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Norm Localization of Carbon Market Transfer from the European Union to China: Development of the Emissions Trading System

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Abstract

This article examines how China localized the global carbon market norm, particularly the European Union Emissions Trading System (EU ETS), within its domestic climate governance framework. Using a qualitative approach grounded in constructivist International Relations theory and Amitav Acharya's norm localization framework, the study analyzes how international norms were adapted to fit China's political and institutional context. The findings show that China did not directly replicate the European cap-and-trade model. Instead, policymakers selectively reconstructed the norm through policy learning, domestic framing, grafting onto existing governance practices, and pruning elements considered incompatible with national priorities. China's ETS evolved into a hybrid model characterized by intensity-based benchmarking, free allocation, output-based adjustment, sectoral sequencing, and strong state supervision. The regional pilot schemes (2013–2014) and the national ETS launched in 2021 demonstrate this localization process. The study concludes that norm localization increased the domestic legitimacy and institutional compatibility of China's ETS, although it also created challenges such as weak carbon price signals, limited market liquidity, and uneven implementation. This article contributes to International Relations scholarship by showing that climate norm diffusion involves active translation rather than simple policy transfer.

Keywords

Carbon Market Norm, Climate Governance, EU ETS, Norm Localization, Policy Learning.

1. Introduction

Climate change has encouraged the development of diverse global governance instruments, ranging from emissions targets and technological cooperation to carbon crediting mechanisms and emissions trading systems (Tanveer et al., 2024; Kurniadi et al., 2024). In environmental economics, emissions trading or cap-and-trade is understood as a market-based instrument that assigns a price to emissions, thereby creating economic incentives for firms to choose between reducing emissions and purchasing allowances (Stavins, 2003). The IPCC (2014) notes that emissions trading has evolved from an academic idea into an important policy instrument for pollution control. From an International Relations perspective, carbon markets are not only technical mechanisms but also governance norms that embed assumptions about efficiency, emissions accountability, market discipline, and the relationship between the state and the market (Wendt, 2025).

The European Union became a central actor in institutionalizing this norm through the European Union Emissions Trading System (EU ETS), operating since 2005 under Directive 2003/87/EC. While earlier tradable permit systems existed in the United States and other jurisdictions, the EU ETS transformed greenhouse gas emissions trading into the most prominent regional model (Višković et al., 2017). Over time, it evolved from a system relying heavily on free allocation toward a more centralized design in which auctioning increasingly became the main allocation mechanism (Mariotti, 2016). In this process, emissions trading acquired global referential power, as emissions were increasingly treated as regulatory objects that can be measured, capped, allocated, traded, verified, and sanctioned. This development also reflects broader governance logics in global climate policy that emphasize market discipline and efficiency-oriented regulation.

China is a particularly important case because it is both a major emitter and a state with a political-economic structure different from liberal market economies. Its domestic system is shaped by state planning, strong central government authority, local government influence, and the dominance of state-owned enterprises in strategic sectors. Lo and Howes (2015) highlight that carbon trading discourse in China is closely linked to carbon sovereignty and the ambition to gain influence in international carbon markets. In 2011, the National Development and Reform Commission selected seven pilot jurisdictions for emissions trading: Beijing, Tianjin, Shanghai, Chongqing, Hubei, Guangdong, and Shenzhen (Zhang et al., 2014). Compared with the EU ETS, China implemented these pilots in a relatively short time, reflecting rapid policy learning and adaptation. However, the national ETS launched in 2021 diverges from the EU model, initially covering only the power sector and gradually expanding to other industries, while remaining characterized by free allocation, emissions intensity benchmarks, and strong state control over monitoring, reporting, verification, and enforcement (ICAP, 2025).

These developments generate an important academic problem in the study of international environmental governance. Although the carbon market norm has become globally prominent through the EU ETS, China did not adopt it in full. Instead, it selectively adjusted institutional elements to align with domestic governance structures, including strong state intervention, sovereignty considerations, the principle of common but differentiated responsibilities, and experimental policy practices. This indicates that the diffusion of carbon market norms cannot be fully explained through technical efficiency or policy convergence alone. Constructivist theory emphasizes that state interests are shaped by identity and norms rather than being fixed. In this regard, Acharya (2004) introduces norm localization to explain how external norms are actively reconstructed through framing, grafting, and pruning processes. Rather than passive adoption, global

norms are reshaped to fit domestic cognitive priors and institutional constraints, producing hybrid governance arrangements such as China's ETS.

Building on this perspective, this study examines the transfer of carbon market norms from the European Union to China as a process of norm localization within international environmental governance. It addresses four main analytical questions. First, how elements of the EU ETS and related international experiences entered China's policy framework. Second, how these elements were reinterpreted through domestic political-economic priorities. Third, how the localization process unfolded through the stages of prelocalization, local initiative, adaptation, and amplification. Fourth, how China's ETS contributes to global climate governance while reflecting broader dynamics of norm diffusion in contexts where institutional and ideological structures differ significantly from those in which the norm originally emerged. By situating China's ETS within constructivist theory, this research contributes to understanding how global environmental governance instruments are transformed when they encounter domestic institutional realities.

2. Literature Review

2.1. Market-Based Environmental Policy Instruments and the EU ETS Model

The literature on carbon markets and China's ETS begins with market-based environmental policy instruments. Stavins (2003) explains that such instruments include charge systems, tradable permits, market-friction reductions, and reductions in government subsidies. Goulder and Schein (2013) compare carbon taxes and cap-and-trade systems, showing that although both aim to reduce emissions efficiently, they differ in price stability, burden distribution, and revenue use. This body of literature establishes the normative foundation of carbon markets, where emissions reductions are considered more efficient when abatement costs are transmitted through price signals rather than through command-and-control regulation (Pahle et al., 2018).

Building on this foundation, the European Union Emissions Trading System (EU ETS) serves as the most influential institutional model (Bayer & Aklin, 2020). Mariotti (2016) shows that the EU ETS has evolved through significant changes in allowance allocation, particularly the shift from free allocation in earlier phases toward auctioning as the dominant mechanism in later stages, along with harmonized allocation rules. The IPCC (2014) similarly notes that the initial environmental effectiveness of the EU ETS was weakened by generous permit allocation, although this experience provided important lessons for the design of subsequent emissions trading systems. Recent empirical studies further confirm that carbon pricing systems like the EU ETS have achieved measurable emissions reductions while gradually improving efficiency through iterative policy reform (Green, 2021). The EU ETS is not a static model, but one that has evolved through continuous learning and institutional reform, while remaining a central reference point in the global diffusion of emissions trading.

2.2. China's ETS: Development, Institutional Design, and Political Economy

The development of China's ETS is well documented in the literature. Zhang et al. (2014) provide an early analysis of China's seven ETS pilots, covering the policy background, design variation, and challenges in transitioning toward a national system. They show that the pilots differed in sectoral coverage, emissions thresholds, and allocation methods, reflecting variations in regional economic conditions. Huang et al. (2025) extend this discussion by tracing key milestones, including the launch of pilot programs in 2011, the addition of Fujian as an eighth pilot in 2016, and the establishment of the national carbon market in 2021. ICAP (2025) further updates these developments by documenting the 2024–2025 strengthening of the legal framework through State Council regulations and plans for broader sectoral

expansion. Together, this literature provides an empirical basis for understanding how the carbon market norm was translated into China's institutional context.

Beyond institutional development, the political economy literature highlights the regulatory and governance dimensions of China's ETS. Goron and Cassisa (2017) emphasize that the effectiveness of an emissions trading system depends on the strength of both formal and informal institutions supporting its implementation. They find that tensions between state authority and market mechanisms in China's pilot phase tended to reinforce state dominance rather than produce fully autonomous market regulation. Wang and Paavola (2023) further show that China's ETS has been shaped by shifting political-economic dynamics, including the transfer of regulatory authority from the National Development and Reform Commission (NDRC) to the Ministry of Ecology and Environment (MEE) in 2018, as well as broader pressures from economic slowdown and coal dependency. They argue that China's ETS represents not only a climate policy instrument, but also an ongoing experiment in governance transformation with significant political and economic implications.

2.3. Global Climate Governance and Norm Fragmentation

The literature on global climate governance situates carbon markets within a broader system of fragmented and overlapping institutions. Keohane and Victor (2011) conceptualize climate governance as a regime complex, meaning a loosely connected set of regimes that operates without a single hierarchical authority. Within this structure, climate policy is shaped through interactions among multiple institutions rather than through a centralized global regime. Van Asselt (2013) further argues that global climate governance is increasingly fragmented, as reflected in the emergence of multiple emissions trading systems with differing institutional designs, regulatory logics, and implementation approaches. This fragmentation highlights that carbon markets do not evolve within a uniform global framework, but rather within a pluralistic governance environment where institutional diversity is the norm (Ahonen et al., 2022).

Within this fragmented governance landscape, the Paris Agreement represents a significant shift in international climate politics. Falkner (2016) explains that the agreement moved global climate governance away from top-down binding emission targets toward nationally determined contributions, while still embedding countries within systems of transparency and international review. This transition reinforces a governance model that relies on domestic policy interpretation and implementation rather than centralized enforcement. In this context, China's ETS localization occurs within a global architecture that is inherently decentralized and flexible, allowing states to adapt carbon market norms according to their own institutional capacities and political priorities (Bodansky, 2016).

2.4. Constructivism and Norm Localization in Carbon Market Governance

This article adopts constructivism as its theoretical framework, which sees international politics as shaped not only by material capabilities but also by ideas, norms, identities, rules, and intersubjective meanings. Norms are understood not merely as external constraints but as standards of appropriate behavior. Kauppi and Viotti (2023) highlight that norms have constitutive effects in shaping identities and regulative effects in guiding behavior. In this sense, the carbon market is treated as a governance norm rather than an economic instrument, as it frames emissions as measurable, tradable, and priceable objects governed through institutionalized market mechanisms. Within constructivist scholarship, norm diffusion refers to the movement of norms from the international to the domestic level. Acharya (2004) argues that earlier approaches overemphasize global norm authority and underestimate local agency, showing instead that local actors actively reconstruct external norms through framing, grafting, and cultural selection in a process called

norm localization. Norms are thus neither fully adopted nor rejected but reshaped to fit local contexts while retaining elements of their external origin.

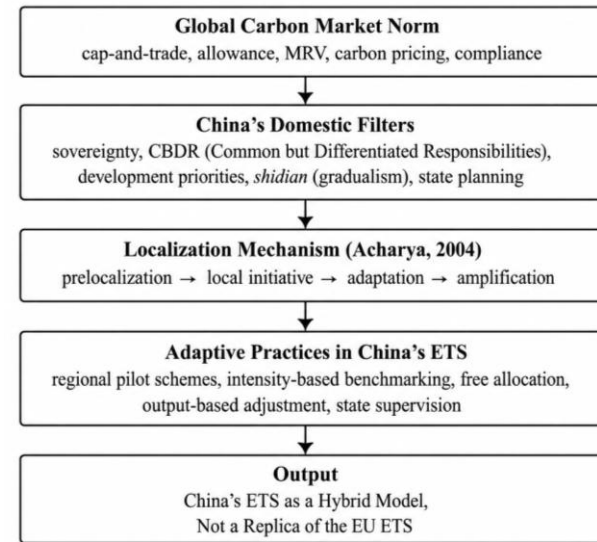


Figure 1. Conceptual Framework of Carbon Market Norm Localization

Acharya's framework in Figure 1 is particularly relevant to China's ETS because the carbon market norm introduced through the EU ETS encountered domestic cognitive priors, including state sovereignty, common but differentiated responsibilities, development and energy security priorities, the experimental policy tradition of *shidian*, and the central role of the state in market governance. The effectiveness of norm adoption depends on compatibility between external norms and these pre-existing structures. Acharya (2004) conceptualizes norm localization as a four-stage process: prelocalization, where external norms face resistance; local initiative, where domestic actors frame the norm as useful; adaptation, involving grafting and pruning; and amplification, where the localized norm gains broader legitimacy. In this article, the EU ETS is treated as a key reference point in global carbon governance, while China is viewed as an adapting actor. The resulting ETS design, including pilot systems, intensity-based allocation, free permits, strengthened Monitoring, Reporting, and Verification (MRV), and gradual sectoral expansion, is interpreted as an outcome of norm localization rather than policy transfer.

3. Methods

This article uses a qualitative-deductive approach to explain how China adapted the global carbon market norm into its domestic system. A qualitative approach is appropriate because the study does not seek to statistically measure the effectiveness of the ETS, but rather to understand the meanings, processes, and political contexts that shaped the reception and adjustment of the carbon market norm in China. According to Neuman (2014), qualitative research seeks to understand social reality in depth by situating a phenomenon within its historical, institutional, and social context. This approach is therefore relevant for examining China's ETS not only as an economic instrument, but also as a socio-political construction within domestic climate governance.

Deductively, the study uses Acharya's (2004) norm localization theory as the main analytical framework. The theory is used to derive analytical indicators:

prelocalization, local initiative, adaptation, and amplification. Through these indicators, the article traces how the carbon market norm that developed through the EU ETS was received, selected, and adjusted to China's domestic cognitive priors, including state sovereignty, the principle of Common But Differentiated Responsibilities (CBDR), economic development, policy gradualism or *shidian*, and state planning.

The data used in this study are secondary data collected through literature study and document analysis. The sources include academic journal articles, reports from international institutions, policy documents, and literature on the development of the EU ETS, China's pilot ETSS, China's national ETS, and norm localization theory. Data analysis is conducted in three stages, following: data reduction, data organization, and data interpretation (Neuman, 2014). In the data reduction stage, materials relevant to the transfer of the carbon market norm are selected and filtered. In the organization stage, the data are grouped according to the stages of norm localization. In the interpretation stage, the data are analyzed to explain how the adaptation of the carbon market norm produced China's ETS as a hybrid model rather than a direct replica of the EU ETS.

The period of analysis covers developments from the emergence of the EU ETS as an early carbon market reference in 2005 to the evolution of China's national ETS after its launch in 2021. The focus is on 2011–2021, the period during which China designed regional ETS pilots, tested various institutional designs, and then developed the national emissions trading system. This method enables the article to explain norm transfer contextually, rather than merely comparing technical differences between the EU ETS and China's ETS.

4. Results

4.1. EU ETS as a Global Reference in Carbon Market Norm Development

The carbon market norm is based on the idea that greenhouse gas emissions can be governed through pricing mechanisms and tradable allowances. In a cap-and-trade system, the state sets an emissions limit, distributes allowances, and then allows regulated actors to trade those allowances according to their compliance needs. Normatively, this instrument combines state authority and market logic: the state creates scarcity through the cap, while the market determines prices through the interaction of supply and demand. Mariotti (2016) emphasizes the symbiotic relationship between the state and the market in emissions trading, since the market does not arise naturally but is created through legal and regulatory decisions by the state.

The EU ETS became an important reference point because it institutionalized this norm on a broad and sustained regional scale. In its early phase, most allowances were allocated for free based on historical emissions. This mechanism was criticized for generating windfall profits and raising questions about its consistency with the polluter pays principle (Mariotti, 2016). In the third phase, auctioning became the default allocation method, while free allocation remained available for certain sectors under more harmonized rules. This development shows that the EU ETS moved toward stronger standardization, centralization, and price discipline.

In the global context, the EU ETS is not only a European regional policy but also a learning device for other jurisdictions. The IPCC (2014) shows that since the establishment of the EU carbon trading system, various countries and subnational jurisdictions have implemented or planned ETSSs, including New Zealand, Australia, California, Quebec, South Korea, Tokyo, and several Chinese provinces and cities. ICAP (2025) records that, as of January 2025, 38 ETSSs were in force globally, covering more than 12 GtCO₂e or around 23 percent of global greenhouse gas

emissions. In other words, the carbon market norm has become an important element of the global climate governance architecture.

However, the global status of this norm does not mean that all countries adopt the same design. Van Asselt (2013) shows that ETSs emerging across jurisdictions differ in terms of whether they are mandatory or voluntary, whether they use absolute or intensity targets, which sectors they cover, how allowances are allocated, and whether offsets are used. This variation is important because it shows that global carbon markets are developing within a fragmented architecture. The EU ETS provides a model and a source of legitimacy, but when the norm enters other domestic contexts, its form may change significantly. This is the analytical space in which norm localization becomes relevant.

4.2. China's Initial Resistance to Carbon Market Norms

In the Chinese case, the prelocalization stage appears in the tension between the cap-and-trade-based carbon market norm and China's domestic cognitive priors. The first priority is sovereignty and CDDR. Since the early climate negotiations, China has emphasized that developing countries cannot be treated in the same way as developed countries because their historical contributions and mitigation capacities differ. The IPCC (2014) notes that the UNFCCC contains the principle of common but differentiated responsibilities, while Falkner (2016) shows that developing countries such as China and India resisted international pressure to accept rigid, internationally negotiated mitigation targets. For this reason, a carbon market norm associated with emissions caps could be perceived as threatening domestic development space.

The second priority is economic development and energy security. China still faces major demands to sustain growth, industrialization, and energy supply. Its economic structure is deeply connected to coal, electricity, steel, cement, and heavy industry. Wang and Paavola (2023) show that although the long-term benefits of the low-carbon transition are recognized, concerns over short-term economic impacts continue to generate resistance from local governments and established interest groups. In this context, an absolute cap similar to that in the EU ETS may be perceived as too restrictive because it is not always compatible with rising industrial output and growing energy demand.

The third prior is suspicion toward international carbon markets controlled by Western institutions. Lo and Howes (2015) show that China's experience with the Clean Development Mechanism (CDM) produced narratives of lost carbon sovereignty. China became a major supplier of emissions reductions, but crediting standards, prices, and trading rules were largely determined outside China's sovereign space. This created a desire to build a domestic carbon market with Chinese rules and standards. Therefore, China's acceptance of the ETS emerged from a combination of market learning and an aspiration to restore authority over carbon markets (Heggelund et al., 2022).

The fourth prior concerns China's state-market configuration. Goron and Cassisa (2017) refer to the view that China represents a major test for carbon trading theory because the case reveals whether a liberal market is required to produce environmental benefits. In practice, China's carbon market did not grow out of a financial-liberal coalition, as often assumed in carbon market literature, but from state decisions driven by policy targets. This explains why, at the initial stage, the carbon market norm could not enter China as a complete liberal model. It first had to be separated from the assumption that markets would diminish the role of the state. Thus, China's prelocalization was not a complete rejection of the ETS, but resistance to a particular version of the carbon market norm: one that required an absolute cap, financial liberalization, and reduced state control. China began to see the usefulness of an ETS, but only if the instrument could be reframed as a domestic

tool for achieving carbon intensity targets, strengthening state capacity, and improving China's position in global carbon markets.

4.3. Prelocalization, Local Initiative, Adaptation, and Amplification

The local initiative stage becomes visible when Chinese domestic actors begin framing the ETS as an instrument aligned with national interests. The NDRC played a central role as the authority responsible for climate policy under the State Council, selecting seven provinces and cities in 2011 to establish ETS pilots during the Twelfth Five-Year Plan. This indicates that norm transfer was not driven by external pressure but by domestic actors who viewed the ETS as a tool to support existing national targets. The framing strategy emphasized efficiency and international compatibility, presenting the ETS as a cost-effective, market-based mechanism rather than an externally imposed obligation (Zhang et al., 2014). As a result, the carbon market norm shifted from market liberalization toward governance efficiency under state direction.

Grafting further enabled localization by linking the ETS to China's tradition of *shidian* (policy experimentation), allowing pilot systems in Beijing, Tianjin, Shanghai, Chongqing, Hubei, Guangdong, and Shenzhen to test and refine the model before national scaling. This ensured administrative flexibility and reduced policy risk. The ETS was also grafted onto existing CDM experience and energy-intensity targets in Five-Year Plans, combining emissions trading with China's established focus on carbon intensity rather than absolute emissions, thereby aligning it with CBDR and development priorities (Raufer et al., 2025). Additionally, international learning, particularly from the European Union, provided reference points for MRV, allocation, and compliance systems. As noted by Goron and Cassisa (2017), China described the EU as a 'teacher,' although the design was selectively adapted rather than copied, with domestic actors choosing elements compatible with China's governance structure.

The adaptation stage is the core of localization, where elements of the European carbon market norm are retained while others are modified or pruned, producing China's ETS as a hybrid model. The retained core is the MRV system, requiring emissions to be measured, reported, verified, and matched with allowance surrender obligations. However, key design elements such as allocation, caps, pricing, and coverage diverge significantly from the EU ETS. A major pruning is the shift from an absolute cap to intensity-based targets, with China adopting output-based benchmarks instead of declining emissions caps. Wang and Paavola (2023) note that China avoided absolute reduction commitments, aligning its ETS with growth and energy security priorities while allowing ex post adjustments based on energy consumption. Another pruning concerns allowance allocation, where free allocation remains dominant instead of auctioning as in the EU ETS. ICAP (2025) explains that allocation is based on intensity benchmarks, reducing compliance pressure and maintaining industrial and local government acceptance. Financialization is also limited, as carbon trading remains tightly regulated, reflecting concerns over market stability and state control (Goron & Cassisa, 2017). Sectoral expansion follows a gradual approach, beginning with the power sector and later extending to steel, cement, and aluminium once MRV and compliance capacity are strengthened (ICAP, 2025). Legal enforcement similarly evolved, with weak initial sanctions later strengthened through the 2024 State Council Interim Regulations, including higher penalties for non-compliance (Zhang et al., 2014; ICAP, 2025).

These adaptations show that China's ETS is not a weaker version of the EU ETS but a domestically embedded hybrid system. However, this design also weakens market signals, as free allocation, low prices, and strong state intervention reduce liquidity and price efficiency. Chang et al. (2018) and Wang and Paavola (2023) note persistent issues such as low prices, fragmented trading, and limited corporate response to carbon price signals.

Table 1. Comparing EU ETS Features and China's ETS as an Outcome of Localization

Feature	EU ETS	China's ETS	Meaning of Localization
Target basis	Declining absolute cap.	Intensity benchmarks and output-based approach.	The absolute cap was pruned to fit growth needs and intensity targets.
Allowance allocation	Auctioning has become the default since the third phase, while free allocation is increasingly harmonized.	Free allocation dominates, using intensity benchmarks.	Initial industrial burdens are reduced to maintain domestic legitimacy.
Coverage	Multi-sectoral and expanding, including aviation and maritime sectors.	The national system began with the power sector and is expanding gradually to steel, cement, and aluminium.	Administrative gradualism and MRV readiness are prioritized.
Market and financialization	Secondary markets and financial instruments are more developed.	Financialization is restricted, and state control remains strong.	Market logic is accepted, but full liberalization is pruned.
Enforcement	Strong legal framework and high penalties.	Initially weaker, then strengthened through the 2024 regulations.	Legal strengthening followed a learning phase.
Policy identity	A European regional market instrument.	A Chinese state-market hybrid instrument.	The global norm is translated into domestic governance.

Table 1 shows that differences between the EU ETS and China's ETS reflect a systematic norm localization process in which core design elements are reshaped to fit domestic conditions. The EU ETS's absolute cap is pruned into intensity-based targets to accommodate economic growth and energy security priorities, while auction-based allocation is replaced by dominant free allocation to maintain industrial and political acceptance. Coverage is also adapted through a gradual sectoral rollout in China, starting with the power sector and expanding in line with MRV readiness, in contrast to the EU's broader multi-sectoral design. Market and financialization features are constrained in China to preserve state control, whereas the EU ETS allows deeper financial market development. Enforcement evolves more incrementally in China, with stronger legal mechanisms introduced only after initial implementation phases, unlike the EU's more established regulatory framework. These adjustments demonstrate how the carbon market norm is selectively transformed into a state-market hybrid rather than directly replicated.

Amplification becomes visible when China's localized ETS extends beyond a domestic policy and begins shaping its role in global climate governance. Goron and Cassisa (2017) argue that China's ETS positions China as a potential rule-maker in linking fragmented carbon markets outside the UNFCCC framework, increasing its influence in Article 6 negotiations, carbon market cooperation, and ETS design in developing countries, despite the absence of formal linkage with other systems. This amplification is reinforced by scale, as Huang et al. (2025) show that China's national carbon market has surpassed the EU ETS in emissions coverage, while ICAP (2025) notes that the power sector alone exceeds 5 billion tCO₂, making China's ETS one of the dominant global models.

However, amplification also reveals key trade-offs of localization. The hybrid design strengthens domestic acceptance but weakens market efficiency, as low prices, limited liquidity, and strong state intervention reduce investment signals for decarbonization. Wang and Paavola (2023) find that ETS prices and liquidity during 2020–2022 remained insufficient to significantly influence corporate strategies. In addition, Huang et al. (2025) show that the ETS may encourage firms to relocate investments to non-pilot regions, while Yu et al. (2021) highlight risks of outward investment leakage. These dynamics illustrate a structural paradox in localization: increased flexibility enhances domestic legitimacy but can generate spatial and carbon leakage effects.

From an International Relations perspective, these dynamics reinforce the fragmented nature of global climate governance. Keohane and Victor (2011) conceptualize climate governance as a regime complex of loosely connected institutions, while Van Asselt (2013) emphasizes variation across ETS designs in targets, coverage, and allocation mechanisms. China's amplification thus contributes to the diversification of carbon market models while simultaneously complicating global coordination, as localized systems diverge in structure yet coexist within an interconnected climate governance architecture.

4.4. Climate Governance Implications of China's ETS

The findings of this article show that China chose localization because full adoption of the EU ETS was incompatible with its domestic cognitive priors. An absolute cap, broad auctioning, and financial liberalization could provide stronger market signals, but they could also disrupt industrial stability, increase short-term economic burdens, and weaken state control. Total rejection would also be costly because China needed an instrument that could demonstrate climate commitment, strengthen MRV capacity, and enhance its position in global carbon governance. Localization became a middle path: China accepted the principle of the carbon market but changed its design to fit domestic development and sovereignty priorities (Zhang et al., 2014). From a constructivist perspective, China's interest in the ETS did not arise only from material efficiency. It was shaped by China's identity as a major developing country: a state that rejects external emissions constraints that do not respect CBDR, but also a state that seeks to become a central actor in climate governance. Lo and Howes (2015) show that narratives of market power and carbon sovereignty connect the ETS to national development aspirations. In Acharya's terms, an external norm becomes acceptable when it helps strengthen the legitimacy of local institutions, not when it replaces those institutions.

The role of insider proponents is also crucial. The NDRC, the MEE, pilot governments, academics, and research institutes functioned as norm translators. They did not merely import a design; they converted the language of carbon markets into the language of Chinese policy: carbon intensity, energy efficiency, regional experimentation, low-carbon development, and governance modernization. Because these actors possessed domestic credibility, their framing was more acceptable than external pressure. This distinguishes localization from top-down policy transfer. Localization was also possible because the carbon market norm is flexible. Unlike norms with a single and rigid definition, an ETS can be designed in many ways: with absolute or intensity caps, free allocation or auctioning, broad or narrow coverage, price stabilization mechanisms or none, and linkages or no linkages. This flexibility creates room for grafting and pruning. Yet flexibility also generates fragmentation risks. If design variation becomes too wide, effectiveness and compatibility among ETSs may weaken. The future challenge is therefore not to force all states to copy the EU ETS, but to ensure that different local models still meet basic standards of MRV, environmental integrity, transparency, and accountability (Tvinnereim & Mehling, 2018).

The answer advanced by this article is that China adapted the global carbon market norm through domestic reconstruction that retained the basic principle of carbon markets while altering key institutional features (Zhou & Li, 2019). This adaptation is visible in the use of pilots, intensity targets, free allocation, output-based benchmarking, state control, and gradual sectoral expansion. The result is a hybrid ETS that is better suited to China's domestic structure, while still facing challenges of effectiveness, liquidity, and leakage

5. Discussion

The findings show that China's ETS is not a direct replication of the EU ETS, but a localized and structurally modified outcome shaped by domestic cognitive priors and institutional constraints. While the EU ETS serves as a reference model for cap-and-trade governance, China selectively adapts its key elements into intensity-based targets, free allocation, gradual sectoral expansion, and strong state control. This hybrid design confirms that carbon market norms are not uniformly transferred, but reconstructed through domestic filtering processes consistent with Acharya's norm localization framework (Acharya, 2004).

The adaptation of absolute caps into intensity-based benchmarks reflects a central finding of this study. Rather than rejecting carbon pricing, China reinterprets emissions control through development-oriented logic. This aligns with Goulder and Schein (2013), who note that cap-and-trade systems and carbon taxes are efficiency tools but differ in distributional and price stability effects. In China's case, the preference for intensity targets demonstrates that efficiency is subordinated to growth security and political feasibility. This supports Wang and Paavola (2023), who argue that China's ETS is embedded in a political economy where industrial stability and state authority remain dominant considerations.

Similarly, the dominance of free allocation over auctioning highlights the persistence of industrial protection and political acceptance as key design determinants. While Mariotti (2016) shows that the EU ETS moved toward auctioning to enhance efficiency and fairness, China maintains free allocation to reduce compliance burdens and ensure policy legitimacy. This divergence illustrates how global norms are reshaped when they encounter different state-market configurations, as emphasized by Goron and Cassisa (2017).

The results also show that China's ETS exhibits limited market efficiency, reflected in low prices, weak liquidity, and fragmented trading. These outcomes are consistent with empirical findings by Chang et al. (2018), who identify structural fragmentation and insufficient trading depth in China's pilot ETS markets. Such inefficiencies indicate that while market mechanisms exist, they are constrained by administrative control, limiting the price signal's ability to drive decarbonization. This partially contrasts with Bayer and Aklin (2020), who find that even low-priced carbon markets can reduce emissions in the EU context, suggesting that institutional context strongly mediates ETS effectiveness.

From a broader governance perspective, the findings reinforce Keohane and Victor's (2011) argument that global climate governance operates as a fragmented regime complex rather than a unified system. The variation between the EU ETS and China's ETS, as well as across jurisdictions, confirms that emissions trading systems evolve in a decentralized institutional environment. Van Asselt (2013) further supports this interpretation by showing that ETS designs differ significantly in coverage, allocation, and regulatory structure, which is clearly reflected in China's localized model. At the normative level, the study confirms Acharya's (2004) argument that norms are not simply diffused but actively reconstructed. China's ETS demonstrates grafting onto existing practices such as *shidian*, CDM experience, and intensity-based governance, showing that external norms gain legitimacy only when aligned with domestic cognitive priors. This supports Falkner (2016), who

argues that contemporary climate governance under the Paris Agreement increasingly relies on nationally determined contributions rather than top-down harmonization, thereby enabling greater institutional diversity.

The findings also highlight a trade-off between localization and effectiveness. While localization enhances domestic acceptance and policy stability, it weakens market efficiency and creates risks of carbon and investment leakage. Yu et al. (2021) and Huang et al. (2025) show that firms may relocate investment or adjust production in response to uneven regulatory coverage, indicating spatial distortions. This supports Pahle et al. (2018), who argue that gradualism improves feasibility but delays efficient carbon pricing. China's ETS reflects a balancing act between global norm adoption and domestic adaptation, producing a hybrid model that expands the carbon market norm while reshaping its operational logic.

6. Conclusion

This study demonstrates that China's carbon market development reflects a non-linear process of norm localization rather than direct adoption of the EU ETS. Guided by constructivism and Acharya's framework, the EU ETS served as a reference model, but its core features were selectively transformed. China did not replicate an absolute cap-and-trade system; instead, it developed a state-oriented, intensity-based ETS shaped by domestic priorities, including sovereignty, CBDR, development needs, and energy security. The process moved through resistance, domestic reframing, institutional grafting, selective pruning, and eventual amplification into a large-scale hybrid system.

The findings show that global climate norms are not passively transferred but actively reconstructed by domestic actors. This confirms that norm diffusion in carbon markets depends on local legitimacy rather than institutional imitation. For policy, international cooperation should prioritize strengthening MRV systems, transparency, and environmental integrity rather than demanding uniform ETS designs. China's experience also suggests that gradual experimentation can enhance adoption, but may weaken price signals and environmental efficiency, creating trade-offs between legitimacy and effectiveness.

This study relies on secondary data and does not include primary interviews with policymakers or market participants. As a result, it cannot fully capture internal decision-making dynamics or firm-level behavioral responses in detail. Future studies should use qualitative fieldwork to examine bureaucratic interpretation of carbon market norms and firm-level responses to intensity-based systems. Comparative research across developing countries such as Indonesia, Vietnam, and Malaysia is also needed to understand how different domestic contexts shape ETS localization and to assess whether fragmented carbon markets can evolve toward greater compatibility or remain a loosely connected regime complex.

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Ethical Approval and Originality Statement

Ethical approval was obtained for this study. The manuscript represents original work and has not been previously published, nor is it under consideration by another journal.

Data Disclosure Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.



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