



Study on the impact of carbon quota trading on the motivation of low-carbon transformation of construction enterprises

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Abstract. Under the background of carbon peaking and carbon neutrality goals, construction enterprises, as the main responsibility of energy saving and emission reduction in our country's construction market, how to effectively promote their choice of low-carbon transition has become an urgent practical problem to be solved. Carbon quota trading is the main means of regulating carbon market in our country at present, this paper combs the costs and benefits of Low-carbon transition of construction enterprises from the perspective of enterprise performance, this paper probes into how carbon quota trading affects the low-carbon transition of construction enterprises, and draws lessons from the development experience of foreign countries, and advances some countermeasures to promote the low-carbon transition of construction enterprises of our country through perfecting carbon quota trading.

Keywords: Carbon quota trading, construction enterprises, low-carbon transformation, enterprise performance.

1 Introduction

Since the first industrial revolution, large amounts of fossil energy consumption have caused problems such as the greenhouse effect, environmental pollution, ozone depletion and global warming, it brings great challenge to the sustainable development of global economy and ecological environment. In response to climate change, the United Nations launched the Kyoto Protocol in 1997 to slow global warming. Currently, China has surpassed the United States as the world's largest emitter of greenhouse gases, under great international pressure to reduce emissions. In order to take the lead among developing countries, China has taken the lead in formulating a series of voluntary emission reduction measures. China's international commitment: "China's carbon dioxide emissions to peak by 2030, strive to achieve carbon neutrality by 2060."

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2 Carbon quota trading and its development

In order to achieve the “3060” carbon peaking and carbon neutrality goals, the need for all-round, multi-channel work. At present, the work of energy saving and emission reduction is mainly led by the government, which does not play the role of market mechanism well. As a market-based incentive measure for energy saving and emission reduction, carbon quota trading mechanism has been paid more and more attention at home and abroad.

Carbon quota are a policy tool used by the government to achieve emissions control targets, that is, within a certain space and time, the emission control targets into carbon quota and distributed to lower-level governments and enterprises. If a company's actual carbon emissions are less than the amount allocated by the government, the company can trade excess carbon quota to achieve a reasonable allocation of carbon quota among different companies.

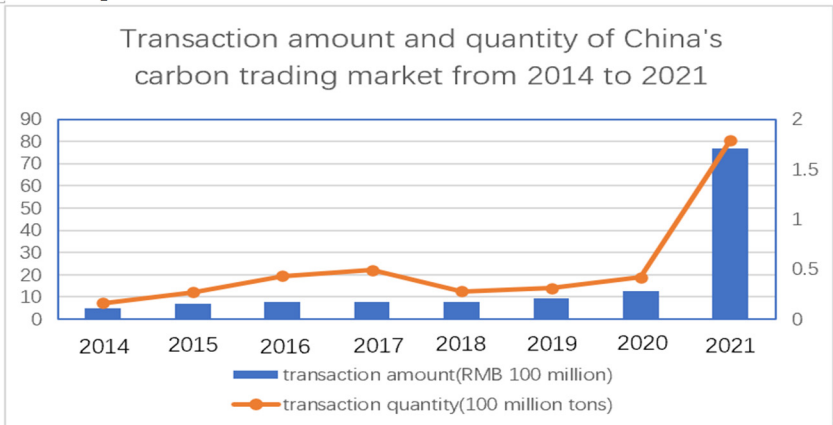


Fig. 1. Transaction amount and quantity of China's carbon trading market from 2014 to 2021

In October 2011, the National Development and Reform Commission approved Beijing, Tianjin, Shanghai, Chongqing, Guangdong, Hubei and Shenzhen to pilot regional carbon emissions trading. The Shenzhen Carbon Market was first launched on June 18, 2013, with 635 industrial enterprises and 197 large public buildings included in the system. The Shanghai Carbon Market was launched on November 26, 2013, the first 197 units to be included in the ETS include key emitters and building sectors such as shopping malls. At 9:30 am on July 16, 2021 the national carbon emissions quota trading was officially launched on the Shanghai Environmental Energy Exchange. At 9:30 pm, the first national carbon trade was successfully brokered, with a price of 52.78 yuan per tone. A total of 160,000 tones were traded, with a trading value of 7.9 million yuan.^[1] As can be seen from the chart above (Fig. 1), carbon market trading in our country has experienced rapid growth after being promoted from pilot to nationwide scale, As of August 23, 246 million tones of carbon allowances had been traded on the national carbon market, with a total turnover of 11.417 billion yuan.

3 The urgency of low-carbon transformation of construction enterprises

With the development of national economy and the acceleration of urbanization, People's living and using requirements for buildings have been gradually raised, which has brought about the rapid development of the construction industry, the expansion of the scale is accompanied by a large number of energy consumption and carbon dioxide emissions increase. Buildings account for about 30% to 40% of the world's energy according United Nations Environment Programme Statistics, based on this, it can be estimated that the carbon dioxide emissions from building energy consumption account for about 1/3 of the global total carbon dioxide emissions. However, developing countries with economies in transition still have considerable construction needs, so it is expected that building energy consumption will continue to increase globally, possibly in the next 20 years, carbon dioxide emissions from buildings will more than double. In 2017, China's State Council issued a document pointing out that the 13th five-year plan should focus on energy-saving and emission-reduction efforts, the construction industry as a "Leader" to lead the implementation of energy-saving and emission-reduction measures. This is not only the inevitable choice to promote the development of low-carbon buildings in our country, but also the urgent need to achieve the sustainable development of our economy. This means the need to further accelerate the low-carbon development of the construction industry.

4 How carbon quota trading affects the low-carbon transition of construction enterprises

With the active carbon emission trading market in our country, it is a general trend to introduce carbon trading system into construction industry. According to the statistical results of the relevant assessment reports of the IPCC working group, the energy consumption targets of residential and public buildings in the future will be reduced by 29% in 2020 and 31% in 2030. Thus, although the energy consumption level of the construction industry is on the high side, it cannot be denied that it also has an energy saving and emission reduction potential that cannot be ignored. In order to seize opportunities in the future carbon market of the construction industry, it is necessary to study the impact of carbon quota trading on low-carbon transition of construction enterprises.

Corporate performance is the foundation of corporate survival. The author will study how carbon quota trading affects the motivation of low-carbon transition of construction enterprises from the perspective of cost-benefit (Fig.2). From the low-carbon transition of construction enterprises in terms of income growth, first of all, construction enterprises through relevant policies to obtain a certain amount of carbon emission rights, if enterprises actively use new energy, innovative building energy-saving new technologies, a scientifically designed green low-carbon building can generate a quota surplus when the quota is set, which can be reaped by trading carbon quotas in the carbon market, with the establishment and development of carbon quota trading market, enterprise's carbon quota as an asset can be recognized through market trading, and the

confirmation of the value of this asset can increase the value of enterprises, finally, as a valuable asset, the carbon quota, under the guidance of a low-carbon policy, can be used to obtain preferential corporate financing through the pledge of this asset, reduce the cost of capital, thereby improving enterprise performance. These are the positive impetus to promote the low-carbon transformation of construction enterprises.

Compared with the traditional energy-intensive construction industry, low-carbon buildings are characterized by high investment, long return cycle and high risk, it is based on the control of carbon emission in the whole life cycle of a building and the innovation and application of low-carbon Technologies in design, material transportation, construction and operation.^[3] Therefore, it has higher requirements to the enterprise's technical level and innovation ability. But at present, our country's overall scientific and technological innovation ability and technology level fall behind those of developed countries to a certain extent, enterprises' Independent R & D ability is weak, and the core technology and equipment of low-carbon buildings need to be imported from abroad, the resulting large amount of investment makes many construction enterprises reluctant to choose low-carbon transition. Compared with developed countries, our country's R & D investment has increased in recent years, but it is still insufficient, and the index of Low-carbon Building R & D investment is not listed separately, this shows that the government does not attach much importance to the research and development of Low-carbon building technology, and the lack of government financial support directly affects the enthusiasm of construction enterprises to participate in the low-carbon transition.

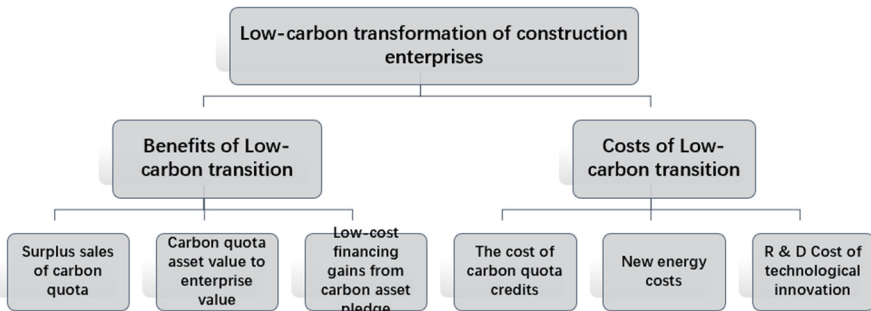


Fig. 2. Power diagram of low-carbon transition of construction enterprises based on enterprise performance

As can be seen from the graph above, carbon trading greatly affects the economic benefits of enterprises, in which the revenue from the sale of surplus carbon allowances and the cost of short-term acquisition are directly related to the initial allocation of carbon allowances implemented at the national and regional levels. At present, the pilot areas of carbon trading in our country are mainly distributed free of charge, supplemented by paid distribution.^[4] By combing the relevant documents of our country's carbon trading system and analyzing the status quo of the initial allocation of carbon quotas, it can be found that there are some problems in the initial allocation of carbon quota in our country, such as the lower level of relevant legislation and the vague provisions, the loose setting of the total amount of carbon quota and the low proportion of

paid allocation, the fragmented management of inter-regional carbon quota allocation and the rough allocation scheme, as well as the incomplete relief and supervision modes. In addition, the value of carbon quota assets and the financing of carbon quota assets pledge are closely related to the maturity of carbon market trading and the innovation of carbon financial products. The development of our carbon market started relatively late, but it has made good progress in just a few years. Since 2014, a series of interim regulations have been National Development and Reform Commission, our country's carbon emission right trading market has moved from the pilot to the whole country formally. Although the carbon emission trading market in our country has a certain scale, but it still has some problems such as imperfect system, low degree of financialization and so on.^[2]

5 Conclusion

5.1 We should enrich and improve the policy system and strengthen government regulation and control

For the low-carbon transformation of construction enterprises, it is obviously not enough to rely on the self-awareness of the enterprises, and the government's Macroeconomic regulation and control and policy support is essential. First of all, our country should establish a set of binding policy and evaluation system around the low-carbon development of construction industry, strengthen the system supply, and improve the standardization of project approval from the source; In the process, the main body responsible for building supply should be defined, the legislative administration should be strengthened, and the enterprises that have the phenomenon of over-discharge and leakage should be severely punished, clear non-standard construction responsibility of the main illegal costs. Second, to enrich the government's incentive measures to broaden the access to subsidies. In addition, the government should also pay attention to the R & D and support of Low-carbon building technologies, and can provide direct financial support to construction enterprises that independently develop low-carbon technologies by setting up special funds for the R & D of Low-carbon buildings, to improve the enterprise's initiative in innovation, so as to stimulate the low-carbon transformation of construction enterprises.

5.2 We should establish and improve a carbon emissions trading market and strengthen market-based regulation and control

The introduction of the carbon market into the low-carbon development of the construction industry is a new move from the government's administrative means to market-oriented means. At the heart of carbon trading is the market-based trading of carbon allowances, which encourages companies that have achieved excessive emissions control to use the credits and allowances they receive, through market-based trading means sold to enterprises with high emission reduction costs to achieve their carbon reduction targets.^[5] This initiative can expand the low-carbon income sources of construction enterprises in the transition process, reduce the transition costs, through the transition

process to give enterprises sustainable economic incentives to promote the sustainable transformation of construction enterprises. In order to give further play to the guiding role of carbon emissions trading, the government should vigorously improve the trading system of the carbon emissions trading market, such as the establishment of a unified carbon trading standards, clear allocation of carbon quotas, the establishment of effective trading supervision and penalty mechanisms for default, to create a fair and transparent trading atmosphere, building a mature carbon market. In addition, in order to increase the motivation of enterprises to transform, the government can also make use of market-based regulatory means, to use new energy, low-carbon production technologies of construction enterprises to give certain price and tax incentives, low-carbon transformation of construction enterprises should be supported by market-oriented means.

5.3 We should build a platform for carbon asset finance demonstration cases

It is helpful for our country to explore and formulate relevant rules and regulations to set up the demonstration case platform of carbon quota asset financing. As the carbon quota pledge financing business is a derivative product of the carbon emission trading mechanism, the carbon emission trading mechanism of our country has just started and is still in the exploration stage, therefore, it is necessary to build a model case platform for financing, while mobilizing the active participation of all parties, we can gradually promote the standardization and standardization of the pledge financing business in our market, and finally form the scale, this will further encourage enterprises to actively explore energy-saving emission reduction technology to promote the development of low-carbon economy.

Fund project

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