Chapter 4

Action: First Round of National Carbon Market Expansion

(1) Background and Significance of the Carbon Market Expansion
(2) General Objective
(3) Implementation Phases
(4) Future Action Plans
(5) MEE's Specific Arrangements for Carbon Market Expansion

(1) Background and Significance of the Carbon Market Expansion

To fully implement the guiding principles of the 20th National Congress of the Communist Party of China and the Second and Third Plenary Sessions of its 20th Central Committee, to act on the decisions made at the National Conference on Ecological and Environmental Protection, and to carry out the requirements outlined in the 2025 Report on the Work of the Government, efforts are being made to promote the high-quality development of the steel, cement, and aluminum smelting industries. In a proactive, prudent, and orderly manner, these industries will be incorporated into the coverage of the national carbon emissions trading market. Following the Interim Regulations on the Administration of Carbon Emissions Trading, the Ministry of Ecology and Environment has formulated the *Work Plan for Including the Steel, Cement, and Aluminum Smelting Industries in the National Carbon Emissions Trading Market*.

The carbon market is a major institutional arrangement that leverages market mechanisms to actively address climate change and promote the green and low-carbon transformation of the economy and society. It is also a widely adopted policy tool in global climate governance. At present, China has established two types of national carbon markets: a compliance market for key emitters to fulfill mandatory emission reduction obligations, and a voluntary market to encourage emission reductions by broader segments of society. In July 2021, China officially launched its national carbon emissions trading market, starting with the power generation sector. This market is now the largest in the world in terms of covered emissions. After nearly four years of development, the market has operated in a generally stable manner, with continuous improvements in the institutional framework, significant enhancements in data quality, and the gradual formation of a carbon pricing mechanism centered on the carbon market. However, the carbon market remains in its early stages of development and still faces several challenges. Notably, the current coverage is limited to the power sector, and the high degree of homogeneity among market participants has led to low trading activity, preventing the market mechanism from playing its full role. The carbon market expansion considers both domestic and international imperatives, follows a problem-oriented and goal-driven approach, and responds to the practical needs of China's efforts to develop and improve its carbon market. It will allow the market mechanism to function more effectively across a broader scope, in more sectors, and at greater depth, helping to establish a new system of incentives and constraints for carbon emissions reduction.

In advancing the achievement of China's dual carbon goals, the national carbon emissions trading market currently regulates approximately 40% of the country's total carbon dioxide emissions through the power generation sector. With the inclusion of the steel, cement, and aluminum smelting industries, the market's coverage will exceed 60% of national CO_2 emissions. By setting a cap on total emissions and allocating allowances accordingly, the carbon market translates national emission reduction targets into binding responsibilities for enterprises. Through accurate carbon accounting, scientifically determined emission targets, and flexible mitigation options, the market enables effective control over both the total volume and intensity of emissions in the sectors it covers.

In improving the carbon pricing mechanism, the market expansion marks a shift from three forms of “singularity” to three dimensions of “diversification” in regulatory scope. Specifically, it transforms the market from single-sector regulation to a multi-sector compatible system; it transforms exclusive control of emissions from energy-related activities to the combined regulation of both energy activities and industrial process emissions; and it transforms the sole regulation of carbon dioxide to the inclusion of multiple greenhouse gases. By broadening the range

Source: The State Council of the People's Republic of China official website | Notice on Advancing the Work Related to the National Carbon Emissions Trading Market in 2025 (2025-04-15) https://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/202504/t20250415_1114934.html of participants and enhancing market dynamism, the expansion integrates entities with varying marginal abatement costs into a unified framework governed by the market, thereby reducing the overall cost of emissions reduction across society. Carbon pricing now provides a benchmark for newly covered enterprises to engage in climate finance activities such as carbon-backed financing and the pledging of emission allowances, helping to attract more financial capital into these sectors. This supports their low-carbon transition and high-quality development. Moreover, the revenues enterprises earn through participation in the carbon market can be reinvested in low-carbon technologies, fostering a virtuous cycle of "investment–emission reduction–returns–reinvestment" that promotes technological innovation and application

(2) General Objective

The general objective of this plan is formulated under the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, with a particular emphasis on Xi Jinping's Thought on Ecological Civilization and Xi Jinping's Economic Thought. It fully implements the guiding principles of the 20th National Congress of the Communist Party of China and the Second and Third Plenary Sessions of its 20th Central Committee. It carries out the decisions made at the National Conference on Ecological and Environmental Protection. Following a “simultaneous implementation and improvement” approach, the plan aims to incorporate the steel, cement, and aluminum smelting industries into the national carbon emissions trading market in two stages, in a proactive, prudent, and orderly manner, thereby expanding the market's coverage (hereinafter referred to as “the expansion”). By using the national carbon emissions trading market as the core platform, the plan seeks to improve the carbon pricing mechanism, optimize the allocation of carbon reduction resources, reduce the overall cost of emissions reduction across society, and promote the development of a more effective, dynamic, and internationally influential carbon market.

Source: ScienceNet.cn | Intensive Policy Measures Unveiled as Carbon Market Accelerates on Dual Fronts
https://www.efchina.org/Blog-zh/blog-20231226-2-zh

The plan will focus on implementing an emissions entity registry system for the steel, cement, and aluminum smelting industries, with a clear definition of regulatory coverage. For the steel and cement sectors, regulation will primarily target direct carbon dioxide emissions from fossil fuel combustion and industrial processes. In the aluminum smelting sector, regulation will cover emissions of carbon dioxide (CO_2), tetrafluoromethane (CF4), and hexafluoroethane (C2F6), among other greenhouse gases. This measure is expected to bring approximately 1,500 new key emitting entities under regulation, with an additional coverage of around 3 billion tons of CO_2 equivalent emissions. Key emitting entities are defined as enterprises in the steel, cement, or aluminum smelting sectors with annual greenhouse gas emissions reaching or exceeding 26,000 tons of CO_2 equivalent. These entities will be incorporated into the national carbon emissions trading market. Provincial-level ecological and environmental authorities, in coordination with relevant departments, are required to compile a regional registry of key emitting entities. These registries must be submitted via the National Carbon Market Management Platform and made publicly available. To ensure smooth implementation, provincial authorities must also oversee the account opening process for relevant enterprises in the National Carbon Emissions Registry System, the National Carbon Emissions Trading System, and the National Carbon Market Management Platform.

(3) Implementation Phases

The implementation of this plan is divided into two phases:

Initial Implementation Phase (2024-2026)

This phase focuses on consolidating the foundation of carbon emissions management and helping enterprises become familiar with market rules. The main goals are to cultivate market participants, improve market supervision, and enhance the participation capacity and management level of all stakeholders. The year 2024 will serve as the first compliance year for the steel, cement, and aluminum smelting industries, with the first compliance cycle to be completed by the end of 2025. The 2024 allowances will be allocated based on verified actual carbon emissions on a one-to-one basis. The allowances for 2025 and 2026 will be allocated based on the principle of emission intensity control, rewarding advanced enterprises and urging laggards. The number of allowances allocated to each enterprise will be linked to production capacity and output, and the allowance surplus and deficit rate will be reasonably determined to ensure a basic balance in overall industry allowances. Guidelines for carbon emission accounting, reporting, and verification will be developed, and monthly archiving of key parameters will be conducted to strengthen the data quality foundation. Key emitting entities will be guided to become familiar with the rules of accounting and reporting, verification, allowance allocation, allowance surrender, and market trading, to foster a low-carbon development mindset of “emissions have costs, and reductions generate benefits” and to enhance carbon emissions management capacity.

Further Improvement Phase (2027 onward)

The policy and regulatory framework will be further refined, and the supervision and management mechanisms will become more robust. The capacity of all stakeholders to participate in the market will be comprehensively strengthened. The quality of carbon emissions data will see substantial improvement, with enhanced authenticity, accuracy, and completeness. The methodology for allowance allocation will become more scientific and precise, and a clear, transparent, and predictable mechanism will be established to progressively and appropriately tighten the total allowance cap for each sector.

(4) Future Action Plans

I. Implementation of Key Emission Units Registry Management

(1) Defining control scope. The steel, cement, and aluminum smelting industries will regulate direct greenhouse gas emissions from fossil fuel combustion, industrial processes, and other sources. The regulated greenhouse gas for the steel and cement industries is carbon dioxide (CO2), while for the aluminum smelting industry, it includes carbon dioxide (CO2), tetrafluoromethane (CF4), and hexafluoroethane (C2F6). Approximately 1,500 new key emission units are expected to be added, covering an additional emission volume of about 3 billion tons of carbon dioxide equivalent.

(2) Identifying key emission units. Units within the steel, cement, and aluminum smelting industries with annual greenhouse gas emissions reaching 26,000 tons of carbon dioxide equivalent or more will be designated as key emission units and incorporated into the national carbon emissions trading market management. Provincial-level ecological and environmental authorities, in coordination with relevant departments at the same level, shall compile a registry of key emission units for steel, cement, and aluminum smelting industries within their administrative regions based on these criteria, submit the registry through the national carbon market management platform, and make it publicly available.

(3) Completing systematic account openings. Provincial ecological and environmental authorities shall organize the key emission units in the steel, cement, and aluminum smelting industries to complete account openings on the National Carbon Emission Registration System, the National Carbon Emission Trading System, and the National Carbon Market Management Platform.

II. Implementation of Accounting Report Verification

(1) Formulating accounting reports and verification of technical standards. The Ministry of Ecology and Environment, considering factors such as industry process characteristics, carbon emission features, management capacity, and emission reduction costs, will develop guidelines and verification manuals for carbon emission accounting reports of the steel, cement, and aluminum smelting industries. These guidelines will clearly define tiered and categorized management requirements for the key parameters in each industry sector. Enterprises will be gradually encouraged to conduct high-quality direct measurements of parameters such as fuels and raw, auxiliary materials. For parameters that cannot be directly measured, prescribed default values will be used as substitutes. The exploration and implementation of online carbon emission monitoring will also be promoted.

(2) Organizing monthly evidence retention. Key emission units shall formulate and strictly implement data quality control plans following the accounting report guidelines for their respective industries. They will conduct inspections and testing in compliance with laws and regulations, retain monthly evidence of key parameters, and submit this data through the National Carbon Market Management Platform. A three-level data quality review system ("national—provincial—municipal") will be enforced. The Ministry of Ecology and Environment will coordinate with local ecological environment authorities to conduct technical audits on the monthly evidence data, with strict scrutiny of key parameters such as fossil energy consumption.

(3) Organizing annual report verification. Key emission units shall prepare annual emission reports following their industry-specific accounting report guidelines and submit them through the National Carbon Market Management Platform. Provincial ecological environment authorities will verify the annual emission reports of key emission units, and the verification results will serve as the basis for allowance allocation and compliance settlement. Key emission units are responsible for the authenticity, completeness, and accuracy of the reported data.

III. Implementation of Allowance Management

(1) Formulating annual allowance quotas and allocation plans. The Ministry of Ecology and Environment, in coordination with relevant departments of the State Council, shall establish the annual carbon emission allowance quotas and allocation plans for the steel, cement, and aluminum smelting industries based on the national greenhouse gas emission control targets. During the implementation initiation phase, the 2024 allowance allocation will be equal to the verified actual carbon emissions, while the 2025 and 2026 allocations will be distributed based on a carbon emission intensity control approach. In the deepening and improvement phase, allocation methods will be optimized by benchmarking against industry-leading standards to promote continuous reductions in carbon emissions per unit of product output.

(2) Allowance allocation, surrender, and trading. Provincial ecological environment authorities, together with relevant local departments, shall allocate allowances to key emission units within their jurisdictions through the National Carbon Emission Registration and Allocation System, following the annual allowance quotas and allocation plans, and organize compliance activities. Key emission units in the steel, cement, and aluminum smelting industries must surrender sufficient carbon allowances annually to their provincial ecological environment authorities. Key emission units participating in the National Carbon Emission Trading Market shall no longer engage in carbon emission trading for the same greenhouse gas types and industries within local carbon markets. Key emission units in the power generation, steel, cement, and aluminum smelting sectors shall

conduct centralized and unified carbon allowance trading through the National Carbon Emission Trading System.

IV. Intensification of Implementation Efforts

(1) Strengthening organizational leadership. The Ministry of Ecology and Environment will lead efforts to broaden the scope of coverage and enhance organizational coordination. Relevant departments will collaborate according to their respective responsibilities to support the expansion work. A normalized interdepartmental cooperation mechanism will be established to facilitate timely communication and coordination on key issues. Extensive consultations will be conducted with government departments, industry associations, technical service organizations, and enterprises to maximize the active involvement and commitment of all parties.

(2) Enhancing capacity building. Improvements will be made to the national carbon emission trading market's registration, reporting, and trading rules. The functions of the National Carbon Market Management Platform will be expanded to comprehensively support the management of key emission units' registries, accounting report verification, and other related tasks. Upgrades will be made to the national carbon emission registration and trading systems to enhance system stability and service convenience, with gradual integration into a unified public resource trading platform. Targeted professional training programs will be organized for key emission units, technical service agencies, and environmental public welfare organizations. Key emission units will be encouraged to establish and improve internal carbon emission data management systems.

(3) Strengthening supervision and law enforcement. The supervision of the national carbon emission trading market will be integrated as a key part of routine enforcement activities by local ecological environment and market regulation departments. A daily cooperation mechanism will be set up between local ecological environment authorities and registration and trading institutions to ensure the market's safe and stable operation. Continuous compliance monitoring will be reinforced, and an interdepartmental information-sharing mechanism will be established to track and evaluate compliance risks of key emission units. Supervision and enforcement of carbon emission report data quality will be organized, with identified issues categorized and addressed accordingly, and strict penalties imposed on violations.

(4) Conducting tracking and evaluation. A regular evaluation mechanism for the national carbon emission trading market will be established to conduct comprehensive and systematic assessments of the expansion's effectiveness, summarize advanced practices and experiences, and lay a solid foundation for further coverage expansion into more key emission sectors. Ongoing assessments of carbon emission data quality trends will be carried out, with periodic analysis of prominent industry data quality issues and

timely proposals for optimization.

(5) Strengthening publicity and guidance. Policy documents related to the expansion will be widely publicized and interpreted. Official voices will be actively communicated through platforms such as the China Carbon Market Conference, National Low-Carbon Day, routine press conferences by the Ministry of Ecology and Environment, and authoritative channels like the National Carbon Market Information Network. Local governments and relevant organizations will be encouraged to utilize multiple channels to promote carbon market policies and foster a positive social environment for the development and operation of the carbon market. Information disclosure will be strengthened following laws and regulations, requiring relevant entities to promptly publish information on emissions, compliance, trading, pledges, and other related activities to ensure transparency and public oversight.

(5) MME's Specific Arrangements for Carbon Market Expansion

To further advance the expansion of the national carbon market, the Ministry of Ecology and Environment issued the *Notice on Advancing Relevant Work for the National Carbon Emissions Trading Market in 2025 on April 15, 2025*, outlining the following arrangements and guidance:

Confirmation of the List of Entities for Market Expansion

The national carbon emissions trading market's list of key emission entities is compiled annually by sector. Entities in the power generation, iron and steel, cement, and aluminum smelting sectors with annual direct carbon emissions reaching or exceeding 26,000 tons of CO_2 equivalent shall be included in the list of key emission entities. Provincial ecological and environmental authorities are required to formulate the lists of key emission entities under their jurisdiction for the years 2024, 2025, and 2026, thereby identifying the entities subject to national carbon market regulation. Once an entity is included in the national carbon market, it will no longer participate in local carbon emissions trading markets for the same sector and the same type of greenhouse gases, to avoid duplicate regulation.

By May 10, 2025, provincial ecological and environmental authorities shall publicly release the 2024 and 2025 lists of key emission entities in the iron and steel, cement, and aluminum smelting sectors via both the National Carbon Market Management Platform and the official websites of the respective provincial departments. They shall also promptly inform the entities on the list of their associated rights and obligations. The list of key emission entities for the power generation, iron and steel, cement, and aluminum smelting sectors for 2026 shall be released by October 31, 2025. By May 15, 2025, provincial ecological and environmental authorities shall ensure that newly included key emission entities open accounts on the national management platform and activate relevant functions, including emissions management, carbon allowance registration and trading, and voluntary emissions reduction registration and trading. The account registration procedures and application material requirements can be downloaded from the management platform.

Data Quality Management and Greenhouse Gas Emissions Reporting

Provincial Departments of Ecology and Environment shall organize data quality management for greenhouse gas (GHG) emissions from key emission units in the power generation, steel, cement, and aluminum smelting industries, following the accounting, reporting, and verification (MRV) technical specifications formulated by the Ministry of Ecology and Environment. By June 30, 2025, key emission units in the steel, cement, and aluminum smelting industries must develop their 2025 annual data quality control plans through the national carbon market management platform and complete technical reviews. The data quality control plans for 2026 in the power generation, steel, cement, and aluminum smelting industries shall be completed by December 31, 2025. Starting from July 2025, within 40 calendar days after the end of each month, key emission units in the steel, cement, and aluminum smelting industries shall conduct monthly digital archiving of carbon emission accounting data via the management platform, which will be subject to technical review. By October 31, 2025, the supplementary digital archiving for January–June 2025 carbon emission data in these industries must be completed.

By June 30, 2025, provincial departments shall organize key emission units in the steel, cement, and aluminum smelting industries to submit their 2024 GHG emissions reports. In parallel, technical reviews of the 2024 emissions reports submitted by key power generation units shall be completed, and the verification results shall be communicated via the platform. By August 31, 2025, verification and notification of results for 2024 reports from the steel, cement, and aluminum smelting industries shall be completed. Independent electric furnace-based short-process steel producers, independent steel rolling and processing enterprises, and non-silicate cement clinker producers with annual direct emissions of 26,000 tons of CO_2 equivalent or more shall also conduct GHG reporting and verification following the MRV technical specifications. The deadline for submission of 2024 GHG emission reports by these enterprises is extended from March 31 to June 30, 2025. By December 31, 2025, provincial departments shall evaluate the quality, compliance, and timeliness of work performed by verification service providers for 2024, following *the Guidelines for Verification of Corporate GHG Emission Reports (Trial).* Evaluation results shall be published via the national carbon market management platform and the official websites of the provincial departments.

Pre-allocation and Final Verification of Carbon Emission Allowances

By April 20, 2025, provincial ecological and environmental authorities shall pre-allocate 2024 carbon emission allowances to key emission units in the power generation industry. No pre-allocation will be conducted for the steel, cement, and aluminum smelting industries for the 2024 compliance year. By July 31, 2025, based on the results of the 2024 emissions verification, authorities shall determine the final number of allowances to be issued to key power generation units and submit the relevant data tables in writing to the registration agency for allowance registration. By August 20, 2025, the final allocation of 2024 carbon emission allowances for the power generation industry shall be completed. For the steel, cement, and aluminum smelting industries, the final determination of 2024 allowances shall be completed by September 30, 2025, and the allowance issuance shall be completed by

October 20, 2025. By December 31, 2025, key emission units in the power generation, steel, cement, and aluminum smelting industries shall complete the full and timely surrender of their 2024 carbon emission allowances.

Safeguard Measures

Provincial ecological and environmental authorities must attach great importance to prominent issues in the steel, cement, and aluminum smelting industries, such as complex production processes, weak data foundations, and insufficient carbon emission management capabilities. Efforts should be made to strengthen overall coordination, increase staffing for management and technical review, secure adequate funding, carry out technical research on identifying and controlling data quality risks, and promptly summarize and refine effective practices and case studies in data quality management. The Ministry of Ecology and Environment will provide policy interpretation and capacity-building training for provincial authorities and their technical support institutions, and, with the support of relevant industry associations, promote policy awareness among newly included key emitters. Provincial departments should intensify technical assistance efforts by organizing specialized training on carbon emission data quality management, allowance allocation, and compliance settlement, aiming to achieve full coverage of key emission entities and their carbon management personnel by the end of 2025. Local ecological and environmental authorities at all levels must strictly implement the provisions of the *Interim Regulations on the Administration of Carbon Emissions Trading,* incorporate data quality management and allowance compliance into their routine supervision and enforcement, and take firm action against falsification of carbon emission data.

Source: The State Council of the People's Republic of China official website | *Notice on Advancing the Work Related to the National Carbon Emissions Trading Market in 2025* (2025-04-15)
https://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/202504/t20250415_1114934.html

(6)Active Responses from Local Governments, Departments, and Organizations to the Carbon Market Expansion

From April 10 to 11, the second policy and standards briefing conference on the steel industry's carbon emissions trading market was held in Nanjing, Jiangsu Province. The event was hosted by the China Iron and Steel Association, organized by the Metallurgical Science and Technology Development Center, and co-organized by Nanjing Iron and Steel Group Co., Ltd. Nearly 400 representatives from provincial environmental authorities, steel enterprises, and research institutes in the low-carbon sector gathered by the Yangtze River to discuss strategies for the green and low-carbon transformation of the steel industry chain. The conference aimed to comprehensively interpret national policies related to the carbon emissions trading market through policy dissemination and exchanges, enhance steel companies' awareness and capacity in carbon asset management and allocation, and provide guidance to improve the green and low-carbon competitiveness of the steel industry as well as better prepare for future challenges from the EU carbon border adjustment mechanism.

Rizhao Steel Group has actively responded to the national dual-carbon strategy by phasing out outdated capacity and carrying out key projects for capacity transfer and upgrading. These projects have become one of the first provincial pilot projects for reduction substitution. The group has cumulatively reduced carbon emissions by 910,000 tons, exploring a replicable low-carbon transformation model for the industry. Facing the major opportunity of the steel industry's imminent inclusion in the national carbon market, Rizhao Steel Group has made forward-looking plans, investing 1 billion yuan to implement technological upgrades such as sintering flue gas recycling to achieve an annual emission reduction of 550,000 tons. It has also launched a 200,000-ton-per-year carbon capture demonstration project and partnered with top research teams to develop CO_2 utilization technologies. Rizhao Steel Group's innovative “Carbon Intelligent Management Platform” features three core functions: one-click generation of internationally recognized carbon reports, simulation and optimization of carbon trading strategies, and full-process carbon footprint tracking. Carbon reduction targets are integrated into the production unit KPI evaluation system. In terms of smart manufacturing, Rizhao Steel Group takes ultra-low emissions, extreme energy efficiency, and digital transformation as strategic pillars, achieving ultra-low emissions throughout the process and receiving an A-grade environmental performance certification. Through a smart energy system optimization, its comprehensive energy consumption per ton of steel ranks among the industry leaders, and it utilizes AI, big data, and other technologies to build a benchmark factory for full-process intelligent manufacturing.

Driven by relevant policies, domestic steel companies such as Baowu, HBIS, and JISCO are exploring the use of hydrogen in steelmaking. Northeast University has established China's first research institute focused on hydrogen metallurgy. Together they are offering a “China solution” for the steel industry's zero-emission progress, driving the transformation and upgrading of the country's steel sector, and have already made significant phased progress. The JISCO coal-based hydrogen metallurgy pilot base has successfully conducted hot-load commissioning and partial pilot tests. According to Lei Pengfei, project manager of the JISCO pilot base construction, the facility completed its first and second commissioning runs using blast furnace gas ash as raw material. The project team conducted comparative tests of carbon metallurgy and hydrogen metallurgy, using JISCO-produced metallurgical coke and lignite as reducing agents. The metallization rates were approximately 40% for carbon metallurgy and over 85% for hydrogen metallurgy, demonstrating the significant advantages of hydrogen metallurgy technology. Regarding hydrogen sources, China National Nuclear Corporation (CNNC) has proposed a “nuclear-powered hydrogen production and hydrogen-based steelmaking” approach, using water as raw material and waste heat as energy, coupling nuclear reactors with advanced hydrogen production technologies to enable large-scale, low-cost hydrogen generation.