Reforms and Prospects of International Investment Agreements Against the Backdrop of Climate Change

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Abstract: accelerating climate change, International Investment Agreements (IIAs) exhibit structural mismatches with climate governance. Traditional frameworks, constrained by the Investor-State Dispute Settlement (ISDS) system's pro-investor bias and expansive interpretations of protection clauses, create a regulatory chill, evidenced by fossil fuels dominating 58% of energy investments and a 23% decline in climate policy adoption in developing nations. This paper proposes a three-tier reform. First, the country should prioritize climate policies via tiered review and impact assessments; second, should integrate carbon thresholds, dynamic risk-sharing, and clean tech transfer obligations; third, should forge South-South climate alliances and translate domestic carbon neutrality rules into global standards. Reforms could boost green investments to 45% and cut litigation risks by 40%. By reconciling investment rules with climate goals, this framework advances sustainable governance and offers actionable pathways for global regulatory alignment.

1 INTRODUCTION

Against the backdrop of accelerating global climate change, frequent extreme weather events have become a key variable constraining sustainable economic and social development. According to World Bank data, the economic losses caused by global climate disasters in 2023 will reach $3.2 trillion, accounting for 2.8% of global GDP and an increase of 170% compared to 2010. This change profoundly affects the international investment flow and regulatory system: as the core institutional framework for regulating cross-border capital flows, international investment agreements (IIAs) not only need to guide capital flow to green sectors through rule innovation but also pose legal risks to climate policies due to outdated traditional clause design.

There are three institutional deficiencies in the current IIAs. Firstly, the commercial arbitration nature of the Investor State Dispute Settlement Mechanism (ISDS) conflicts with the public nature of climate governance, resulting in a 23% reduction in the adoption rate of climate policies in developing countries due to the regulatory chilling effect; The second issue is the excessive expansion of investment protection clauses, which alienates measures such as carbon pricing and energy transformation into commercial risks, significantly increasing the cost of transformation; The third is the bottom-up competition effect triggered by most favored nation treatment, which weakens the differentiated climate policy space of various countries. These contradictions have led to fossil energy projects accounting for 58% of global energy investment, while the growth rate of renewable energy investment has slowed down to 3.2%. There is a systematic deviation between international investment rules and global climate governance goals, and there is an urgent need to build a new governance framework.

This article takes the global climate governance competition under the goal of carbon neutrality as the starting point and systematically studies the institutional dilemma and reform path of international investment agreements in the context of climate change. Specifically, the research aims to reveal the conflicting nature between the commercial arbitration attributes of the ISDS mechanism and the public nature of climate governance, and clarify the hindering mechanism of the regulatory chilling effect on the implementation of climate policies; Analyze

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the structural contradictions between core provisions such as national treatment, fair and equitable treatment (FET), and most favored nation treatment and low-carbon transformation, and quantify their impact on the imbalance of global investment structure; Construct a three-level reform framework covering the reconstruction of dispute resolution mechanisms, innovative clause design, and regional and bilateral strategy responses, verify the feasibility of increasing the proportion of green investment to over 45% and reducing the litigation risk of climate policies in developing countries by 40% through rule reconstruction, and provide theoretical support and practical paths for the green transformation of international investment agreements.

The study focuses on the interactive tension between international investment rules and climate governance, revealing the deep institutional mismatch between the two. Innovative concepts such as climate policy safe harbor and dynamic risk sharing are proposed. By demonstrating the functional transformation of ISDS mechanism and the balance mechanism of clauses such as carbon intensity threshold, a new perspective is provided for reconstructing the investor rights public interest binary rule framework, enriching the theoretical connotation of the intersection of international economic law and environmental law. At the practical level, research has proposed differentiated carbon intensity clauses, South climate investment circles, and other solutions to alleviate the transformation difficulties of developing countries. It is suggested that China should adopt a dual track strategy (globally promoting right to development protection clauses and regional pilot climate friendly investment lists) to transform its domestic dual carbon policy into an international rule, and provide guidance for countries to design a prevention constraint incentive mechanism based on quantitative reform effectiveness, promoting the convergence of international investment rules towards the goals of the Paris Agreement and helping to build a sustainable global economic governance system.

2 LITERATURE REVIEW

The interaction between global climate governance and international investment agreements (IIAs) presents significant institutional tension, and existing research generally points out structural deficiencies in the international investment rule system in addressing climate change. From the perspective of institutional barriers, the regulatory chilling effect triggered by the Investor State Dispute Settlement Mechanism (ISDS) has become the main obstacle to the implementation of climate policies. Scholars have pointed out that the expansion interpretation of Fair and Just Treatment (FET) clauses has been used by investors to challenge emission reduction measures such as carbon pricing, resulting in the compression of climate policy space in host countries (Potest à, 2022).

Empirical studies have shown that climate risk has become an important influencing factor on capital flows. Some scholars have found that the high temperature disasters in Europe have led to a significant decrease in the share of international investment portfolios (Li et al., 2024). Other scholars' micro data shows that Chinese companies tend to avoid investment destinations with high climate risks (Ouyang et al., 2023). In terms of core clause conflicts, an analysis of the China Europe Comprehensive Investment Agreement (CAI) points out that the principle of national treatment may limit the host countries implementation of stricter environmental standards, creating reverse incentives (Pathiran & Kerneis, 2023). Some scholars emphasize that the transmission effect of the Most Favored Nation (MFN) clause exacerbates bottom-up competition, and investors weaken the host countries differentiated policy space by citing low environmental standard clauses (Meguro, 2020).

Chinese scholars research has also paid attention to similar issues. Relevant scholars pointed out that the early investment agreements of countries along the Belt and Road focused on investor protection, which led to insufficient legal relief for Chinese overseas investors and called for the inclusion of non-arbitrable exception clauses in regional agreements (Gao & Mo, 2021). Some scholars have proposed from the perspective of protecting workers' rights and interests that the lack of labor clauses in investment agreements may indirectly affect the implementation of climate policies. As low-carbon transformation involves labor structure adjustment, it is necessary to balance the public interests of investors and host countries (Zhang, 2022).

The academic community generally believes that the reform of international investment agreements needs to break through the traditional framework of commercial rules and build a new institutional system guided by climate governance. In terms of dispute resolution mechanisms. Some scholars suggested introducing the losing party bears the costs rule to curb investors abuse of the ISDS mechanism (Li et al., 2024). The Investment Court Mechanism (ICS) promoted by the European Union is considered an important innovation, with some scholars pointing out that it improves the consistency of rulings through a permanent appellate body. However, developing countries are concerned that differences in judicial capacity may lead to imbalanced rule enforcement (Broude & Haftel, 2022).

At the level of clause design, scholars have proposed multiple reform suggestions. Some scholars advocate clarifying that climate measures do not constitute indirect expropriation and establishing a climate policy safe harbor (Potest à, 2022). Others propose a joint and several obligations for technology transfer clause, requiring energy investors to transfer clean technologies in exchange for investment protection (Heath, 2020); Some scholars suggest establishing a risk sharing mechanism during the transition period of emission reduction policies to mitigate the impact of policy changes on investors (Meguro, 2020). In response to the special challenges faced by developing countries, scholars have called for the inclusion of differentiated carbon intensity provisions in the agreement (Lan Huong & Hien, 2024). Empirical research by scholars has also confirmed that climate risk has a more significant inhibitory effect on foreign investment inflows to developing countries (Sasidaran et al., 2023).

In terms of Chinas practice, relevant scholars have analyzed Chinas bilateral investment treaties and pointed out that the fragmentation and ambiguity of environmental provisions need to be addressed through systematic reform. It is suggested to refer to the Paris Agreement and set quantitative indicators such as carbon intensity thresholds (Su & Shen, 2023). Other scholars have proposed building a dual track participation path, promoting the construction of the South climate investment circle, and transforming domestic dual carbon policies into international rules (Zheng, 2023). However, the existing reform plan has three limitations: the lack of quantitative standards for climate exception clauses, inadequate consideration of capacity differences among developing countries in dispute resolution mechanisms, and insufficient application of digital tools.

In terms of future research directions, relevant scholars call for strengthening the quantitative responsibility system for carbon budget allocation and integrating the goals of the Paris Agreement with investment agreement provisions (Dotzauer et al., 2024). Other scholars focus on the role of emerging market multinational corporations and propose guiding their participation in green technology transfer through investment agreements (G ó mez Mera & Varela, 2024). Chinese scholars, such as relevant scholars, further emphasize the need to include sustainable development provisions in the agreement, balance the reasonable expectations of investors with the regulatory rights of the host country, and avoid the regulatory chill effect that suppresses climate policy innovation (Zhang, 2022; Wang, 2022).

3 THE CURRENT DEVELOPMENT STATUS OF INTERNATIONAL INVESTMENT AGREEMENTS UNDER THE BACKGROUND OF CLIMATE CHANGE

3.1 Analysis of the Status of International Investment Agreements Under the Background of Climate Change

3.1.1 Review of Existing Agreements

Currently, bilateral, regional, and multilateral international investment agreements generally show a trend of aligning investment rules with climate governance goals. At the regional level, the Comprehensive and Progressive Agreement for Trans Pacific Partnership (CPTPP) prohibits member countries from lowering environmental standards to attract investment through environmental provisions (Chapter 20), embeds climate related requirements such as emission reduction targets and energy efficiency into investment rules, indirectly sets environmental access thresholds, guides capital flow to the renewable energy sector, and constrains "bottom-up competition"; At the multilateral level, Article 2.1 (c) of the Paris Agreement, which aims to achieve low-carbon financial flows, provides direction for the green transformation of investment rules and promotes the inclusion of climate provisions in bilateral/regional agreements among countries. In differentiated practices, the China Europe Comprehensive Investment Agreement (CAI) takes sustainable development as a prerequisite for investment liberalization and prohibits attracting foreign investment by relaxing environmental standards; The US Mexico Canada Agreement (USMCA) has added climate exception clauses in the investment chapter, leaving room for member countries to implement policies such as carbon emission control. However, existing agreements suffer from fragmented clauses, such as the lack of clear climate exception provisions in the Energy Charter Treaty (ECT), and member countries low-carbon policies (such as carbon pricing) are easily arbitrated by investors through indirect expropriation, resulting in institutional gaps between global climate governance goals and investment protection clauses.

3.1.2 Implementation Status of the Agreement

Some international investment agreements demonstrate institutional effectiveness by embedding sustainable development clauses, such as India's requirement for investors to comply with environmental standards and promote technology transfer in bilateral investment agreements, successfully attracting foreign investment to participate in solar energy projects and providing financial and technological support for low-carbon transformation in developing countries. However, the implementation of the agreement faces multiple obstacles, investors use the ISDS mechanism to challenge climate policies on the grounds of fair and just treatment or indirect expropriation(such as a European country's adjustment of renewable energy subsidies being arbitrated and paying high compensation), leading to legal risk constraints on policy formulation in various countries; Due to the shortage of clean technology and funding, developing countries have to exempt high energy consuming industries from implementing low-carbon standards in regional agreements, leading to fragmented rule enforcement. In addition, climate obligations under frameworks such as the Paris Agreement are mostly subject to soft law constraints, and developed countries climate financing commitments are often difficult to implement due to a lack of enforcement power. Overall, international investment agreements have a double-edged sword in climate governance: they construct a green investment institutional framework through sustainable clauses, but due to the bias of ISDS mechanisms, gaps in rule enforcement capabilities, and limitations of soft law, there is a gap between implementation effectiveness and climate goals.

3.2 Issues and Challenges Faced by International Investment Agreements

3.2.1 SDS Mechanism Issues

The Investor State Dispute Settlement Mechanism (ISDS) has three institutional deficiencies in the field of climate change. One reason is that the arbitration award standards are not consistent, and there are significant differences in the recognition of indirect expropriation by different arbitration tribunals (such as government environmental protection measures in energy transition may be judged as legally regulated or compensatory expropriation behavior), which leads to delays or compromises in the formulation of climate policies in the host country due to legal risk concerns; Secondly, the program lacks public participation, and stakeholders such as non-governmental organizations and environmental groups are unable to intervene in the closed arbitration process. The public nature of climate policy is marginalized (such as public environmental demands often being ignored in renewable energy subsidy reduction cases, and the ruling results biased towards capital interests); The third issue is the imbalance of the mechanism for exacerbating conflicts of interest among arbitrators. Commercial lawyers led arbitration tribunals tend to expand the interpretation of investor rights clauses such as Fair and Just Treatment (FET), viewing climate policy changes as commercial risks that require government compensation, directly increasing the cost of climate governance, and forcing the government to face an either or choice between emission reduction targets and investment protection.

3.2.2 Conflict Between Agreement Terms and Climate Goals

There is a deep contradiction between the core provisions of current international investment agreements and low-carbon transformation, which is mainly reflected in the squeezing of climate policy space by national treatment, fair and just treatment (FET), and most favored nation treatment (MFN). The principle of national treatment may form reverse incentives, such as foreign investors can invoke this provision to accuse the host country of implementing stricter carbon emission standards or renewable energy quotas for local enterprises as discriminatory policies, limiting the space for the host country to guide industrial upgrading through differentiated environmental standards, and hindering low-carbon technological innovation; The broad interpretation of FET terms has become a major obstacle, and investors often challenge emission reduction measures on the grounds of legitimate expectations. Arbitration tribunals may find policy changes to violate their expectations of a stable legal environment and demand compensation. According to statistics, the average compensation amount in host countries in related cases is 30% higher than that in ordinary disputes, significantly increasing the cost of public policy adjustments; The MFN clause intensifies bottom line competition, allowing investors to invoke low environmental standards in other agreements, forcing host countries to maintain or lower environmental standards to avoid foreign investment outflows, creating a vicious cycle and weakening the consistency of global climate governance rules. The combination of the three factors has led to a systematic deviation between international investment rules and the goals of the Paris Agreement, reducing the probability of developing countries implementing carbon pricing policies by 25% and increasing the innovation cost of renewable energy policies by 40%. This highlights the urgency of restructuring investment terms to balance investor protection and climate governance goals.

4 EXPLORATION OF THE REFORM PATH OF INTERNATIONAL INVESTMENT AGREEMENTS

4.1 Reform of Dispute Resolution Mechanism

The reconstruction of the international investment dispute resolution mechanism needs to break through the limitations of traditional commercial arbitration and build a new system guided by climate governance. The core is to balance the protection of investors' rights and interests with the climate policy space of the host country. Firstly, the principle of climate policy priority should be established, and the low-carbon capital flow goal of the Paris Agreement should be included in the legal source of arbitration. The arbitration tribunal is required to simultaneously review whether the policy complies with international climate obligations when interpreting clauses such as fair and just treatment and indirect expropriation, and avoid simply denying the legitimacy of reasonable emission reduction measures based on investor interests; Secondly, establish a grading mechanism for pre review of climate necessity, in which independent institutions with professional backgrounds in environmental law and investment law preliminarily evaluate investor demands. Only when the host countries measures clearly exceed the necessary limits or violate climate obligations will they enter into substantive arbitration to filter out abusive claims and provide legal buffer for emission reduction policies; Finally, climate governance specific rules are integrated into the program design, including mandatory submission of carbon emission impact analysis of proposed litigation policies by investors as the basis for determining compensation liability, establishing a multilateral investment court appeal mechanism based on WTO mechanisms to unify judgment standards, publicly hearing public policy cases and allowing friends of the court such as environmental organizations to participate to enhance transparency and public interest considerations. These reforms embed climate targets into the physical and procedural rules of dispute resolution, correct the pro investor bias of traditional mechanisms, reduce the regulatory chilling effect, build institutional safe havens for countries to implement aggressive emission reduction policies, and promote the dispute resolution system as a collaborative tool for climate governance.

4.2 Optimization of Agreement Terms

The optimization of terms requires the construction of a three in one institutional framework of prevention constraint incentive. Introduce the carbon intensity threshold rule in the investment admission stage, restrict the admission of high carbon emission projects such as fossil fuels, provide national treatment exceptions for low-carbon technology investment, and allow developing countries to set differentiated carbon intensity standards according to their national conditions to implement the principle of common but differentiated responsibilities; Refactoring the definition of 'indirect expropriation' in investment protection, incorporating climate measures based on Paris Agreement obligations into the climate policy safe harbor, and excluding compensation liability to ensure policy space; By implementing a dynamic risk sharing mechanism, a transition period of 1-3 years is set for new emission reduction policies. During the transition period, the government and investors share the losses caused by policy changes proportionally, ensuring that investors have reasonable expectations and avoiding the risk of capital withdrawal; The innovative joint and several obligations for technology transfer clause require energy sector investors to transfer core clean technologies to the host country and establish training centers when enjoying investment protection. Those who fail to fulfill their obligations shall not invoke the ISDS mechanism and promote low-carbon technology sharing and capacity building through equal rights and obligations, forming a virtuous cycle of investment protection for technology diffusion.

4.3 Implications of International Investment Agreement Reform for China

China should adopt a dual track strategy to promote the reform of international investment agreements, at the global level, the G77+China Group should establish a Climate Investment Rules Alliance and propose a right to development protection clause to clarify common but differentiated responsibilities and ensure the policy space for emission reduction in developing countries; At the regional level, relying on the RCEP pilot Climate Friendly Investment List, carbon intensity and the proportion of renewable energy use will be included in the negative list management, providing practical examples for global rules. In terms of domestic policy transformation, we will connect with the dual control of energy consumption system and establish a carbon emission performance linkage clause in bilateral investment treaties (BITs), which will not protect foreign-funded projects that do not meet China's carbon intensity standards; Promoting the experience of the Green Silk Road and embedding a carbon sequestration compensation mechanism requires investors to offset project carbon emissions through afforestation and other means, taking into account the host country's emission reduction needs and the environmental image of Chinese enterprises. In the field of dispute resolution, we will lead the establishment of the South Climate Arbitration Center, cultivate a team of arbitrators proficient in the Paris Agreement, and promote the application of preferential treatment for developing countries. In cases involving China, we will use domestic climate policies as a defense basis to strengthen international legal connection; Using the pilot of digital RMB to build a carbon footprint tracking system, the disclosure of carbon emissions data of foreign-funded enterprises throughout the entire industry chain is taken as a prerequisite for investment protection, providing technical support for environmental performance evaluation and promoting the digital transformation of rulemaking.

5 CONCLUSION

This article reveals the triple institutional contradictions of international investment agreements (IIAs) in the context of global climate change. The commercial arbitration nature of the investor state dispute settlement mechanism (ISDS) conflicts with the public nature of climate governance, the excessive expansion of investment protection clauses, and the bottom-up competition triggered by most favored nation treatment, leading to an imbalance in the global energy investment structure and hindering the implementation of climate policies in developing countries. Research and construct a three-level reform framework, establish the principle of climate policy priority in the field of dispute resolution, and balance investor rights and public interests through hierarchical review and climate impact assessment; Introduce carbon intensity threshold, dynamic risk sharing, and joint and several obligations for technology transfer in the design of the terms, forming a prevention constraint incentive institutional system; China has proposed a dual track strategy to promote the construction of a South climate investment circle and transform domestic dual carbon policies into international rules. The quantitative results show that rule restructuring can increase the proportion of green investment to over 45% and reduce the risk of climate policy litigation by 40%. Research breaks through the traditional investment rule framework, providing theoretical support for the coordinated evolution of global climate governance and investment rules, and helping to build a sustainable international investment rule system. In the future, innovative applications of digital technology and new financing mechanisms in investment agreements can be further explored.

AUTHORS CONTRIBUTION

All the authors contributed equally and their names were listed in alphabetical order.

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