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The Future of Quasi Emission Control Enterprises in a Low-Carbon Economy

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Abstract: At 9:30 a.m. on July 16, 2021, the national carbon emission trading market started operation at Shanghai Environment and Energy Exchange. On the first day, the carbon emission quota totaled 4.244 million tons, with a turnover of 210 million yuan and an average transaction price of 51.23 yuan/ton. The carbon trading price is on the rise. With the gradual maturity and improvement of conditions, there will be about 8,000 to 10,000 emission control enterprises under the eight major industries in the future, and China's carbon market will become the largest market covering greenhouse gas emissions worldwide. It can be seen that carbon trading is a "big deal." If enterprises participate well, they will form carbon assets, but if they do not participate well, they will form carbon liabilities. This paper analyzes the opportunities and challenges faced by quasi emission control enterprises under the background of low-carbon economy. This provides certain reference significance for these enterprises to actively participate in the national carbon trading market in the future.

Keywords: Low-carbon economy; Carbon trading; Carbon asset management; Quasi emission control enterprise

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1. Connotation of low-carbon economy

Driven by the concept of "low carbon" and "carbon reduction," scholars and relevant workers from all over the world continue to explore and find that the leading factor of climate change is people's dependence on fossil fuel-based energy utilization, including coal and crude oil, for economic growth. Climate change is not only an environmental problem, but also an economic challenge. Therefore, academic and political circles have begun to explore how to link low carbon with economic development.

Extensive discussions on low-carbon economy have been carried out. According to a study, the objective of low-carbon economy is to achieve social and economic development goals with less energy consumption and greenhouse gas emissions [1] or obtain larger economic output [2]. Low-carbon economy itself is a green ecological economic development mode, characterized by or based on low energy consumption, material consumption, emission, and pollution [3]. It is a general term for low-carbon industry, low-carbon technology, low-carbon life, and other economic forms. Similar to the aforementioned study, as discussed in another paper, the fundamental purpose of low-carbon economy is to achieve sustainable economic, social, and ecological development [4]. Low-carbon economy aims at sustainable development,

relying on a series of feasible measures, such as technological innovation, system optimization, industrial upgrading, and clean energy development, in order to achieve low-carbon development of energy flow and recycling of resource flow, as well as reduce high-carbon energy consumption and greenhouse gas emissions, thus solving the issue of climate warming and achieving a coordinated development in economic growth and environmental protection [5]. Ever since the concept of "low-carbon economy" was put forward, it has been extending to all fields of economy, technology, and society. Its connotation is also deepening and expanding.

We believe that low carbon represents the following practices: optimizing the energy consumption structure, improving energy utilization efficiency, reducing greenhouse gas emissions, and reducing conventional or local pollutants. Low-carbon economy, therefore, emphasizes the goal of achieving "economic" development, while "low carbon." It is an organic integration of "low carbon" and "economic" development, including top-down institutional innovation and policy implementation. Low-carbon economy also includes specific emission control behaviors and ideological changes from the bottom up. It is crucial to understand that low carbon is not contradictory to economic development.

2. Definition of quasi emission control enterprises

In line with the overall arrangement of the state, the Ministry of Ecology and Environment has carried out data accounting, submission, and verification for years in power generation, petrochemical, chemical, building materials, steel, nonferrous metals, paper, aviation, *etc*., which are all high-emission industries [6]. Therefore, the data accounting, submission, and verification of these high-emission industries have a relatively solid foundation. We will follow the principle of "mature one-by-one," further expand the coverage of the carbon market, and give full play to the role of the market mechanism in controlling greenhouse gas emissions, promoting low-carbon technology innovation, and guiding climate investment and financing.

With the continuous maturity of the national carbon market and progress of emission data monitoring and verification technology, it is only a matter of time that the aforementioned key emission enterprises in petrochemical, chemical, building materials, steel, nonferrous metals, paper, aviation, and other high-emission industries will be included in the scope of emission control. These enterprises already possess the characteristics of emission control enterprises (with the same or more energy consumption and carbon emission scale). Since some restrictive factors are not included in the scope of emission control, the key emission enterprises that will be included when these restrictive factors are removed in the future are called "quasi emission control enterprises."

3. Analysis of the current situation of quasi emission control enterprises

For quasi emission control enterprises that have not been included in the national unified carbon market, carbon trading is both, an opportunity and a challenge. SWOT analysis is used to analyze the strenghts, weaknesses, opportunities, and threats of quasi emission control enterprises (**Figure 1**).

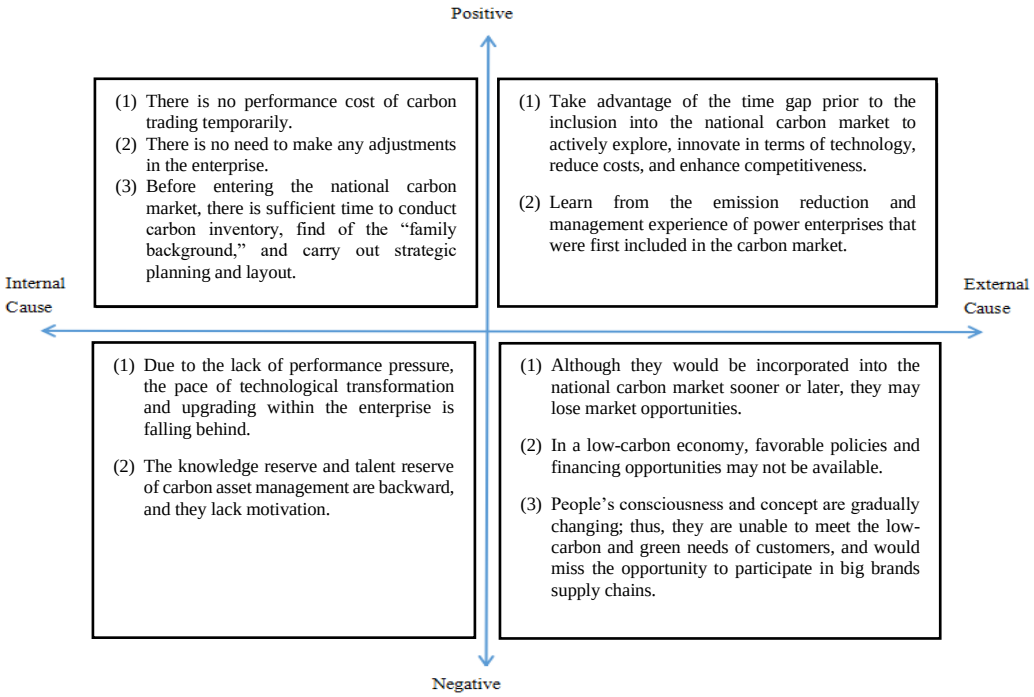

Figure 1. SWOT analysis of quasi emission control enterprises

At the initial stage of the establishment of the national carbon market, these enterprises were not covered by the trading system. The biggest advantage is that there is no contract performance cost. Contract performance cost here includes the cost of obtaining carbon emission rights with compensation, the data monitoring and verification fee paid to intermediaries, and the cost of technological transformation. Owing to these costs, the operating burden of emission control enterprises increases, whereas quasi emission control enterprises are exempted from this burden. At the same time, quasi emission control enterprises do not need to make any adjustments in the enterprise for the time being, thus remaining unchanged and coping with all kinds of changes, which may create a late-mover advantage in the process of improving the national carbon market. Before entering the national carbon market, quasi emission control enterprises have sufficient time to conduct a more detailed carbon inventory and formulate a strategic plan suitable for their own development based on the amount of carbon emissions, while taking into consideration of the current carbon price and carbon trading-related policies and regulations.

From the perspective of external environment, quasi emission control enterprises that are not included in the national carbon market should take advantage of the time gap to actively explore and find ways to minimize the cost of emission reduction, such as cooperating with new energy enterprises to carry out energy-saving technological transformation efforts, improve energy use efficiency and reduce carbon emissions, or investing in efforts to launch zero emission projects or emission reduction projects in advance, as well as using the generated emission reduction credits to fulfill the contract in the future. Since voluntary emission reduction projects often take a long time to develop, and the certification process is complicated, it is likely to miss the opportunity to redevelop them when it is really necessary. Moreover, China's national unified carbon market has only been operational for a few decades. Although a pilot market existed in the past, it has limited coverage and inactive trading activities; additionally, previous carbon trading activities are not highly referenced, and compared with the carbon market in Europe, the maturity of the carbon market is far from enough. Therefore, the carbon trading process of power enterprises that are included in the national carbon market, carbon asset management methods, and carbon price fluctuations are valuable experiences for quasi emission control enterprises to enter the national carbon market.

It is precisely because these quasi emission control enterprises are not under any pressure to fulfil contracts that there will be some inertia created, thus affecting enterprises. One of the original purposes of establishing the carbon trading system is to drive enterprises to make efforts to reduce emissions and control greenhouse gas emissions in terms of the total amount by increasing the carbon emission costs of enterprises incorporated into the national carbon market, especially those high-energy consuming enterprises. However, quasi emission control enterprises are not under any of these pressures at the moment; hence, they may lack the motivation to be actively involved in emission reduction. When the pace of technological transformation and upgrading within enterprises fall behind, the same goes for the awareness and action of carbon asset management knowledge reserve and talent reserve.

Without doubt, the external disadvantages of quasi emission control enterprises are also evident. First of all, compared with emission control enterprises that have already been included in the national unified carbon market, quasi emission control enterprises, which would be included sooner or later, may lose market opportunity. Secondly, under the background of low-carbon economy, the state is vigorously promoting green finance and green funds and providing capital support to "green enterprises" that meet the standards; however, quasi emission control enterprises may lose such preferential policies and financing opportunities. Thirdly, the climate issue is a global issue that is relatable to every country and person. People's consciousness and ideologies have also changed with policy advocacy. Green consumption has become a new fashion for both, enterprises and consumers. Those quasi emission control enterprises that have yet to participate in carbon trading would not be able to establish a good image, improve their soft power, or meet the low-carbon needs of consumers; they may miss the opportunity to participate in big brand supply chains.

4. Problems of quasi emission control enterprises

4.1. Lack of internal motivation and weak awareness of emission reduction

Carbon trading makes use of the market mechanism to turn carbon emission rights into assets with commodity attributes, such as scarcity, consumption, and investment, under total amount control. The effort of emission control enterprises to obtain emission space through market-oriented trading of carbon assets or exchange economic benefits through energy conservation and emission reduction through technical means would add a certain burden on their production costs and management costs. These burdens will imperceptibly drive emission control enterprises to innovate emission reduction technologies and improve their energy structure to reduce their contract performance costs. Since quasi emission control enterprises have not been included in the carbon trading system, they have no contract performance pressure for the time being, so they might fall behind in terms of core technology and knowledge reserves; additionally, they might not have the awareness or motivation to strive for internal emission reduction.

4.2. Large demand for core technology investment

In order to improve energy use efficiency and reduce greenhouse gas emissions, it is necessary to develop low-carbon technologies vigorously. This means that enterprises need to make technological transformation or introduce new energy-saving and emission control equipment, which demands large investments of additional funds and may eventually double their operating costs. This is a huge obstacle for enterprises that put interests first.

4.3. Lack of independent innovation ability

The gap between China's low-carbon technology research and development (R&D) base and the international advanced level is estimated to be 7–10 years or more (National Technology Foresight Research Group, 2008). There are about 28,000 large and medium-sized enterprises in China, of which

only 25% have their own R&D institutions; moreover, 75% of them do not have full-time R&D personnel. In terms of enterprise technology innovation, most of China's patent applications are practical technologies, which focus on short-term economic benefits. In addition, most of the invention patents in the high-tech field come from abroad, such as radio transmission and semiconductors. Now, under the background of low-carbon economy, both, emission control enterprises and quasi emission control enterprises lack independent core low-carbon technologies. This has become a major constraint for China to achieve the dual carbon goal and develop a low-carbon economy.

5. Suggestions for the development of quasi emission control enterprises

5.1. Train the management and set up a carbon asset management department

The arrival of the brand-new low-carbon economy era has introduced some novel terms, such as carbon trading, carbon finance, carbon assets, carbon disclosure, carbon audit, *etc*., which not only requires the update of knowledge reserves by the management, but also conceptual innovations. Quasi emission control enterprises that are not included in the national trading system should make full use of this period by conducting carbon knowledge lectures, low-carbon awareness training, and low-carbon culture construction for the management and all their employees. They should also actively introduce and encourage low-carbon researchers to serve the enterprises and constantly improve their competitiveness.

5.2. Develop and invest in China Certified Emissions Reduction (CCER) projects in advance to prepare for future performance and participation in carbon finance

CCER projects tend to have a complicated development process and a long development cycle. The time point of project development will affect the listing time of CCER, and ultimately the income of emission reduction projects. If quasi emission control enterprises invest in CCER projects in advance, the carbon assets generated based on these projects that are successfully filed can be used for future performance or financial activities, such as quota CCER replacement, carbon pledge financing, and carbon trusteeship.

5.3. Fulfill social responsibilities, actively disclose carbon information, and establish a good corporate image

At present, China is implementing a voluntary disclosure of carbon information. Quasi emission control enterprises voluntarily disclose carbon information and are constantly improving the carbon information disclosure mechanism, which may play a role in social supervision and placing constraints on the enterprise's management. On the one hand, carbon information disclosure intuitively reflects the enterprise's carbon emissions and emission reduction status, helps establish a good public image for the enterprise, breaks international green barriers, promotes international trade, and enhances the brand value and influence of the enterprise. On the other hand, carbon information disclosure guides enterprises in such a way to discover their own shortcomings and strengths in carbon management, cultivates their awareness of coordinated development for emission reduction and profits, as well as inspires initiatives for carbon planning and management.

Disclosure statement

The authors declare no conflict of interest.

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