

The Impact of Carbon Border Adjustment Mechanisms and China's Response Strategies

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Abstract. The Carbon Border Adjustment Mechanism (CBAM) is a core tool of the European Union in advancing climate governance. However, CBAM fundamentally conflicts with the principle of "common but differentiated responsibilities (CBDR-RC)" and the national treatment principle of the World Trade Organization (WTO) in its institutional design, quoting the exception clause of Article 20 of General Agreement on Tariffs and Trade (GATT) also faces strict tests of "necessity" and "proportionality". For China, the short-term trade impact of CBAM is limited, but in the medium to long term, it will exacerbate export costs and pressure for industrial transformation; at the industrial level, it may not only force green innovation in high carbon industries, but also trigger the reverse effect of small and medium-sized enterprises exiting and carbon leakage. Therefore, China should respond systematically from three levels: multilateral, bilateral, and domestic. Collaborating with developing countries at the border level to strive for fair rules and promote the institutionalization of CBDR-RC principles; strive for carbon price deduction, mutual recognition of accounting standards, and equivalent exemptions at the bilateral level; improve the carbon pricing system at the domestic level and accelerate the green transformation of industries. The strategic framework of internal and external collaboration helps China safeguard its development rights and interests in the climate trade game.

Keywords: Carbon border adjustment mechanism, WTO compliance, common but differentiated Responsibilities, industrial green transformation.

1. Introduction

On January 1, 2026, the EU's CBAM officially entered the phase of substantive charging. It imposed carbon tariffs on six major products: imported steel, aluminum, cement, fertilizers, hydrogen, and electricity, marking a hard constraint on global climate governance. The EU claims that implementing CBAM aims to level the carbon costs of domestic and foreign products and prevent "carbon leakage", but its unilateralism has sparked controversy. For example, the high default carbon emission values set for Chinese products have been criticized by the Chinese Ministry of Commerce as unfair and discriminatory treatment [1]. As a major trading partner of the European Union, China's exports to the EU in sectors such as steel and aluminum have ranked fifth globally. Currently, the EU plans to expand the coverage of CBAM to approximately 180 downstream products, and the affected Chinese enterprises will further expand. At the same time, other countries are also considering similar carbon constraint mechanisms.

Given the multiple pressures mentioned above, it is of great practical urgency to study how China can systematically address the legal and policy challenges posed by CBAM.

The current research mainly focuses on the conflicts of CBAM, the transformation of governance models, and the national response strategies, providing a multi-dimensional theoretical foundation for this study.

First, the dimension of compliance with international economic and trade rules. The academic community is generally concerned about the potential conflict between CBAM and the WTO framework. Meyer and Tucker pointed out that any pragmatic CBAM design is difficult to fully align with the current interpretation of WTO core rules, and its legitimacy will ultimately depend on a reinterpretation of exception clauses [2]. The specific focus of the conflict is reflected in three aspects: firstly, differential treatment based on carbon emissions from the production process may violate the principle of national treatment [3]. Secondly, it is still uncertain whether the quota cost under the EU

Emissions Trading System constitutes a "domestic tax" within the meaning of Article 2.2 (a) of GATT; the third is whether the non discriminatory condition required by the preamble can be met when citing the general exception clause of Article 20 of GATT [2,3].

Secondly, the dimension of governance model transformation. This mechanism is essentially the extraterritorial application of a country's domestic climate policy, and its unilateral implementation may promote the evolution of the international rule-based "club model"[3]. Zou Lei further pointed out that CBAM, together with foreign investment review, foreign subsidies and other legislation, constitutes an important component of the EU's "open strategic autonomy" policy toolbox. Although its restrictive measures are not explicitly targeted at specific countries, they are generally believed to mainly target China [4].

Third, the dimension of national response strategies. Ding Chun and Cao Xuelin's simulation analysis based on the GTAP-E model shows that CBAM will reduce exports from China's carbon intensive industries, while also adversely affecting GDP and overall welfare [5]. Guo Qingbin et al. revealed that CBAM affects the implicit carbon emissions of China Europe trade through three effects: export suppression, import substitution, and trade transfer [6]. In terms of response strategies, scholars suggest improving the domestic carbon pricing system, promoting the expansion of the carbon market, and timely levying carbon taxes; Exploring the path of industrial transformation from the perspective of zero carbon park construction [7,8].

Existing research has provided important insights, but there is still room for deepening: there is a lack of systematic integration in the legal analysis of the conflict between CBAM and WTO rules; lack of a systematic research framework that combines international rule games with domestic institutional reforms. Based on the existing research, this article will conduct in-depth analysis focusing on the above three dimensions.

2. Analysis of the CBAM System and Impact Assessment

2.1. Core System Design of CBAM

CBAM adopts a phased promotion strategy, completing payment through certificate purchase and deduction. Its coverage initially covered six carbon intensive and high carbon leakage risk industries such as cement and steel. In December 2025, the European Union proposed to expand to about 180 downstream products of steel and aluminum, showing an expanding trend.

In terms of time, it is divided into a transition period (January 1, 2023, to December 31, 2025) and a formal implementation period (starting from January 1, 2026). During the transition period, only carbon emission data needs to be declared, while during the formal period, importers need to purchase corresponding carbon emission certificates and pay fees.

The operating mechanism consists of five stages: authorization, declaration, accounting, purchase, and deduction. Importers are required to declare their annual carbon emissions and calculate them based on actual measurements or EU default values. After purchasing the certificate, they can use third-party carbon cost certificates to offset expenses.

2.2. Disputes Over the Legality of CBAM

Conflict with the principle of CBDR-RC). The core essence of the principle of CBDR-RC is that developed countries should take the lead in fulfilling their energy conservation and emission reduction obligations while providing financial and technological support to developing countries and developing countries should bear corresponding responsibilities according to their own capabilities. However, the institutional design of CBAM fundamentally conflicts with this principle [9]. On the one hand, CBAM unilaterally applies pricing standards to all countries, regardless of their historical national conditions and fundamental differences in carbon emissions reduction capabilities. On the other hand, the EU, through the operation of CBAM, transfers carbon intensive industries to developing countries, which in turn have to pay for the carbon emissions of exported products when

exporting them to the EU, which clearly violates the core principle of "common but differentiated responsibilities".

Conflict with the WTO principle of national treatment. Under the framework of WTO rules, the compatibility between CBAM and the principle of non-discrimination has become the primary challenge. In the practice of WTO dispute settlement, the judgment of "similar products" is mainly based on standards such as nature, ultimate use, and tariff classification of the product. However, CBAM uses the carbon emissions generated during the production process of the product as the basis for purchase vouchers, essentially establishing a recognition standard based on the production process and methods related to the product. This is the key feature of CBAM's violation of the principle of national treatment [10]. In addition, although CBAM provides corresponding reductions in the free quotas enjoyed by importers for EU enterprises during accounting, the differences in the initial allocation methods of carbon costs and carbon emission quotas between the EU and other countries cannot be ignored. This also means that under the CBAM mechanism, it is difficult for the EU to ensure that the carbon cost borne by imported products is consistent with that of similar domestic products [3].

Disputes over the application of the exception clause in Article 20 of GATT. The general exception clause of Article 20 of GATT allows WTO members to deviate from their core obligations in order to protect human, animal and plant life and health (paragraph b) and to protect depletable natural resources (paragraph g). However, if the EU wants to invoke both to defend the legality of CBAM, it must pass the "necessity" and "proportionality" tests to ensure that carbon measures are substantially beneficial to achieving environmental goals and do not constitute arbitrary or unreasonable discrimination [11]. However, CBAM is not the only effective means to promote the reduction or suppression of carbon emissions, and its contribution to achieving the goals is not substantial. In addition, the EU does not consider the historical conditions and other emission reduction actions of other countries, forcing them to adopt a carbon pricing system that is consistent with theirs. In an equal rights international community, this certainly constitutes arbitrary and unreasonable discrimination [2].

2.3. The Main Impact of CMBA on China

The implementation of CBAM has a multifaceted impact on China's economic development, mainly reflected in the coexistence of opportunities and challenges at the trade and industrial levels.

The impact of CBAM on China's trade presents characteristics of short-term controllability and long-term deepening. In the short term, the impact of CBAM on China's overall exports is relatively limited. One reason is that during the "transition period", Chinese exporters only need to fulfill their reporting obligations and do not need to make actual payments. Secondly, the initial product coverage of CBAM was limited, and the overall proportion of the collection targets in the product categories exported from China to the European Union was relatively small. However, as the coverage of CBAM products expands and the number of countries imposing carbon border adjustment taxes increases, it will further weaken the price advantage of China's export trade and cause an imbalance between supply and demand in China's export industry chain.

The industrial transmission effect of CBAM has duality. From a positive perspective, the collection of carbon border adjustment tax provides emission reduction incentives and external impetus for high emission industries, triggering domestic institutional changes, technological innovation, and industrial upgrading under specific conditions, forming a "pressure opportunity paradox" effect. However, the negative consequences of the transmission effect are also prominent, mainly reflected in the intensification of industrial concentration and the risk of triggering the reverse effect of "carbon leakage". Small and medium-sized enterprises lack financial support and technological reserves to promote green transformation, and are forced to exit the EU market due to high compliance costs and carbon tax burdens, leading to accelerated concentration of resources on top enterprises with carbon management capabilities and further intensification of industry

concentration [12]. At the same time, it may lead to further transfer of high carbon industries to countries with lower carbon costs, thereby triggering a "spillover" of global carbon emissions [13].

3. CMBA's Coping Strategies

Facing the multiple pressures brought by CBAM, China should build an integrated response framework from three aspects: multilateral rights protection, bilateral coordination, and domestic reform. At the multilateral level, China should join hands with developing countries to strive for fair rules. At the bilateral level, efforts should be made to promote mutual recognition of carbon prices and standards between China and Europe. At the domestic level, the carbon pricing system should be improved and the green transformation of industries accelerated, forming a comprehensive response path with internal and external synergy and complete institutional support.

3.1. Multilateral Legal Resistance

Under the multilateral framework, China should join forces with developing countries to launch legal protests, use the WTO dispute settlement mechanism to question the legitimacy of CBAM, and adhere to the principle of CBDR-RC to strive for fair institutional space for developing countries and promote a positive interaction between global climate governance and economic development.

China can join forces with developing countries such as the "Basic Four" and ASEAN to speak out on WTO trade environment issues and multilateral platforms such as UNFCCC, promote the inclusion of historical emissions and development stage differences of developing countries in rule making, and question the discriminatory nature of CBAM towards developing countries. At the same time, promote the integration of the principle of CBDR-RC into global carbon border rules to avoid EU importers turning to internal procurement due to CBAM, thereby weakening the trade penalty effect on developing countries [14].

China can actively use the WTO dispute settlement mechanism, draw on Russia's practice of submitting consultation requests on CBAM, and focus on launching defenses against CBAM's violation of the principle of national treatment and unfair default carbon emission values. When citing the exception clause of Article 20 of GATT in the European Union, precedents such as the "Brazil Tire Case" and the "US Shrimp Case" can be cited to require the EU to prove that the measures are necessary and have a "close and genuine connection" with climate goals.

Adhering to the principle of CBDR-RC is the core of achieving fair regulation. China should promote the institutionalization of this principle within the WTO framework: promoting full exemptions for the least developed countries and small island countries, and partial exemptions for developing countries. Establish institutional linkage between WTO and UNFCCC to achieve cross system application of principles; advocating the application of CBAM benefits to support the low-carbon transformation of developing countries, in order to meet the legitimacy requirements of Article 20 of GATT and promote the formation of more equitable global carbon border governance rules [9,15].

3.2. Bilateral Negotiation Coordination

The negotiation and coordination path between China and the European Union around CBAM within a bilateral framework mainly refers to seeking institutional recognition from the EU for China's carbon pricing system and emission reduction effectiveness through bilateral negotiations and technical cooperation, in order to reduce compliance costs and institutional burdens for export enterprises.

Promoting the EU to recognize China's carbon price deduction. According to CBAM regulations, if the exporting country's enterprises have already paid the corresponding carbon costs in their own country, they can receive deductions when making payments in CBAM. This means that China needs to first establish a carbon pricing system recognized by the European Union. The current carbon emission trading system in China has not yet achieved "equivalence" recognition with the EU carbon

market. The institutional design of China's carbon market differs from that of the EU carbon market in terms of accounting scope, product and enterprise, and certification mutual recognition. China should absorb the reasonable part of the CBAM collection scope and pricing based on its own historical national conditions, financial and technological reserves, development status and needs, establish a compliant and fair carbon tax regulation system, actively engage in systematic negotiations with the EU, promote the inclusion of carbon market cooperation in the bilateral agenda, and strive for the EU's recognition of China's carbon price deduction [16].

Promoting mutual recognition of carbon emission accounting standards, verification mechanisms, and data quality between China and Europe. Under the CBAM system, Chinese export products are subject to high carbon emission default values set by the European Union, and the EU does not recognize China's carbon accounting standards. This means that Chinese products exported to the EU within the coverage of CBAM face high carbon taxes. Therefore, China should actively strive for mutual recognition of carbon emission accounting standards in bilateral negotiations, promote the EU's recognition of China's carbon footprint accounting methods and data quality supervision system, and promote the coordination of China-EU carbon emission accounting standards under the framework of the International Organization for Standardization [17]. At the same time, people will improve the quality control system for domestic carbon emission data, establish an independent third-party verification agency certification system, and lay the institutional foundation for striving for mutual recognition of standards. In addition, China should actively engage in bilateral dialogue around the core working mechanism of CBAM, such as implicit carbon accounting for trade products, setting carbon emission benchmarks, exemption clauses, etc., and strive to build a mutually recognized carbon accounting system between China and Europe [18].

Exploring the possibility of 'equivalent exemption'. An Equivalent exemption "refers to seeking CBAM exemption treatment from the European Union for certain industries based on China's emission reduction effectiveness and carbon pricing level. The possibility of China exploring "equivalent exemptions" for the European Union lies in Article 9 of the CBAM, which stipulates that if imported goods have already paid an equivalent carbon price in a third country, they can apply to reduce the corresponding payment amount. In this regard, China can strive for differentiated treatment from two aspects: promoting carbon market reform and utilizing industry emission reduction achievements. On the one hand, China can promote total carbon emission control, enhance the rigidity of carbon pricing, and gradually improve the accuracy and credibility of carbon accounting data. On the other hand, China can systematically review the progress of low-carbon transformation in industries covered by CBAM, provide detailed emission reduction data to prove that the actual carbon footprint of Chinese products is lower than the default value of CBAM, and strive for exemption space.

3.3. Domestic Legal Path to Deal with CNBA

Accelerating the improvement of the national carbon market pricing mechanism, expand coverage, and increase the proportion of paid quota allocation. In terms of improving the carbon pricing system, China should expand the coverage of the carbon market and gradually cover all carbon intensive industries after incorporating the current coverage of CBAM into the carbon market regulatory system. And China should gradually reduce the proportion of free quotas, introduce auction mechanisms, change the existing system of free allocation, and improve the level of carbon pricing. In addition, China should introduce a carbon tax on the basis of building a carbon emissions trading system, allowing China to have more pricing power over carbon emissions, and use carbon tax revenue to support the research and development of green production technologies for enterprises, thereby speeding up the progress toward carbon emission reduction goals..

Promotign the green and low-carbon transformation of high carbon industries through the synergy of zero carbon parks, green finance, and energy transformation. Promoting the green and low-carbon transformation of high carbon industries through the synergy of zero carbon parks, green finance, and energy transformation. China should seize the opportunity period of carbon peak and carbon

neutrality strategy, and work together to promote the construction of zero carbon parks, green finance support, and energy structure optimization. In terms of zero carbon park construction, zero carbon parks are laid out in high carbon industries such as steel and aluminum, providing tax incentives and green finance support. With the principle of substantial reduction of carbon emissions, the existing zero carbon park construction gradually solves problems such as blurred accounting boundaries, excessive dependence on carbon offsetting, and insufficient international recognition of green electricity, effectively reducing product carbon footprint and enhancing the green competitiveness of exported products[8]. In terms of green finance support system, by facilitating industrial structure upgrading and enhancing energy utilization efficiency, green credit policies can substantially lower the carbon emission intensity of the manufacturing industry [19]. Therefore, China should provide diversified financing support for the green technology transformation of enterprises through means such as green loans, green bonds, and green industry funds. In terms of energy structure, China should promote a systematic balance between the priority allocation of renewable energy and industrial output, carbon emissions, and electricity costs, in order to accelerate the transformation of high carbon industries [20].

4. Conclusion

The implementation of CBAM marks a deep interview of global climate governance and international trade rules. The EU has taken unilateral measures to promote carbon border regulation, although it has its intention to reduce emissions, the current design ignores the objective differences in historical responsibilities and development stages of each country, which constitutes a de facto trade barrier for developing countries. As the world's largest trading nation and carbon emitter, China finds itself confronted with a situation of controllable short-term pressure and severe long-term challenges. Therefore, China's response should not be limited to passive compliance, but should actively build a three in one strategic system of "multilateral rights protection, bilateral coordination, and domestic reform". Adhere to the principle of common but differentiated responsibilities on multilateral platforms and promote fairness in carbon border regulation rules; Strive for carbon price mutual recognition and standard linkage through technical dialogue at the bilateral level; Accelerate the total carbon market control in China, introduce paid quotas, and study the introduction of carbon taxes, while relying on zero carbon parks, green finance, and energy structure optimization to achieve deep decarbonization of industries. Only by transforming external pressures into internal institutional innovation and industrial upgrading can China take the initiative in reshaping global climate governance and trade rules, and strive for a more equitable and inclusive new international economic order for developing countries.

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