

# **Transition from Dual Control of Energy Consumption to Dual Control of Carbon Emissions: Mechanism**

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**Abstract:** To achieve the "dual carbon" goals and drive high-quality development, China will comprehensively initiate a systemic institutional reform from dual energy consumption control to dual carbon emission control during the 14th Five-Year Plan period, advancing carbon management toward refinement. Based on regulation tools and environmental governance theory, this study systematically analyzes the internal mechanisms of this transition, constructs a specific implementation framework, and evaluates its potential emission reduction effects from three dimensions: energy structure optimization, industrial structure upgrading, and regional coordinated development. The findings indicate that this transition, centered on carbon emissions, emphasizes the synergy of market mechanisms and administrative measures, covering all stages of the industrial chain. To ensure smooth implementation, further improvements in the carbon emission accounting system, enhanced technical support, and strengthened incentive-constraint mechanisms are required. This transition is expected to significantly promote cleaner energy structures, higher-end industrial structures, and regional coordinated emission reductions. The study aims to provide theoretical support and practical guidance for refining carbon control during the 14th Five-Year Plan period.

**Keywords:** Dual Control of Energy Consumption; Dual Control of Carbon Emissions; Implementation Pathways; Emission Reduction Effects

## **1. Introduction**

### **1.1 Research Background**

The dual control system of energy consumption has played a key role in supporting economic growth and reducing carbon emission intensity.

However, in the face of the requirements of the "dual carbon" goals and high-quality development, its limitations have become increasingly prominent: it only controls the total energy consumption without distinguishing the carbon attributes of energy, leading to inaccurate control orientation; its measures focus on administrative orders with insufficient flexibility; and it does not cover carbon emissions from non-energy activities. These systemic defects make it difficult for it to adapt to the emission reduction requirements of the new stage.

The full-scale transformation to the dual control of carbon emissions launched at the end of 2025 marks a new stage of carbon control featuring precise regulation with the "total amount and intensity of carbon emissions" as the core. This move aims to directly focus on the core task of emission reduction and overcome the deviations of the original system. The 15th Five-Year Plan period is a critical stage for the implementation of this transformation, but current research still lacks an integrated analysis of its internal logic, implementation path and comprehensive effects. Therefore, scientifically analyzing the transformation mechanism, constructing an operable framework and prospectively evaluating its effects have become an urgent task. This study aims to address the aforementioned issues and provide theoretical references for building a precise carbon management system.

### **1.2 Research Significance**

This paper has important value and practical significance at both the theoretical research and practical application levels. At the theoretical level, a systematic analysis of the policy transformation mechanism from the dual control of energy consumption to the dual control of carbon emissions can make up for the research gap in the existing research that lacks systematic theoretical discussion on this issue, thereby enriching the theoretical research system of China's environmental policy transformation. At the same time, the implementation path and

analysis framework of the dual control of carbon emissions constructed in this study can also provide a new research perspective for subsequent research in the field of carbon control. At the practical level, the scientific implementation path and specific effect evaluation proposed in the study can provide direct practical reference for the central and local governments to design and implement precise carbon control policies; the targeted countermeasures and suggestions for the transformation help promote the steady transformation of carbon control policies, effectively avoid various development risks in the transformation process, thus boosting the high-quality advancement of the "dual carbon" development goals during the 15th Five-Year Plan period, and ultimately realizing the coordinated and mutually beneficial win-win of low-carbon development and economic growth.

### **1.3 Research Status**

#### **1.3.1 Foreign research status**

Foreign research in the field of carbon control started early and has formed a relatively mature theoretical framework and practical application system. Its research focus has long been on the policy design and implementation effect evaluation of the total amount and intensity control of carbon emissions. Early research mainly focused on the construction of the carbon emission trading market. In the 1970s, some studies had put forward the theoretical framework of carbon emission trading, indicating that market mechanisms can help achieve low-cost emission reduction. Subsequently, research gradually focused on the synergistic effect between carbon control policies, energy structure optimization and industrial transformation. A landmark report released in the early 21st century emphasized that carbon control must be deeply integrated with energy transformation and industrial upgrading to achieve long-term emission reduction goals.

In recent years, with the strengthening of the global consensus on carbon neutrality, foreign research has further shifted to the exploration of precise carbon control paths, designing differentiated carbon control policies by identifying the emission reduction potential of different industries and regions. A 2024 study by an international organization pointed out that precise carbon control should formulate

corresponding plans based on the characteristics of each country's industrial structure to avoid policy homogenization. At the same time, research also emphasizes the coordinated use of market incentives and administrative orders, promoting a model that combines carbon tax, carbon trading and administrative control. However, these studies are based on the energy structure, development stage and market mechanism of various countries, and there are obvious differences with the policy background and implementation environment of China's transformation from the dual control of energy consumption to the dual control of carbon emissions. Therefore, they cannot be directly applied to domestic practice.

#### **1.3.2 Domestic research status**

In recent years, China's research on the dual control of energy consumption and the dual control of carbon emissions has gradually emerged, especially after the central government put forward relevant requirements for policy transformation at the end of 2025, research in this field has become a research hotspot in the field of environmental economy:

First, research on the limitations of the dual control of energy consumption and the necessity of transformation. Domestic scholars generally believe that the dual control of energy consumption has prominent problems such as insufficient control accuracy and poor coordination with energy transformation in the advancement of the "dual carbon" goals. Jiang et al. pointed out that the dual control of energy consumption fails to effectively distinguish the carbon intensity of different energy sources, which may lead to an adverse incentive phenomenon of "high-carbon energy crowding out low-carbon energy", which is also not conducive to the market-oriented development of the renewable energy industry [1]. Li et al. argued that the implementation mode of the administratively led dual control of energy consumption lacks sufficient policy flexibility and is difficult to meet the development needs of the market economy. Therefore, promoting its transformation to the dual control of carbon emissions is an inevitable choice for the development of carbon control [2].

Second, research on the policy design and implementation difficulties of the dual control of carbon emissions. Existing research mainly focuses on core elements such as the construction of indicator systems and the design

of implementation mechanisms. From the perspective of new productive forces, Wang et al. emphasized that the dual control of carbon emissions should be advanced in coordination with digital and green transformation, and the goal of emission reduction can be achieved by upgrading the manufacturing structure and improving total factor productivity [3]. Xuan pointed out that it is necessary to actively expand the scope and role of the national carbon trading market, give play to the role of "carbon tax" and "carbon standards", improve the institutional and functional settings of the "dual carbon control" policy, create an incentive-compatible environment, and effectively stimulate the enthusiasm of various regions to carry out the "dual carbon control" work [4]. In addition, domestic scholars generally believe that carbon emission accounting is the foundation of policy transformation, but currently it faces problems such as difficulty in data acquisition and inconsistent accounting standards, which directly affect the implementation effect of the dual control policy. Third, research on the mechanism and effects of policy transformation. Some scholars have begun to pay attention to the transformation logic from the dual control of energy consumption to the dual control of carbon emissions. Yuan pointed out that in terms of paths, it is necessary to improve top-level design, supporting measures and tools, build a complete dual control system of carbon emissions, coordinate the advancement of energy, industrial structure, economic system transformation and the construction of the dual control system of carbon emissions, develop carbon budget and carbon market, optimize carbon emission assessment, enhance the global governance capacity for carbon emission control, and set a policy transition period to avoid short-term faults [5]. However, the existing research has a single dimension for evaluating emission reduction effects, lacking a comprehensive evaluation of the synergistic emission reduction effects of the three dimensions of energy, industry and region. In addition, some studies have failed to fully integrate the policy orientation of the 15th Five-Year Plan. This paper will conduct a systematic research starting from this point.

To sum up, foreign and domestic research have formed a certain foundation. Foreign research has established a carbon control theory with

market mechanisms as the core, and recently emphasized policy coordination and precise design, but its conclusions are based on Western contexts and are difficult to be directly applied to China's policy traditions and development stages. Domestic research mainly focuses on three aspects: first, a critical analysis of the limitations of the dual control of energy consumption and the necessity of transformation; second, a forward-looking discussion on the implementation support of the dual control of carbon emissions such as the accounting system and differentiated mechanisms; third, a preliminary analysis of the theoretical logic and potential effects of the transformation. However, the existing research still has deficiencies in depth and breadth: the systematic explanation of the internal mechanism of the transformation is insufficient, and there is a lack of in-depth analysis combined with the critical period of the 15th Five-Year Plan; a complete path connecting top-level design and practical implementation has not been constructed; the comprehensive evaluation of the synergistic emission reduction effects of energy, industry and regions is relatively weak. This paper aims to address these gaps and provide a more systematic mechanism analysis, a more complete path construction and a more comprehensive effect evaluation.

## **1.4 Research Ideas and Methods**

### **1.4.1 Research ideas**

Taking the transformation from the "dual control of energy consumption" to the "dual control of carbon emissions" as the main line and based on the planning background of the 15th Five-Year Plan period, this paper unfolds in the logical order of "background analysis - mechanism explanation - path construction - effect evaluation - countermeasures and suggestions". First, it comprehensively sorts out the policy evolution and the latest research trends at home and abroad, and defines the transformation background and significance. Second, it deeply analyzes the realistic motivations and internal logic of the transformation. Third, in accordance with the latest policy orientation, it systematically constructs the implementation path of the dual control of carbon emissions during the 15th Five-Year Plan period. Then, it qualitatively evaluates its emission reduction effects from three dimensions: energy structure, industrial upgrading and regional coordination. Finally, it puts forward systematic policy

suggestions.

#### 1.4.2 Research methods

This paper mainly adopts the following three methods:

First, the literature research method. By systematically combing authoritative literature at home and abroad and the latest policy documents, it grasps the research frontier and policy trends, laying a research foundation.

Second, the theoretical analysis method. Relying on relevant theories such as policy instruments and environmental governance, it deeply analyzes the internal mechanism of policy transformation, providing a theoretical framework for subsequent research.

Third, the inductive summary method. By summarizing the existing policy practices and academic viewpoints, it concludes the transformation characteristics and difficulties, and then refines targeted policy suggestions.

### 1.5 Research Innovations

The main innovations of this study are reflected in the following three aspects:

First, in terms of research perspective, closely focusing on the critical transformation period of the 15th Five-Year Plan, it organically integrates the transformation of carbon control policies with the "dual carbon" goals and high-quality economic development, focuses on its characteristics of precise regulation and collaborative governance, making up for the limitation of insufficient analysis of the relevance of the times background in existing research.

Second, in terms of research content, it systematically explains the internal mechanism of policy transformation, constructs a trinity analysis framework of "goal - method - scope", and comprehensively evaluates the emission reduction effects from the three major systems of energy, industry and region, breaking through the limitation of a single evaluation dimension in existing research.

Third, in terms of practical application, combined with the latest policy trends and academic achievements, it designs an implementation path with both pertinence and operability. The suggestions put forward can provide direct reference for policy optimization during the 15th Five-Year Plan period and meet the implementation needs of local governments.

## 2. Related Concepts and Theoretical Basis

### 2.1 Definition of Related Concepts

#### 2.1.1 Dual control of energy consumption

The dual control of energy consumption refers to a policy framework for the dual control of total energy consumption and energy consumption intensity (energy consumption per unit of GDP). Its core goal is to "save energy and reduce consumption". By setting binding indicators, it mainly relies on administrative orders and assessment and accountability to promote the improvement of energy utilization efficiency. This policy covers all energy consumption and is the core tool of China's carbon control from the 11th Five-Year Plan to the 14th Five-Year Plan. However, it is characterized by "emphasizing total energy volume and neglecting carbon content" and failing to distinguish the differences in carbon emissions of different energy sources [1,2].

#### 2.1.2 Dual control of carbon emissions

The dual control of carbon emissions refers to the dual control of total carbon emissions and carbon emission intensity (carbon emissions per unit of GDP). Its core orientation is "carbon emission reduction", focusing on carbon dioxide emissions from fossil energy consumption and industrial processes, and distinguishing the differences in the carbon intensity of energy sources. This policy attaches importance to the combination of administrative measures and market incentives (such as carbon trading and carbon tax), and its control scope covers carbon emissions in all fields. It aims to connect with the "dual carbon" goals in a more precise and coordinated manner, and is regarded as the upgrading and optimization of the dual control of energy consumption [6].

#### 2.1.3 Policy transformation mechanism

The policy transformation mechanism refers to the internal logic, driving forces and laws of the transformation from the dual control of energy consumption to the dual control of carbon emissions. Its essence is the systematic upgrading of carbon control policies in terms of goals, tools, methods and scope to adapt to the requirements of the "dual carbon" goals and high-quality development, which reflects the modernization process of China's environmental governance system and governance capacity.

### 2.2 Theoretical Basis

#### 2.2.1 Policy instrument theory

This theory classifies policy instruments into

three types: administrative orders, market incentives and voluntary participation. The dual control of energy consumption is dominated by administrative orders, which have strong executive power but insufficient flexibility; the dual control of carbon emissions emphasizes the coordination of administrative and market tools, which can better stimulate the endogenous motivation for emission reduction and is the key driving force for achieving precise carbon control.

#### 2.2.2 Environmental governance theory

This theory takes the coordination of multiple subjects and precise governance as the core points. The dual control of energy consumption is dominated by the government with a relatively single method; the dual control of carbon emissions constructs a collaborative system of "government supervision, enterprise leadership and social participation", focuses on the core goal of carbon emission reduction, realizes the precise advancement of governance scope and governance methods, and conforms to the development requirements of modern environmental governance.

#### 2.2.3 Collaborative governance theory

This theory focuses on the synergistic effects among policies, subjects and fields. The dual control of carbon emissions pays attention to the coordination with policies such as energy transformation and industrial upgrading, focuses on fossil energy emission reduction, promotes the cleaning of the energy structure and regional coordination, and takes into account the central top-level design and local actual conditions, further improving the scientificity and operability of policies.

#### 2.2.4 Theory of new productive forces

The core characteristics of new productive forces are reflected in greenization and digitalization, which are committed to achieving the goal of high-quality development through structural optimization and efficiency improvement. The transformation from the dual control of energy consumption to the dual control of carbon emissions is precisely the concrete manifestation of new productive forces in the field of carbon control. By forcing industrial upgrading and technological innovation through precise control, green and low-carbon becomes an inherent attribute of new productive forces, promoting the coordination of development and emission reduction [3].

### **3. Analysis of the Policy Transformation Mechanism from Dual Control of Energy Consumption to Dual Control of Carbon Emissions**

#### **3.1 Theoretical Logic of the Transformation**

The transformation from the dual control of energy consumption to the dual control of carbon emissions marks a systematic upgrading of China's environmental governance paradigm. Its theoretical logic is rooted in the theories of policy instruments and environmental governance, and is embodied in profound changes in three core dimensions of control goals, methods and scope, which can be summarized as the "three shifts".

First, the control goal shifts from "energy efficiency" to "precise carbon emission control". The dual control of energy consumption takes total energy consumption and intensity as the control objects, and its core goal is to improve the energy utilization efficiency of the whole society. However, it fails to distinguish the carbon attributes of different energy sources, which may inadvertently inhibit the development of renewable energy in policy implementation. The dual control of carbon emissions precisely anchors the goal on "carbon emissions" itself. By setting indicators for the total amount and intensity of carbon emissions, it directly focuses on fossil energy consumption, the main source of emissions. This transformation not only directly connects with the core of the "dual carbon" goals, but also can release policy space for the development of clean energy by exempting non-fossil energy from constraints, realizing the coordination of "energy conservation" and "carbon reduction".

Second, the control method shifts from "administrative leadership" to "market coordination". The dual control of energy consumption mainly relies on top-down administrative orders and assessments, which have obvious short-term effects but insufficient flexibility, and it is difficult to continuously stimulate the emission reduction motivation of micro subjects. The dual control of carbon emissions is committed to building a collaborative system of "command-control" and market incentive tools. On the basis of retaining necessary administrative measures, it actively integrates market mechanisms such as carbon emission trading and green finance, and uses price signals to optimize the allocation of carbon

emission resources, thereby reducing the emission reduction cost of the whole society and building a more efficient and sustainable long-term governance mechanism [7].

Third, the control scope shifts from the "energy field" to "full-chain coverage". The boundary of the dual control of energy consumption is limited to energy consumption activities, ignoring non-energy carbon emissions from industrial production processes, waste disposal and other aspects, resulting in control "blind spots". The dual control of carbon emissions expands its focus to "all fields" and "the entire industrial chain", covering not only direct and indirect emissions from energy activities, but also carbon emissions from key non-energy activities into the regulation scope. This expansion conforms to the requirement of "full-field emission reduction" and ensures the integrity and scientificity of the carbon control system.

### **3.2 Realistic Motivations for the Transformation**

This profound policy transformation is an inevitable choice driven by multiple realistic development forces, mainly stemming from the urgent needs in the following four aspects:

First, it is an inevitable requirement for deepening the advancement of the "dual carbon" strategic goals. The 15th Five-Year Plan period is a critical stage to ensure the completion of the carbon peak task before 2030, which has further raised the requirements for the accuracy and effectiveness of carbon control policies. The dual control of energy consumption, due to its indirect correlation with the "carbon emission reduction" goal, is no longer competent for the core policy task. Shifting to a dual control system directly targeting carbon emissions can provide precise starting points and quantitative tools for the country to scientifically set and decompose the carbon peak path, ensuring the steady advancement of the "dual carbon" goals.

Second, it is a realistic need to break the limitations of the existing policies and avoid "reverse emission reduction". The dual control of energy consumption has shown problems such as control deviation and incentive dislocation in the new stage. For example, its "one-size-fits-all" total energy control may force some regions to restrict zero-carbon renewable energy projects to complete indicators and instead rely on high-carbon energy, resulting in

an "adverse incentive" that is contrary to the emission reduction goal. Shifting to the dual control of carbon emissions can fundamentally correct this policy deviation and ensure the consistency between the policy orientation and the ultimate goal.

Third, it is an inherent need to boost high-quality economic development and coordinate various multiple goals. High-quality development emphasizes the need to coordinate the relationship between development and emission reduction, energy security and industrial transformation. By focusing on "carbon" as the core element, the dual control of carbon emissions can more accurately identify and promote the green transformation of high-carbon industries, and at the same time create a clearer policy expectation for low-carbon emerging industries and renewable energy. This helps promote the upgrading of the industrial structure and the cleaning of the energy structure, and realize the coordination of economic growth and carbon emission reduction on the premise of ensuring energy security.

Fourth, it is an external driving force for the deepening of global climate governance and the transformation of China's role. The control of the total amount and intensity of carbon emissions has become the international mainstream carbon control paradigm. Promoting this transformation can not only better align the domestic policy system with international mainstream practices, but also help enhance China's voice and rule-making capacity in global climate governance, demonstrate the mission and responsibility of a major responsible country, and inject Chinese wisdom and strength into the construction of global ecological civilization.

### **4. Design of the Implementation Path of the Dual Control of Carbon Emissions during the 15th Five-Year Plan Period**

The 15th Five-Year Plan period is a critical period to facilitate the all-round transformation from the dual control of energy consumption to the dual control of carbon emissions and ensure the achievement of the carbon peak goal before 2030. To ensure the steady and efficient implementation of the transformation, it is necessary to follow the principles of "precision, coordination, marketization and systematization" and construct an implementation framework consisting of the following four levels.

First, consolidate the cornerstone of precise

control in metering and allocation. This relies on a sound and unified accounting system and a scientific and flexible indicator allocation mechanism. In terms of accounting, it is necessary to overcome the problems of inconsistent standards, weak data and incomplete coverage, establish a unified four-level accounting standard for the state, local governments, industries and enterprises, strengthen data quality by using the Internet of Things and big data, and fully include non-energy activity carbon emissions in the accounting to achieve "full-chain" coverage. In terms of indicator allocation, it is imperative to abandon the "one-size-fits-all" approach, conduct differentiated decomposition according to regional resource endowments, industrial structure and development potential, impose mandatory constraints on high-carbon industries, provide incentive guidance for emerging industries, and establish a market adjustment and dynamic adjustment mechanism for indicators to improve the efficiency of resource allocation [8].

Second, build external support for policy coordination and technological drive. The key to policy coordination is to form a joint force for "carbon reduction" and "development": it is necessary to coordinate with energy policies, reduce carbon emissions from the source by developing renewable energy and rationalizing the price mechanism, and clearly stipulate that the excess consumption of renewable energy is not included in the total energy assessment; coordinate with industrial policies, strictly control high energy-consuming and high-emission projects, promote the upgrading of traditional industries, and cultivate green new productive forces; and do a good job in the coordination and connection with regional policies to boost the high-quality development of the green industry in the central and western regions. In terms of technological drive, it is necessary to increase R&D investment in key technologies such as carbon capture, utilization and storage (CCUS), hydrogen energy and energy storage, establish a "government-industry-university-research" research mechanism, and accelerate their industrial application and international cooperation.

Third, optimize the long-term operation mechanism that balances incentives and constraints. Implementation depends on a dual mechanism of "strong constraints and effective incentives". On the constraint side, it is

necessary to incorporate carbon emission goals into the performance assessment of local governments and leading cadres, and impose severe penalties on enterprises that exceed the standards. On the incentive side, give fiscal, tax and financial policy inclinations to subjects with significant emission reduction effects; fully deepen the construction of the national carbon market and explore the practice of carbon tax tools in a timely manner; and explore the establishment of a corporate carbon emission reduction credit evaluation system linked to financing and evaluation.

Fourth, build a collaborative governance pattern of co-governance by multiple subjects. Its ultimate implementation is inseparable from the construction of a governance system of "government leadership, enterprise main body and social participation". The government needs to clarify the roles of central top-level design and local implementation and supervision, and reduce inappropriate intervention. Enterprises must integrate low-carbon strategies into the whole process of production and operation and take the initiative to participate in the carbon market. At the social level, it is necessary to strengthen public education, give play to the role of industry associations, improve the supervision mechanism, create a low-carbon development atmosphere of co-construction and sharing, and gather the joint force for transformation.

## **5. Evaluation of the Emission Reduction Effects of the Dual Control of Carbon Emissions during the 15th Five-Year Plan Period**

To systematically evaluate the potential impact of the dual control of carbon emissions policy, this paper conducts a qualitative analysis from three core dimensions: energy structure, industrial upgrading and regional coordination, and comprehensively discusses its synergistic benefits.

### **5.1 Driving the Cleaning of the Energy Structure**

This policy directly promotes the low-carbon transformation of the energy system by precisely restricting fossil energy consumption and actively encouraging the development of non-fossil energy. On the one hand, the dual control of the total amount and intensity of carbon emissions, combined with the carbon market mechanism, will increase the cost of fossil

energy use and curb the demand for high-carbon energy; on the other hand, exempting renewable energy from the total energy consumption assessment and supporting it with incentive policies will accelerate the large-scale development of wind power, photovoltaic and other industries. The study predicts that this measure is expected to significantly increase the proportion of non-fossil energy consumption, steadily reduce the proportion of coal consumption, and drive a substantial cumulative reduction in energy carbon intensity, becoming the core pillar for achieving the national emission reduction goal.

### **5.2 Promoting the Greening of the Industrial Structure**

Through a differentiated mechanism of "rewarding the good and punishing the bad", the policy promotes the evolution of the industrial structure towards upgrading and greening. For high-carbon industries such as iron and steel and cement, rigid emission reduction indicators will force them to carry out energy-saving technological transformation and low-carbon upgrading, and accelerate the elimination of backward production capacity. Providing incentive support for strategic emerging industries and low-carbon industries can cultivate new economic growth points and comprehensively reduce the economic carbon intensity. It is estimated that during the 15th Five-Year Plan period, carbon emissions from high energy-consuming industries are expected to drop significantly, their proportion in industrial output value will decrease, while the proportion of strategic emerging industries will increase, and the industrial carbon intensity will drop significantly. This process is an important way to cultivate green new productive forces.

### **5.3 Promoting the Coordinated and Balanced Development of Regions**

The implementation of differentiated regional indicator decomposition helps form a national pattern of coordinated emission reduction. Setting stricter goals for the economically developed eastern regions and regions with concentrated high-carbon industries can force them to take the lead in transformation and exert technological spillover effects; giving appropriate flexibility to the central and western regions and regions rich in renewable energy, supporting them to develop green industries

based on resource advantages, and realizing the balance between growth and emission reduction [9]. This move is expected to narrow the regional emission reduction gap, promote integrated emission reduction in key regions, and make the northwest, southwest and other regions become the core supply bases of national clean energy.

### **5.4 Gathering Comprehensive Synergistic Effects**

The emission reduction effects of the policy will eventually be transformed into synergistic benefits in various aspects: first, the coordination of environment and development. Driven by industrial upgrading and energy revolution, it comprehensively advances the tasks of "carbon reduction, pollution control, green expansion and growth"; second, the coordination of development and security. The cleaning of the energy structure will reduce external dependence and enhance the capacity of independent energy security; third, the coordination of domestic and international development. The transformation aligns China's carbon governance system with the international mainstream paradigm and enhances its influence in global climate governance [10]. Although there may be growing pains in the short term, in the long run, this transformation is the only way to achieve high-quality development and a fundamental improvement of the ecological environment.

### **6. Optimization Suggestions for the Implementation of the Dual Control of Carbon Emissions during the 15th Five-Year Plan Period**

To ensure the steady and efficient operation of the dual control system of carbon emissions, combined with the orientation of the 15th Five-Year Plan and relevant research, the following four aspects of optimization suggestions are put forward.

First, optimize the accounting system and consolidate the data foundation. In response to the current problems of inconsistent accounting standards and to-be-improved data quality, it is necessary to prioritize the improvement of a unified and standardized national carbon emission accounting standard, focus on filling the gaps in accounting methods for weak links such as agriculture and waste disposal, and provide simplified accounting guidelines for small and medium-sized enterprises. At the same

time, it is necessary to establish a rigorous digital monitoring and data quality management closed loop, build an intelligent monitoring network with the help of the Internet of Things and big data, and establish a full-chain supervision mechanism covering data traceability, verification and accountability to ensure the authenticity and comparability of data. Second, promote regional coordination and resolve the risk of imbalance. To alleviate the problem of unbalanced regional development, it is necessary to build a regional cooperation and linkage mechanism based on the principle of "common but differentiated responsibilities". On the one hand, increase targeted support for the central and western regions, help them transform resource advantages into green industrial advantages through technology transfer, industrial cooperation and the establishment of special funds. On the other hand, explore the construction of a horizontal ecological compensation mechanism between regions, give reasonable compensation to regions that undertake more emission reduction missions and export clean energy, stimulate the transformation motivation of all regions, and form a coordinated emission reduction pattern of "the whole country as a single chess game".

Third, deepen market incentives and stimulate enterprise motivation. The key to solving the insufficient motivation of enterprises for emission reduction is to make emission reduction generate tangible economic benefits. It is necessary to continue to deepen the construction of the national carbon market: accelerate the expansion of the industry coverage and introduce a paid carbon quota allocation model in a timely manner; study the carbon tax policy prudently to form a complementarity with the carbon market. At the same time, it is necessary to build a targeted support system, provide fiscal and tax support for the green transformation of key industries, and establish a technical service and financing support platform for small and medium-sized enterprises to reduce their transformation threshold.

Fourth, strengthen system integration and improve implementation efficiency. To ensure the coordinated implementation of policies, it is necessary to establish an inter-departmental policy coordination mechanism at the national level, regularly evaluate and rationalize the connection with energy, industry, environmental

protection and other policies. At the local level, the performance assessment should be optimized: incorporate the effectiveness of the dual control of carbon emissions into the core assessment of local governments and leading cadres, and put an end to "campaign-style emission reduction"; at the same time, strengthen the construction of the grassroots carbon management team and establish a normalized supervision and accountability mechanism to comprehensively improve the efficiency of local governance.

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