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Research on the Legal Nature and Regulatory Framework of the Carbon Trading Market under the Carbon Neutrality Goal

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Abstract: *As a core policy instrument for achieving China's "Dual Carbon Goals," the effectiveness and fairness of the national carbon emissions trading market (hereafter "carbon market") are highly dependent on a sound legal foundation. This paper aims to look beyond the surface-level activity of market practice to deeply analyze two fundamental legal issues underlying it: the legal nature of carbon emission allowances and the construction of a rule-of-law-based regulatory framework. Utilizing dogmatic, comparative, and empirical legal analysis, this paper systematically critiques the shortcomings of the "New Property Right Theory" and proposes that the essence of a carbon emission allowance is an "economic right enabled and regulated by public law." Its value derives from scarcity created by public law, while its circulation relies on the protection of private law rules. This theoretical reinterpretation provides a new perspective for resolving legal dilemmas concerning allowance pledging, inheritance, infringement, and expropriation compensation. Addressing regulatory realities, this paper identifies multidimensional challenges within the current system, including the absence of top-level legislation, overlapping regulatory competencies, a fragile MRV (Monitoring, Reporting, and Verification) system, and an ineffective enforcement mechanism. Ultimately, this paper proposes a systematic regulatory framework. This framework is led by a "Climate Change Response Law," centers on the balance between "power and rights," and integrates four key components: "dynamic cap-and-trade, intelligent data governance, unified supervision with collaborative enforcement, and a tiered legal liability system." The goal is to harness the complexity of the carbon market through high-level legal rationality, providing robust institutional safeguards for the national carbon neutrality transition.*

Keywords: *Carbon Emission Rights; Legal Nature; Public-Law Empowerment; Regulatory Framework; MRV System; Rule of Law*

1. Introduction

China's solemn declaration to the world of its goal to "achieve carbon peaking before 2030 and carbon neutrality before 2060" is not merely a climate commitment but also a profound and extensive systemic transformation of its economy and society. In this transformation, the national carbon emissions trading market (hereafter "carbon market") is placed at the core of the policy toolbox for its ability to efficiently allocate environmental capacity resources through market mechanisms. Since the power generation sector launched online trading in 2021, China's carbon market has rapidly grown into the world's largest by covered CO_2 emissions, with significant asset scale and financial potential.

However, in stark contrast to the fervent activity of market trading is the paleness and fragility of its legal foundation. The highest-level regulation currently supporting this vast market is merely the departmental rule "Interim Measures for the Management of Carbon Emission Trading" formulated by the Ministry of Ecology and Environment. This legislative situation of "a small horse pulling a heavy cart" creates dual anxiety in both theory and practice. At the theoretical level, what is the legal nature of the carbon emission allowance (EA), the primary tradable object in the market? Without a clear answer to this ontological question, a series of derivative legal relationships remain ambiguous: Can allowances be used as collateral for pledge financing? In corporate bankruptcy liquidation, should allowances be classified as bankruptcy estate or canceled? If government regulatory changes cause a sharp decrease in allowance value, can controlled enterprises seek administrative compensation? Resolving these questions urgently requires a fundamental clarification of the legal attributes of allowances [1]. At the practical level, unclear regulatory responsibilities and powers, questions regarding the fairness of the initial allocation mechanism, risks of data fraud in the verification process, and insufficient deterrence in the legal liability

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system collectively form the "Achilles' heel" constraining the healthy development of the carbon market[2].

Therefore, this paper argues that the future development of China's carbon market must shift from the accumulation of "quantity" in coverage scale to a leap in "quality" by strengthening its legal foundation. This research will first deconstruct and reconstruct the theory of the legal nature of carbon emission allowances as the logical starting point[3]. It will then systematically diagnose the chronic ailments of the current regulatory framework[1][2][4], ultimately proposing a blueprint for constructing a legal and regulatory system that is grounded in China's context and possesses both theoretical coherence and practical operability[5][6].

2. Theoretical Restatement of the Legal Nature of Carbon Emission Allowances: Moving Beyond the Myth of the "New Property Right"

The legal qualification of carbon allowances is the "genetic code" of the entire carbon market legal system, determining all subsequent rule design. While academic discussion on this topic has been ongoing, traditional theories show limitations when explaining Chinese practice[1][3].

2.1. The Explanatory Limitations and Evolution of Traditional Doctrines

2.1.1. Shift from "Pure Administrative License" to "Properization"

Early views regarded allowances as typical administrative licenses, emphasizing their public law benefit-granting nature and revocability. While this view reveals the origin of allowances, it completely ignores their distinct property value demonstrated in the secondary market. Adhering strictly to this theory would undermine the legal basis for free trading, pledge financing, and other market behaviors, as the transfer of administrative licenses is usually strictly restricted. In practice, market forces have spontaneously promoted the "properization" of allowances, compelling theory to catch up[1].

2.1.2. Contributions and Inherent Defects of the "Quasi-Property Right" Theory

This theory, drawing on property law, posits that the rights holder has exclusive control over a specific emission quota, with specific obligees and non-specific obligors, conforming to the characteristics of a right in rem[3][7]. This theory provides strong support for guaranteeing the stable holding of allowances and excluding interference from others. However, its defects are: Firstly, the principle of numerus clausus requires that the types and content of property rights be prescribed by law, which allowances currently lack. Secondly, the object of a property right typically has physical substance, whereas an allowance, as an intangible emission permit, exists solely by legal fiction of the state. Finally, and most crucially, the state's power to dynamically adjust the total allowance based on public interest (e.g., accelerating emission reduction) fundamentally conflicts with the inherent stability and exclusivity of property rights[1][2].

2.1.3. The Compromise and Ambiguity of the "Regulatory Property Right" Theory

To reconcile public and private law attributes, some scholars proposed the concept of a "regulatory property right." While enlightening, this formulation remains vague. The term "regulatory" fails to clearly reveal the decisive role of public power throughout the entire process of right creation, alteration, and extinction, potentially leading to the misunderstanding that public and private law attributes carry equal weight[1].

2.2. The Position of This Paper: Proposing an "Economic Right Enabled and Regulated by Public Law"

To describe the legal essence of allowances more precisely, this paper proposes that a carbon emission allowance is an "economic right enabled and regulated by public law." This characterization comprises the following three core, progressively layered tenets.

2.2.1. Public-Law Empowerment as the Origin of the Right

Allowances do not exist as "natural" or "pre-state" rights like traditional private rights[7]. Their birth stems from the state's exercise of its environmental regulatory function to address climate change as a "common concern of humankind." Through public law norms, the state transforms the previously free and unrestricted act of carbon emission into a scarce, manageable "legal permission." Without state

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intervention and institutional creation, allowances would be meaningless and valueless. The term "empowerment" accurately expresses that public law not only "restricts" the freedom to emit but also "creates" a previously non-existent legal entitlement[1][5].

2.2.2. Economic Value as the Content of the Right

The purpose of public-law empowerment is to introduce market mechanisms[8]. Once an allowance is initially allocated (whether paid or unpaid) to a specific controlled enterprise's account, it is transformed from a piece of paper into an asset with significant economic value. Enterprises can "save" allowances through technological innovation and efficiency improvements and sell them for profit in the market; conversely, if emissions exceed held allowances, they must purchase them. In this process, allowances clearly demonstrate their use value and exchange value as "commodities," becoming an important economic resource on corporate balance sheets[3][4].

2.2.3. Comprehensive Regulation Throughout the Exercise of the Right

The economic value of allowances is perpetually framed by public law regulation. This is evident in: (1) Controlled Cap: The total scale of rights (market-wide allowance cap) is set and dynamically adjusted by the government based on carbon neutrality goals, reflecting the state's ultimate sovereign control over environmental capacity[5]. (2) Defined Boundaries: The scope of rights (applicable sectors, gas types, calculation rules) is strictly defined by public law. (3) Explicit Duration: Allowances typically have compliance periods and validity dates, potentially expiring if overdue, unlike the perpetuity of general property rights. (4) Supervised Circulation: Their trading venue, participants, and methods are subject to dual supervision by financial and environmental regulators[4].

This theoretical qualification is not only more legally comprehensive but also has clear guiding value in judicial practice. For example, in allowance pledge contract disputes, courts should recognize their pledgeability as an "economic right," but must also understand that if the pledged allowance's value decreases due to state cap adjustments, the creditor cannot claim state compensation, as this is an inherent regulatory risk of the right[4]. In government expropriation compensation cases, if allowances are canceled early for public interest, fair compensation based on their market value should be provided, as this deprives the enterprise of a legal entitlement with property interest[3].

3. A Multi-Dimensional Examination: The Real-World Dilemmas and Deep-Seated Mechanisms of China's Carbon Market Regulation

Re-examining China's carbon market regulatory practice through the lens of this new understanding of the allowance's legal nature reveals that its dilemmas are rooted in a misapprehension of these attributes and a lack of legal supply[1][2].

3.1. Absence of Top-Level Legislation: The Root of Systemic Risk

The current regulatory system, centered on departmental rules, is unfit to command the whole situation. Its drawbacks are: First, lack of authority, making it difficult to coordinate with basic laws like the "Civil Code" (security interests), the "Enterprise Bankruptcy Law," and the "Criminal Law," leading to confusion in judicial application[1]. Second, lack of stability, as departmental regulations are subject to frequent adjustments due to policy changes, which hinders the formation of long-term stable expectations for market participants[1][5]. Finally, the limited coordination capacity, as departmental regulations often struggle to transcend departmental silos and make holistic arrangements for cross-sectoral issues such as fiscal policy, taxation, and finance. This is exemplified by issues like the allocation and use of allowance auction revenue and the division of regulatory responsibilities for carbon financial derivatives[4][5].

3.2. Disorder in the Allocation of Regulatory Powers: The Potential Risk of "Multiple Dragons Managing the Waters"

The Ministry of Ecology and Environment, as the lead agency, focuses its supervision on environmental benefits and emission data, but its professional capacity is stretched thin regarding increasingly active carbon finance activities. Simultaneously, financial regulators like the People's Bank of China and the China Securities Regulatory Commission have statutory authority over carbon market infrastructure (e.g., trading platforms, clearinghouses) and derivatives (e.g., carbon futures, options)[4]. If such overlapping mandates are not clearly delineated by higher-level legislation and supported by an efficient coordination mechanism, they can easily breed regulatory arbitrage or create regulatory gaps.

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This is particularly evident when addressing financial risks such as market manipulation and insider trading, potentially leading to a situation where everyone assumes someone else is responsible, resulting in collective inaction[2][4].

3.3. Dual Tests on the Justice and Efficiency of the Initial Allocation Mechanism

The current model, primarily based on free allocation, reduced resistance at the market's inception, but its inherent flaws are becoming apparent: The grandfathering approach essentially legitimizes past high-emission practices and entrenches them as "entitlements." This de facto penalizes early-mover companies that have invested in emission reductions and creates a reverse incentive that punishes the good and rewards the bad[5] [8]. Designing a smooth transition to Benchmarking and gradually introducing auctions that better reflect the "polluter pays" principle is a core issue related to the market's long-term viability and moral legitimacy[1][5].

3.4. The Trust Crisis of the MRV System: The Temptation of Data Fraud and the Inadequacy of Punishment

The Monitoring, Reporting, and Verification (MRV) system is the "heart" of the carbon market; data authenticity is its credit lifeblood. The current predicament lies in: First, questionable neutrality of verifiers. Verification agencies are hired and paid by the controlled enterprises, a financial relationship that may compromise independence and impartiality[2]. Second, lack of unified technical standards. Different verifiers may apply varying calculation methods for complex emission sources, affecting data comparability and fairness. Third, excessively low violation costs. The maximum fine for data fraud under the "Interim Measures" is almost negligible compared to the potential huge profits (through the sale of spurious surplus allowances or the circumvention of allowance procurement), offering little deterrence[1][2]. Without the "Sword of Damocles" of criminal liability, data fraud almost becomes a "high-reward, low-risk" speculation[2][9].

3.5. The Missing Gradient and Failed Deterrence of the Legal Liability System

The current liability system suffers from a structural imbalance characterized by the disproportionate dominance of administrative liability, the diluted role of civil liability, and the absence of criminal liability[1][2]. Regarding administrative liability: The fines imposed are insufficiently high to serve as an effective deterrent[2]. Regarding civil liability: Current regulations are largely silent on the legal pathways for bona fide traders, who suffer losses due to data fraud or market manipulation by others, to pursue civil claims[4]. Regarding criminal liability: Due to the lack of a direct interface with the Criminal Law, it is difficult to hold perpetrators accountable for egregious carbon emission data fraud that leads to severe consequences. This undoubtedly poses a profound challenge to the integrity of the market[1][2].

4. Systematic Reconstruction: Towards a Rule-of-Law-Based Carbon Market Regulatory Framework

Addressing the above dilemmas requires systematic legal reconstruction to build a modern regulatory framework with legally defined powers, efficient operation, and powerful enforcement[5][6].

4.1. The Cornerstone: Promoting High-Level Specialized Legislation

This is the master switch to solving all problems[1][5]. The legislative path can be two-fold: The near-term goal is for the State Council to promptly formulate and promulgate the "Carbon Emission Trading Management Regulations," providing comprehensive and systematic stipulations on allowance attributes, regulatory structure, allocation, trading, verification, compliance, and legal liability in the form of administrative regulations[5]. The long-term goal is for the National People's Congress to enact a "Climate Change Response Law" or "Low-Carbon Development Promotion Law" when conditions are ripe, dedicating a chapter to the carbon emission trading system to provide the highest legal basis and clarify its relationship with other laws[1][6].

4.2. The Core: Establishing a "Unified Leadership, Collaborative Implementation" Regulatory Model

Based on the "public-law empowered" nature of allowances, the Ministry of Ecology and

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Environment should be established as the core regulator of the carbon market. Simultaneously, a "Carbon Market Regulatory Inter-Ministerial Conference" system should be established through legislation, led by the State Council, with participation from the Ministry of Ecology and Environment, the People's Bank of China, the CSRC, the State Taxation Administration, the Ministry of Public Security, etc. This body would be responsible for assessing market risks, formulating collaborative policies, unifying enforcement standards, and sharing regulatory information, achieving seamless connection between environmental and financial supervision[4][5].

4.3. Key Principle I: Establishing a Fair and Dynamic Allowance Allocation System

Legislation should establish the principles of "cap-and-trade, categorized guidance, and steady advancement of paid allocation." It is recommended to establish an independent "National Carbon Allowance Allocation Committee" composed of environmental scientists, economists, legal scholars, and industry representatives, responsible for the scientific assessment and public hearing of allocation plans for different sectors, ensuring transparency in the process and fairness in outcomes[5]. The legislation should direct revenues from paid allocation (auctions) into the national Carbon Neutrality Fund, with its use rigorously designated for specific areas like supporting research and development of emission-reduction technologies and advancing a just transition[5][6].

4.4. Key Principle II: Forging a Rigid, Transparent, and Intelligent MRV Regulatory System

4.4.1. Institutional Rigidity

Implement a lifetime responsibility system and a "one-strike" blacklist system for verification bodies. Once collusive fraud is discovered, permanently revoke their qualifications and pursue significant joint liability for compensation[2].

4.4.2. Process Transparency

Establish a mandatory public disclosure system for corporate carbon emission data and verification reports, subject to public and peer supervision[2][10].

4.4.3. Intelligent Means

Mandate the installation of real-time monitoring equipment (e.g., CEMS) directly linked to the government regulatory platform at key emission points, and actively explore the application of blockchain technology for recording, storing, and verifying emission data, leveraging its immutability and traceability to technically eradicate the possibility of data fraud[6].

4.5. The Safeguard: Perfecting a Tiered and Multi-Dimensional Legal Liability System

4.5.1. Strengthen Administrative Liability

Significantly increase fine amounts, linking their calculation to the economic benefits gained from the violation or the environmental damage caused, implementing "daily penalties" or "multiple-based fines" to ensure the "punishment fits the violation."[2][9]

4.5.2. Activate Civil Liability

Clarify that traders who suffer losses due to market manipulation, insider trading, or data fraud have the right to file civil tort lawsuits claiming damages, using private enforcement to supplement public regulation[4].

4.5.3. Integrate Criminal Liability

Promote the revision of the "Criminal Law," considering adding the crimes of "Providing False Carbon Emission Data" and "Manipulating the Carbon Emission Trading Market," applying criminal penalties to illegal acts causing serious consequences, thus constructing the final legal defense line[1][2].

5. Conclusion

The construction of the national carbon market is a grand experiment crucial to the nation's future development. The arguments in this paper demonstrate that the success of this experiment cannot rely solely on the spontaneous order of the market or short-term policy drives but must be deeply rooted in

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mature legal rationality A precise grasp of the legal nature of carbon emission allowances—as an "economic right enabled and regulated by public law"—is the theoretical cornerstone for building all subsequent rules. Based on this, integrating regulatory resources through high-level legislation, defending data authenticity through a rigid MRV system, and maintaining market integrity through a tiered liability arrangement can systematically resolve the current dilemmas. The rule of law is the indispensable "rein" for taming the carbon market "steed." Only by harnessing it with the rein of law can China's carbon market gallop robustly along the correct track, ultimately reaching the grand destination of carbon neutrality.

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