



Research on China's Carbon Financial Market: Legal System and Prospect of Institution

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Abstract: To achieve the goals of carbon peak and carbon neutrality, it requires cutting the overall emissions reduction costs with the help of the carbon financial market. Toward that end, the top priority is to draw up rules working for it as soon as possible. By examining the evolution and status quo of research on the legal system of the carbon financial market, this paper comes to a conclusion that current research on the legal system in China's legal circle pays more stresses to macro concepts than micro-mechanisms. Besides, it analyzes the "public power theory" and "usufruct theory" of the carbon emission right, and tables the research proposition that further efforts are necessitated to make the legal attribute of the carbon emission right as a "quasi-property right theory" justified. Based on the comparison and analysis of the banking and borrowing mechanism of carbon banks in China and the practices of carbon banks in California, this paper puts forward the schemes of reference that may help carbon banks give play to their financial functions. In addition, it analyzes the merits and demerits concerning effects of different linkage modes in the carbon market, and lists theoretical issues demanding further breakthroughs for selecting crediting mechanisms and recognizing double counting. Finally, as a result of the literature analyzed in this paper, research propositions that the law and economics communities shall underline in the future are put forward in the conclusion part.

Keywords: Carbon Finance, Legal System, Carbon Emission Right, Carbon Bank, Carbon Market Linkage

1. Introduction

Carbon finance refers to investment and trading activities that derive from the carbon emission right and its derivatives. [1] Unlike traditional finance, it refers to a variety of trade activities and financial policies in relation to greenhouse gas emissions, including trade and investment of the carbon emission right and its derivatives, and investment and financing of various low-carbon projects. [2] It is generally believed that the Coase theorem is the theoretical basis of carbon finance. As proposed by Coase, without the establishment of this initial delimitation of rights, there can be no market transactions to transfer and recombine them...If such market transactions are costless, such a rearrangement of rights will always take place if it would lead to an increase in the value of production. [3] Thus, if rights are well-defined, the observed situation will be efficient (the parties having taken all Pareto-improving steps) and any further intervention (for example, Pigouvian remedies) will make matters worse rather than better. [4] The greenhouse gas

atmospheric environmental capacity is similar to environmental public goods in nature. Thus, if its property rights are not well defined, negative external environment issues such as global warming as described in Coase theorem will arise. To address such issues, the carbon financial market that is characterized by scarce total allowances and well-defined ownership comes into being. [5] Research available suggests that the carbon financial market is the most cost-effective among various ways to reduce emissions and is efficient as a dynamic incentive. [6] For these reasons, developing the carbon financial market becomes one of the major legal mechanisms for countries around the world, including China, to grapple with climate change.

China, as one of the first signatories of the *United Nations Framework Convention on Climate Change (UNFCCC)*, has always been faithfully responding to climate change and actively practicing a variety of carbon financial market mechanisms. China concluded the *Kyoto Protocol* in May 1998, followed by the registration of its first CDM (Clean Development Mechanism) project in 2004. Taking that as a

starting point, China participated in trading around the world of CERs (Certificated Emission Reductions) of extensive CDM projects. So far, China has registered 3,764 projects under the Executive Board of the Clean Development Mechanism, [7] ranking first in terms of scale in the world. In the Post-Kyoto era, China kicked off a pilot project of emission trading scheme (ETS) at the local level in 2012 and set up in succession seven emission trading scheme exchanges in Beijing, Tianjin, Shanghai, Chongqing, Hubei, Guangdong, and Shenzhen,¹ with both CERs generated from the CDM and mandatory emission reductions allocated by local governments covered. To propel new progress in global climate governance at the COP 26 to the UNFCCC, China announced in September 2020 the climate sustainable development goals of "China aims to have CO₂ emissions peak before 2030 and achieve carbon neutrality before 2060" after joining the *Paris Agreement* and set up formally a unified national emission trading scheme market on July 16, 2021. [8] However, China's carbon financial market is still in its infancy, compared with those of in the developed countries and regions like the EU, and further efforts are required to develop one that is not only compliant with the local legal context but feasible for international cooperation. Toward that end, the main purpose of this paper is to analyze the status quo of the legal system of China's carbon financial market and then propose a research approach in theory to improving the legal system of the carbon market.

For that purpose, the paper sheds light on some issues existent with China's carbon financial market in the second part, including the status quo of the legal system of China's carbon financial market, controversies over the legal attribute of the carbon emission right, implementation of carbon banking, modes of carbon financial market linkage, among others. With issues found in the analysis as clues, this paper proposes in the third part the research approach that will facilitate the construction of China's carbon financial market. To explain it, it tables ways to justify the carbon emission right as a quasi-property right, make reference to substantive carbon banking, and discuss linkage modes feasible for the carbon financial market. The fourth part makes a summary of viewpoints discussed in the paper.

2. Status Quo of the Legal System and Analysis of the Carbon Financial Market

Unlike traditional commodity trading markets, the carbon

financial market has certain artificial attributes. In essence, it derives from the fiction of laws. This makes the constitution and inner logical adequacy of the legal system the premise for market performance evaluation. For that reason, analysis of the rules of laws of the carbon financial market will surely start from its legal system. As the legal attribute of the carbon emission right relates to the legitimacy of the carbon financial market, the legal attribute positioning of it will directly lead the market to a significantly different direction. Accordingly, we will analyze controversies in the academic circle over the legal attribute of carbon emissions right in the second place. Compared with the traditional financial markets, the carbon financial market is unique in that it highlights the roles of various financial instruments in carbon emission governance. What's more, carbon banking acts exactly as the core and linkage for the carbon market to play its financial attributes. Therefore, analysis of carbon banking implementation mechanisms is of typical significance for understanding the current situation of the entire carbon financial market. Analysis of the cross-regional carbon financial market linkage models at the end of this section can be attributed to its unique functions for addressing the spillover of the greenhouse effect and global climate governance. As the *Rulebook 6.4 of the Paris Agreement* makes it possible to carry out international cooperation in cross-regional carbon financial markets, analyzing foreign linkage modes becomes an indispensable part of constructing a complete institutional system.

2.1. Existing State of the Legal System of the Carbon Financial Market

2.1.1. Evolution of the Legal System

The construction of the legal system of China's carbon financial market can be traced back to the time when the *Kyoto Protocol* was promulgated. To strengthen the management of CDM projects, four departments including the National Development and Reform Commission (NDRC) jointly released the *Interim Measures for the Operation and Management of Clean Development Mechanism Projects in China* (hereinafter referred to as "Interim Measures") on June 30th, 2004. It is the very first departmental rule formulated by Beijing after it got involved in the global climate governance process, which was revised twice in 2005 and 2011 respectively, and renamed as "*Measures*". The "*Measures*", after the two revisions above, comprise 39 Articles in 5 chapters and provide the administrative system, application and implementation procedures, and legal liability of China for CDM projects in pursuance of procedures determined by the Executive Board of CDM Projects. They thus act as essential Chinese laws for CERs generated within China to participate in global ETS.

2012 saw the second commitment period of the *Kyoto Protocol*. Concerned about the impacts of quantified emission reduction on the right to national development, Parties included in Annex I became less interested than before in CDM projects, and funds and technologies provided by developed countries shrank dramatically. [9] After 2013, the EU carbon market didn't accept new CERs under CDM

1 Beijing Environmental Exchange (now Beijing Green Exchange) kicked off carbon trading on November 28, 2013; Tianjin Climate Exchange kicked off carbon trading on December 26, 2013; Shanghai Environment and Energy Exchange Corporation kicked off carbon trading on November 26, 2013; China Emissions Exchange (Guangzhou) kicked off carbon trading on December 19, 2013; China Emissions Exchange (Shenzhen) kicked off carbon trading on December 19, 2013; Hubei Emission Exchange kicked off carbon trading on April 2, 2014; Chongqing United Assets and Equity Exchange kicked off carbon trading on June 19, 2014; Hainan International Carbon Emission Trading Center was approved for establishment on March 17, 2022.

projects from emerging countries such as China and India anymore, making the prospect of the *Kyoto Protocol* highly uncertain. [10] The construction of China's carbon financial market in this period showed characteristics of two tracks going in tandem and trial and error. On the one hand, China controlled the development scale of CDM projects by suspending the approval of new projects and began to explore independently the construction law of China's ETS market on the other hand. In October 2011, NDRC issued the *Notice on the Pilot Work of Emissions Trading Scheme* (NDRC Office Climate [2011] No.2601), authorizing seven provinces and cities to pilot ETS. Following that, China authorized Fujian and Hainan to pilot as well. To strengthen legal regulation, governments at the provincial and municipal levels that were authorized to pilot issued eight regulatory documents falling into the category of local regulations (See Table 1) in combination with their characteristics of emission sources.² On the whole, the legal system of ETS during this period showed characteristics of different institutional details, irrespective of the same legal framework.

With the phaseout of the *Kyoto Protocol*, the *Paris Agreement* became a new milestone in the legal framework for international climate governance. [11] China, as an important concluding party of the *Paris Agreement*, took the *Rulebook 6.4 of the Paris Agreement* as evidence and fully accelerated the construction of the legal system of its carbon financial market. Specifically, after the carbon peaking and carbon neutrality goals were established in September 2020, the Ministry of Ecology Environment (MEE) of China issued *Measures for the Administration of Carbon Emissions Trading (for Trial Implementation)*, *Draft of Interim Measures for the Administration of Carbon Emission Permit Trading*, *Rules for the Administration of Registration of Carbon Emissions (for Trial Implementation)*, *Rules for the Administration of Trading of Carbon Emissions (for Trial Implementation)* and *Rules for the Administration of Settlement of Carbon Emissions (for Trial Implementation)* in succession from the end of 2020 through 2021. The legal framework of the unified national emission trading scheme was primarily set up.

2.1.2. Current Research on the Legal System

Corresponding to the aforesaid evolution of the legal system, theoretical studies of China's law circle around climate governance can also be divided into three stages. In the first stage, the period after the *Kyoto Protocol* was promulgated and before the COP 15 to the UNFCCC (Copenhagen Summit), scholars focused more on how to build an appropriate institutional framework for addressing climate change. In particular, they focused more on how to choose

institutions for both the carbon taxes and ETS. Wang and Cao, for example, combed characteristics of carbon taxes and carbon markets from economic costs, administrative management, political feasibility, international coordination, anti-fraud and corruption prevention; [12] Deng pointed out that carbon taxes had the advantages of simple implementation procedure, clear cost calculation, flexible regulation and control, outstanding institutional performance, etc. [13] Suppressing irrational energy consumption using the economic control means of tax revenues should be a significant way for China to control greenhouse gas emissions. Xu argued that a greater impact would be produced on social welfare if carbon taxes were introduced: Social welfare losses would be 3.262 billion yuan in total if the carbon tax at 85 yuan/t carbon was introduced; Social welfare expense losses would amount to 17.5 billion yuan if the carbon tax of 200 yuan /t carbon was levied on coal only, accounting for about 0.56% of China's GDP the same year. [14] Bian maintained that impacts produced on the economy were hard to measure in the short term because China had to make energy prices completely market-oriented first before levying a carbon tax. [15] For that reason, she supported too using ETS which is based on the market mechanism as the preferred institutional model to cope with climate change.

As a major achievement of the Copenhagen Summit, AWG-KP (the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol) and AWG-LCA (the Ad Hoc Working Group on Long-term Cooperative Action under the Convention) that developing countries adhered to won recognition. However, debates on how to realize them dominated the follow-up six-year-long global climate negotiation process. [16] To support the negotiation position stuck to by the vast number of developing countries including China, the legal circle has shifted its research focus in this period. It shifted to fair realization of the dual liabilities mechanism under the system of AWG-KP and AWG-LCA and supported theoretically the universal effectiveness of the principle of "Common but Differentiated Responsibilities" (CBDR), from the previous focus of selecting emission reduction systems. [17] Wang, for example, maintained that the global climate governance model required innovations to respond to climate change. However, no innovation can be made at the cost of CBDR principle. [18] Gong maintained that the principle of fairness was the logical basis of CBDR of international laws on climate change and that countries should undertake obligations accordingly "based on differences between them in influence and capabilities"; [19] he also maintained that a more solid legal basis could be provided for "differentiated responsibilities" only when survival emissions were differentiated from luxury emissions and the right to subsistence was established as the most basic human right. [20]

The period from the *Paris Agreement* being adopted to the present can be regarded as the third stage of theoretical research. How can Nationally Determined Contributions (NDCs) under the *Paris Agreement* be included, in form and substance, in China's legal system of ecological environment

2 As a supplement to local regulations, the carbon exchanges in each pilot region have also developed exchange rules, such as Beijing Environmental Exchange Carbon Emissions Trading Rules, Shanghai Environmental Energy Exchange Carbon Emissions Trading Rules, Tianjin Emissions Exchange Carbon Emissions Trading Rules (Interim), Chongqing Assets and Equity Exchange Carbon Emissions Trading Rules (Interim), Hubei Emission Exchange Emissions Trading Rules, Guangzhou Emission Exchange Carbon Emission Allowance Trading Rules (2019), Shenzhen Emission Exchange Spot Trading Rules (Interim).

was hotly discussed in the academic circle in this period. Cao and Cheng maintained that carbon neutrality and carbon peak cannot be realized in the absence of rules of law and market orientation. [21] As there are only less than 10 years to go before the carbon peak, they maintained that it was necessary to speed up the formulation and promulgation of climate change and energy laws. Wang and Sun maintained that the *Carbon Neutrality Promotion Law* shall be prepared as soon as possible to clarify the legal attribute and titling mechanism of greenhouse gas emission right while the "Climate Change Response Law" can be developed when conditions were ripe. [22, 23] But some scholars believed that the basic path to promote the realization of the carbon peaking and carbon neutrality goals were to vigorously implement renewable energy alternative action. Toward that end, the construction of a market mechanism based legal system should be further promoted for technological innovations conducive to the development of renewable energies. [24] Lyu maintained that essential institutions for fields like climate change response and international cooperation should be included in the environmental code to transform and connect the national obligations specified in international laws. [25] While some

scholars believed that the green and low-carbon chapter of the environmental code should take responsibility for responding to climate change, providing substantial institutional arrangements for realizing the carbon peaking and carbon neutrality goals. [26]

Through combing the research on the legal system of carbon finance in the past 30 years, it can be found that research in the field of law synchronizes with the process of global climate governance. Theoretical issues such as selecting the core system for climate change response, international law path of climate governance, and the presentation of carbon reduction mechanisms in the Environmental Code were addressed in succession. However, they eyed more on macro-construction of the carbon financial market and paid insufficient attention to issues of more practical value, such as the construction of market operation mechanisms and connection with achievements of relevant disciplines like economics and management. Therefore, pushing the shift of research on the legal system regarding carbon finance to dynamic aspects from static aspects and also to practices from theories shall be the area of focus of the legal field in the future.

Table 1. Regulatory documents with respect to ETS of pilot regions.

Title of legal documents	Time of promulgation	Issuing authority
<i>Guangdong Carbon Emissions Trading Pilot Work Plan</i>	September 7, 2012	People's Government of Guangdong Province
<i>Trial Measures of Shanghai Municipality on Carbon Emission Management</i>	November 20, 2013	Shanghai Municipal People's Government
<i>Interim Measures of Tianjin Municipality for the Administration of Emission Trading Scheme</i>	December 20, 2013	Tianjin Municipal People's Government
<i>Interim Measures of Shenzhen City for the Administration of Emission Trading Scheme</i>	March 19, 2014	Shenzhen Municipal People's Government
<i>Interim Measures of Hubei Province for the Administration and Trading of Emission Trading Scheme</i>	Promulgated on April 4, 2014, and revised on September 26, 2016	Hubei Provincial People's Government
<i>Interim Measures of Chongqing City for the Administration of Emission Trading Scheme</i>	April 26, 2014	Chongqing Municipal People's Government
<i>Measures of Beijing Municipality for the Administration of Emission Trading Scheme (Trial)</i>	May 28, 2014	The People's Government of Beijing Municipality

2.2. Implementation of Carbon Banking Mechanism

In the analysis of roles played by the financial mechanism in preventing and controlling environmental pollution, scholars such as Catherine Kling have pointed out "intertemporal trading of emission permits, trading, averaging" were the three main ways to reduce compliance costs of regulated entities. [27] Specifically, in the context of the carbon financial market, intertemporal trading of emission permits corresponds to the banking and borrowing mechanism of carbon allowances. The so-called "banking" here refers to storage by companies of existing carbon allowances for future use; while its counterpart "borrowing" allows companies to use over some time more emissions reduction than the current standard and repay them in the future. [27] The practice of banking and borrowing emissions credits can be traced back to the Corporate Average Fuel Economy (CAFE) developed by National Highway Traffic Safety Administration (NHTSA) in 1980. CAFE covers "Averaging, Banking, and Trading credit program" in its "Medium and Heavy-Duty Vehicle Fuel

Efficiency Program" and provides that emission credits can be saved for up to three years. Likewise, the Clean Air Act of 1990 permits the banking and trading of sulfur dioxide emission allowances. California allows manufacturers of passenger cars to bank (and trade) hydrocarbon emissions. [28] Since 1987, virtually every EPA (Environmental Protection Agency) emission standard for new motor vehicles has allowed manufacturers the flexibility to average emissions among similar engines or vehicles, to sell credits to other manufacturers, or to bank emission credits for use in future years. [29] Based on the above practical experience, the EU made reference to relevant provisions regarding allowance banking of the "Acid Rain Program" of the United States when it later designed the EU trading rules for the carbon market and allowed regulated entities to bank excess carbon allowances.

Deep discussions have been made in the academic circle about whether the banking and borrowing mechanism of carbon allowance helps reduce the cost of emission reduction while achieving the target of emissions reduction. Jonathan

Rubin, for example, maintained that the banking and borrowing mechanism gave regulated entities more flexibility to adjust their emission stream over time. [28] Thus, the costs required to comply with emission standards were reduced. According to his studies, allowing companies to bank carbon allowance is a public policy with positive incentives when environmental standards become stricter over time. Burtraw *et al.* further pointed out that it was hard for regulated entities to realize overall emission reduction if allowance trading and banking mechanisms were missing. [30] Besides, as a flexible and compliant measure provided by the regulator to regulated entities, allowance banking also made the emissions reduction plan more acceptable, both economically and politically. Research by Ellerman *et al.* suggested that the banking mechanism reduced the overall abatement cost while improving the environmental compliance, and that allowance banking served as a flexible mechanism for addressing uncertain factors affecting allowance demands such as production level, and compliance cost, etc. [31] Schleich *et al.*, based on the Game Theory model, simulated possible impacts when EU ETS prohibited carbon allowances of the first compliance period from being banked into the second compliance period. Results showed that prohibiting banking of allowance was the main player in slowing down the efficiency of emissions reduction and may hinder regulated entities from reducing their compliance costs. [32]

Most of the existing research results suggest that both allowance banking and borrowing mechanism under given conditions are positive for improving the environmental quality and reducing the environmental compliance costs of regulated entities. But the academic circle has full insights into their disadvantages: First, current practices of carbon allowance banking and borrowing are not real carbon financial activities, which play a limited role in allocating resources in the carbon financial market; Second, the inherent defects of allowance borrowing mechanism may put environmental standards at risk. [30] Current practice systems that permit allowances banking include mainly Acid Rain Program, Regional Greenhouse Gas Initiative (RGGI), Western Climate Initiative, California's Low-Emission Vehicle Program, and EU ETS. However, institutions responsible for banking, registering, and regulating emission allowances are not typical banking organizations. In contrast to traditional financing institutions, the carbon board is currently playing the role of a public authority, which has a strong regulatory undertone but few financial attributes. In the aforementioned ETS system, a "carbon bank" (or carbon board) is "an independent institution free from politics and responsible for regulating and managing the carbon market". [33] In other words, the "carbon bank" is an emission market regulator independent of government departments. In essence, it still manages the allowance banking and borrowing of the carbon financial market by the operation logic of public powers. Though named a "bank", it acts as a "regulator". In addition to it, many economists worry that carbon allowance banking and borrowing will damage environmental integrity. In particular, risks of debt default will cause irreversible damage to environmental goals. First of all,

the allowance borrowing mechanism is inconsistent with the principles of Cap and Trade (CAT). [34] In the "Cap and Trade" mechanism, what the regulator expects is to make allowances scarce artificially by setting the cap. By doing so, industries covered by the carbon financial market will be driven to update their production technologies to minimize emissions reduction during their compliance periods and realize consequently a transition to a low-carbon economy, whereas the borrowing mechanism allows regulated entities to "consume" beforehand the emission allowances for future compliance periods. Though the additional cost burdens enterprises are caused to suffer from by price fluctuations in the emission trading market are reduced to some extent, the emissions reduction in the current compliance cycle is caused to spike, which goes against the core principles of the emissions trading market. [35] Secondly, the debt default risk of the carbon allowance borrowing mechanism itself also casts a shadow on its future development. Regulated entities may fall into business difficulties due to changes in the economic environment after they borrow allowances, having difficulty in fulfilling their debts after consuming allowances. [36] As they have already consumed emission allowances, they may occupy a stronger position in compliance negotiations with regulators, which is unfavorable for the regulator to control emission reduction targets. [37] Under the current borrowing mechanism, there is not yet a sufficient guarantee to ensure that emission allowances banked and borrowed by regulated entities from regulators will be repaid in the future. It is for this very reason that emission trading markets of many countries prohibit the banking and borrowing of emission allowances.

2.3. Modes for Linkage of Carbon Financial Markets

Theoretically speaking, two options of carbon emission governance are practiced globally: unitary and plural modes. In the unitary approach, countries all over the world join a unified emission reduction system, instead of establishing a country-specific one, whereas the plural mode comprises regional, national, and sub-national carbon markets. Without obstacles encountered in the unitary model practiced, the plural model is more conducive to uniting the consensus of all parties. [38] It makes each concluding state more acceptable, both politically and economically. However, the three tiers (regional, national and sub-national) of the carbon emission governance structure under the plural model will inevitably make the carbon financial market construction fragmented. [39] It puts forward new demands to enhance the linkage between carbon financial markets at all levels while respecting differences between them. The linkage between carbon financial markets under the plural mode can be divided into direct and indirect ones. Direct linkage refers to the mode in which one or both parties of two linked carbon markets permit regulated entities to use carbon allowances or credits acquired from other's carbon market in its/their own markets and offset its/their carbon emission reduction obligations. [39] Indirect linkage refers to the mode in which both markets A and B don't recognize each other but they have established two-way

linkage with a third-party market C for indirect intercommunication.

As emissions reduction policies and levels of economic development vary along with countries or regions, a substantial gap exists in theory between prices of carbon allowances among different carbon markets (that is, the cost of emissions reduction) involved in carbon market linkage. The linkage mechanism functions to improve the cost-benefit of greenhouse gas emission reduction projects. [40] Regulated entities in the carbon market with higher allowance prices have, undoubtedly, stronger motivation to buy carbon allowances from other interlinked carbon markets. As a result, emissions reduction in the market purchasing the carbon allowances keeps rising, while those in the selling market declining, and cross-market transactions don't stop until prices of allowances of two two-way linked carbon markets finally tend to be the same. It follows those transactions, irrespective of the linkage modes, will make prices of interconnected markets consistent over time. Consequently, compliance costs of regulated entities in a wider range are reduced. [39] However, hindered by differences in interests between countries from climate governance, linkage, and cooperation between global carbon markets are also in face of many challenges, which are typified by issues such as difficulties in linking emissions crediting mechanisms and double counting of emissions reductions.

As the result of the evolution of historical development, two different crediting mechanisms for emissions reduction exist in the global climate governance system currently. One is the project-based crediting mechanism, which is represented by the CDM under the *Kyoto Protocol*. It takes the approved methodologies as the benchmark, takes specific emission reduction projects as targets, and credits emissions reduction accordingly. The other is the sectoral crediting mechanism adopted in the *Paris Agreement*. In practice, it can be further divided into sectoral benchmark and carbon intensity. Sectoral benchmark usually anchors the average emissions reductions of a specific industry in the base year, defines accordingly the nature of specific emission behaviors, and measures their positive and negative environmental benefits. Therefore, it is highly rigid; whereas the carbon intensity benchmark is more elastic and flexible, which can achieve emission reduction targets without producing a significant impact on economic development. However, as it is not linked to the historically cumulative emissions reductions, it cannot be used to reduce the total emissions reductions. [41] The existence of the above-mentioned differences makes the two crediting mechanisms applicable in different carbon financial markets. It is also the major institutional obstacle inhibiting the effective linkage of carbon financial markets.

Double counting is a common term in economics and occurs when a single GHG emission reduction or removal reduction is accounted for more than once towards attaining mitigation pledge. [42] What's more, the valuation of ecological services will be disturbed. [43, 44] Theoretically speaking, ERCs generated by CDM can be transferred, in whole, to Parties included in Annex I, and there is no need to

care the double counting of emissions reduction as no mandatory emission reduction obligations are imposed on them in the *Kyoto Protocol*. However, all Parties to the *Paris Agreement* have made their own commitments to reduce emissions. According to provisions of the *Paris Agreement*, emissions reduction generated by the new mechanism under the *Rulebook 6.4* cannot be used again to offset NDCs of the country itself once used by other countries as the subject to fulfill their NDCs. Some countries that hope to both obtain transfer incomes and fulfill their NDC goals through the 6.4 mechanism are clearly against this restriction. [45] Consequently, linking carbon financial markets based on this mechanism becomes uncertain.

3. Research Approach to the Construction of the Carbon Financial Market

This part, based on the aforesaid analysis, will discuss the institutional research directions of three issues that have important practical values for pushing research on the legal system of carbon finance to a dynamic process, from a static process.

3.1. Approach to Making Reference to Carbon Banking Mechanism

As mentioned above, there is the issue of inadequate financial attributes with China's carbon allowances banking and borrowing mechanism. The practice of California's atmospheric legislation to control the emission of air pollutants through market-oriented mechanisms such as banking and borrowing has well resolved the theoretical defects of this mechanism. It serves as a good example for China to learn from. According to provisions of California's Monterey Bay Unified Air Pollution Control District under Rule 215-Banking of Emission Reductions, the District has specially set up an ERC registry and a pollutant tracking system, with the former making a log of all stored entries and accumulative counts and opening an independent account for each depositor. Notably, Rule 215 allows the registry to inject 10% of the stored ERC into the community ERC account, which can be used to offset implementation costs of events it recognizes, in the form of its income. This objectively creates a profit guidance mechanism for the registry to implement the ERC banking plan. Effects of funds circulation similar to those of the saving and loan business of commercial banks arise. The essence is to stimulate the vitality of the market to allocate pollutant emission allowances by endowing the banking and borrowing mechanism with financial attributes. Both China and the United States agree that ETS is of great value for mitigating negative effects caused by climate change and also that carbon allowance banking and borrowing mechanism operate in a way similar to that of traditional commercial banks. [27] Moreover, as China has set up a commercial bank operation system that meets the requirements of the New Basel Accord, [46] the practical

experience of California is of great reference for China to attract a substantial carbon banking mechanism through traditional commercial banks. The specific rules to operate and modes to regulate this business shall be areas subject to focused discussions and exploration of the academic and practical circles in the future.

The carbon allowance banking mechanism may put the realization of environmental goals at risk because it allows for infinitely continuous exercise. [47] To avoid the issue, foreign regulators design a response mechanism that applies different discount rates for returned banking allowances based on banking cycles. [27] Low-Emission Vehicle (LEV) III regulations of California, for example, provide that if the allowances have not been used for compliance from 2009 through 2012, credits obtained between 2000 and 2008 will be discounted by 50% before 2013, by 75% before 2014, and lose their full values before 2015; if they have not been used within five years from the date of acquisition, credits obtained from 2009 to 2016 and subsequent years will be discounted by 50% before the sixth year, by 75% before the seventh year, and will lose their full values before the eighth year. It makes financial regulators of ETS of the US able to set upper limits of income and scale of intertemporal trading of emission permits by adjusting the banking and borrowing scale and applying discount rates to emissions reduction allowances. As the People's Bank of China also has the right to adjust its credit scale and market interest rates with the help of monetary policies, [48] China and US are common institutionally in terms of the regulatory bases and environments for carbon allowance credits. Thus, it is possible to refer to California's Low-Emission Vehicle Program to build China's "statutory allowance reserve ratio" and "allowance discount rate". The preparation and justification of procedures enabling the adjustment of the above-mentioned ratios and the mechanism giving rise to them reply upon the cooperation between scholars in economic laws and applied economics.

3.2. Approach to Linking Carbon Financial Markets

To link the cross-regional carbon markets, what needs to address first is to transform allowances (credits) caused by differences in the crediting mechanism between different markets. As sectoral benchmark (EU ETS, for example) established first have gained first-mover advantages in the field of carbon emissions crediting, chances that they will be completely abandoned in the future are low. But it is unlikely to be adopted by most developing countries including China in a short time as it is highly rigid. In such a case, "equivalent benchmark" schemes that are internationally accepted become a major reference choice for linking markets that adopt two distinct crediting mechanisms. To explain it, respective emissions reductions under sectoral benchmark and carbon intensity corresponding to emission behaviors of entities in different markets are converted to CO₂ emission equivalents, which are taken as benchmarks to measure carbon allowance emission effects of entities in different markets. [49] When the "equivalent benchmark" of a specific carbon market is generated, it can be used as a carbon allowance exchange tool

to link other carbon markets, thereby breaking the linkage dilemma between cross-regional carbon markets. As both these two emission benchmarks have been applied in different pilot areas in the process of promoting the pilot construction of the carbon market in China,³ it suggests that China has an objectively practical environment for applying the "equivalent benchmark". Next up, the circles of law and energy economics shall scheme and demonstrate, hand in hand, related "equivalent benchmark" methodologies as soon as possible.

To eliminate uncertainty possibly brought about by controversies over double counting of emissions reduction, the consensus reached by COP 26 provides that ERC holders can make a choice, whether to sell carbon credits they hold to other countries or include them in their own NDC programs. In case of sales, the country concerned shall increase its NDC emissions reduction targets corresponding to such credits, whereas the buyer, to the country, may offset corresponding credits in its NDC to ensure that the emissions reduction is counted only once. It suggests that the COP 26 finally opted out of the opinion of recognizing double counting. As an analogy, when credit obtained through the CAT or ERC system is used or offset in any other linked carbon market, it shall also be deducted from the carbon market where it is sold and shall not be included in the mitigation pledge of the selling country (region). To aid in the implementation of the above-mentioned mechanism, the COP 26 has decided to set up internationally transferred mitigation outcomes (ITMOs) in the future, to record all allowances transferred internationally and changes in NDC of relevant countries/regions resulting from such transfer. Though the *Rulebook 6.4* under the *Paris Agreement* is voluntary rather than mandatory for concluding Parties, China, as the largest carbon emitter in the world, is hard to achieve emissions reduction without the international cooperation mechanism for emissions reduction. Given this objective situation, China's carbon financial market is bound to act in line with the "double counting" mechanism established in the *Paris Agreement* and take it as the foundation for long-term system construction. Besides, China will take into account recent issues on how to transition the ERC of the "Kyoto Era". In such a case, when it comes to research on the linkage model of China's carbon financial market, the top priority is to observe emissions reduction counting rules of the *Paris Agreement* and provide mechanisms for linking CER generated by the *Kyoto Protocol* during the transition period.

4. Conclusion

The paper aims to raise research suggestions for constructing the legal system of the carbon financial market. Toward that end, it combs the research status quo of issues including the evolution of the legal system, implementation mechanisms of carbon banks, and linkage modes between

³ In terms of carbon allowance allocation methods, Tianjin, Shenzhen and Guangdong adopted the sectoral benchmark, while Shanghai and Hubei adopted both the carbon intensity and sectoral benchmark.

carbon financial markets. It is found that research on the above issues in the field of law was staged. Most research was in tune with and in reference to the global climate governance process, with a focus on theoretical support for the macro-construction of the carbon financial market. However, less than adequate attention was paid to issues with more practical values regarding institution construction such as market operation mechanism and research on interdisciplinary linkage. It is mainly manifested as follows: institutional supplies allocated to banking and borrowing mechanism were unbalanced, making it difficult to fully explore financial functions of banking and borrowing mechanism; and exploration on ways that linkage mechanisms of cross-regional carbon financial markets were inadequate, making it impossible to provide insights on issues such as difference in crediting mechanism and double counting of emissions reduction.

This paper points out that the above-mentioned issues can be addressed by following the research approach below: endow carbon banks with interest-oriented mechanisms and create regulatory tools for negative environment externalities, and take them as logic starting points to discover financial functions of carbon banking mechanism; design "equivalent benchmark" through interdisciplinary cooperation and interpret the rules for calculating emission reductions under the *Paris Agreement*, to complement the practical mechanism of the carbon financial market linkage mechanism. Eventually, research on the legal system of China's carbon financial market will realize a turn to a dynamic process from static process and also a turn to practices from theories.

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Biography

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