

# *Study on Financial Instruments to Promote the Transition to a Low Carbon Economy*

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**Abstract:** After entering the 21st century, low-carbon economy, as a new economic model based on low energy consumption, low pollution and low emissions, is increasingly favored by all countries in the world. Finance is an important part of the world economy today. And this is a historic challenge and opportunity not only for the development of the global economy, but also for the future of our country's financial industry. This paper intends to explore the current situation and channels of financial instruments promoting the transformation of low-carbon economy under the background of fully understanding the low-carbon economy.

## 1. Introduction

With the world's attention to the Copenhagen climate change conference, the world has set off a wave of low carbon economy. In the context of global warming threatening the survival and development of human beings, the development of low-carbon economy has become a global consensus.<sup>[1]</sup> Low carbon economy, known as the "fourth industrial revolution", is a historic challenge and opportunity not only for the development of the global economy, but also for the future of our country's financial industry. However, capital and technology are restricting the development of low carbon economy to a great extent, which also creates the demand for "green finance" objectively. The emergence of the carbon financial market, which is most closely related to the development of low-carbon economy, has injected fresh blood into the development of low-carbon economy. However, this is only a kind of tool for financial support. Only when a perfect and effective financial support system is constructed, can the financial needs of low-carbon economy industrialization be fully met.

## 2. Status of research

In order to promote the transformation of low-carbon economy, research has been carried out both at home and abroad. This paper will introduce the research status of our country and other countries in this field.

### 2.1 Domestic research status

Since the rapid development of the world economy after the Second World War, in addition to

enjoying the rich material life brought by economic growth, people have also begun to realize that economic growth is at the cost of sacrificing resources and the environment to a certain extent. As a responsible major country, China signed the United Nations Framework Convention on Climate Change as early as 1998. In the "ninth Five-Year plan", "tenth Five-Year Plan", "eleventh Five-Year plan" respectively put forward the goals and plans related to environmental issues, which shows that China attaches great importance to environmental issues, and for economic transformation, the development of low-carbon economy, China's finance industry has actively carried out a series of actions in line with China's basic national conditions. For example, among the domestic banking industry, Industrial Bank takes the lead in the development of carbon finance business, and established the Sustainable Finance Center, a special business operation institution for sustainable finance, in January 2009, which is responsible for the business operation and product marketing of energy efficiency finance, carbon finance, environmental finance and other fields of the bank. On October 25, 2009, SPD Bank and Tianjin Sino-Singapore Eco-City Investment Management Co., Ltd. jointly launched the establishment of China's first voluntary emission reduction joint organization -- Eco-City Green Industry Association in Tianjin. However, up to now, there are still some financial problems in China's development of low-carbon economy. Liu Zhihe believes that the lack of motivation of government departments and financial institutions to develop green finance and the underdeveloped intermediary market are the great challenges facing the development of green finance in China. Thus, our country has a very strong consciousness of developing low-carbon economy, but a perfect financial system has not yet been formed.<sup>[2]</sup>

## 2.2 Current situation of foreign research

Table 1: Carbon banking business of Fortis Bank Netherlands

Carbon finance & Banking business	Carbon trading & Risk management business	Carbon clean business	Carbon storage & Carbon management & Carbon treatment business
Secure credit support for emission reduction purchase agreements	Trade on demand or by order	Market Entry	Custody of carbon credits and project tracking
Mortgage loans: Monetization of emission reductions	Index-based purchase or transfer of EU emission allowance futures contracts and trading of CER futures contracts	clean	Financial and administrative management
Clean Development Mechanism financing	Exchange date Swap (quasi-repurchase)	Foreign exchange settlement transactions, OTC transfers and carbon-related products	Custody and carbon settlement services
Bank deposit and cash management			

As for the development of low-carbon economy, the UK is a pioneer. As early as 2003, the UK Energy White Paper published the government document "Our Energy Future: Creating a Low-carbon Economy". The EU hopes to improve the employment situation through the development of low-carbon economy<sup>[3]</sup>. On November 17, 2009, the European Commission issued a communique, welcoming the adoption of the EU energy and climate package by the European Parliament on the

same day, believing that the plan will help the EU develop towards low-carbon economy and enhance the energy security of the EU. On July 11, 2007, the US Senate proposed the Low-carbon Economy Act, indicating that the development path of low-carbon economy is expected to become an important strategic choice for the US in the future<sup>[4]</sup>. As early as April 2004, the Global Environmental Research Fund established by the Ministry of Environment of Japan set up the research program of "Japan's low-carbon society Scenario towards 2050." The importance of the low carbon economy is shown by the fact that BNP Paribas is creating a Low Carbon Transition Group to mobilize global resources and contribute to accelerating the transition to a sustainable and low carbon economy for its corporate and institutional clients. The issue of financial instruments promoting the transformation from traditional economy to low-carbon economy is a frontier research both at home and abroad (table 1). It shows that the perfect financial support system has not been obtained in foreign countries.

### 3. Research significance

Many literati and scholars have written a large number of inscriptions, which were praised at that time and passed down to later generations, such as Han Yu's "Inscription on the Tomb of Liu Zihou" and Su Shi's "Inscription on the Biaozhong Temple", which are popular literary works. Secondly, the calligraphy of the engravings is mostly written by famous calligraphers, such as Ouyang Xun's "Inscription on the Liquan Spring in Jiucheng Palace" and Yan Zhenqing's "Duobao Pagoda Inscription". These works are their representative works, exemplary works of calligraphy art at that time, and also models for calligraphers of all generations. Furthermore, the patterns and carvings of the engravings are also unique and can be regarded as masterpieces of art<sup>[3]</sup>.

#### 3.1 Theoretical significance

In some industries of low-carbon economy, such as new energy and new materials, once the technology is mature, it not only means the reduction of carbon emissions, but also the significant reduction of costs and the increase of profits. In addition, the government is inclined in policy, so in the long run, low-carbon industry will likely produce good economic benefits. It also pays off in the long run. Under the advocacy and publicity of the low-carbon economy by the government, including the media, if financial institutions can implement green finance, they will form a good reputation in the whole society, and even form a certain brand effect, and such public visibility and reputation can also be transformed into economic effects under certain conditions. Of course, to develop green finance, there is still a long way to go. How to promote the development of green finance from the system, how to realize the cooperation between the financial sector and the relevant departments of low-carbon industry, to achieve the win-win economic and social effects of financial institutions; How to create a new model and a new field of green finance in China on the basis of learning from the successful experience abroad is worth exploring and has strong research significance.

#### 3.2 Practical significance

Although China has quite sufficient new low-carbon energy and low-carbon emission market with great development capacity, it is almost stagnant in the direction of research and development of carbon finance and carbon capital. At present, the world's four major carbon trading platforms (EU Carbon Emission Trading Agency, UK Carbon Emission Trading Agency, Chicago Ring Exchange, Australia National Credit Commission) are guided by developed countries. Therefore, the systematic research and establishment of the carbon financial support framework under China's

low-carbon economic development framework is not only conducive to solving the environmental problems in China and even the world at the root, but also conducive to further promoting the process of China's transformation of economic operation mode, increasing and improving the speed and level of China's economic operation, and providing a reference for the government's scientific decision-making. It has a strong practical significance.

## **4. Research method**

### **4.1 Literature research method**

By reading a large number of domestic and foreign literature, accurately grasp the current situation of relevant research at home and abroad and its shortcomings, and strive to have their own unique innovation based on the excellent achievements of predecessors.

### **4.2 Comparative approach**

This paper hopes to draw on the advanced experience, theory and method of domestic and foreign research on the role of financial instruments in promoting economic transformation, combined with China's actual conditions, to provide effective strategic suggestions for the development of China's construction of low-carbon economic financial support system.

### **4.3 Quantitative and qualitative research methods**

The research on the development of low-carbon economic and financial support system must be a combination of "qualitative + quantitative". This paper will use tools such as economic models, charts and case studies to process relevant research models, enhance the practicability and verification of research results, and contribute to better qualitative analysis of the research on the financial support system of low-carbon economy.

## **5. Conclusions**

### **5.1 The importance of establishing a sound financial support system for low-carbon economic transformation.**

The development and cultivation of low-carbon economy need the support of policy, technology and financial capital, among which the most important is financial support. As an important part of modern economy, finance is inevitably affected by the trend of low-carbon economy. From the perspective of the relationship between finance and economy, the transformation of economy from high carbon to low carbon cannot be separated from the support of the financial system, and this transformation will also provide a new development space for the financial system, so it is inevitable to require the transformation and development of traditional finance to carbon finance.

#### **5.1.1 Develop carbon finance to promote financial financing of energy chain transformation**

Diversified financing methods such as project financing, private equity fund and venture capital carried out by carbon finance are helpful to promote the research and industrialization of emission reduction technology and clean energy, and can mobilize resources from all aspects to promote sustainable economic development, thus changing the dependence of energy consumption on carbon energy, and finally realizing the transformation of energy chain from high carbon link to low carbon link.

### **5.1.2 Developing carbon finance can promote international trade and investment**

The clean development mechanism of carbon financial market can coordinate the comparative advantages of developed and developing countries, reduce the emission reduction cost of developed countries, and promote the transfer of emission reduction technology and capital to developing countries, which is conducive to promoting international trade and investment and realizing a win-win situation for developed and developing countries.

### **5.1.3 Developing carbon finance can transfer and manage climate risks**

In recent years, the global climate is abnormal, and the frequency of meteorological disasters is increasing. Different industries are affected by climate and their adaptive capacity are different, but most industries disperse and transfer climate risks through financial markets, promoting the catastrophe bond market and weather derivatives market to become the new growth pole of the global financial market.

## **5.2 Problems existing in financial instruments to assist low-carbon economic transformation**

The fundamental reason that affects the rapid development of carbon finance in China lies in the lack of financial support for low-carbon industrial projects and the "short board effect" of financing structure. The limited development of low-carbon industrial projects makes it difficult for carbon finance to grow bigger and stronger.

### **5.2.1 Financial institutions have a relatively low understanding of carbon finance**

Most domestic financial institutions lack understanding of carbon finance business development, approval, operation, trading rules, risk aversion, profit path and other aspects, and the shortage of talents leads to the lack of internal driving force for the development of carbon finance in China.

### **5.2.2 A conflict of interest between the external economy (i.e., social benefit) of carbon finance and the profit-seeking goal of financial institutions**

Although it has a strong external economy, it lacks realistic and immediate corporate benefits, which leads to a sharp rise in the credit risk of financial institutions.

### **5.2.3 Imperfect development of domestic low-carbon intermediary market**

The approval process of CDM projects in the world is strict and complex, which makes the future income of CDM project investment uncertain, and it is difficult for non-professional institutions to have the development ability of the project. Most foreign CDM project transactions are completed through intermediary agencies, but such intermediary agencies in China have just started and have not yet the ability to develop and evaluate large-scale CDM projects.

## **5.3 Countermeasures and suggestions on developing carbon finance to support low-carbon economy**

### **5.3.1 Government macro policy environment and institutional support**

Government should strengthen policy incentives and support the development of carbon finance.

### 5.3.2 Establish a sound carbon trading market mechanism.

Commercial banks should actively improve the support system for the development of low-carbon economy. In addition, they had better actively join the sustainable development norms in the international financial field. What's more, establish special organizations and strengthen the reserve and training of relevant talents are crucial to commercial banks. Last but not the least, they also need to strengthen cooperation with domestic and foreign financial institutions and further carry out energy conservation and emission reduction loans.

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