

Research on the Impact of Low Carbon Economy on China's Foreign Trade

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Abstract: Considering the growing prominence of global environmental issues, a low-carbon economy has emerged as a crucial direction for economic development across various countries. As the world's second-largest economy, China has also witnessed the influence of a low-carbon economy on its international trade development. This article aims to commence with an exploration of the development background, meaning, and significance of a low-carbon economy. Subsequently, it delves into an in-depth analysis of the impact that a low-carbon economy has on China's international trade. The article concludes by proposing pertinent countermeasures and suggestions.

Keywords: Low carbon economy; Foreign trade; Trade structure; Trade barrier

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1. Introduction

The convening of the Copenhagen Climate Change Conference in 2009 marked the establishment of a global consensus on a low-carbon economy, characterized by low energy consumption, minimal pollution, and reduced emissions. As an approach to economic development, the low-carbon economy, guided by the principles of sustainable development, strives to minimize the use of high-carbon energy sources, such as coal and oil. Its objectives include the reduction of greenhouse gas emissions and the pursuit of a mutually beneficial model that intertwines economic and social development with ecological environment protection, which is achieved through diverse means, including technological innovation, institutional reform, industrial transformation, and the development of new energy sources^[1]. Across the globe, developed economies view the development of low-carbon economies – encompassing new energy, automotive power, clean energy, and the biotechnology industry – as pivotal for overcoming the international financial crisis.

In its quest for a development path aligned with national conditions, China has introduced a series of development concepts in the 21st century, such as “new industrialization,” “circular economy,” “two-oriented society,” and “low-carbon development.” Notably, the 18th National Congress of the Communist Party of China identified “green development, circular development, and low-carbon development” as crucial to ecological

civilization construction. The subsequent 19th National Congress officially proposed the establishment and enhancement of a green, low-carbon, and circular development economic system. As the world's largest carbon emitter, China, in September 2020, explicitly set goals for “peaking carbon emissions by 2030” and achieving “carbon neutrality by 2060”. The 20th National Congress emphasized that “promoting green and low-carbon economic and social development” is a pivotal element for achieving high-quality development.

From the aforementioned context, it is evident that low-carbon development has become a universal direction for economic progress globally. Consequently, understanding the precise impact of the low-carbon economy on China’s foreign trade and implementing corresponding measures to foster the sustainable development of China’s foreign trade has emerged as a central issue.

2. The impact of low carbon economy on China’s foreign trade

2.1. Adjustment of trade structure

Against the backdrop of global climate change, nations worldwide, particularly developed ones, are actively championing the “low-carbon revolution,” emphasizing high energy efficiency and low emissions. This drives the development of “low-carbon technologies” and necessitates significant adjustments to policies related to industries, energy, technology, trade, and others to capitalize on opportunities to promote industrial development.

Historically, China’s exported products have been predominantly resource-intensive and high in carbon emissions. The advent of the low-carbon economy is steering a transformation in the trade structure. On one hand, the push for a low-carbon economy prompts enterprises to embrace low-carbon production technologies, fostering the production of environmentally friendly and energy-efficient products that exhibit high demand in the global market.

Exporting these low-carbon technologies and green products becomes a catalyst for industrial restructuring. It mitigates reliance on traditional high-carbon products, broadens export markets, disrupts conventional trade structures, and enhances international market competitiveness. This shift is particularly noticeable in China’s new energy vehicle exports. According to data from the China Association of Automobile Manufacturers, in the period from January to August 2023, China’s automobile exports surged to 2.941 million units, a remarkable year-on-year increase of 61.9%. Notably, the export of new energy vehicles reached 727,000 units, a year-on-year increase of 1.1 times. China’s new energy vehicle production and sales have maintained global dominance for eight consecutive years. The diverse product range and exceptional quality of Chinese brand-new energy vehicles have earned widespread recognition in the international market. The increasing popularity of domestic new energy vehicles overseas is now a pivotal force propelling China’s automobile exports.

On the other hand, the adjustment in trade structure is fostering the establishment of more diversified trade partnerships with other nations. It facilitates the breakdown of technological barriers, achieving a diversification of trade partnerships. By engaging in low-carbon product trade with multiple countries, China is reducing its dependence on specific trade partners, promoting a more resilient and varied international trade landscape.

2.2. The increase in trade costs

2.2.1. Cost of technological upgrading, research and development, and transformation

As the world’s second-largest trading economy and the largest goods trading country, China enjoys the advantage of lower labor costs and more affordable raw materials in international trade. Consequently, numerous multinational companies with high energy consumption and significant pollution opt to establish factories in China. Simultaneously, domestic enterprises have historically paid scant attention to environmental

considerations in their production processes.

The transition to a low-carbon economy necessitates a fundamental shift in the corporate mindset, urging enterprises to prioritize low-carbon production processes and adopt technologies aligned with green energy practices. Achieving this shift requires substantial upgrading and transformation of technical equipment, involving tasks such as acquiring new equipment, overhauling production lines, and training employees. These endeavors contribute to an increase in enterprise costs. Additionally, the expenses incurred during the research and development phase, coupled with the upgrading of technology and equipment, may compel enterprises to offset these costs by either raising product prices or reducing profits. This, in turn, diminished the price competitive advantage for export enterprises, leading to an increase in overall trade costs.

2.2.2. The increase in carbon emission costs and green certification standard costs

In numerous countries and regions, especially developed ones, stringent environmental quality standards and regulations surpass those of their developing counterparts in the name of environmental protection and energy conservation. Notably, common environmental trade barriers, such as “carbon tariffs” and “carbon labels,” are prevalent in the international market.

Consequently, Chinese export enterprises aiming to access markets in such countries or regions must comply with green certification or carbon emission certification requirements. The entire process, from application to testing and certification completion, not only amplifies the time cost for export enterprises but also escalates intermediate and additional costs ^[2]. These elevated costs directly contribute to the production costs of enterprises, thereby influencing the competitiveness and trade costs of products in the international market.

Despite the short-term financial and technological challenges associated with establishing a low-carbon trade structure – leading to increased production and management costs, and a subsequent squeeze on corporate profits – research indicates a positive correlation between carbon emission rights constraints and China’s exports. This correlation is primarily attributed to technological advancements and the cost-effectiveness of trade. Although disparities exist in environmental regulations between China and foreign countries, the primary role of trade lies in reducing environmental costs through technological progress. Consequently, in the long run, this endeavor can indeed stimulate high-quality and sustainable development in international trade, promote enterprise modernization, augment the role of technological factors in international trade, facilitate the expansion of international trade on a global scale, and contribute to the establishment of a positive, green, and sustainable low-carbon trade structure.

2.3. The increase in trade barriers

The trade barriers discussed here primarily pertain to the emergence of “low-carbon” barriers following the implementation of a low-carbon economy. These represent a novel form of non-tariff trade barriers designed to safeguard the environment and foster sustainable development by constraining carbon emissions. By implementing environmental regulations and increasing carbon emission costs, these barriers aim to curtail products and services with high carbon emissions, thereby impeding the progress of international trade liberalization.

2.3.1. Setting stricter environmental standards

China’s export regions are predominantly concentrated in developed countries. However, the advent of the low-carbon economy has prompted many developed nations to establish exceedingly rigorous environmental standards and regulations. Additionally, disparities in the environmental standards and certification systems

required for a low-carbon economy exist among countries. These differences make it challenging for China's exported products to meet the environmental standards of importing countries, thus becoming a hurdle to trade.

2.3.2. Imposing additional trade restrictions

Amidst the Green Industrial Revolution, a new wave of green trade barriers is taking shape, reshaping trade rules and dynamics. This transformation includes deeper rule changes, with new trade relations based on "climate" and "carbon emissions." These relations are characterized by the establishment of new trade rules involving carbon tariffs and carbon trade. In the European Union, for instance, one ton of carbon dioxide is valued at 700–800 Chinese Yuan (CNY), while in China, it may be priced at 70–80 CNY. This stark difference has raised concerns among some developed countries about "carbon leakage." Consequently, economies are promoting zero-carbon transformations through mechanisms like carbon border adjustments, such as carbon tariffs or similar measures, to encourage green industrial upgrading and safeguard their own industries. This dynamic stands as a significant factor contributing to the rise in trade barriers.

2.3.3. Environmental subsidies and technological barriers

Certain countries may offer subsidies to support their own low-carbon industries, influencing the competitiveness of products from other countries in the international market. Moreover, within the realm of the low-carbon economy, China encounters substantial competitive pressure in key technologies and patents related to low-carbon technologies. Some importing countries may set excessively high thresholds for the technical specifications and equipment of imported products from China. These situations collectively contribute to the formation of trade barriers.

3. Development strategies for China's international trade under a low-carbon economy

3.1. Optimizing the export industry structure and promoting the transformation of foreign trade enterprises

In the context of a low-carbon economy, the government must implement corresponding measures to realign the domestic industrial structure and facilitate low-carbon development for China's foreign trade, ensuring its sustainability. Firstly, the government can employ economic and administrative measures to formulate pertinent policies, and institute tax incentives, fiscal subsidies, and other interventions. These actions aim to channel resources towards low-carbon industries, curbing the growth of high-carbon industries ^[3], and motivating enterprises to undertake low-carbon transformations and industrial upgrades.

Secondly, the government should foster cooperation and mutually beneficial relationships among enterprises within the industrial chain. This can be achieved through policy guidance and market mechanisms, urging enterprises to establish green supply chain management systems for effective green management and optimization of the supply chain. This collaborative effort contributes to the shared goal of achieving low-carbon development. Moreover, encouraging enterprises to augment investments in technology research and development is crucial. This involves promoting technological innovation, facilitating the transformation of achievements, and enhancing product technology content and competitiveness.

Furthermore, various government departments need to enhance collaboration and leverage information technology to construct a comprehensive information database. Summarizing the low-carbon standards of various countries, this database aids enterprises in querying pertinent information during international trade activities. Such measures not only attract and aggregate global innovation factor resources but also focus on

global industry leaders and foreign research and development institutions possessing key core technologies or enriched application scenarios. This concerted effort accelerates the construction of an international innovation ecosystem.

3.2. Increasing investment and enhancing the innovation capability of enterprises

The innovation capability of enterprises is directly intertwined with the sustainability of China's foreign trade development. Therefore, in the era of the low-carbon economy, enterprises must fortify their innovation capabilities to navigate new challenges and seize emerging opportunities. Recognizing that innovation capability is pivotal for enterprise development, it not only provides a competitive edge in intense market competition but also propels sustainable growth.

In the low-carbon economy era, enterprises should continually pioneer new technologies aimed at reducing carbon emissions, enhancing energy efficiency, and mitigating environmental pollution. Achieving technological innovation can be realized through the adoption of advanced technologies, robust independent research and development, and collaborations with scientific research institutions. Simultaneously, enterprises must prioritize the practicality and marketability of technological innovations. Aligning these innovations with market demands ensures they meet consumer needs, thereby bolstering market competitiveness.

Establishing comprehensive systems, encompassing innovation incentive mechanisms, intellectual property protection systems, and talent training mechanisms, is paramount. Through these mechanisms, enterprises can attract and retain high-level technical talents. Furthermore, enterprises need to elevate their innovative awareness and concepts through training, fostering the continuous development and transformation of the enterprise.

Moreover, companies should reassess their business models, striving for approaches that curtail carbon emissions, enhance energy efficiency, and mitigate environmental pollution. Embracing green supply chain management, championing circular economy models, and implementing energy-saving and emission-reduction measures are avenues through which enterprises can trim costs, amplify efficiency, bolster profits, and heighten their sense of social responsibility and brand image.

3.3. Strengthening international and regional exchanges, cooperation, and improving low-carbon emission reduction mechanisms

The widespread adoption of the low-carbon economy has precipitated transformative shifts in international trade rules, reshaping traditional trade patterns. To adeptly navigate the impact of these changes on international trade, China must deepen economic and trade cooperation between global regions. By establishing a community that promotes the development of international trade, China can augment its influence in global trade discussions and refine low-carbon emission reduction mechanisms ^[4].

China can fortify regional collaboration with developed nations like the European Union, the United States, and Japan. This collaboration can manifest in cross-border projects and collaborative research and development initiatives in the renewable energy sector. This proactive approach is a strategic response to potential technological trade barriers associated with the introduction of low-carbon technologies. The establishment of a cross-border carbon trading market is another avenue for incentivizing enterprises and countries to implement more robust emission reduction measures. This market would enable different countries and regions to engage in the trading of carbon emission quotas.

In addressing green trade barriers or technical trade barriers arising from “carbon tariffs” and “carbon labels,” China can actively engage in regional economic and bilateral trade cooperation and explore the establishment of “common but differentiated” international trade carbon emission standards and rules ^[5].

Simultaneously, China can expand its low-carbon economic cooperation with countries along the “Belt and Road” through initiatives such as green investment and low-carbon technology trade. Since the implementation of the Regional Comprehensive Economic Partnership (RCEP) agreement, it has played a constructive role in China’s economic green recovery in collaboration with other member countries. Strengthening communication and experience sharing among member countries on low-carbon product standards and low-carbon industry policies, along with reinforcing collaboration in green trade, green finance, and green investment, will further catalyze the exchange and integration of green technologies.

Disclosure statement

The authors declare no conflict of interest.

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