

Research on the legal regulation and improvement of carbon emission trading

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Abstract

Carbon emission trading system is a kind of environmental institutional arrangement to solve externalities through market mechanism, which is one of the most effective ways to deal with climate change in China and to control air pollution represented by haze pollution. In accordance with the requirement of "using system to protect ecological environment", China should position carbon emission trading system as the basic legal system of environmental protection in the new Environmental Protection Law, and from the aspects of reasonable determination of total carbon emission control mechanism, allocation of carbon emission trading quota, selection of pricing mechanism, and improvement of government supervision mechanism, etc. To improve China's emissions trading system.

Keywords

Carbon emission rights, To trade, Climate change, Legal regulation.

1. Introduction

Carbon emission trading mechanism is an important part of market-based emission reduction measures. Compared with traditional command-and-control environmental regulation, carbon emission trading mechanism is more flexible and can seek market forces to achieve supervision goals in an economically efficient way, so it has been widely accepted by modern countries and incorporated into their national legislation, becoming the international mainstream trend. The EU launched its emissions trading market in 2005, and the emissions trading system based on this market is regarded by the European Commission as "the cornerstone of the EU's strategy to combat climate change". The US Regional Greenhouse Gas Initiative is also an important reference for the carbon emission trading scheme. In the early days of the international climate change negotiations, the United States repeatedly proposed to solve the problem of greenhouse gas emissions through market-based mechanisms. The European Union initially criticized the market-based mechanism proposed by the United States, and then accepted it[1]. The inspiration for the design of the carbon trading scheme can be traced back to the 1990s. The acid rain program in the Clean Air Act Amendments of 1990 was a bold attempt. The operation of the acid rain program mainly includes the following aspects: setting the emission caps of acid pollutants such as SO₂ and NO_x; Initial allocation of pollutant discharge quotas; Trading and transferring emission quotas between pollutant discharge units and any quota holder; The continuous emission monitoring system is used to conduct supervision and review to achieve supervision objectives. The Kyoto Protocol, adopted in 1997, set strict and legally binding targets for reducing greenhouse gas emissions for the first time in international law, and became the first international convention to provide for economic mechanisms to help States parties meet their international obligations. However, market-based emission reduction mechanisms allow developing countries to miss out on the following opportunities: first, there is a lack of projects to generate the cheapest trading indicators through the Clean Development Mechanism under the Kyoto Protocol; Second, energy-intensive developing countries have

fewer opportunities to reduce their carbon emissions and can only meet their carbon reduction obligations in a more limited way.

China is a traditional carbon-intensive country. Since 2011, some provinces and cities in China have started to pilot carbon emission trading, and in 2019, the construction of a national carbon emission trading market began, and on July 16, 2021, the national carbon emission trading market was officially launched. However, in the national carbon emission trading is hot at the same time, we should look at the carbon emission trading mechanism rationally. This paper will analyze the risks existing in China's current carbon emission trading, and explore solutions to the limitations of the current mechanism itself, so as to promote the efficient and orderly operation of the national carbon emission trading market[2].

2. Legal risk performance of carbon emission trading in ChinaSection Headings

In the context of global green and low-carbon transition, China solemnly committed to the world at the seventy-fifth session of the United Nations General Assembly that China will be committed to the "3060" "dual-carbon" target development strategy, becoming the first developing country in the world to set a "dual-carbon" target period[3]. China has established the first national carbon emission trading market among developing countries, which, as an important tool to implement the "dual carbon" goal, has made progress in using market mechanisms to control and reduce total greenhouse gas emissions to achieve energy conservation and emission reduction. However, the problem of insufficient activity and small trading volume of the national carbon market is more prominent, mainly because the carbon emission trading market is still in its infancy, the operation rules are only preliminaries, and the legislation is lagging in the implementation process. Due to the lack of a complete specialized system for China's "dual carbon" legislation, the climate change law and the "carbon peak" and "carbon neutrality" laws have not been completed, and the carbon emission rights trading management regulations are still in the draft revision state. The existing policies and legislation are in a fragmented state, the linkage between systems is not sound enough, and the legal protection of carbon trading is not perfect enough, which causes the concern of market participants and thus fails to meet market expectations. The practice of carbon emission trading in the EU, the United States and other countries and regions fully proves the necessity of legislation in advance. At present, China's carbon trading market has only a few departmental regulations and policies, in the case of national legislation has not been introduced, can only follow the policy first, the idea of gradually improving the legislation. In addition to the impact of the imperfect "two-carbon" legislation on carbon emission trading, the whole cycle of carbon emission trading and the management of carbon assets have legal risks to different entities to varying degrees. Due to limited space, this paper only discusses the national carbon market, and the local carbon market is not within the scope of discussion.

2.1. Legal risks arising from improper management of carbon quotas

Carbon emission quota is the carbon dioxide emission quota generated in the production and operation activities owned by the participants of the carbon trading market. The national market currently only carries out spot trading of quotas among key emitters in the power generation industry. The provincial ecological environment department adopts the benchmark method to allocate and issue quotas to key emission enterprises in the power generation industry, which is summarized from the bottom up[4]. First, key emission enterprises calculate the quota amount, and then the provincial ecological environment department verifies the quota of key emission enterprises according to the actual output during the calculation period, the quota data method of key emission enterprises and the carbon emission base value. The total quota of provincial administrative regions is summarized by the quota of key emission

enterprises in the region, and the national quota is summarized by the total quota of provinces. On the basis of mature market and perfect data, quota allocation will introduce total requirements, and do a good job in the combination of total budget effect and top-down. In order to achieve the emission reduction target, the competent government departments will convert the emission reduction target into carbon emission quota and allocate it to enterprises through the verification of the carbon emission cap and the administrative empowerment of carbon emission rights. The compliance and rationality of quota management affect the actual emission reduction effect of carbon trading system, and also determine the cost of emission reduction and compliance of key emitters. The legal risks of quota management are as follows: First, the risk of unfair quota allocation by the competent department of carbon market. Some local administrative departments, taking economic factors into account, have implemented local protectionist policies and acquiesced in high-emission enterprises modifying data to increase carbon quotas, which violates the principles of fairness and justice. At present, carbon quota is allocated free of charge, and provincial ecological environment departments are crucial to quota allocation. If the quota allocation process is not scientific, fair and reasonable, it will affect the enthusiasm of key emission enterprises to reduce emissions, and it will go against the original intention of emission reduction. The above behavior may cause risks: on the one hand, some enterprises are not satisfied with the quota allocation behavior and filed administrative reconsideration, administrative litigation; On the other hand, if the relevant staff of the carbon market authorities are involved in abuse of power, dereliction of duty, favoritism and malpractice, they will be punished according to law. Second, key emission enterprises do not properly manage the risk of quotas. Key emission enterprises have the obligation to do a good job in quota management, including quota acquisition, trading, settlement and compliance, or they may face administrative penalties, which will cause economic losses to the enterprises and affect their corporate image. The first implementation cycle of the national carbon market is from January 1 to December 31, 2021, according to the statistics of the Ministry of Ecology and Environment, the completion rate of 2021 is 99.5%, and the remaining 0.5% of the approved amount of compliance has not been completed. In February 2022, the Ministry of Ecology and Environment issued the Notice on the Follow-up Work of the First Compliance Cycle of the National Carbon Market, requiring that key emission enterprises in the national carbon market that fail to pay their quotas in full and on time be ordered to correct within a time limit and be punished according to law. Zhejiang, Jiangxi and other places have issued the first carbon emission fines in their respective provinces since the establishment of the national carbon market because carbon emission enterprises have not paid carbon emission quotas on time and in full. In January 2022, Meishan Ecological Environment Bureau filed an investigation into Qingshenhua Liqi Thermal Power Co., Ltd. for suspected illegal acts of not paying carbon emission quotas in full and on time. After investigation, the amount of carbon emission quota that should be settled by the company in 2019-2020 is 128,666 tons, the amount of free quota is 82,813 tons, and the loss is 45,853 tons. It is necessary to complete the settlement of carbon emission loss of 45,853 tons, but the company has not settled in time. This behavior violates the provisions of the Measures for the Administration of Carbon Emission Trading (Trial). According to the provisions of Article 28 and Article 40 of the Measures for the Administration of Carbon Emission Trading (Trial Implementation), the Meishan Ecological Environment Bureau ordered the company to correct its illegal behavior and imposed a fine of 20,000 yuan. The company's outstanding quota is calculated according to the average carbon price of 42.85 yuan per ton of carbon emission quota transaction in the national carbon market in 2021: $45\,853 \times 42.85 = 1\,964\,801.05$ yuan, and the amount of punishment is only 20,000 yuan, and the gap between the amount of performance is too large, some enterprises take the risk of punishment in terms of data processing fraud or cause performance failure[5]. And the violation of the

enterprise overdue correction, in the allocation of the next year's carbon emission quota, will face the same amount of verification of the insufficient part of the penalty.

2.2. Legal risks in the process of registration, trading and settlement of carbon emission rights

The registration of carbon emission rights is the first step for trading entities to enter the market after confirming their rights. The registered account is used to record the holding, change, settlement and cancellation of carbon emission rights. At present, the national carbon emission right registration subjects, trading subjects and settlement subjects are only included in the key emission enterprises in the power generation industry, and the remaining seven key energy consumption industries (petrochemical, civil aviation, steel, etc.) are steadily advancing when the time is ripe, and gradually included in the national carbon market system. Both parties involved in carbon trading are required to open three types of accounts: registration account, trading account and fund settlement account[6]. These three types of accounts are connected to each other and cannot be without each other. Legal risks in the carbon emission rights registration process: First, after receiving the application for opening an account of an enterprise, the registration authority will conduct an authenticity review of all the information submitted by the registration subject, which may result in a registration subject opening multiple registration accounts, using false documents to open registration accounts and other errors, and one party of the transaction subject may have fraud or false transactions causing investment losses to the other party; Second, when the information of the registration subject changes, it does not go through the change procedures in time, and the registration authority does not take measures to restrict the use of unqualified accounts, which may lead to the loss of the other party due to the wrong judgment of the transaction caused by illegal business; Third, the construction of the national carbon market adopts the "twin cities" model, the registration center and settlement center are located in Wuhan, and the trading center is located in Shanghai. The data related to carbon emission rights are subordinate to two different entities, and the two entities have their own information systems. If the data is not verified in real time, the two centers are prone to the risk of data errors.

China's carbon trading mainly implements spot trading, and the trading entity needs to deposit the transaction settlement fund in advance in the special account of the transaction settlement fund opened by the registration institution. The corresponding funds declared by the purchaser to purchase the trading product shall be less than or equal to the funds available in its trading account; The amount of trading products declared by the seller should be less than or equal to the amount available for trading in its trading account, in order to ensure the safety of trading. Carbon emissions trading is divided into two ways, the first way is online public trading, the second way is offline agreement transfer, different trading modes bring very different risks. Because online trading is carried out in the network system, the transaction risk is relatively low. However, if the quota of the seller enterprise is obtained through illegal means of data fraud to achieve the purpose of emission reduction, and then the surplus quota is sold, there is a risk of invalid trading contract, which will cause the buyer to suffer losses[7]. The offline agreement transfer is based on the will of both parties to the transaction. If there is uncertainty in the terms of the contract, there may be fraud, malicious collusion, spreading false information, inadequate execution and other problems, resulting in losses for the transaction party in the settlement process. For example, in the case of the contract dispute between Micro Carbon (Guangzhou) Low Carbon Technology Co., Ltd. and Guangzhou Carbon Emission Trading Center Co., LTD., there was a long-term delivery clause of the carbon emission quota transfer payment in the carbon emission trading contract signed by Micro Carbon (Guangzhou) Low Carbon Technology Co., Ltd. and Dongguan Tongming Electric Power Co., LTD., which resulted in the lack of payment and led to civil litigation.

2.3. Carbon emissions data monitoring, reporting and verification (MRV) system legal risks

MRV is an acronym for Monitoring, Reporting and Verification. It is a system for monitoring, reporting and verification of greenhouse gas emissions of participants in the carbon trading market. Enterprise monitoring, reporting and third-party verification agencies are important means to complete the data work, and carbon allowances are calculated on the basis of carbon emission data. In 2017, the National Development and Reform Commission issued the Notice on Making Carbon Emission Reporting and Verification and Emission Monitoring Plans for 2016 and 2017; in 2021, the Ministry of Ecology and Environment issued the Notice on Accounting Methods and Reporting Guidelines for Greenhouse Gas Emissions of Enterprises (Power Generation Facilities). These two documents regulate the accounting, reporting and verification of carbon emissions, and specify the verification principles and basis, verification procedures and key points in detail. Monitoring refers to the monitoring and measurement of greenhouse gas emissions by enterprises or entrusted third-party technical service institutions, including monitoring of activity level data and monitoring of emission factors, etc. In the monitoring process, if there are data tampering, concealment, false reporting, data fraud and other violations such as changing monitoring samples, enterprises will face administrative penalties, bear civil liability and other legal risks. The third party technical service institutions will face the legal risk of bearing civil and criminal liability[8].

Carbon emission report refers to the inventory that calculates the GHG emission information of key emitters in all aspects of social and production activities. It shows the GHG emission, activity level and emission factor data. The risk of carbon emission reporting is manifested in the following two aspects: On the one hand, the reported data will reveal the measures taken by the company in response to greenhouse gas management and climate change. The inauthenticity of the reported data will not only affect the social image of enterprises, but also make enterprises face legal risks such as administrative penalties and the reduction of the equivalent amount of quotas in the following year. It will also cause banks to overestimate the competitiveness of enterprises when carrying out green credit projects for energy conservation, emission reduction and efficiency improvement, thus increasing the amount of green credit. If banks cannot recover loans in time, the risk of lawsuits is high. Reporting errors or omissions will greatly affect investors' investment judgment, greatly increase the possibility of investment failure, and then make enterprises face the legal risk of being sued. On the other hand, some third-party technical service agencies, driven by interests, take risks to carry out data falsification, tampering and falsifying test reports. There are also some technical service agencies to reduce the cost of carbon business layer by layer subcontracting, there is a "signature" "name" phenomenon, the above circumstances are easy to make these agencies in the illegal situation. In 2022, the Ministry of Ecology and Environment notified that Liaoning East Coal Testing and Analysis Institute Co., Ltd. was suspected of fabricating false test reports and other four typical problem cases, which can be seen. If the enterprise colludes with the institution in this process, it may also bear the corresponding legal responsibility.

Carbon verification is the core step of the carbon market. It is a process in which provincial ecological and environmental authorities and entrusted third-party verification agencies systematically and independently evaluate and document GHG reports according to the verification guidelines. The verified data is the basis for the allocation of quotas, the annual compliance of enterprises and the establishment of emission reduction targets by enterprises, and the guarantee for the implementation of carbon trading. Through the verification of third-party verification institutions, the independent review and judgment of six types of greenhouse gas emissions such as carbon dioxide in the specified period of time of the enterprise. In order to build a three-level greenhouse gas emission accounting system for the state, local governments and enterprises, and implement the task of direct reporting of greenhouse gas

emission data by key enterprises, the National Development and Reform Commission has successively issued greenhouse gas emission accounting methods and reporting guidelines for enterprises in 24 key industries since 2013. The accounting index, quality index, report scope and other contents are standardized respectively, but there are some problems in the actual operation, such as non-compliance of the verification procedure and obvious false verification conclusions. At present, there are some problems in the carbon verification work, such as a small number of testing institutions, tight verification time, uneven quality of personnel in testing institutions, insufficient accounting standards, and imperfect carbon verification and supervision system. If third-party verification institutions verify data falsification or collude with enterprises to falsify, they will face the legal risk of cancellation of verification qualification and bear civil and criminal liability[9]. Key emission enterprises will bear administrative responsibility for data fraud, be fined, the same amount of reduction in the next year's quota and other penalties, and be included in the credit system. If the crime of providing false supporting documents is involved, criminal responsibility shall be investigated according to law.

2.4. Legal risks of false disclosure of carbon emission information

The carbon emission information disclosure system can enable the environmental protection department to grasp the emission situation of the region in a timely and comprehensive manner, and provide an objective basis for the scientific and reasonable determination of emission permit quotas. True and effective information disclosure is a guarantee for the healthy development of the carbon market, and key emitters should disclose their greenhouse gas emissions of the previous year in a timely manner after the completion of the settlement of carbon emission quotas. The legal risks of carbon emission information disclosure mainly include: first, the risk of false statements in carbon information disclosure documents. Various parties involved in carbon trading, MRV and settlement compliance may commit fraud. Enterprises, third parties and other parties may have different degrees of false statements. Second, the data involved in the process of carbon reduction may be at risk of fraud or fraud. The original records of GHG emissions reporting data are untrue and incomplete, and the manipulation or falsification of emissions data or ledger records, which are important elements of GHG emissions reporting, can cause harm to countries or investors. The false disclosure of carbon emission information may have legal risks of illegal disclosure, non-disclosure of important information, crime of providing false supporting documents, and major false disclosure of supporting documents[10].

3. Reference for foreign regulation of carbon emission trading

3.1. EU carbon emission trading regulations and implications

3.1.1. Concepts and characteristics of automated administration

The European Union Trading System (EUETS) was officially launched in early 2008 after a three-year trial run. Taking the previous three-country emissions trading system as a reference, the EU adopted a cap-and-trade model to allocate emission allowances to the enterprises under its jurisdiction. Enterprises can choose how to reduce emissions, which can reduce the cost of emission reduction, and even earn profits by buying and selling quotas.

The implementation process of the EU emissions trading system is divided into three stages. The period from 2005 to 2007 was the previous exploration phase, mainly through exploration to accumulate experience. This phase of the ETS will cover high-emission facilities that produce 46% of the EU's total CO₂ emissions. There are five major energy-consuming industries involved, namely oil and steel, building materials, energy supply and paper industry. From 2008 to 2012, it was the stage of promoting the implementation of energy conservation and emission

reduction driven by the market mechanism. By summarizing the experience of the first stage, the scope of industry fields and greenhouse gases included was expanded, and the countries covered were increased to 30 countries. The period from 2013 to 2020 is a more mature and smooth operation stage. At this stage, it is mainly to continuously improve the emission trading system and expand its coverage from the perspective of scope: from the perspective of quota allocation, a unified total emission amount should be established throughout the EU, and the free allocation of quotas should be gradually replaced by auction, while the restriction on external emission reduction credit offset is increased. The complete supervision and punishment mechanism can promote the good operation of the trading system. The monitoring mechanism of the EU ETS has three parts: the EU monitoring report is used as a model, which each member State must use as a guide to develop its own national and monitoring procedures and reports: Each country sets monitoring standards, which each emitter must submit reports to. At the same time, countries entrust independent third-party verification institutions to conduct audits and certifications; The verification authority entrusted by the country shall ensure that the emission reductions certified in the trading system of the country are consistent with the actual emissions reductions of the abatement company after verification.

The EU has developed a strict punishment mechanism, including the emission trading directive, the monitoring report directive and the certification system, which have clearly stipulated legal responsibilities and punishment measures through legislation. EU rules require member states to pay up their excess emission allowances, with heavy fines for non-compliance and a corresponding amount deducted from the following year's emission allowances. The EU's fines have risen from €40 per tonne of excess CO₂ emissions to €100 per tonne, five times the price freely traded in the carbon market. Strict punishment means for the good operation of the carbon trading market "escort".

3.1.2. Implications of EU carbon emission trading regulation

(1) Establishing a cap-and-trade mechanism for carbon emissions

The advantage of setting the total quantity control is that the quota allocation under the total quantity condition is more scientific and reasonable[11]. By collecting historical data on greenhouse gas emissions and monitoring emission reductions, emission targets and tasks are set, and key emission industries are cross-complemented through trading. If the emitters have surplus allowances through the optimization of emission reduction technologies, they can choose to sell them to achieve profit purposes; if the emission reduction target is not met, they need to buy additional credits through the trading market. Through market-based trading mechanism, the scarcity of carbon emission rights is created and the commodity characteristics of environmental resources are strengthened. Make use of market mechanism to rationally allocate environmental resources.

(2) A complete legislative system has been formed

The reason why the EU has formed a large-scale and orderly carbon emission trading market is inseparable from a complete legal system. The carbon trading law of the European Union regulates all aspects of the carbon trading market in member states. The EU carbon trading legal system consists of three levels: international conventions, EU law and national law of member states. Taking carbon emission regulation as an example, the provisions of the Framework Directive on Carbon Emission Trading can be seen that the EU attaches great importance to the regulation of the carbon trading market, and all aspects that need to be regulated and guaranteed through the legal system. It includes the subject of supervision, the object of supervision, the method of supervision, the reporting procedure, the specific verification steps and the punishment measures for failing to perform the agreement on time. In terms of the coverage of emission reduction industries and target allocation, the directive elaborated the relevant contents and specific emission reduction targets of the Kyoto Protocol

on energy conservation and emission reduction, making the emission reduction plan more feasible. The EU sets overall emission reduction targets, which are allocated according to the level of economic development and historical emissions of each member state. At the same time, the Responsibility Sharing Agreement has been formulated based on the actual emission reduction capacity of member states, which is mandatory and binding on all member states.

(3) An open and transparent information disclosure system has been established

Open and transparent information disclosure system is an important way to realize subject participation and public supervision. Especially the carbon emission trading system, which uses market-oriented means to carry out energy conservation and emission reduction system, the higher the degree of marketization, the transaction has certain risks. The formulation of trading prices, models, market risks, and the formulation of relevant policies all require an open and transparent environment and a relatively high degree of information disclosure. The EU has a large scale carbon emission trading market with many member states. The reasonable and orderly operation of the market and the sharing of international carbon trading information can not be separated from its perfect and open information disclosure system.

(4) Have a strict punishment mechanism

The EU has a strict punishment mechanism for violations of carbon trading related entities. Taking the excess emissions of the emitting subjects in the trading system as an example, the EU has limits on the annual greenhouse gas emissions of each member state, and the carbon dioxide emissions must be within the prescribed range. Carbon dioxide emissions that are smaller than required can be used for carbon trading. If the enterprise's emissions exceed the prescribed allowable emissions, it can purchase additional carbon allowances to fulfill the settlement obligation. If you violate the relevant laws and regulations, you will be punished. In terms of economic means, the amount of excess emission fine is higher than the carbon price in the current trading market. After paying the fine, you still need to deduct the emission credits of the following year, and if the circumstances are serious, you will be investigated for criminal responsibility. The establishment of a strict punishment mechanism and the use of strict legal liability to constrain emission enterprises to voluntarily comply with trading regulations will help smooth and orderly carbon emission trading and promote the realization of energy conservation and emission reduction goals[12].

3.2. Carbon emission trading regulations and implications in the United States

3.2.1. Us carbon emission trading regulation

In response to climate change, the US government has put forward a series of national bills on greenhouse gas emission reduction, including the Global Change Mitigation Act, the Safe Climate Act, the Low Carbon Economy Act, the US Climate Security Act, etc. From the legislative level, federal legislation is not the basis of the carbon emission trading system in the US. America's emissions trading scheme must first be voluntary. In January 2003, the United States established the Chicago Climate Exchange, a legally binding trading platform for the cap-and-trade system. To provide eligible trading entities with a member market platform for emission credit trading, in order to achieve the purpose of controlling greenhouse gas emissions. First, there is a wide variety of products that can be traded on the exchange, including greenhouse gas emission allowances, post-certification emission offsets and post-certification time-limited action offsets. Secondly, the trading mechanism is fully market-oriented, the trading process and trading price are open and transparent, and members can inquire information at any time to ensure their own interests. At the same time, a convenient electronic transaction method is adopted, and all transactions of quota registration, circulation and settlement are directly connected with the exchange registration and settlement system: Finally, in order to ensure the fairness of certification, the exchange will appoint a qualified third-party certification body to

conduct certification. Members can choose from authorized certification authorities or provide their own certification authority with the approval of the exchange.

America's regional emissions trading system is growing fast. In the United States has three well-known regional project, which came into effect in 2009, the regional greenhouse gas action (RegionalGreenhouseGasInitiative, RGGI) is the most representative. In the United States, it is the first market-based mandatory emission reduction trading system with a cap-and-trade model for carbon dioxide. At the regional legislative level, RGGI creates flexible and uniform trading rules and an emissions trading scheme combined with individual state carbon trading rules. It not only reduces the obstacles of unified legislation in the states, but also bases on the actual economic development and regulatory power of each state. At the same time, it is not scattered but a complete and unified carbon emission trading system[13]. In addition to the unified and flexible trading system, the US government's environmental awareness and enterprises' awareness of emissions trading are relatively high, which is also a solid force for carbon emissions trading to form and continue to promote progress in the United States.

3.2.2. Implications of the US carbon emission trading regulation

(1) Introduce relevant bills to regulate emissions trading

The United States has passed a lot of bills to control greenhouse gas emissions in the early days, including the Clean Air Act, which is directly related to carbon emission trading, which encourages enterprises to actively participate in the trading market of sulfur dioxide emissions, in order to achieve the purpose of controlling air pollution. The Clean Air Act, enacted during the Obama administration, regulated greenhouse gases that were not previously considered pollutants. The act was enforceable, and with its enactment a uniform emissions trading system was established in the United States. In addition, many states and regions in the United States have also introduced relevant bills to limit greenhouse gas emissions, the main purpose is to control industrial emissions, limit greenhouse gas emissions, and control air pollution. At the same time, the corresponding punishment measures for violations of the regulations are provided.

(2) A strict market access system has been formulated

Practical experience shows that too narrow coverage of carbon emission reduction industries and too wide market access standards are not conducive to the realization of emission reduction targets. Although the United States is mainly voluntary emission reduction, its emission reduction industry coverage is very wide, and the total emissions of the industries and enterprises included in the emission reduction account for 75% of the entire country. In addition to heavy industry, which emits more carbon dioxide, enterprises with total emissions of more than 10,000 tons are within the main scope of their emission reduction. The European Union monitors emissions reductions more broadly, notably including aviation in 2007. Despite the involvement of individual member states and many international issues, the EU's overall emission reduction system and institutional design has always been at the forefront of the world.

(3) Establish a reasonable carbon quota allocation mechanism

The transaction distribution mechanism of California adopts the mixed distribution mode of free distribution and auction distribution based on the principle of complete auction. It basically includes several energy-intensive fields and industries in this action, which provides an example for emissions trading in other states while improving the climate environment for California's energy conservation and emission reduction. In the process of transferring from free distribution to auction distribution, the related supporting systems involved have been stipulated openly and uniformly. For example, a quota price reserve has been established to control high volatility in transaction costs, free quotas have been established to protect local taxpayers, and industrial reserves have been set aside to prevent carbon leakage.

California's trading mechanism regulations not only make provisions on the scope of the coverage of the industry and trading principles, but also make provisions on the detailed process of quota auction. First of all, the minimum reserve transaction price is established in order to maintain the stability of the trading market and avoid some market speculation in the auction process to cause the emission trading price too high or too low[14]. If in the process of the transaction, the price of the transferor is lower than the minimum reserved transaction price, the transaction will not be completed. In order to ensure the openness and legality of the entire auction process, California has also issued a special bill to strictly regulate the auction. This includes strict oversight and maximum transparency of subsequent processes.

4. Carbon emission trading legal risk prevention countermeasures

To improve the carbon emission trading market, it is necessary not only to systemize the regulation from the environmental basic law to the separate law, but also to improve the carbon emission trading system itself. Therefore, China should learn from the successful international experience, combined with the international situation and the actual economic and social development of our country, and design a set of economic incentives for carbon emission trading that can effectively promote the development of low carbon economy and also integrate with the international carbon emission trading market, in order to form a set of legal system of carbon emission trading that meets the requirements of our "indigenization" in Chinese context.

4.1. Reasonable determination of the total carbon emission control mechanism

The determination of the total amount of carbon emissions is the core link of the establishment of carbon emission trading system. If there is no total carbon emission control, enterprises will emit greenhouse gases into the atmosphere without limit, so that the concentration of greenhouse gases in the atmosphere exceeds the level of the climate system is protected from destruction, and then destroy the global climate resources. This way of setting a cap on the total amount of carbon dioxide emissions makes carbon dioxide emission rights become a scarce resource and have the attribute of commodities, which provides the possibility for the establishment of carbon emission rights trading market.

Some scholars believe that in the initial stage of carbon trading pilot, due to the lack of relevant data basis and experience, the bottom-up aggregate formulation method can be adopted. After the carbon trading pilot has accumulated a certain number of years of experience, the historical emission data method can be adopted to measure and formulate a more scientific and strict total emission. Therefore, in order to effectively deal with climate change and air pollution, China's total carbon emission control mechanism should be determined from the following aspects: First, through legislation to determine the total carbon emission control mechanism, and clarify the specific content and procedure of total carbon emission control. Secondly, in order to make it easy for enterprises to accept the carbon emission trading system, attention should be paid to the gradual control of total carbon emissions, and the key enterprises in key industries with large carbon emissions should be strictly monitored first, and then all enterprises should be monitored when the time is ripe. Third, under the principle of "common and differentiated responsibilities", the national environmental protection department monitors the carbon emission data of different enterprises in China, and then determines the total carbon emission in China by scientific methods according to the economic development status, environmental quality requirements and carbon emission reality.

4.2. Allocation of carbon emission trading quotas

The allocation of carbon emission trading quota is an important link of carbon emission trading system. There are mainly free distribution, paid distribution, free and paid combination of mixed models. The free allocation model is more effective in the initial stage of carbon emission

trading, which can reduce the burden on enterprises and is easy to be accepted by enterprises. The paid distribution model mainly takes the form of auction and fixed price sale, which can internalize the external costs caused by greenhouse gas emissions and does not require the government to formulate complex distribution rules. However, in the initial stage of operation of the carbon trading system, it is easy to impose excessive burdens on enterprises and affect the enthusiasm of participants. Mixing mode includes progressive mixing mode and industry mixing mode. The progressive hybrid model is to allocate all or most of the quotas for free at the initial stage of the establishment of the carbon trading market, and then gradually increase the proportion of auction, and finally achieve all auction. The mixed industry model fully considers the characteristics of different industries, adopts auction or paid distribution for industries that are easy to transfer costs, and adopts free distribution to encourage carbon-intensive and easily affected industries to participate in the carbon trading market. Most of the international carbon trading systems in the early stage of the choice of free allocation to gradually increase the proportion of auction in the progressive mixed mode, or according to the characteristics of the industry to choose auction or free allocation of industry mixed mode.

Judging from the current pilot practice of carbon emission trading, the allocation of carbon emission trading quotas in China is mainly based on free issuance, supplemented by paid methods such as auction or fixed price sale. Therefore, China's carbon emission trading should consider the fairness and acceptability of quota allocation, in order to ensure the balance of regional and industrial interests, choose a suitable quota allocation model for China. At the initial stage of China's carbon emission trading market, the allocation of carbon emission allowances should adopt a mixed model, that is, the state will first allocate carbon emission trading allowances to governments at all levels free of charge according to certain standards, and then the governments at all levels will allocate carbon emission trading allowances to enterprises with compensation or free of charge after considering the situation of enterprises. This can encourage and promote the development of carbon emission trading market more effectively, and lay a solid foundation for China to integrate with the international carbon emission trading market.

4.3. The choice of pricing mechanism

The pricing mechanism of carbon emission trading is one of the important contents in the design of carbon emission trading system. According to the economic principle, the scarcity of commodities is an important factor in determining the market price of commodities. However, the most fundamental difference between the carbon market and the general market is that the amount of carbon emission credits in the market directly depends on the government's decision on the allocation of carbon emission credits, and the market expectations for the future are mainly expectations for future emission reduction targets. In the short term, China's carbon emission trading market is still in its infancy, and when the design of carbon emission trading system is not mature enough, it can be considered to design a certain price control mechanism through the play of the role of the government, so as to reduce the market risks brought by policy changes and large fluctuations in market prices. Therefore, the government can reserve a certain proportion of carbon emission trading quotas in the initial allocation to mitigate the adverse effects of excessive price fluctuations. If the trading price of carbon emission rights in the market is too high, enterprises can buy quotas from the government at a fixed price, so that enterprises will not buy quotas at too high a price, thus reducing the burden on enterprises. On the contrary, if the trading price of carbon emission rights in the market is too low and there are too many carbon emission rights trading quotas, the government can ultimately achieve the purpose of raising the carbon emission rights trading price by buying more carbon trading quotas in the market. In the long run, with the development and improvement of China's carbon emission trading market, the price regulation of the carbon emission trading market will

gradually be influenced by the law of value, so that the market will spontaneously adjust the price of carbon emission trading. In addition, the price of carbon emissions trading is also affected by geographical and time factors. Therefore, we need to consider comprehensively the development stage, development status of the carbon emission trading market and other factors that may have an influence on the price of carbon emission trading when we make a choice on the pricing mechanism of carbon emission trading[15].

4.4. The improvement of government supervision mechanism

The supervision of the carbon emission trading market is an important guarantee for the healthy and orderly development of the carbon emission trading market. However, China has not yet established a unified carbon emission trading supervision and management organization. At present, the national carbon emission trading regulator is mainly the National Development and Reform Commission, while the local development and reform departments are mainly, which is easy to cause conflicts between the authority of the departments, and there is a "regulatory vacuum", which is not conducive to the supervision and management of the carbon emission trading market. The main contents of the legal system of carbon emission trading include carbon emission quota allocation, settlement, trading, carbon emission monitoring, reporting, verification, verification, legal liability, etc. In this process, government management departments should not only scientifically determine the total amount of carbon emissions and rationally allocate carbon emission trading quotas, but also effectively supervise and manage various problems arising from carbon emission trading, so as to maintain the fair and just market trading order of carbon emission trading and ensure the stability of carbon emission trading market. Second, the government should use financial, fiscal, tax and other macro-control means to strengthen the carbon emission rights

Regulation of trading markets. Finally, the government should adopt a series of policies and measures to encourage enterprises, organizations and individuals to actively and voluntarily participate in carbon emission trading, and promote the establishment of a unified national carbon emission trading market. Therefore, China should fully learn from the successful legislative experience of foreign countries, establish a carbon emission trading supervision and management body in line with China's national conditions, and gradually determine a unified regulatory system, such as organization and management bodies, certification and certification management bodies, accountability and identification bodies, etc., so as to eventually form a mature and perfect carbon emission trading supervision and management platform. To achieve effective supervision and management of carbon emission trading.

5. Conclusion

Carbon emission trading is an important policy tool to reduce greenhouse gas emissions and promote green and low-carbon development, which will play an important role in China's carbon emission reduction cause and is an important starting point for the implementation of the "double carbon" goal. Therefore, it is necessary to formulate perfect laws and regulations, guide the market to achieve ecological civilization construction, and provide legal guarantee for the formation of a safe, stable and efficient carbon trading market. From the previous experience, although there are still some twists and turns and shortcomings, China's carbon emission trading pilot has also provided experience for the development of the national carbon market. By analyzing the legal problems existing in the carbon market, this paper puts forward suggestions for improving the development of the carbon emission market. It is believed that in the future, relevant institutions in China will continue to reform and improve the relevant regulations of carbon emission trading according to China's national conditions, so as to achieve the goal of carbon peak before 2030 and carbon neutrality before 2060 as scheduled.

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