

Path Selections in the Development of Low-Carbon Economy

Shuning Bi*, Lan Jiang

School of Economics and Management, Southwest Petroleum University, Chengdu 610000, China

* Corresponding author

Abstract: The development of a low-carbon economy plays a crucial role in human survival and the sustained and healthy development of economic society, and its trend is irreversible. This article delves into the core concepts of a low-carbon economy, further exploring the importance of promoting its development and the current challenges it faces. Based on this, practical path selections for the development of a low-carbon economy are proposed, aiming to effectively overcome various difficulties in the process and achieve harmonious coexistence between economic development and ecological protection, thus promoting comprehensive and sustainable development of human society.

Keywords: Low-carbon economy, Sustainable development, Energy structure.

1. Introduction

Currently, energy conservation and emission reduction have gradually become a common consensus among all sectors of society. Government departments at all levels in China are actively taking actions to promote economic development with more efficient resource utilization. This initiative not only fits in with the new development concept advocated against the backdrop of global warming, but also represents a profound energy revolution. It helps optimize the energy structure, thereby laying a solid foundation for sustainable human development^[1-2].

2. Overview of Low-Carbon Economy

In 2003, the concept of "low-carbon economy" was first mentioned in the UK's Energy White Paper "Our Energy Future: Creating a Low Carbon Economy". The introduction of this concept does not mean a slowdown in the speed of economic development, but emphasizes the balance between economic development and environmental protection, avoiding the pursuit of short-term economic interests at the cost of human long-term development. Therefore, the low-carbon economy has gradually attracted widespread attention from countries around the world. Countries have begun to reflect and examine the impact of traditional economic development models on the environment, actively exploring and practicing the development path of the low-carbon economy.

Since China clearly put forward the "double carbon" goal of carbon peaking and carbon neutrality in 2020, the pace of low-carbon economic development has significantly accelerated in our country. This development concept has not only been written into the government work report, becoming an important strategic guide at the national level, but also has been well known and put into practice by a large number of enterprises. The promotion and implementation of the low-carbon economy has injected powerful momentum into the high-quality development of China's economy, becoming a key force in promoting industrial upgrading and transformation. The development of a low-carbon economy in China not only helps to reduce carbon emissions and

mitigate the negative effects of global warming, but is also an important step in building a green economic development model that is in line with China's national conditions. Through the development of a low-carbon economy, we can achieve a win-win situation between economic growth and environmental protection, improve people's livelihood and well-being, and promote sustainable social development. At the same time, the development of the low-carbon economy will also give birth to a series of green industries, build a green industrial system, and lay a solid foundation for the long-term development of China's economy.

3. The Importance of Developing A Low-carbon Economy

(1) The development of a low-carbon economy is an inevitable choice to address global climate change

With the acceleration of industrialization, the emission of a large amount of greenhouse gases has led to global warming and frequent extreme weather events, posing a serious threat to human survival and development. By reducing high-carbon energy consumption and greenhouse gas emissions, a low-carbon economy can help slow down the pace of climate warming and protect the earth's ecological environment.

(2) The development of a low-carbon economy is an important driving force for economic transformation and upgrading

The traditional high-carbon economic model, which comes at the cost of resource consumption and environmental destruction, is difficult to achieve sustainable development. A low-carbon economy emphasizes technological and institutional innovation, promoting the optimization and upgrading of industrial structures, the development of green industries and circular economies, improving energy utilization efficiency, reducing production costs, and enhancing economic competitiveness.

(3) The development of a low-carbon economy is an effective way to improve people's livelihood and quality of life

As people's living standards improve, their demands for the ecological environment and quality of life are also increasing. A low-carbon economy focuses on the protection and

restoration of the ecological environment, promoting the formation of green lifestyles and consumption patterns, and providing people with a healthier, more comfortable, and livable living environment.

(4) The development of a low-carbon economy is an important means to enhance a country's image and international competitiveness

With the deepening of global climate governance, low-carbon development has become a consensus and trend in the international community. The development of a low-carbon economy can help enhance China's image and status on the international stage, and strengthen its voice and influence in global governance.

4. The Challenges Facing the Development of A Low-carbon Economy

(1) The energy structure restricts the development of a low-carbon economy

Resource conditions are an important constraining factor. China's resource characteristics of "rich in coal, scarce in gas, and lacking in oil" determine that the energy structure is dominated by coal, and the options for low-carbon energy resources are limited. This results in thermal power accounting for over 77% of power production, while hydropower only accounts for around 20%, making the "high-carbon" characteristic occupy an absolutely dominant position in energy consumption. In addition, the relatively backward level of industrial production technology also aggravates the high-carbon characteristics of China's economy.

(2) Relatively Outdated Technology and Equipment

China is currently in a critical stage of rapid industrialization, urbanization, and modernization, during which the demand for large-scale infrastructure construction is particularly urgent. However, this rapid expansion of construction often goes hand in hand with significant energy consumption and carbon emissions, making it difficult to achieve a substantial reduction in carbon emissions in a short period of time. At the same time, the relatively outdated technology and equipment in China significantly limit the development of a low-carbon economy. Compared with developed countries, there are still significant gaps in our country in terms of energy utilization efficiency, production processes, and carbon emission control. This leads to a relatively high carbon dioxide emission per unit of GDP in China, further exacerbating the practical challenges of developing a low-carbon economy.

(3) Need for Strengthening Low-Carbon Policy Implementation and Supervision

Although the concept of low-carbon development has gained widespread acceptance, China only proposed the "dual carbon" target in 2020, and policy support appears to be slightly insufficient compared to other countries. In terms of energy legislation, some regulations are too general and lack specific implementation details and operability. At the same time, tax incentives and subsidy policies for the low-carbon economy are also relatively scarce, and the reward mechanisms are not diverse enough, resulting in a low level of coordination between the development of a low-carbon economy and policies.

(4) Insufficient Public Awareness and Participation in the

Low-Carbon Economy

First, the public's awareness of the low-carbon economy is relatively low. Although the propaganda on environmental protection and low-carbon development has increased in recent years in China, many people still lack a deep understanding of the concept, significance, and daily relevance of the low-carbon economy. Without sufficient knowledge, it is difficult for the public to form a correct understanding of the low-carbon economy and translate it into practical actions. Second, the public's awareness of environmental protection has not been fully aroused. Although environmental protection and low-carbon development have become hot topics in society, some members of the public still hold the attitude of "none of my business," believing that environmental protection and low-carbon efforts are the responsibility of the government or enterprises, not individuals. This mindset leads to a lack of attention and participation in low-carbon behaviors in daily life. Furthermore, the promotion of low-carbon lifestyles faces certain challenges. Low-carbon living requires the public to change traditional consumption and lifestyle habits, such as reducing energy consumption and choosing environmentally friendly products. However, these changes often require a certain economic cost or sacrifice in convenience, making some members of the public reserved about adopting low-carbon lifestyles. Finally, there are also deficiencies in China's science education on the low-carbon economy. Currently, public science activities related to the low-carbon economy are relatively scarce and monotonous, making it difficult to attract public attention and participation. At the same time, schools and social organizations have also invested insufficiently in low-carbon education, resulting in limited understanding of the low-carbon economy among the younger generation.

5. Discussion on the Path Selection of Low-carbon Economic Development

(1) Promoting the Optimization and Upgrading of Industrial Structure

Facing the current global trend of low-carbon economic development, China's traditional industrial structure has shown signs of weakness and urgently needs profound adjustment and reform. This transformation is not only related to the transformation of China's economic growth mode, but also the only way to achieve green, low-carbon, and circular development.

Firstly, we should vigorously promote the industrialization process of clean energy. For a long time, China's energy structure has been dominated by coal, which has not only caused serious environmental pollution but also intensified greenhouse gas emissions, posing a severe challenge to global warming. Therefore, we must accelerate the elimination of high-energy-consuming industries, vigorously develop clean energy such as wind, solar, and water, gradually optimize the energy structure, and reduce carbon emission intensity.

Secondly, we should focus on developing low-carbon equipment manufacturing. This field not only has broad market prospects but also is an important support for promoting low-carbon economic development. By introducing and cultivating low-carbon equipment manufacturing technology, we can effectively promote the optimization and upgrading of the industrial structure, improve energy utilization efficiency, and reduce resource

consumption and environmental pollution.

In addition, we should actively develop pollution-free and low-energy-consuming industries such as the service industry, information technology industry, and cultural and creative industry. The service industry covers multiple fields such as commerce, catering, transportation, postal and telecommunications, finance, and insurance, and has multiple functions such as absorbing employment and promoting consumption. Meanwhile, the information technology industry, as an important component of high-tech industries, has the characteristics of low energy consumption and high efficiency, which is of great significance for promoting the green transformation of the economy^[3].

In the process of adjusting the industrial structure, we should also focus on cultivating technologies and talents for low-carbon economic development. By strengthening industry-university-research cooperation, promoting the deep integration of technological innovation and industrial development, and cultivating a group of excellent talents with low-carbon technology research and application capabilities, we can provide strong support for the development of a low-carbon economy.

(2) Strengthening Scientific and Technological Support and Promoting Low-carbon Technological Innovation and Development

Technological innovation is an important engine for promoting economic development, and for China, it is even the key to achieving low-carbon transformation. However, China still faces many challenges in the field of low-carbon technology. Our independent innovation capability is relatively weak, making it difficult to provide solid technological support for the deep development of a low-carbon economy^[4]. Therefore, we must further increase investment in science and technology in the field of low-carbon, strengthen scientific and technological support, and promote the innovation and development of low-carbon technology.

Firstly, strengthening technological cooperation and exchanges with foreign countries is an important way to improve China's low-carbon technology level. Through cooperation with internationally advanced research institutions and enterprises, we can introduce and absorb advanced low-carbon technologies and management experience, providing strong support for the development of China's low-carbon economy. At the same time, this cooperation also helps us broaden our international perspective, understand the latest trends and development trends of global low-carbon technology, and provide useful references for China's technological innovation.

However, relying solely on external cooperation is insufficient. We must strengthen our independent research and development capabilities, master core technologies, and truly achieve the transformation of a low-carbon economy. To this end, we need to increase investment in low-carbon technology research and development, attract and cultivate a group of high-end technical talents, and establish a high-quality research team. At the same time, we should also encourage enterprises to increase investment in research and development, enhance independent innovation capabilities, promote the deep integration of industry, universities, and research, and form a group of low-carbon technological achievements with independent intellectual property rights.

In addition, to stimulate the vitality and motivation of technological innovation, we should also improve relevant policies and measures, improve the treatment and status of technical personnel, and provide them with a good working environment and development platform. By implementing a series of incentive policies, we can attract more outstanding talents to devote themselves to the research and innovation work of low-carbon technology, injecting new vitality and momentum into China's low-carbon economic development.

(3) Establishing a Perfect Supporting Mechanism for a Low-Carbon Economy

As the global climate warming issue becomes increasingly severe, environmental awareness has gradually penetrated into people's hearts. The low-carbon economy, as an important way to address this challenge, has gradually become the focus of competitive development among countries around the world. To seize the commanding heights of the low-carbon economic development market, various countries have introduced relevant policies, committed to building a wealthy and sustainable society. However, in China's current situation, the market trading mechanism, investment and financing mechanism, and relevant laws and regulations for the low-carbon economy are still imperfect and urgently need to be adjusted and improved to ensure that economic development and environmental protection can proceed side by side.

Firstly, the government should focus on improving the market trading mechanism for the low-carbon economy. This includes developing a series of guidelines on emission standards, regulating the operation of the low-carbon market, and ensuring the formation of an organic connection between the market and the government. By establishing a sound market trading mechanism, we can better promote energy conservation and emission reduction cooperation among enterprises, drive the widespread application of low-carbon technologies, and achieve effective reductions in carbon emissions.

Secondly, China should gradually raise the threshold for attracting foreign investment to create a favorable environment for the development of the low-carbon economy. During the rapid development of industrialization in the past, China imposed relatively few restrictions on foreign-funded enterprises. However, in the context of the low-carbon economy, the introduction of high-energy-consuming and carbon-intensive industries will bring tremendous pressure to China's environment and have a negative impact on ecological civilization construction. Therefore, we should pay more attention to introducing industries with less pollution, especially the technology industry, to accelerate the development of the green economy.

Moreover, after the financial crisis, developing a green and low-carbon economy has become an inevitable choice for the healthy development of mankind. For China, economic model transformation is a necessary condition for achieving sustainable development. We should face up to the current problems, continuously improve the supporting mechanism for the development of the low-carbon economy, be good at seizing opportunities, and bravely embrace challenges. This includes strengthening policy guidance, promoting the optimization and upgrading of the industrial structure, increasing technological innovation efforts, and improving energy utilization efficiency. At the same time, we should also deepen energy conservation and emission reduction efforts to

ensure that various supporting policies and measures can provide strong support for the development of the low-carbon economy.

(4) Adhering to the Low-Carbon Concept and Carefully Drawing Up a Development Blueprint

Currently, China's low-carbon economy development is facing many challenges and difficulties. To truly implement low-carbon development, we not only need firm determination, but also practical actions and scientific development plans. We must adhere to the low-carbon principle, ensure that every city can effectively implement energy conservation and emission reduction measures, make the concept of low-carbon development deeply rooted in people's hearts, and thus promote the transformation and upgrading of the economic structure.

At the city level, it is crucial to make a good plan for low-carbon development. We can establish special institutions to guide the development of the city's low-carbon economy from the perspective of urban development, to ensure that various measures are implemented scientifically and reasonably. For example, strengthening the construction of urban green belts can not only beautify the environment, but also purify the air and absorb pollutants, which is conducive to creating a livable low-carbon city. At the same time, we should strengthen the supervision of industrial parks, strictly control the emission of pollutants, avoid pollution to residential areas, and ensure the quality of life and health of the people.

Energy conservation and emission reduction are also our focuses in transportation. Urban planning should fully consider traffic conditions, disperse the population pressure of the old urban areas by building new urban areas, alleviate traffic congestion, and improve the efficiency of urban traffic. In addition, we can also achieve the goal of low-carbon development by controlling the scale of vehicles, such as implementing a limited number policy to reduce traffic flow and exhaust emissions. At the same time, we should strengthen the construction of the public transportation system, such as optimizing bus routes, increasing subway lines, etc., to provide convenient and comfortable travel modes for citizens, and encourage people to choose public transportation through preferential policies to reduce carbon emissions.

For old buses in the city, the government should increase investment to gradually replace them with electric buses, in order to reduce urban pollution and improve citizens' travel experience. Such measures can not only attract more people to choose public transportation, but also contribute to the city's low-carbon development^[5].

In general, urban planning plays a pivotal role in China's low-carbon economic development. If we can ensure that every city can implement the low-carbon development concept, establish special institutions for scientific guidance, then China's path of low-carbon and circular development will be smoother. Let us work together with firm beliefs and practical actions to jointly promote the prosperous development of China's low-carbon economy.

(5) Enhance Nationwide Awareness of Low-Carbon Development and Jointly Build a Green and Beautiful Home

The slogan "Protecting the environment is everyone's responsibility" is deeply rooted in people's hearts, reminding us that every individual is a guardian of our earth home. The essence and significance of low-carbon economic

development lies in protecting our common ecological environment and achieving sustainable development. Therefore, every citizen should deeply understand the importance of the low-carbon development concept, actively establish a low-carbon consumption awareness, and contribute to promoting China's low-carbon economic development.

To achieve this goal, relevant government departments should play a leading role, increase the promotion of the low-carbon development concept in public places such as bus stops and billboards, and make the low-carbon concept deeply rooted in people's hearts through vivid propaganda paintings, eye-catching slogans, and easy-to-understand texts. At the same time, the education sector should also undertake the responsibility of cultivating the next generation's awareness of environmental protection. Schools can organize diverse activities such as speech contests and class discussions on low-carbon themes, allowing students to experience the charm of low-carbon life and cultivate a sense of responsibility for protecting the environment from childhood^[6].

In terms of consumption patterns, each of us should consciously practice the concept of low-carbon consumption. When traveling, we can prioritize public transportation, reduce the use of private cars, and reduce carbon emissions. When traveling, we can choose green travel modes such as cycling and hiking to reduce the pressure on the environment. At the same time, tourist attractions should also actively respond to the call of the low-carbon economy, update tourist facilities, adopt environmentally friendly transportation methods such as electric cars and bicycles to replace traditional fuel-powered tourist vehicles. In addition, building low-carbon sanitary facilities such as ecological toilets is also an important measure to enhance the tourism experience and promote green tourism.

In general, low-carbon economic development should not just remain at the level of slogans and policies, but requires the participation and efforts of everyone. Let us work together, adhere to the principle of low-carbon development, achieve low-carbon consumption and green travel in our daily lives, and jointly create a beautiful and livable ecological environment, contributing to promoting China's low-carbon economic development. Only by doing so can we truly achieve harmonious coexistence between man and nature

6. Conclusion

Facing the severe challenges of global climate change, countries around the world are increasingly focusing on ecological and environmental protection issues. As a responsible major country, China has always been committed to building a resource-saving and environment-friendly society in close connection with its basic national conditions. This strategic choice aims not only to fundamentally change China's long-standing status of high carbon emissions and promote the transformation of economic development mode towards a more green and low-carbon direction, but also reflects China's active response to the new requirements of the times and its demonstration of responsibility as a major country.

Building a resource-saving society means that we will pay more attention to the rational utilization and effective protection of resources, improve resource utilization efficiency and reduce resource waste through technological

innovation and industrial upgrading, and achieve sustainable utilization of resources. This is not only in line with China's basic national conditions of a large population and relative scarcity of resources, but also an active measure to address the global resource shortage issue. Meanwhile, building an environment-friendly society is a reflection of China's active response to the global call for ecological and environmental protection. We will be committed to promoting green development, strengthening ecological and environmental protection, reducing pollutant emissions, improving the quality of the ecological environment, and creating a more livable living environment for the people. This will not only help improve China's environmental conditions, but also contribute Chinese wisdom and solutions to global ecological and environmental protection.

By building a resource-saving and environment-friendly society, China can not only achieve a virtuous cycle of economic development and environmental protection, leaving a better home for future generations, but also demonstrate its responsibility and commitment as a major country to the world, making a positive contribution to global climate change and ecological environmental protection.

References

- [1] Zeng Fanyin. On the Low-carbon Economy and the Sustainable Development of China's Economy [J]. *China New Technologies and Products*, 2012(22): 232.
- [2] Peng Jinxin. Humanity's Transition from Coping with Climate Change to a Low-carbon Economy [J]. *Environmental Science & Technology*, 2009, 32(12): 1-8.
- [3] Zhang Huiting. Research on the Green Financial Innovation Path under the Development of Low-carbon Economy [J]. *Business Exhibition Economy*, 2022(21): 62-64.
- [4] Liu Lu. Analysis of China's Low-carbon Economic Development from the Perspective of High-quality Development [J]. *Business News*, 2021(27): 151-153.
- [5] Zhao Wentao. Reflections on the Development of Low-carbon Economy in China [J]. *Investment and Cooperation*, 2021(07): 15-16.
- [6] Dai Wei, Zhang Xuefang. Research on the Development Path of Low-carbon Economy under the Constraint of Economic Growth Targets [J]. *Journal of Hubei University of Science and Technology (Humanities and Social Sciences Edition)*, 2021, 38(01): 37-46.