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China's Carbon Trading Market Globalization Strategy: A Conceptual Review

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Abstract

China has once participated in the international carbon market through the Clean Development Mechanism (CDM) faced problems such as falling certified emission reductions (CER) prices and carbon sink fraud, which led to the decline of China's carbon trading market. However, with China's announcement of the goal of peaking carbon emissions before 2030 and achieving carbon neutrality before 2060, China's carbon market has regained vitality and launched China Certified Emission Reductions (CCER) as the main trading product. The study discusses the opportunities and challenges of China in the globalization of the carbon trading market, including key obstacles such as differences in rules and inconsistent carbon absorption measurement methods. At the same time, the paper proposes strategies such as connecting China's carbon trading market with the global market through the Hong Kong platform, strengthening international cooperation, optimizing market mechanisms, and improving technological innovation capabilities to promote the deep integration and coordinated development of China's carbon trading market with the international market. It emphasizes China's position and role in the global carbon trading system in the future, as well as its positive role in promoting global low-carbon transformation and international exchanges and cooperation.

Keywords

Carbon trading, Carbon market, Carbon market globalization, Carbon sink, Climate action

Introduction

The global fight against climate change has placed carbon markets at the forefront of emissions reduction strategies. A better living environment is necessary for maintaining the survival and development of human society. Since the 20th century, with the continuous development of society, forests have been destroyed and the extensive use of fossil fuels has led to the intensification of the climate crisis. The massive emission of carbon dioxide is the main cause of global warming. The "Kyoto Protocol" signed in 1997 officially came into effect in 2005. An important part of the Kyoto Protocol is the establishment of a flexible market mechanism, the basis of which is emissions permit trading. It also provides countries with additional means to achieve their goals through three market-based mechanisms: Emissions Trading, The Clean Development Mechanism (CDM) and Joint implementation (JI). (UNFCCC,2021)

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The product traded in the international carbon market is certified emission reductions (CER). With the establishment of CDM, Chinese companies also participated in the international carbon market through CDM. However, due to the economic downturn in Europe, the price of CER continued to fall. China established China Certified Emission Reduction (CCER) based on the CER calculation methodology. However, due to the lack of environmental awareness at the time, the use of CCER was relatively small, and a large number of carbon sink fraud cases occurred, resulting in China's carbon sink products not being accepted by the European and American carbon sink markets. Therefore, China suspended the filing of CCER projects in 2017. This also led to the brief decline of China's carbon trading market.

Globalization of this market can enhance its efficiency and influence while promoting international collaboration on climate goals. The objectives of this research are to analyze the current state of China’s carbon trading market, assess the potential for global integration and propose strategies for aligning China's market with international standards.

Literature Review

China's carbon trading market has undergone a remarkable evolution since its inception, becoming a cornerstone of its climate action strategy. This section delves into the history and literature of China's carbon market, focusing on its development, challenges, and the strategy for globalization. By analyzing existing studies, policy frameworks, and market dynamics, this paper provides an overview of China's efforts to integrate its carbon market into the global economy.

Early Pilots (2013–2017): China launched pilot carbon trading markets in seven regions, including Beijing, Shanghai, and Guangdong (Table 1). These pilots served as testbeds for policy design and market operation.

Table 1. Summary of China’s Carbon Market Pilots

Region	Launch Year	Sector Coverage	Key Features
Beijing	2013	Industrial and services	Focus on emissions reporting
Shanghai	2013	Power and industry	Integration with local industries
Guangdong	2013	Power, cement, steel	High trading volume

In September 2020, Chinese President Xi Jinping delivered an important Statement at the general debate of the 75th Session of the United Nations General Assembly, announcing that carbon would peak before 2030 and be carbon neutral before 2060 (The Central People’s Government of the People’s Republic of China,2020). China launched CCER on the basis of the Clean Development Mechanism, which is still the main trading product in China's carbon market. This is a greenhouse gas emission reduction actively created by environmental protection projects or enterprises that has been approved and recorded by an officially designated agency (Ministry of Natural Resources, PRC, 2020). This is also a commodity traded on China’s carbon trading market.

Carbon sink refers to the process, activity, and mechanism of removing carbon dioxide

from the air. It mainly covers five aspects: deep forest, grassland, cultivated land, ocean, and artificial. Among them, the main sources of carbon sinks in China's carbon trading market are forests and artificial. China's current carbon sink measurement methodologies are only four types: grid-connected solar thermal power generation, grid-connected offshore wind power generation, afforestation carbon sinks, and mangrove afforestation. (MEE,2024)

As a rapidly emerging developing country, China is in urgent need of carbon sink resources in the process of seeking a balance between economic development and environmental protection. China has a high forest coverage rate, which means that there will be huge carbon sink reserves, but such reserves may face the problem of oversupply in the domestic market. Excessive carbon sink supply will undoubtedly depress market prices and weaken the attractiveness of carbon sinks as investment products, which may lead to the withdrawal of funds from environmental protection industries and carbon sink investment fields, posing a threat to the healthy development of China's carbon market and even causing a downturn or even collapse of the market.

As one of the countries with important influence in the world, China bears an unshirkable responsibility and obligation in environmental protection. Therefore, promoting the integration of China's carbon trading market with the international market is not only to alleviate the problem of imbalance between supply and demand in the domestic market, but also to play a leading role in the world and promote the common development of low-carbon economy and environmental protection. Through integration with the international carbon market, China can introduce more advanced carbon trading mechanisms and concepts, promote the standardized and professional development of the domestic carbon trading market, and at the same time use the vitality and potential of the domestic market to inject new impetus into the global low-carbon environmental protection cause.

However, it is not easy to achieve the internationalization of China's carbon market. At present, due to the irregularities in project application and differences in carbon sink measurement methods, CCER have not yet been recognized in international markets such as Europe and the United States. This requires China to adopt special and effective strategies in the process of promoting the internationalization of the carbon market.

Methodology

The environment should be protected by combining public, private and shared measures. (Cai, 2012) Emission trading is the transaction of administrative licenses issued by the government. The emission trading system is a market-based solution, not a privatized solution. (Zhang, 2014) China should selectively absorb and learn from international carbon emission trading rules based on its national conditions, focus on the causes, processes and actual effects of the relevant international rules, and deeply analyze the rationality and feasibility of international rules applicable to China (ZHAO and MENG, 2021). The Hong Kong Emissions Exchange and the Hong Kong Carbon Rights and Carbon Sink Trading Company jointly launched the Hong Kong Emissions Trading Platform. The products currently listed are only CCER, Certified Emission Reductions (CER) and Voluntary Emission Reductions (VER). (Xia, 2023) As governments around the world move to implement climate policy frameworks, emissions trading systems (ETS) emerge as pivotal tools in the global fight against climate change, offering a market-based approach to reducing greenhouse gas emissions. (ICAP, 2024)

Difficulties in the internationalization of carbon market

The EU promotes other countries to learn from and accept its carbon emission trading rules by advocating the connection of carbon emission trading mechanisms in the international community. If other countries' carbon emission trading mechanisms want to connect with the EU, they must accept the conditions stipulated by the EU. (ZHAO and MENG, 2021) There are practical contradictions and problems in international carbon trading, such as unclear ownership of carbon emission rights, soft legality of carbon trading regulations, different carbon certification standards, and unequal rights and obligations in carbon trading agreement templates. (Shen, 2021)

Analysis and Discussion

Table 2 shows the annual data of China's national carbon trading market, with the peak of trading volume in 2023, most likely because most companies resumed production after the epidemic, so they needed to purchase a large amount of carbon sinks to offset the carbon dioxide generated in their production. From the average price point of view, the price per ton of carbon has been rising year by year since 2021, which shows that carbon sinks are indeed very valuable products, and many companies have demand for them.

Table 2. China's carbon trading market transaction data from 2020 to 2024

Year	Quantity (ton)	Transaction amount (RMB)	Average price (RMB)
2024(JAN-JUN)	6,786,896	595,728,325.34	87.78
2023	35,635,859	2,569,986,418.42	72.12
2022	6,218,972	357,855,798.67	57.54
2021(JUL-DEC)	26,670,643	1,241,241,108.12	46.54

(Data Source: National Carbon Market Information Network)

Table 3. Annual quota auction revenue of various carbon markets in the world in 2024

Carbon trading market name	Revenue (million USD)	Carbon trading market name	Revenue (million USD)
EU ETS	47,098.0	Germany	11,560.0
UK	5,223.9	California	4,720.6
Washington	1,824.5	RGGI	1,264.9
Québec	1,051.4	Austria	911.5
Republic of Korea	64.4	Chinese Pilots	59 .5
Massachusetts	41.4	Switzerland	38.8
Others (including Nova Scotia*, New Zealand, Montenegro, and Newfoundland and Labrador OBPS)	56.7		

(Data Source: ICAP STATUS REPORT 2024)

There are currently 36 carbon markets in operation around the world, and another 22 jurisdictions are at different stages of consideration and policy formulation. The carbon markets currently in operation cover 18% of global greenhouse gas emissions, and the jurisdictions in which these carbon markets are operating account for 58% of the global GDP, and nearly one-third of the population lives in areas with carbon markets. (ICAP, 2024) From the Table 3 on

Annual quota auction revenue of various carbon markets in the world in 2024, we can see that the main global carbon trading is still in exchanges in Europe and the United States (Figure 1). The trading volume in mainland China is only a small part, and it is mainly in pilot cities, which shows the huge potential of China's carbon sink market (Table 3). However, due to different measurement methods, policies and other reasons, this also restricts the internationalization of China's carbon trading market (Figure 2).

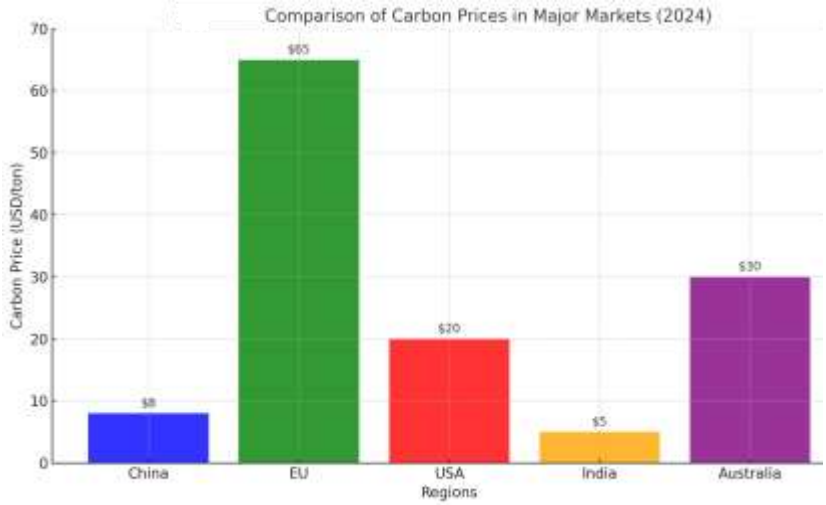

Figure 1: Comparison of Carbon Prices in Major Markets China, the EU, the USA, India, and Australia).

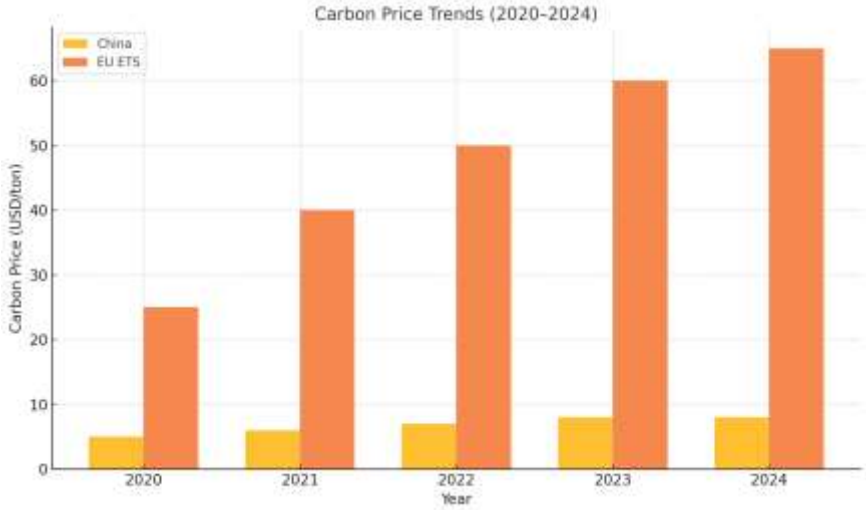

Figure 2: Carbon Price Trends (2020–2024) in China and the EU ETS.

When discussing the globalization strategy of China's carbon trading market, we need to make it clear that although carbon trading is essentially globalized, the carbon trading markets of various countries and regions show significant diversity in operating mechanisms, trading rules and product types. Looking ahead, achieving net zero emissions is imperative, and countries need to adopt new approaches to designing and operating carbon markets. Therefore, the in-depth analysis of the globalization strategy of China's carbon trading market is not a denial or conflict with the globalization characteristics of carbon trading, but a discussion of the specific paths and strategies for how China's carbon trading market can better integrate into the global system and play a positive role under this macro background. Using free trade zones as a carrier to realize the platformization of carbon trading markets may require a long

development time or fail to reach the ideal state due to differences in social systems, laws, and carbon sink calculation methods. The "Belt and Road" initiative can indeed achieve the globalization of carbon trading markets, but it can only be achieved in specific regions and cannot effectively affect the global market. The platform that can connect China's carbon trading market with the global carbon trading market in a short period of time may be through Hong Kong. Let the carbon sink calculation methods and carbon sink products of mainland China be recognized by the Hong Kong Carbon Exchange, so that the carbon sink products of mainland China can be traded on the Hong Kong Carbon Exchange. There are no differences in social systems, laws, carbon sink measurement methods between Hong Kong and the United States and Europe. Through the Hong Kong platform, carbon sink products from mainland China can be sold to the world, thereby strengthening the connection between China's carbon trading market and the global carbon trading market, and influencing and driving the development of the global carbon trading market and low-carbon environmental protection.

Table 4: Key Differences Between China’s Carbon Market and EU ETS

Feature	China’s Market	EU ETS
Sector Coverage	Power generation	Multi-sector
Carbon Price (Avg)	$8/ton	$60/ton
Trading Volume	200 million tons	500 million tons

As a major carbon emitter, the globalization process of China's carbon trading market is not only related to the development of its own low-carbon economy, but also has a far-reaching impact on the integration and deepening of the global carbon trading market. Through this study, we aim to reveal China's position and role in the global carbon trading system, analyze the opportunities and challenges it faces in the process of globalization, and how to promote the deep integration and coordinated development of China's carbon trading market with the international market through policy guidance, market regulation and technological innovation.

Specifically, we will focus on the key obstacles that China's carbon trading market needs to overcome in the process of globalization, such as differences in rules and inconsistent carbon sink measurement methodologies, and explore how to achieve effective integration with the international market through strategies such as strengthening international cooperation, optimizing market mechanisms, and improving technological innovation capabilities. At the same time, we will also pay attention to the positive role of China's carbon trading market in the process of globalization, such as promoting global low-carbon transformation, promoting international exchanges and cooperation, etc., in order to provide useful reference and inspiration for the future development of China's and even the global carbon trading market.

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