

# Research on the Impact of Low-Carbon Economy on the Export Trade of China's Energy-Intensive Industries

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## Abstract

Since the reform and opening up, my country's trade export volume has increased year by year, and it has become a country in the forefront of the world's total export trade. However, it is followed by increasingly serious environmental problems: air pollution, severe smog and climate warming. In order to achieve the harmonious development of atmospheric environment and trade, my country has successively formulated relevant low-carbon policies and measures. Compared with other industries, energy-intensive industries are more affected by the constraints of low-carbon economy. Therefore, this paper chooses the impact of low-carbon economy constraints on the export trade development of China's high-energy-consuming industries as an entry point, and explores the impact of my country's low-carbon economy on the export trade of high-carbon emission industries from the perspectives of general transmission mechanism and empirical research and analysis. And giving corresponding policies and suggestions is also conducive to coordinating the relationship between low-carbon emission policies and high-carbon emission industries, which has practical and practical significance.

## Keywords

Low-carbon Economy; High Energy-Consuming Industries; Export Trade; Transmission Mechanism.

## 1. Introduction

After years of reform and opening up, my country has made remarkable achievements in economic development. Foreign trade has developed rapidly and has become the world's largest exporter. This time, however, there was a considerable environmental and resource cost. At present, China's carbon emissions have surpassed the United States and become the world's largest carbon emitter. The grim reality shows that the development of a low-carbon economy is an inevitable choice for China to achieve sustainable development, and the development of a low-carbon economy will inevitably have an important impact on Chinese enterprises. Judging from the current national conditions of my country's economic development, it is more realistic to reduce the scale of exports to meet the carbon emission constraints than to adjust the export structure. The government also emphasized that it is necessary to promote the upgrading of the export structure from a strategic height, and control the export of high energy-consuming, high-polluting and resource-based products. This paper will provide a theoretical basis for the formulation of export structure adjustment policies for high energy-consuming industries in my country.

## 2. An Overview of Low-Carbon Economy and High-Energy-Consuming Enterprises

### 2.1. The Connotation and Development of Low Carbon Economy

The concept of "ecological economy" was first proposed by American economists in an important paper entitled "The Economics of Ecological Science" published in 1966. Within the scope of the carrying capacity of the ecosystem, using the principles of ecological economics and systems engineering methods to change the ecological economy refers to production and consumption patterns, to tap all available resource potential, to develop some economically developed and ecologically efficient industries, and to build a reasonable and efficient system. A culture of social harmony and an environment with ecologically healthy and suitable landscapes. Later, in 1968, Boulding K.E. further put forward the concept of "circular economy" on the basis of its "spaceship economy" ideological theory, which means that in the large system of people, natural resources and science and technology, resource input, enterprise production, product In the whole process of consumption and its waste, the traditional linear growth economy that relies on resource consumption is transformed into an economy that relies on ecological resource recycling, and the utilization rate of natural resources is continuously improved to realize the material recycling of the whole society. The concept of "green economy" was first put forward by the British economist David Pearce in the "Blue Book of Green Economy" published in 1989, which advocates that economic development must proceed from the basic conditions and carrying capacity of society and its ecology, and must be realized efficiently. The sustainable use of natural resources will continuously improve the quality of the natural ecological environment and the living standards of human society. From the above changes in environmental protection and ecological economic theories, it can be seen that the ecological economy, circular economy and green economy that have developed successively around ecological environmental protection have strong theoretical tendencies but lack specific practices, but they all have relatively obvious economics, ecology, system theory and other characteristics, provide important theoretical support for the emergence and development of low-carbon economy.

### 2.2. Definition and Development Status of High Energy-consuming Enterprises

The so-called high-energy-consuming industries refer to industries that consume a relatively high proportion of primary energy or secondary energy in the production process, and the energy cost accounts for a relatively high proportion of the output value, which can also be called energy-intensive industries. Currently, industries with high energy consumption and high pollution that are subject to national macro-control: As far as specific industries are concerned, chemical products: The range of chemicals involved in high consumption of resources and energy in this export tariff adjustment is relatively wide, and the cancellation of export tax rebates involves 385 varieties. Mainly include basic petrochemical products, basic inorganic chemical raw materials, metal and non-metallic compounds, dyes and dye intermediates, etc; 239 varieties of export tax rebates have been reduced to 5%, mainly including basic organic basic products, various types of plastics, etc. This has a greater negative impact on the profitability of phosphorus chemical companies with a high export ratio. For the steel and non-ferrous metal industry, steel and non-ferrous metal products are basically the main objects of each tariff adjustment. However, according to the list of adjusted commodities, the steel products involved in this adjustment are mainly steel pipes, hollow profile products, steel rails and other steel products. The adjustment plan is to cancel the current 13% export tax rebate for general welded pipes, and stainless steel pipes other than oil casings, seamless steel pipes, rails and other steel products will all reduce the current 13% export tax rebate rate to 5%.

Since the "Thirteenth Five-Year Plan", China's energy-intensive industries have undergone tremendous changes, including product performance, environmental protection indicators for pollutant emissions, and corporate innovation capabilities. On the one hand, the main idea of controlling smog is to raise emission standards, close companies that fail to meet the standards, and control high-energy-consuming production capacity. In addition to further strengthening the above-mentioned measures during the haze control period, measures such as "double control of energy" have been added to promote "carbon reduction" by controlling the energy consumption of enterprises.

### **3. Status Quo and Influencing Factors of China's Carbon Emissions**

#### **3.1. China's Carbon Emissions**

##### **3.1.1. The Total Carbon Emission is Growing Rapidly, But the Historical Accumulation is Lower than that of Major Developed Countries**

1980-1996 was a stage of steady growth of carbon emissions, 1996-2002, carbon emissions showed a steady trend, and 2002-2008 was a stage of rapid growth of carbon emissions. The main reason is that during the period from 1980 to 1996, although carbon emissions were relatively small, due to the implementation of the reform and opening-up policy, China's economy developed rapidly, industrialization developed rapidly, and coal consumption increased significantly, so carbon emissions increased year by year. Rising trend; from 1996 to 2002, carbon emissions showed a steady trend, mainly because, during this period, the domestic market demand was weak and the demand for energy products decreased; a number of polluting and high-energy-consuming enterprises were closed one after another; the industrial structure was optimized, technological progress and other factors combined results. During the period from 2002 to 2008, the national economy entered a new stage of development, investment in fixed assets increased rapidly, the proportion of heavy industry increased, and industries with high energy consumption such as steel, building materials, and electrolytic aluminum expanded rapidly, resulting in energy consumption, resulting in a rapid increase in carbon emissions.

Although China's total carbon emissions are increasing rapidly, its historical accumulation is lower than that of major developed countries. From 1902 to 2004, the global total accumulated about 30.3 billion tons of carbon emissions. Among them, the cumulative carbon emissions of the United States are 8.4 billion tons, accounting for 27.7% of the world's total carbon emissions; Japan's cumulative carbon emissions are 1.2 billion tons, accounting for 4.0% of the world's total; China's cumulative carbon emissions are 2.4 billion tons, accounting for 7.9% of the world's share. It can be seen that China's cumulative carbon emissions are significantly lower than the United States.

##### **3.1.2. Low Carbon Emissions Per Capita, Lower than the Major Developed Countries and the World Average**

The per capita carbon emissions and total carbon emissions have similar characteristics, that is, the overall trend is increasing, and since 2002, the per capita carbon emissions have grown rapidly. Although China's per capita carbon emissions are growing rapidly, the per capita carbon emissions are lower than developed countries and the world. In 2004, my country's per capita carbon emission was 1.00 tons of carbon, equivalent to 80.65% of the world average, 17.79% in the United States, 37.18% in Japan, and 53.76% in Western Europe. Through analysis, we can know that although China's per capita carbon emissions are on the rise, it is lower than the average level of developed countries and the world.

## **3.2. Influencing Factors of Carbon Emissions**

### **3.2.1. Population Growth and Residents' Lifestyles Cause Carbon Emissions to Increase**

Both population and carbon emissions are on the rise, which simply shows that population growth has led to an increase in carbon emissions to varying degrees. This is mainly due to the increase in population, which leads to more energy consumption, along with the changes in residents' lifestyles, resulting in a gradual increase in carbon emissions.

In addition to the impact of population factors, carbon dioxide emissions are also greatly affected by the actions of human life. My country is a typical country with dual economic and social structure. For decades, the difference between urban and rural areas is quite large. Therefore, it is in line with the actual situation of China to study the living behaviors of urban residents and rural residents separately. At present, my country is in a period of social transformation, which has brought profound changes to housing, employment, living, and consumption patterns, involving not only social and economic issues, but also resource and environmental issues. From 1990 to 2007, the urban per capita domestic energy consumption was higher than the rural per capita domestic energy consumption, and since 1998, the urban and rural per capita domestic energy consumption has shown an upward trend.

### **3.2.2. Sector-heavy FDI Leads to Increased Carbon Emissions**

With the rapid development of China's economy and the promotion of the "bringing in" strategy, foreign direct investment in China has shown a growing momentum of development. The growth rate of foreign direct investment amounted to 46.2 times. The rapid development of foreign direct investment has driven the progress of China's economy, and the technological progress of Chinese enterprises has made the management concepts of Chinese enterprises more reasonable and progressive. However, the development of foreign direct investment has brought problems to China's environment that cannot be ignored. Most of the industries invested by foreign investors in China are the country's "sunset industries", which are highly polluting and energy-intensive industries, which will inevitably have an adverse impact on China's environment.

## **4. The Impact of Low-Carbon Economic Constraints on Export Trade**

### **4.1. The Overall Impact of Low Carbon Economy on My Country's Export Trade**

As a "world factory", my country's export products are mostly high energy consumption, high pollution and low value-added products. Therefore, my country has always maintained a growing trade surplus at the expense of excessive energy, resource consumption and environmental pollution. The low-carbon economy will bring about changes in the trade structure. The proportion of energy-intensive and high-pollution products in world trade will tend to decline, while the proportion of low-energy-consumption and low-pollution products in world trade will tend to rise. On the one hand, the low-carbon economy of technological innovation and institutional innovation will help my country to promote the transformation of foreign trade structure. On the other hand, under the influence of low-carbon economy, my country's steel, textile, electromechanical and other industries, as the focus of energy conservation and emission reduction, will be more restricted by trade barriers under the pretext of low-carbon environmental protection, and trade frictions will also follow. Increase, product exports will be deeply affected. In addition, with the growing carbon trading market, carbon trading may circulate in countries like labor, capital technology and other elements, which may replace part of the trade in goods. However, my country's export trade has always been dominated by goods trade. There is no doubt that the establishment and improvement of the international carbon trading market will have a great impact on my country's export trade.

## 4.2. The Impact of Low Carbon Economy on China's Export Trade Scale

The carbon tax policy that may be implemented in the future is undoubtedly the biggest impact of the low-carbon economy on the scale of China's export trade. In order to meet the coming wave of low-carbon economy, it is imperative for China to impose a carbon tax. This plays an important role in the adjustment and transformation of China's economic structure and the reduction of international trade frictions. Jia Chen, the former director of the Taxation Department of the Ministry of Finance of China, publicly proposed to actively promote the reform of environmental taxes and fees, change the current pollution charges to environmental protection taxes, and include carbon dioxide emissions into the scope of collection, the so-called "carbon tax". Once China imposes a carbon tax, it will undoubtedly increase the cost of enterprises and reduce the scale of China's exports. In the short term, the general technical level of Chinese enterprises will inevitably be difficult to meet the exemption threshold. Most enterprises will be levied a certain amount of carbon tax. Due to the sticky price, the first reaction of enterprises must be to reduce production, which will lead to the reduction of China's export scale. In the long run, due to the levy of carbon tax, the cost of export enterprises will increase, which will eventually manifest as an increase in the price of export products, which will make China's export products lose their price advantage in the international market, thus affecting the scale of China's export trade.

## 4.3. Low-carbon Economy Will Become a New Type of Trade Barrier

The concept of "carbon tariff" has made my country aware of the opportunities and challenges of the green development model. When the world focused on climate change in 2009, the United States and France proposed to try to impose a "carbon tariff" to deal with the climate change that was gradually coming into people's attention. Therefore, some developing countries are anxious about the possibility that developed countries may implement their own trade protection in the name of environmental protection. Regardless of the starting point of carbon tariffs, my country should take the initiative to respond to this new trade rule. Under the circumstance that my country's export share accounts for a large proportion of GDP, the proposal and implementation of "carbon tariff" will definitely have a profound impact on "Made in China", and may also fundamentally affect China's international export trade. At the same time, we should also seize the impetus brought by the green economy and invest heavily in the improvement of production technology, so as to cope with challenges and solve problems, and at the same time optimize our international image.

## 4.4. Low-carbon Economy Will Weaken the Relative Competitive Advantage of My Country's Trade

The trend of low-carbon will not only make developing countries invest a lot of money in low-carbon technology upgrades, but also increase the single cost of export products, thus weakening the price advantage and hindering the development of foreign trade. However, it will also lead to a situation in which developed countries take the opportunity to substantially increase the prices of export commodities, while the prices of export products of developing countries are forced to be depressed, and finally lead to a worsening of the trade environment for developing countries.

## 5. Conclusion and Policy Recommendations

### 5.1. Conclusion

It is necessary for China to develop a low-carbon economy. At present, my country's total greenhouse gas emissions ranks second in the world. According to the forecast of the US Energy Administration, my country's total carbon emissions will reach 8.145 billion tons by 2020,

surpassing the United States and becoming the world's largest carbon dioxide emitter. China is facing enormous pressure to reduce greenhouse gas emissions. In addition, the decline of China's ecological carrying capacity, the worsening trend of ecological environment, and the over-utilization of resources have seriously threatened the sustainable development of my country's economy and society. Therefore, it is urgent and necessary for China to develop a low-carbon economy.

## **5.2. Policy Suggestions**

### **5.2.1. Adjusting the Trade Policy to Conform to the Low-Carbon Wave**

Under the low-carbon economy, international trade rules will also be adjusted under the international framework to address climate change. The Chinese government should adjust its trade policy in a timely manner, which is in line with our country's real and long-term interests, and will help our country achieve the goal of establishing a "harmonious society" and "two-oriented society". The government should comprehensively consider the environmental impact of trade activities, the internalization of climate costs and other issues, fully grasp the low-carbon economic policies formulated by various countries, and appropriately restrict the export of high-energy-consuming products; timely revise some of my country's existing outdated foreign trade policies and regulations, environmental protection policies Laws and regulations to make it in line with the trend of green trade development, and fully reflect the obligations of international environmental protection conventions that my country should fulfill; in terms of trade and investment systems, the government should establish a low-carbon trade and investment system to avoid pollution outsourcing and carbon leakage. Raise the entry threshold for foreign investment and encourage foreign investment to introduce and use clean technologies in production. We should also vigorously research and develop high-efficiency energy-saving and environmental protection equipment through strengthening international cooperation, and promote and apply major energy-saving and emission-reduction technologies.

### **5.2.2. Improve Green Finance Policies**

At present, my country has implemented carbon sequestration and carbon neutrality, but it has not entered into in-depth promotion and development, and there are not many companies that can use carbon finance. For the development potential and comprehensive process of the carbon market, my country needs to formulate a more complete green financial policy. Through the binding effect of laws and regulations, financial institutions such as commercial banks can change from passively adopting national policy requirements to actively responding to the conscious behavior of green financial business innovation, and even integrate the concept of green finance into the culture of enterprise management and application. into any aspect of business activities. Therefore, the legalization process of energy conservation and emission reduction must be further accelerated, and binding energy conservation and emission reduction indicators should be formulated through national laws and regulations, so that green finance can be legally abided by. At the same time, the Chinese government can learn from foreign experience and formulate relevant policies and guidelines to encourage financial institutions, so that more and more financial institutions can actively participate in the innovation and development of green finance. Therefore, the state must issue green credit support policies as soon as possible, formulate green loan guidelines, environmental standards and environmental risk assessment standards, conditionally implement environment-friendly credit controls, and implement differentiated credit policies, so that financial institutions can develop green financial services at the same time. be able to obtain due economic benefits.

### **5.2.3. Accelerate the Transformation of Industrial Structure**

As the world's largest exporter and the world's most populous country, China has taken the secondary industry as its main economic growth mode since the 1920s. In recent years,

although the annual growth rate of GDP has remained high, my country lacks strong support for high-tech industries and service trade exports. As we all know, the adjustment of industrial structure is an important way to develop a low-carbon economy. Both knowledge-intensive and technology-intensive industries belong to low-carbon industries. For example, the energy consumption and material consumption of the information industry are very limited, and the impact on the environment is minimal. For the better development of my country's trade export structure, we should actively promote the development of the tertiary industry and high-tech industry, and increase the export scale of the two, so that my country's international competitiveness is not only limited to price wars, but also to quality wars, science and technology. Better in battle.

#### 5.2.4. Enterprises should Formulate Low-Carbon Management Strategies

As a concrete practitioner of trade, enterprises should firstly change their concepts from awareness, establish a good awareness of green environmental protection, and especially increase their sense of corporate social responsibility. Secondly, it is necessary to take advantage of the government's support for the "going out" policy of enterprises, accelerate the innovation of foreign investment and international cooperation, and reasonably implement the internationalization strategy. In addition, enterprises should vigorously implement technological innovation and product innovation. It is necessary to extend innovation work to all links of the production chain, improve the technical level, profit margin and overall competitiveness of the entire industry, improve the quality and added value of export products, and develop innovation mechanisms in international cooperation. , Integrate international innovation resources, and enhance the re-innovation ability of enterprises to import, digest and absorb.

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