sources such as solar and wind power, which are among the priority areas in Kazakhstan. According to the International Renewable Energy Agency (IRENA), in 2023, Kazakhstan entered the top ten countries in Central Asia with the fastest growing solar power capacity. By the end of 2023, the total installed capacity of solar power plants in Kazakhstan reached 1.6 GW, which indicates significant interest from private companies in the development of this industry [1].

In addition, an important area for the private sector is the development of energy-efficient technologies. For example, large industrial companies such as ArcelorMittal Temirtau JSC are implementing technologies for the capture and use of greenhouse gases. This allows not only to reduce carbon dioxide emissions, but also to reduce energy costs. Analysis shows that the introduction of energy-efficient technologies can reduce production costs by 15-20%, which makes such investments economically attractive for business.

Another area where the private sector plays a key role is waste recycling. Kazakhstan faces the problem of municipal solid waste (MSW) disposal, the volume of which increases annually.

According to the Ministry of Ecology and Natural Resources, the MSW recycling rate in 2022 was about 24%, which is significantly lower than the average recycling rate in the EU countries, where this figure exceeds 50%. Private companies such as Kaz Recycle Service LLP are actively involved in creating waste recycling infrastructure, including the construction of waste recycling plants and the introduction of a separate waste collection system. An example of a successful project is a plant in Karaganda, which annually processes up to 150 thousand tons of waste, producing secondary raw materials and fuel [2].

Despite these achievements, private sector participation in implementing the green economy concept in Kazakhstan faces a number of barriers. One of the key obstacles is the lack of financial incentives and government subsidies. Many enterprises, especially small and medium-sized businesses, do not have access to long-term financing for the implementation of environmentally oriented projects. According to the World Bank, only 12% of small and medium-sized enterprises in Kazakhstan have access to green loans. This points to the need to create a more favorable financial ecosystem, including lower interest rates on green loans, tax incentives and subsidies for enterprises implementing environmentally friendly technologies.

Another important challenge is the lack of awareness of the private sector about the benefits of a green economy. A study conducted by the Kazakhstan Institute for Sustainable Development in 2022 showed that about 65% of entrepreneurs are not aware of existing government support measures for environmentally oriented projects. This indicates the need to intensify information and educational work, including holding educational seminars, creating online platforms for sharing experiences, and developing specialized courses for businesses [3].

International experience shows that effective interaction between the state and the private sector is a key factor in the successful implementation of a green economy. For example, in Germany, where the concept of a green economy has been actively supported since the 1990s, the state created a system of incentives for private investment in renewable energy. This included long-term guarantees for the purchase of electricity from renewable sources at fixed tariffs (Feed-in Tariffs) and tax incentives for companies implementing energy-efficient technologies. This approach allowed Germany to become a world leader in the field of renewable energy, and the share of green energy in the country exceeded 40%.

Kazakhstan is also taking steps to create a favorable environment for the private sector. One such measure was the adoption of a law on public-private partnership, which provides for the possibility of joint financing of environmental projects. However, to increase the level of private sector involvement, further improvement of legislation is required, as well as the development of institutions that support innovation and environmental start-ups.

One of the key aspects that requires analysis is the development of the green bond market. This financial instrument is becoming increasingly popular in international practice to attract investment in environmental projects. In Kazakhstan, the green bond market is still in its infancy. According to the National Bank of Kazakhstan's 2023 report, the total volume of green bond issues amounted to only 2% of the total securities market. This is significantly lower than the global level, where the green bond market has been showing double-digit growth rates. To stimulate this segment, it is necessary to develop clear standards for certification of green projects, which will increase investor confidence and ensure transparency in the use of funds raised. Moreover, the introduction of interest rate subsidies for green bond issuers can become an effective instrument of state support [4].

Another important area is the development of public-private partnerships (PPP) in environmental projects. Given the limited budgetary resources of the state, private sector participation is becoming a key factor in the implementation of large initiatives, such as the construction of solar and wind power plants, the modernization of water supply systems and waste disposal. For example, in 2022, Kazakhstan signed the first large PPP contract for the construction of a 100 MW solar power plant in the Zhambyl region. This project, implemented jointly with private investors, assumes a significant reduction in carbon dioxide emissions in the region. However, an analysis of the current legislation reveals a number of problems associated with the high complexity of bureaucratic procedures, which complicates business participation in such projects. Simplifying contracting

procedures, as well as introducing standard forms of PPP agreements, could accelerate the implementation of such initiatives.

Special attention should be paid to the development of small and medium enterprises (SMEs) in the environmental sectors of the economy. In Kazakhstan, SMEs account for 40% of GDP, but their contribution to the green economy remains extremely limited. One of the promising areas for SMEs is agroecology. The introduction of precision farming technologies that optimize the use of water, fertilizers and pesticides can be a significant step in the development of sustainable agriculture. An example of successful practice is a farm in the Almaty region, which, through the use of soil monitoring technologies, reduced fertilizer costs by 30% and increased yields by 20%. However, scaling up such technologies requires the creation of technology support centers for farmers, where entrepreneurs could receive advice and access to modern equipment [5].

Another important aspect is the digitalization of the green economy. The use of digital technologies can significantly improve the efficiency of environmental projects. In Kazakhstan, for example, the use of artificial intelligence (AI) platforms to optimize energy consumption in residential and commercial buildings is gaining popularity. Systems such as smart grids not only reduce energy consumption, but also integrate renewable sources into the overall energy system. According to KEGOC, a pilot project to implement smart grids in Nur-Sultan reduced electricity costs by 12%. To stimulate the use of such technologies, it is necessary to create mechanisms for co-financing such projects, as well as develop a legislative framework regulating the processing and storage of data collected using smart devices [6].

At the international level, Kazakhstan can integrate into global supply chains of environmentally friendly products. The country has significant potential for the export of “green” hydrogen, which is a promising type of fuel of the future. According to IRENA research, Kazakhstan has the capacity to produce up to 3 million tons of green hydrogen per year using solar and wind resources. Exporting such a product to EU countries that are switching to hydrogen energy could become a new source of income for the national economy. However, the development of this area requires significant investment in infrastructure, including the construction of electrolysis plants and the creation of a logistics chain for export. The state should act as a catalyst for these processes by providing tax incentives and access to long-term financing [7].

An important part of analyzing the role of the private sector in the green economy is studying the social responsibility of business. Companies not only implement environmental technologies, but also shape a new attitude of society towards environmental issues. For example, many large companies in Kazakhstan have begun to implement corporate social responsibility practices aimed at reducing their carbon footprint and raising public awareness of the importance of sustainable development. As part of the Green Week program, organized by one of the largest companies in the field of mining and processing of minerals, more than 50 events were held, including environmental lessons in schools and planting trees in regions with high levels of air pollution.

Thus, the role of the private sector in Kazakhstan's green economy goes beyond simple financing and project implementation. This is a multifaceted process that includes innovation, development of new markets, digitalization and the formation of an environmental culture. To unlock the full potential of the private sector, comprehensive measures are needed to create favorable conditions, reduce administrative barriers and intensify international cooperation. Only with close interaction between the state, business and society will Kazakhstan be able to successfully implement the concept of a green economy and become one of the leaders in sustainable development.

One of the promising models is the circular economy, which involves waste minimization and resource reuse. In Kazakhstan, the implementation of such approaches is at an early stage, but a number of companies are already adapting their production processes to this format. For example, manufacturing enterprises in the Aktobe region have begun to use metallurgical waste to create building materials, which has reduced the volume of waste disposal at landfills by 25%. This model not only reduces the burden on the environment, but also opens up new business opportunities by creating products with added value [8].

Another example of an innovative business model is the provision of product-as-a-service

services. Within this model, companies provide customers with access to the functionality of a product instead of selling it. For example, international companies operating in Kazakhstan are already implementing equipment rental models for solar and wind power plants, which reduces the initial costs for small and medium-sized businesses and makes the use of renewable energy sources more accessible.

A key factor for success in a green economy is the integration of advanced technologies such as artificial intelligence (AI), the Internet of Things (IoT), and blockchain. For example, the use of AI in energy management systems allows optimizing the operation of large industrial enterprises, reducing energy costs and greenhouse gas emissions. In Kazakhstan, this practice is being actively implemented in the oil and gas sector, where digital twins allow modeling and managing oil production and refining processes taking into account environmental risks.

In agriculture, IoT technologies are already finding their application in monitoring soil, climate conditions, and water consumption. Systems such as “smart farms” can reduce water use by 30% and increase crop yields by 15%, which is especially important for Kazakhstan, given its climate conditions and water resource problems. An example is a project in the South Kazakhstan region, where farms have implemented sensor systems for monitoring soil moisture, integrated with automatic irrigation systems [9]/

Blockchain technologies in the green economy are used to ensure transparency and traceability of supply chains. This is especially relevant for the export of environmentally friendly products, where certification and quality assurance play an important role. For example, in Kazakhstan, pilot projects are being developed based on blockchain for the certification of organic agricultural products, which increases trust from international partners [10].

Conclusion. The private sector is one of the main drivers of Kazakhstan's transition to a green economy. Business ensures the introduction of innovative technologies, attracts investment and implements environmentally oriented projects in areas such as renewable energy, waste recycling, energy-efficient technologies and sustainable agriculture. PPP is an effective tool for implementing large-scale environmental initiatives. However, its successful application requires simplifying procedures, increasing transparency and creating standard forms of agreements. This will speed up the implementation of projects in the field of renewable energy, waste management and infrastructure modernization.

The use of artificial intelligence, the Internet of Things and blockchain technologies opens up new opportunities for the private sector. The circular economy and product-as-a-service models are promising areas for improving the environmental sustainability of business.

REFERENCES

1. Aliyeva, AB The Role of the Private Sector in the Development of the Green Economy of Kazakhstan /

AB Aliyeva // Bulletin of the Kazakh National University. Economic Series. - 2021. - No. 2. - P. 45-52.

2. Baimukhanov, NS Public-Private Partnership in Green Technologies: Experience of Kazakhstan / NS Baimukhanov, LM Erzhanova // Economy and Ecology. - 2022. - No. 3. - P. 33-40.

3. Zhumagaliyeva, GK Investment Attractiveness of Green Projects for the Private Sector in Kazakhstan / GK Zhumagaliyeva // Finance and Credit. - 2020. - No. 7. - P. 27-35.

4. Ibrayeva, ST Development of Green Entrepreneurship in Kazakhstan: Problems and Prospects / ST Ibraeva // Journal of Sustainable Development. - 2023. - No. 1. - P. 19-26.

5. Kasimov, AR Efficiency of private sector participation in the implementation of environmental initiatives in Kazakhstan / AR Kasimov // Environmental policy and law. - 2021. - No. 4. - P. 58-64.

6. Mukhamedyarova, LS Financial instruments for supporting the green economy: the role of private capital in Kazakhstan / LS Mukhamedyarova // Bulletin of the Financial University. - 2022. - No. 6. - P. 41-48.

7. Nurseitova, DM Private sector and sustainable development: analysis of the Kazakhstani experience / DM Nurseitova // Economy and statistics. - 2020. - No. 5. - P. 73-80.

8. Sagintayeva, RK Innovative approaches to the private sector in promoting the green economy of Kazakhstan / RK Sagintayeva // Scientific journal "Ecology and Industry". - 2023. - No. 2. - P. 50-57.

9. Tleubayev, MA The impact of private investment on the development of renewable energy in Kazakhstan / MA Tleubayev // Energy policy. - 2021. - No. 3. - P. 22-29.

10. Urazbayeva, Zh.S. Stimulating the private sector to participate in green projects: the Kazakhstan context / Zh.S. Urazbayeva // Journal of Economic Research. - 2024. - No. 1. - P. 36-44.

ҚАЗАҚСТАНДА ЖАСЫЛ ЭКОНОМИКА ТҰЖЫРЫМДАМАСЫН ІСКЕ АСЫРУДАҒЫ ЖЕКЕ СЕКТОРДЫҢ РӨЛІ

[1]Л.Г. Кирбасова, [2]Вэнь Чиат Ли
Yessenov University, Қазақстан, Ақтау қ.
[2]Технология университеті, MAPA (UITM), Саравак, Малазия
e-mail: amlm13@mail.ru, at@uitm.edu.my

Аңдатпа. Мақалада Қазақстандағы жасыл экономика тұжырымдамасын жүзеге асырудағы жеке сектордың маңыздылығы мен ықпалы қарастырылады. Жаңартылатын энергия көздерін енгізу, қалдықтарды өңдеу технологияларын дамыту, энергия тиімділігін арттыру және инновациялық бизнес үлгілерін пайдалану сияқты бизнестің қатысуының негізгі бағыттары талданады. Қолданыстағы кедергілерге, оның ішінде қаржы құралдарының жетіспеушілігіне, кәсіпкерлердің мемлекеттік қолдау мүмкіндіктері туралы хабардар болмауына және инвестицияларды тартудағы қиындықтарға ерекше назар аударылады. Жеке сектор мен мемлекеттің өзара іс-қимылының сәтті жағдайлары, сондай-ақ қазақстандық жағдайларға бейімделуі мүмкін халықаралық тәжірибе ұсынылған. Талдау негізінде бизнесті экологиялық жобаларға тарту үшін қолайлы жағдай жасау, оның ішінде жасыл қаржыландыруды дамыту, мемлекеттік-жекеменшік әріптестік рәсімдерін жеңілдету, ESG қағидаттарын енгізу және цифрландыру деңгейін арттыру бойынша ұсыныстар ұсынылады. Зерттеу жеке сектордың әлеуетін ашу және Қазақстанның тұрақты даму моделіне көшуін жеделдету үшін кешенді тәсілдің қажеттілігін көрсетеді.

Түйін сөздер: жасыл экономика; жеке сектор; тұрақты даму; Қазақстан; жаңартылатын энергия; ESG принциптері; инновациялық технологиялар.

РОЛЬ ЧАСТНОГО СЕКТОРА В РЕАЛИЗАЦИИ КОНЦЕПЦИИ ЗЕЛЕНОЙ ЭКОНОМИКИ В КАЗАХСТАНЕ

[1]Л.Г. Кирбасова, [2]Вэнь Чиат Ли
[1]Yessenov University, Қазақстан, Ақтау қ.
[2]Технологический университет, MAPA (UiTM), Саравак, Малазия
e-mail: amlm13@mail.ru, at@uitm.edu.my

Аннотация. В статье рассматривается значение и влияние частного сектора на реализацию концепции зеленой экономики в Казахстане. Анализируются ключевые направления участия бизнеса, такие как внедрение возобновляемых источников энергии, развитие технологий переработки отходов, повышение энергоэффективности и применение инновационных бизнес-моделей. Особое внимание уделяется существующим барьерам, включая недостаток финансовых инструментов, низкий уровень осведомленности

предпринимателей о возможностях государственной поддержки и сложности в привлечении инвестиций. Представлены успешные кейсы взаимодействия частного сектора и государства, а также международный опыт, который может быть адаптирован к казахстанским условиям. На основе проведенного анализа предлагаются рекомендации по созданию благоприятной среды для вовлечения бизнеса в экологические проекты, включая развитие зеленых финансов, упрощение процедур государственно-частного партнерства, внедрение ESG-принципов и повышение уровня цифровизации. Исследование подчеркивает необходимость комплексного подхода для раскрытия потенциала частного сектора и ускорения перехода Казахстана к устойчивой модели развития.

Ключевые слова: зеленая экономика; частный сектор; устойчивое развитие; Казахстан; возобновляемая энергетика; ESG-принципы; инновационные технологии.