A STUDY ON STRATEGIES FOR SUSTAINABLE DEVELOPMENT OF THE GREEN ECONOMY IN THE CHINA-BELARUS INDUSTRIAL PARK

Liu Ziqi

School of Business of Belarusian State University
7 Oboynaya Street, Minsk 220004, Belarus,
bmt.lyuC19@bsu.by

As global attention to environmental protection and sustainable development continues to rise, green economy has become an important development direction in international economic cooperation. China-Belarus Industrial Park actively responds to this global trend and aims to build a modernized industrial park with green, low-carbon and sustainable development. Through the introduction of advanced green technologies and the cultivation of green economy industries, the Park promotes the economic growth of the region and significantly reduces the negative impacts of development and construction on the ecological environment. This paper takes the Park as the study focus, and based on the perspective of green economy, systematically explores the strategies for industrial parks to achieve sustainable development, and analyzes the specific strategies that can be used in the implementation process, aiming to provide practical experience for more green economy sustainable development areas in China and Belarus.

Keywords: China-Belarus Industrial Park; green economy; implementation strategy; sustainable development; China; Belarus; «4+» solution; Green infrastructure construction; Environmental technologies.

ИССЛЕДОВАНИЕ СТРАТЕГИЙ УСТОЙЧИВОГО РАЗВИТИЯ «ЗЕЛЕНОЙ ЭКОНОМИКИ» В КИТАЙСКО-БЕЛОРУССКОМ ИНДУСТРИАЛЬНОМ ПАРКЕ

Лю Цзыци

Институт бизнеса
Белорусского государственного университета
ул. Обойная, 7, 220004, Минск, Беларусь,
bmt.lyuC19@bsu.by

По мере того как глобальное внимание к вопросам охраны окружающей среды и устойчивого развития продолжает расти, «зеленая экономика» становится важным направлением международного экономического сотрудничества. Китайско-Белорусский индустриальный парк активно откликается на данный мировой тренд и стремится к созданию современного индустриального парка с ориентацией на экологичность, низкий уровень выбросов углерода и устойчивое развитие. Посредством внедрения передовых «зеленых» технологий и развития отраслей «зеленой» экономики Китайско-Белорусский индустриальный парк способствует экономическому росту региона и в значительной мере снижает негативное воздействие процессов развития и строительства на экологическую среду. В статье Китайско-Белорусский индустриальный парк рассматривается в качестве объекта исследования и, исходя из концепции «зеленой» экономики, системно анализирует стратегии достижения устойчивого развития индустриальных парков, а также исследует конкретные меры, которые могут применяться на этапе реализации, с целью предоставления практического опыта для дальнейшего развития сфер устойчивой «зеленой» экономики в Китае и Беларуси.

Ключевые слова: Китайско-Белорусский индустриальный парк; «зеленая» экономика; стратегия реализации; устойчивое развитие; Китай; Беларусь; решение «4+»; строительство «зеленой» инфраструктуры; экологические технологии.

As the highest-level bilateral cooperation project between China and Belarus, and the most ambitious development

project under the framework of the Belt and Road Initiative, the strategic value and demonstrative significance of China-Belarus Industrial Park is self-evident. Located in the geometric center of the European continent and adjacent to Minsk International Airport, the capital of Belarus, the park has developed into the largest and most functional comprehensive investment platform in Belarus by virtue of its unique spatial positioning. As a core engine of regional economic development and a key carrier of international cooperation, the Park plays an irreplaceable role in promoting the industrial upgrading of Belarus, facilitating the process of regional economic integration and deepening international production capacity cooperation [1, p. 265].

In particular, the further promotion of the Belt and Road initiative has built an all-round and multi-level strategic support system for the development of the China-Belarus Industrial Park. The initiative provides an important channel for the Park to link with global resources and integrate into the international industrial chain by building an extensive international cooperation network. At the same time, relying on the huge market scale and diversified demand structure of the countries along the route, China-Belarus Industrial Park has gained a highly potential market expansion space, and the cross-border flow and optimal allocation of various industrial factors have provided a systematic guarantee, thus significantly enhancing the competitiveness and influence of the Park in the industrial division of labor in the Eurasian continent.

Analysis of the situation in the China-Belarus Industrial Park. Located 25 km east of Minsk, the capital of Belarus, the Park, with a total planning area of 112.5 square km, is one of the largest economic and trade cooperation zones built by China overseas. After years of development and construction, the zone has made remarkable progress. As of 2024, the infrastructure construction of 8.5 square km in the first phase of the zone has been basically completed and has reached the standard, providing good hardware conditions for enterprises to move in [1, p. 266].

At present, the CBIP has initially formed a diversified industrial layout, «covering a wide range of fields such as machinery manufacturing, e-commerce, new materials, traditional Chinese medicine, artificial intelligence, 5G network development, etc. As of 2024, the zone has attracted 107 enterprises from 15 countries, with a total agreed investment of 1,336.52 mln USD. Among them, 49 Chinese-funded enterprises, accounting for 45.8 %, mainly come from machinery manufacturing, e-commerce, information technology and other fields»; 31 White-funded enterprises, accounting for 29 %, cover food processing, building materials and other industries; and 19 third-country-funded enterprises, accounting for 17.8 %, are involved in electronics, chemicals and other fields. In terms of investment scale, there are 5 enterprises with a total investment of over 100 mln USD, accounting for 4.7 %; 12 enterprises with a total investment of 50 mln USD – 100 mln USD, accounting for 11.2 %; 35 enterprises with a total investment of 10 mln US dollars – 50 mln USD, accounting for 32.7 %; and 55 enterprises with a total investment of less than 10 mln USD, accounting for 51.4 %. The presence of these enterprises not only brings capital and technology to the CBIP, but also promotes industrial agglomeration and economic development [2, p. 56; 3, p. 112—113; 4].

The Green and Sustainable Development of the China-Belarus Industrial Park. With the increasing global emphasis on sustainable development, environmental protection has become a key indicator of the development quality of an industrial park. From the very beginning of its planning, the Park has placed the concept of green economy development at its core, and is committed to building a modernized industrial new town that is ecological, intelligent and sustainable.

The China-Belarus Industrial Park clearly takes «green, intelligent, ecological and digital» as its core development direction. This concept runs through the entire process of planning, construction, investment and operation of the

CBIP. In order to ensure that green economy development is put into practice, the park strictly complies with Belarusian domestic environmental regulations and actively benchmarks itself against high international standards. It is positive to note that China-Belarus Industrial Park has been awarded the Environmental Management and Audit System certification by the European Union, which demonstrates that Park's environmental management system is at an internationally advanced level and that it is committed to continually improving its environmental performance. Besides, the Belarusian government also attaches great importance to the ecological environmental protection of the park and provides policy support and regulatory framework for the green economy development of the park through relevant presidential decrees and policy documents [5].

Next, we have analyzed the specific implementation aspects of the sustainable development of the CBIP, where a number of environmentally friendly technologies and concepts have been integrated into the infrastructure development in table 1.

Based on the above information, it can be seen that the China-Belarus Industrial Park is actively responding to the global trend of green transformation, and has made green industry one of the key directions for future development. in March 2021, the park welcomed its first project in the Chinese medicine industry, which marks the expansion of its biomedical field, and may also involve the cultivation of Chinese herbal medicine, green extraction, and other ecological-related segments. In addition, the Park plan also includes new materials, environmental technology and other developments and production, which have green attributes in their own right or help promote the green transformation of other industries.

In the process of development and construction of the China-Belarus Industrial Park, great importance was attached to the protection of the original ecological environment. A large number of original forest belts have been preserved in the master plan of the park, and it has been reported that more

than 30—50 meter wide original forest belts in the park have formed an ecological protection barrier business department. The overall greening rate in the park is planned to be nearly 50 %, and two ecological protection zones are preserved intact, as well as the original settlements. We can be certain that this approach reflects the concept of protection in development and development in protection, and seeks to achieve a balance between industrial development and ecological environmental protection, to promote the harmonious coexistence of man and nature, and to lay the foundation for the eventual construction of an ecologically livable industrial new city.

Table 1

Environmental technologies and implementation features

Technical approach	Implementation characteristics
Sewage treatment	The design of the wastewater treatment station takes full account of the complexity of the incoming water quality and the high requirements of the outgoing water, and adopts high standards, digitization and automation in order to ensure that the discharge standards are met and to protect the local water bodies (e. g., the Wusha River) [6]
Waste management and recycling	The China-Belarus Industrial Park has established a comprehensive solid waste classification, collection, treatment and recycling system. This includes the minimization, resourcing and harmless treatment of industrial waste
Clean energy and energy-saving technology applications	The China-Belarus Industrial Park has introduced digital and intelligent technologies in the construction of power grids and plant design. The design of standardized factory buildings makes full use of natural light, ventilation and energy-saving technologies to reduce energy consumption. The China-Belarus Industrial Park is increasing the low-carbon and intelligent transformation of water, electricity, gas and other infrastructures

Therefore, the sustainable development of green economy in the China-Belarus Industrial Park is to maintain the balance and stability of the ecosystem through measures such as reducing pollution emissions, protecting biodiversity, and improving the quality of the ecological environment, which are in line with the requirements of environmentally sustainable development in sustainable development. Green economy encourages enterprises to adopt environmentally friendly technologies and equipment, strictly abide by environmental regulations, and effectively treat and comprehensively utilize waste gas, waste water and waste residue generated in the production process, thus reducing the negative impact of economic activities on the environment.

The strategies implemented by the China-Belarus Industrial Park in the sustainable development of the green economy are next explored, as shown in Table 2.

The table above shows that our strategy of building green infrastructure + optimizing green industrial deployment is one of the most effective ways to provide sustainable development of green economy in the Park. We have adopted the «4+» solution (developing circular economy industries + fostering new green industries + building green transportation networks + improving environmental infrastructure) to ensure the implementation of the strategy.

China and Belarus are working together on green economy cooperation to promote ecological construction and sustainable development of the two countries, to seize the opportunity of high-quality development of the Belt and Road initiative, and to promote healthy and stable development of the relations between China and Belarus at a high level. Therefore, the green economy cooperation in the China-Belarus Industrial Park provides an important guarantee for the realization of sustainable development.

Table 2

Strategies for Sustainable Development of green economy in the China-Belarus Industrial Park

Strategies	Methodology	Content of implementation
Green Infrastructure Construction	Construction of green transportation infrastructure	«Plan and build a green transportation network within the industrial cooperation zone, giving priority to the development of public transportation systems» [7], such as the construction of light rail, rapid transit and other high-capacity public transportation facilities, and encouraging enterprise employees and residents to choose public transportation for their trips. Increase the construction of charging facilities for new energy vehicles, and «reasonably distribute charging piles in parking lots, along roads and other areas in the zone, so as to provide convenient conditions for the use of new energy vehicles and reduce the environmental pollution caused by motor vehicle exhaust emissions» [8].
	Improve environmental protection infrastructure	Construction of centralized sewage treatment plants, garbage treatment plants and other environmental protection facilities to ensure that industrial wastewater and domestic sewage in the cooperative zone are effectively treated, and garbage is harmlessly treated and utilized in a resourceful manner. Advanced sewage treatment technologies and garbage treatment processes will be adopted to improve the treatment efficiency and quality of the environmental protection facilities and provide solid infrastructure protection for the green economy development of the China-Belarus Industrial Park.
Optimization of green industrial deployment	Development of circular economy industries	Vigorously develop circular economy industries in the industrial cooperation zone to form an industrial chain with efficient utilization of resources [9].
	Cultivate emerging green industries	Increase efforts to cultivate emerging green industries, such as new energy automobile manufacturing, green building materials, and energy-saving and environmental protection equipment manufacturing. Using China's advantages in new energy technology research and development and industrial development, combined with Belarus's manufacturing base, we will jointly build an emerging green industry cluster with international competitiveness.

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