

Study on the Influence of Low-carbon Economy on International Trade Development

Runkun Shi^{1,a,*}

¹*International College, China Agriculture University, Beijing, China*
a. srk15147618672@163.com

**corresponding author*

Abstract: In recent years, with the rapid economic and social development, people's living standards have continued to improve, and production materials and production modes have undergone major changes. The continuous consumption of limited resources has led to more and more sustainability issues erupting globally. How to find a balance between environmental and economic development has become an important challenge for mankind to explore. At this important historical juncture, the low-carbon economy was born and has gained widespread popularity and support around the world. Aiming at the development mode of low-carbon economy, countries around the world have launched a series of related policies to promote its operation and development. The proposal of low carbon economy also has a greater impact on the development of China's foreign trade. This essay analyzes the impact of low carbon economy on the development of China's foreign trade and puts forward the direction and strategy of International trade development in the context of low carbon economy.

Keywords: Low-carbon economy, national trade, development

1. Introduction

In the past century, with the development of the industrial economy, the means and modes of production have been constantly upgraded. Population growth has also led to more and more uncontrolled utilization of limited resources, which has led to more and more serious global climate problems. Carbon dioxide emissions continue to increase, global warming, the earth's ozone layer has been unprecedented impact, and the frequency of catastrophic climate change around the world, which is a serious threat to our survival of the home and health and safety. This means that global collaboration is expected to reduce carbon emissions. Scale studies show that the efficient functioning of institutions is critical to controlling emissions, and highlight the urgency of building a strong legal and policy structure for environmental management [1]. Therefore, the development of a low-carbon economy has become a globalization trend, and this round of revolutionary development will profoundly affect the development of economies around the world. As the low-carbon economy gradually assumes the role of leader in the global economy and trade, the pattern of China's foreign trade and economy has also changed. With the continuous development of the low-carbon economy, each country is also constantly updating new technologies and introducing relevant policies, to enhance its position in the international trade competition. However, the emergence of low-carbon economy has undoubtedly caused some impacts and obstacles to the inherent foreign trade structure,

as well as the development of China's foreign trade economy. This paper will analyze the influence and hindrance of low carbon economy on China's foreign trade from many aspects and put forward the strategies that China's foreign trade economic development should take under the background of low carbon economy.

2. Overview of the low-carbon economy

The concept of "low-carbon economy" was first put forward in the British Energy White Paper in 2003 - a low-carbon economy achieves more economic output through less consumption of natural resources and less environmental pollution [2]. At present, economic development is gradually integrating the concept of sustainability, aiming to reduce the dependence on high-emission energy sources such as coal and oil and slow down the release of greenhouse gases through innovative technology, institutional reform, optimization of industrial structure and promotion of clean energy strategies. This transformation is an effort to achieve a win-win relationship between economic growth and environmental protection. The development of a low-carbon economy has not only significantly reduced pollution and energy use, but also significantly improved corporate financial results. In the field of international transactions, this economic model plays a key role in China's foreign trade activities. Still, there is no universally accepted definition of a low-carbon economy. Generally speaking, it is believed that the low-carbon economy refers to the economic development model based on the perspective of sustainable development, which can not only control carbon dioxide emissions within a reasonable range but also promote the normal development of the economic system. At its core, it is about energy efficiency, clean energy and environmentally friendly economic growth. Its core is to promote the innovation of energy and emission reduction technologies, as well as the innovation of industry and system structure, reflecting the fundamental change of human concept of survival and development. The beneficial effects of a low-carbon economy can be maximized only if all the countries of the world work together and each country takes responsibility for green development.

3. The Influence of Low Carbon Economy on China's International Trade Market

3.1. Low Carbon Economy to Promote our Foreign Trade

3.1.1. Promote the Development of New Energy in China

Arguably, China is now the world's largest consumer of energy and emitter of carbon dioxide. Due to China's late economic start, compared to other developed countries, China's environmental protection economy in the traditional industry development is relatively slow. At this stage, China began to pay attention to the environmental protection economy, low-carbon economy, pay attention to the development and utilization of energy, in the field of new energy, China's current development situation is relatively good, solar energy and lithium batteries and other industries are in a more advantageous position, and other developed countries with a relatively small gap between. Currently, there is a global emphasis on the advancement and utilization of renewable energy sources, as well as the promotion of low-carbon economies and environmental preservation. Considering this backdrop, China has a unique opportunity to proactively foster the development and application of new energy technologies. By creating favorable conditions for increased investment and growth in the new energy industry within an environmentally conscious framework, our government should provide substantial support to facilitate its progress and ultimately drive forward the expansion of renewable energy sectors. Due to the strong interconnections between our nation and other countries worldwide, there has been a notable enhancement in communication and cooperation regarding environmental protection and the low carbon economy. This progress can be observed through our

country's efforts to introduce advanced technologies and exceptional management practices from developed nations, effectively propelling the rapid development of China's new energy industry.

3.1.2. Promote the Upgrading of the Industrial Structure of the Relic of our Economic Framework

Based on the Porter Hypothesis, the implementation of strict low-carbon environmental policies can drive companies to adopt innovative technologies, improve productivity, and reduce costs. Such measures will help promote China's economic growth and optimize its industrial structure [3]. In the international trade market, countries are increasingly inclined towards supporting environmentally friendly products, while imposing restrictions on industries that exhibit severe pollution and high energy consumption. Consequently, enterprises engaged in highly polluting activities face hindrances due to their excessive energy usage, thereby impacting the level of pollution they generate. At the same time, it can also foster the rapid advancement of the environmental protection industry and stimulate China's foreign trade enterprise economy, as well as facilitate the emergence of new industries. This will enhance enterprise competitiveness and elevate its position in international foreign trade, thereby promoting progress and upgrading in both domestic economic structure and industrial composition. From another perspective, developed nations' continuous development and utilization of low-carbon energy sources alongside innovative technologies have the potential to transform China's prevailing high-pollution, high-consumption mode of economic development. Consequently, this shift would contribute to mitigating pollution levels while fostering sustainable economic growth. On the contrary, developed nations persistently advance and employ low-carbon energy sources and innovative technologies, thereby transforming their domestic economic development model characterized by high pollution and excessive consumption. Consequently, this mitigates environmental degradation and linguistic impairment resulting from rapid economic growth while facilitating the upgrading of China's economic structure and industrial framework. Moreover, it fosters the advancement of China's international trade.

3.1.3. Promote the Development of China's Import and Export Trade

Due to the delayed initiation of China's economic development model, the implementation of a low-carbon economy has been relatively slow compared to the country's overall progress. Moreover, there is an evident negative impact of high emissions on China's import and export trade. However, it can be observed that environmental protection measures have positively influenced China's international trade by promoting sustainable economic growth. In light of global concerns regarding carbon emissions, countries worldwide have imposed stringent regulations and monitoring mechanisms in this regard. The environmental protection automobile industry in China has demonstrated remarkable competitiveness in the international trade market, particularly through the successful development of low-emission cars. Moreover, China possesses a strong advantage in energy-saving and environmentally friendly technologies. Consequently, Chinese environmental protection products have achieved significant sales volumes in the global market, thereby fostering the growth of China's international trade sector. Although this progress may not be conducive to the development of certain traditional industries at this stage, it undoubtedly contributes to advancements in new technology products and related sectors such as new energy. China's environmental protection products can occupy a certain market position in the international market, the same China will increase investment in such industries and support to promote their development, which can also promote the development of China's international trade. It is important to emphasize that while decarbonisation offers new trade opportunities for many countries, including emerging economies, achieving a low-carbon transition often requires other policy measures. Doing so could help those affected regions and small and

medium-sized enterprises smooth the decarbonisation process and adjust their production and consumption patterns [4].

3.1.4. Model of Realize the Low-carbon Economic Development

To promote the development of a low-carbon economy and reduce the impact of carbon emissions on the social environment, governments of various countries have begun to explore ways to reduce carbon emissions. For example, implementing carbon taxes and carbon emission trading schemes are effective policy tools to reduce carbon emissions [5]. The transition to a low-carbon economy depends on government leadership, which involves building a comprehensive and long-term strategic framework, promoting policies to stimulate technological innovation and energy efficiency, reducing greenhouse gas emissions, increasing the use of renewable energy, and promoting sustainable development. And through tax incentives, financial assistance, green procurement system, environmental credit programs and other means to lead and promote the sustainable development of low-carbon economy. Furthermore, it demands that enterprises acknowledge this conscientious trajectory and actively promote the core tenets of the "low-carbon revolution," emphasizing high-energy efficiency and low emissions while prioritizing advancements in "low-carbon technology" to seize advantageous market positions and secure dominance within industries. Enterprises must acknowledge the trajectory and consciously pursue the advancement of the "low-carbon revolution" centered on heightened energy efficiency and reduced emissions. Moreover, they should prioritize the development of "low-carbon technology" to capitalize on market opportunities and secure a prominent position within the industry.

In order to achieve a low-carbon economy in China with a large population, all sectors of society need to work together. Only when every citizen actively participates in and ADAPTS to the transformation of a low-carbon lifestyle can China effectively shift to this economic model and lay a solid foundation for the future. Therefore, reducing the use of fossil fuels and giving time and space to more widely used renewable energy is one of the indispensable goals and action plans for China's pursuit of low-carbon development. At the same time, in the process of tapping the energy saving and emission reduction potential of the service industry and the consumption-oriented lifestyle, it is also necessary to guide the public to reflect on the bad habits that are high in energy consumption and exacerbate environmental pollution.

Important strategies for the general public to transition towards a low-carbon economy and adopt a low-carbon lifestyle include: firstly, relinquishing the inclination for "convenience consumption" that entails excessive energy usage, and forsaking the habit of utilizing products that prioritize convenience over energy efficiency. Secondly, fostering an enhanced consciousness regarding both energy conservation and environmental protection; thirdly, establishing a strong association between energy-saving practices and environmental preservation awareness; and fourthly, refraining from disregarding or neglecting the significance of energy-saving measures alongside environmental protection efforts. The second is to advocate reducing the use of disposable products and improving energy conservation and environmental protection awareness. The public should understand that water conservation is equally important and recognize that reducing the use of single-use products has a direct impact on reducing energy consumption, reducing carbon emissions and improving quality of life. Third, we need to abandon our vanity driven habits of excess and luxury consumption as the price of a simpler, low-carbon lifestyle. Fourth, promote the development of a balanced scientific diet in the direction of low carbon, that is, limit the intake of high-carbohydrate foods, and appropriately increase the proportion of protein and fat foods. It is believed that the sustainable and healthy growth of low-carbon economy will be promoted by everyone practicing a low-carbon lifestyle.

3.2. Exploration of International Trade Development Path under Low Carbon Economy

With the progression of time, environmental preservation is increasingly capturing people's attention, leading to a growing realization of the significance of safeguarding the ecological environment. The implementation of a low-carbon economic development model plays a pivotal role in enhancing a nation's economic, environmental, and social benefits. Numerous countries have already reaped advantages from adopting this model. Given its extensive influence, every country worldwide stands to gain under the low-carbon economic paradigm. Consequently, in order to further enhance comprehensive competitiveness, it is imperative for nations to actively explore an international trade development path that aligns with the principles of a low-carbon economy. This will enable them to secure greater prominence amidst fierce global economic competition.

3.2.1. Enhance the Scientific Nature of the Formulation of Low-carbon Standards

Scientific low-carbon concepts, such as the development of a low carbon city evaluation system, can help to recommend a comprehensive and continuous planning strategy to the central government to build the low emission towns of the future [6]. Currently, Europe and the United States have implemented stringent low-carbon regulations on foreign trade, requiring exported commodities to meet their respective national standards. It is imperative for China to learn from this practice and take relevant measures to enhance the scientific nature of its own low-carbon standard formulation. Firstly, a management mechanism should be established in order to ensure smooth implementation of these standards and effectively break down barriers. Firstly, China should establish a robust management mechanism to ensure the seamless implementation of low-carbon standards, thereby effectively overcoming any barriers. Secondly, it is imperative to employ legal measures in order to uphold the successful execution of these standards. Therefore, the country must enhance its legal provisions pertaining to low-carbon standards as this aspect remains relatively underdeveloped due to the short duration of low-carbon economy development. Currently, international trade relies heavily on low-carbon standards and regulations from developed nations which significantly impacts normal foreign trade activities for China. Consequently, relevant Chinese authorities should prioritize their attention towards adhering to these low carbon standards. Accordingly, it is imperative for the relevant departments in China to prioritize the safeguarding of low-carbon products and the preservation of their intellectual property rights. This will effectively prevent any potential leakage of crucial technologies and mitigate any adverse consequences that may arise. Moreover, such measures are essential to sustain the motivation and dedication of both low-carbon product manufacturers and researchers involved in this field.

3.2.2. Improve the Export Structure of Product Trade

Under the development mode of a low-carbon economy, it is imperative for our country to enhance the export structure in order to align products more effectively with carbon emission standards. On one hand, the government should assume its role in policy guidance by temporarily slowing down trade and exports, meticulously screening high-carbon products, and implementing appropriate measures to minimize their proportion in exports. For instance, petroleum processing products and metal smelting products are susceptible to high carbon emissions. Consequently, governmental efforts should be redirected towards fostering low-carbon industries while formulating policies that bolster support for such sectors. The government should also redirect its focus towards low-carbon industries and enhance its support for such sectors through policy formulation. For instance, this can be achieved by implementing a range of measures like increasing export subsidies for low-carbon products and adjusting the export tax rebate upwards specifically for low-carbon goods. These actions are crucial in ensuring the sustainable and robust development of low-carbon industries. Additionally,

it is imperative to foster advancements in the service trade industry encompassing areas such as healthcare, finance, education, insurance, academic research, technical services, among others. The service trade industry encompasses various sectors, including tea farming, which also produces low-carbon products that comply with the environmental standards of different countries. This not only reduces energy consumption but also effectively controls carbon emissions, thereby positively impacting China's economic development and facilitating smooth international trade cooperation. Furthermore, it is imperative for the country to expedite advancements in bioengineering, information technology, aerospace technology, and other fields to transform China's trade and export industry pattern. By shifting away from solely exporting low-end products towards gradually upgrading the industrial structure, this will enhance the technical content and value-added of our products. It is worth mentioning that, energy-substitution technology is quite beneficial in improving a low-carbon economy. Furthermore, the channel analysis demonstrates that this reduction effect is primarily generated from the optimisation of the energy consumption structure [7].

3.2.3. Vigorously Develop Low-carbon Technology

The low-carbon economy necessitates higher technological requirements, thus demanding the relevant departments to prioritize extensive research on low-carbon technology. This entails strengthening innovation and promoting the widespread adoption of low-carbon technology development through capital investment, equipment purchases, and other expenditure aspects. Such efforts are crucial in establishing a solid foundation for effectively adapting to the low-carbon economic model. Electric vehicles are mainly powered by battery technology, which is also a key solution to low-carbon emissions and decarbonizing the power system using renewable energy sources. Countries should strive to continuously develop new battery technologies through innovation and cooperation [8]. But upon analyzing the current situation, it becomes evident that our country lacks an advantage in terms of researching and developing low-carbon technology due to its relatively recent entry into the field of low-carbon industries. Consequently, government departments should not only provide policy support for such research and development but also establish cooperative relationships with other countries to acquire knowledge about cutting-edge international low-carbon technologies. These endeavors will propel China's research on low-carbon technology towards a new stage of advancement. At the same time, it is imperative to foster a sense of independent innovation that aligns with China's economic development and the current state of international trade. This entails conducting comprehensive research on low-carbon technologies and intensifying their promotion, aiming to maximize their impact by extending their application to both industrial production and everyday life. By doing so, China can pave a smoother path for its international trade under the umbrella of a low-carbon economy.

4. Conclusion

In summary, the low-carbon economy serves as an innovative economic development model with robust vitality and extensive potential for growth. Its feasibility has been acknowledged by numerous countries worldwide. However, the emergence of international trade, led to a widespread adoption of carbon labeling. Consequently, positive measures must be taken to address this issue while simultaneously enhancing China's international standing. To address the challenges and enhance overall social, economic and environmental benefits, the key is to strengthen the establishment of low carbon standards, optimize the composition of trade and exports of products, actively promote the development of low carbon technologies, and through international cooperation and other diversified strategies. In order to enhance China's influence in the future complex international trade pattern, in-

depth study of low-carbon economy is of great importance. This will lay a solid foundation for the continued sustainability of the Chinese economy.

References

- [1] Wahab, S., Imran, M., Ahmed, B., Rahim, S., Hassan, T. (2024b). Navigating environmental concerns: Unveiling the role of economic growth, trade, resources and institutional quality on greenhouse gas emissions in OECD countries. *Journal of Cleaner Production*, 434, 139851.
- [2] Department of Trade and Industry. (2003, February 24). Our energy future - creating a low carbon economy. GOV.UK. <https://www.gov.uk/government/publications/our-energy-future-creating-a-low-carbon-economy>
- [3] Xu, B., & Lin, B. (2018) Assessing the development of China's new energy industry. *Energy Economics*, 70, 116–131.
- [4] C The trade implications of a low-carbon economy. (n.d.). https://www.wto.org/english/res_e/booksp_e/wtr22_e/wtr22_ch3_e.pdf
- [5] Liu, W., Li, Y., Liu, T., Liu, M., Wei, H. (2021) How to Promote Low-Carbon Economic Development? A Comprehensive Assessment of Carbon Tax Policy in China. *International Journal of Environmental Research and Public Health*, 18(20), 10699.
- [6] Yang, W., Zhao, R., Chuai, X., Xiao, L., Cao, L., Zhang, Z., Yang, Q., Yao, L. (2019) China's pathway to a low carbon economy. *Carbon Balance and Management*, 14(1).
- [7] Xiao-jing, G. (2012) The Influence of Low-carbon Economy on Global Trade Pattern. *Physics Procedia*, 25, 1676–1681.
- [8] Bonsu, N. O. (2020) Towards a circular and low-carbon economy: Insights from the transitioning to electric vehicles and net zero economy. *Journal of Cleaner Production*, 256(1), 120659.