

# ***Analysing the Impact of Low-Carbon Economy on International Trade of China***

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**Abstract:** Developing a low-carbon economy plays an important role in China. This energy structure that relies too much on coal resources has become an important factor restricting the sustainable development of China's economy and society. Therefore, developing a low-carbon economy can effectively avoid the drawbacks of China's reliance on "high carbon" energy. However, there are many adverse effects and difficulties in exploring low-carbon energy. This paper analyzes the multi-dimensional impact of over-reliance on high-carbon energy on the structural adjustment of the energy industry, less developed areas and the transportation industry. Government should realize the requirements of low-carbon technology funds and it needs to deal with the sufferings. The overall impact of low carbon on international economy and trade make issues more prominent. To deal with these problems, the measures suggested in this article are to reduce dependence on multiple levels, improve technical level and capabilities, strengthen international cooperation and exchanges, jointly formulate policies to make carbon emissions more standardized, and optimize research and development costs to reduce unnecessary expenses and government financial support.

**Keywords:** low carbon economy, energy structure, green trade barriers

## **1. Introduction**

Developing countries play a dominant role in global carbon emissions. This study, for the first time, uses a panel of 25 major developing countries during the years 1996-2012 to explore the role of renewable energy consumption and commercial services trade in generating carbon emissions [1].

The development of a low-carbon economy requires a large amount of technology and capital investment, which provides opportunities for the development of a large number of emerging technologies and green innovations. help the structure adjusting and upgrading, vigorously to develop low-carbon technologies and products [2]. As the world's largest manufacturer and exporter, China can take advantage of the opportunity of a low-carbon economy to vigorously develop emerging industries and high-tech industries such as new energy vehicles, smart homes and smart cities to help economic development. The development of a low-carbon economy can reduce China's energy consumption and enable China to maintain economic growth while controlling energy consumption growth. China is an industrialized country, so a large number of industrial and manufacturing production needs to consume a large amount of energy. How to reduce energy consumption while economic development has become a challenge for China. First and foremost, the low-carbon economic model is conducive to promoting the development of new energy industries and creating

expanded employment opportunities. As China has sufficient renewable energy, coal mining areas, iron and steel bases and other regions, this provides a broad space and conditions for the development of a low-carbon economy. Under the low-carbon economy, the scale of China's installed capacity of new energy has increased rapidly. In 2019, China's newly built wind power, photovoltaic, hydropower, geothermal and other new energy installations have reached 175.57GW, becoming the world's largest installed new energy power generation. As a major manufacturing country, the transformation of China's energy industry structure is not an easy task, and reducing carbon emissions may have a negative impact on China's economy in the short term, but from the perspective of long-term development, the transformation of China's energy industry structure will have a positive impact on China's economic development.

This paper generally analyzes a series of impacts of the low-carbon economy on international economic and trade, and analyzes the problems caused by excessive dependence on carbon. It is extremely difficult to transform the energy structure, the dependence on carbon in the transportation industry and the demand for carbon energy in underdeveloped areas. It also analyzed the overall impact on international economy and trade. The problem is reflected in the lack of technical level and the impact of green trade barriers on international economic and trade. In response to these problems, China should strengthen the advanced technology, increase research and development investment into low-carbon technologies, upgrade and transform the original equipment to change the backward mode of production and content to enhance the competitiveness of low-carbon products in China's market, and strengthen exchanges and cooperation with the international community to formulate carbon standards and related policies beneficial to China [3]. China still needs to reduce its dependence, strengthen the promotion of low-carbon energy and financial support in poor areas, and launch the use of new energy vehicles to reduce its dependence on the transportation industry. China can optimize the cost of research, refine short-term goals, set long-term goals and strive to implement the above measures.

## 2. Challenges Faced by China

The main problem facing China is that it is too dependent on traditional energy such as coal. It is mainly manifested in the transformation level of the current energy industry structure. The main power generation material is coal [4]. Compared with wind power generation and tidal power generation, thermal power generation is relatively more stable, but it would also produce a large amount of air pollution [4]. It is necessary to adjust the energy framework of China's power generation enterprises, reduce the percentage of thermal power generation, and transform it into new green energy, but new energy power generation. For example, the scientific and technological development of wind power or tidal power has led to the efficiency of new energy power generation far less than that of thermal power generation. At the same time, it is also reflected in the development of less advantaged areas. There are some less developed areas in China that need to consume more traditional energy and resources for their development. In the process of emission reduction, how to balance development demand and carbon emission reduction goals is a challenge, which is also reflected in urbanization and transportation. The process has accelerated, and there are still problems at the level of traffic demand. Urban transportation and construction are one of the main sources of carbon emissions. Controlling the carbon emissions of urban transportation and improving the energy efficiency of buildings are challenging tasks.

The second difficulty is the need for technology and capital. Promoting the development and adoption of clean technology requires a lot of money and research and development investment. China needs to find sustainable sources of funding and strengthen technological innovation to meet the needs of carbon emission reduction.

### 3. Reduction of Carbon Emission and International Trade

First, due to the reduction of carbon emissions, carbon tariffs impact greatly on international economic and trade. China has been in a trade surplus in recent years. As a major exporter, the reduction of carbon emissions and the emergence of green trade barriers will lead to the reduction of China's exports. The main advantage of China's foreign trade lies in the low price and good quality. The development of a low-carbon economy will make other countries pay attention to low-carbon products when importing Chinese goods [5]. The introduction and the increase of tariffs on non-carbon products will lead to the rise in the price of China's products in other countries, the loss of price advantages, and the decline of trade competitiveness [5].

What's more, the impact on international economic and trade due to the reduction of carbon emissions, which inhibits the technical level of product [6]. Green trade barriers are mainly to introduce green technology standards to implement corresponding control systems for imported products, so as to protect the ecological environment and their own trade. In contrast, most of the products exported by China have low technical content, resulting in the failure to meet the requirements of trade barriers of other countries in the face of exports and the loss of the international market [7]. China should strengthen the competitive advantage of product price to promote the commercial trade [5].

### 4. Solutions

#### 4.1. Transformation in Energy Structure

For the main suffering of excessive dependence on traditional energy is that the structure cannot be transformed. There are some measures should be taken. First of all, China should accelerate the adjustment of the energy industry structure. It can encourage economic diversification and reduce its dependence on high-carbon industries [8]. This can be achieved by supporting emerging industries and technologies and cultivating green employment opportunities. China used to pay attention to the development of the secondary industry, but now the economic benefits of the primary industry are not high [9]. The environmental pollution of the secondary industry is serious, and the environmental benefits and social benefits are greatly affected, which is not conducive to the development of the low-carbon economy. Therefore, the government could vigorously develop the tertiary industry and achieve the win-win development of economic benefits, social benefits and environmental benefits.

Additionally, the government ought to promote the research and development, demonstration and application of clean energy technology. Government should strengthen the research and development investment, enhancing the innovation ability and competitiveness of clean energy technology, reducing the cost of clean energy, and improving the reliability and applicability of clean energy, so as to accelerate the popularization and promotion of clean energy to meet market demand [5].

In order to deal with the over-reliance in less advantaged areas, there are several measures should be taken into consideration. The first measures that need to be dealt with are to call on people to adopt clean energy technology and promote it on a large scale. Secondly, promoting low-carbon lifestyle education and publicity are the key to promoting social cognition and behavior change. For example, promote environmentally friendly transportation, environmental protection food application and environmentally friendly production. Appropriate fees can also be levied on carbon trading.

The level of excessive dependence on the transportation industry needs to be dealt with are as follows. China should pay attention to improving the energy efficiency of fuel vehicles. Research shows that the contribution rate of emission reduction can reach 25% and promote the energy efficiency of logistics enterprises. New and low-carbon technologies and equipment still need to be applied. It is found that the contribution rate of emission reduction can reach 54%. Therefore, the

government should accelerate the electrification of transportation equipment and actively explore the application of electric energy, hydrogen energy, liquefied natural gas and other power in the field of heavy cargo vehicles and ships.

China should choose to speed up the application of multimodal transportation. Logistics enterprises should continue to promote the “conversion” of large-sized goods and medium- and long-distance goods, improve the trunk railway collection and transportation system, accelerate the construction of large industrial and mining enterprises, logistics parks and port railway special lines, vigorously develop multimodal transportation, and innovate the multimodal transportation organization model. In summary, transportation structure adjustment is an important emission reduction measure, and its emission reduction contribution rate can reach about 21%.

Finally, it is necessary to optimize the transportation organization and improve the efficiency of the transportation organization. Through the intensive management and scheduling of transportation resources, transportation efficiency is improved, and cost reduction, efficiency improvement, energy conservation and emission reduction are realized.

## **4.2. Tackle with Green Trade Barriers**

At the level of reduced exports caused by green trade barriers, it is necessary to increase the scientific and technological content of products [6]. Science and technology are the primary productivity. In the context of a low-carbon economy, industries should further reduce the carbon content in their products, so that China’s foreign export products can highlight their advantages in the face of green trade barriers [7]. However, the progress of science and technology is not the first measure that can be solved overnight.

First of all, scientific and technological personnel should strengthen international co-operations [8]. Government should understand the standards of the international low-carbon economy in exchanges, learn and introduce advanced technologies [6]. Additionally, the government should increase its investment in low-carbon science and technology [6]. The government should effectively increase the enthusiasm of scientific researchers, so as to accelerate the adjustment of China’s energy structure [6]. Finally, relevant policies should be issued to support the research and development of relevant enterprises and develop a low-carbon economy. The technological innovation ability of enterprises should be improved, and the vigorous development of technologies in new energy conservation and environmental protection can reduce the production costs of enterprises, and ensure that the labeling of enterprises to develop a low-carbon economy meets international standard [9]. China has increased the research and development of low-carbon technologies, improved the low-carbon science and technology innovation ability of enterprises, and brought new growth to China’s economy [6].

At the level where the decline in technical content leads to reduced competitiveness, measures need to be taken. The first is to promote in-depth exchanges between countries on green barriers and carbon tariffs and participate in international cooperation and negotiation [8]. It is recommended to adopt the sustainable development and low carbon economy development strategy, explore policies and measures of foreign trade export coping with the carbon tariff from country and firm aspects [10]. The standards of green trade barriers of various countries in international trade are not consistent. In the face of the development of a low-carbon economy, green economic trade barriers that formulate unified standards in exchanges, negotiations and cooperation. Government authorities should safeguard respective trade interests and reduce the obstacles and impact of trade barriers when exporting Chinese products to foreign countries, and give full play to the advantages of China’s export products in all aspects.

Secondly, China should actively publicize its achievements in carbon emission reduction and strive to raise the international community’s awareness of its emission reduction efforts. Thirdly,

government should set up green trade regulations which are based on international advanced technological standards. The government ought to improve the environmental protection and trade laws, and implement a new environmental regulatory authority.

Fourthly, government should strengthen the support for green ecological agriculture. At present, people are interested in green products. The desire is rising, and the leading role of the government is particularly important. They can refer to the laws and regulations to increase support for exemplary green ecological projects and strictly control high pollution. China's policies should promote the formation of green industrial structure. Through diplomatic efforts, China can improve its international image and reduce the possibility of trade barriers [7].

### 4.3. Technological Improvement and Support

In response to the demand for technical funds, the first measure to be dealt with is to formulate a plan to optimize research development costs, comprehensively evaluate research and development costs, and adjust for unnecessary expenses. Reducing unnecessary administrative expenses, lowering the management level of research and development teams, optimizing research and development processes are all measures that can be considered. The government could strengthen cooperation with external institutions to jointly carry out research and development, and share the costs and risks. Then, the government ought to formulate a long-term development plan to solve the problem of capital turnover through planning and budgeting. Setting long-term development goals is conducive to the rational use of funds and stable operation. Finally, the government provides corresponding subsidies and financial support.

## 5. Conclusion

The low-carbon economy has had an important impact on China's international economic and trade development. However, due to the excessive dependence on traditional coal energy, problems have repeatedly appeared at many levels. For example, the transportation industry and construction industry, the excessive consumption of traditional energy in less developed areas, and the transformation of economic and industrial structure are difficult. This requires China to improve its technical content as much as possible, strengthen the application of products, improve the added value of products, and enhance its competitiveness in international trade. On the issue of green trade barriers, China should strengthen international cooperation and communication, formulate rational standards, and put country in a favourable position in international economy and trade as much as possible. In response to the improvement of technology, the government need to set long-term goals, optimize consumption costs, and give appropriate support. China needs to strengthen the cultivation of emerging industries and green employment opportunities, and accelerate the transmission of economic and energy industrial structures. The government should require each enterprise to take the standards formulated by the International Organization for Standardisation as a guide and basis to clarify the regulations and standards they need to comply with, and implement them in actual development. In particular, government should participate in the formulation of new concepts and standards such as "new energy", "carbon footprint" and "carbon label", so as to maximise the right to speak for China's development in international trade, so that Chinese enterprises can develop smoothly in international trade. China's export structure must be adjusted, in order to transform the mode of economic growth. Traditional industries need to transform into the track of emerging industries and implement preferential policies for some low-carbon industries.

The shortcoming of this article is that there is still a lack of sufficient data support and case analysis and research. However, it needs to conduct long-term research while seeing the measures have to be implemented as subsequent research direction. Chinese government should attach great importance

to set long-term goals and refine them into short-term goals, which can be implemented more closely according to daily requirements.

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