REVIEW OF CRIME, PEACE AND SOCIETY
ISSN (O): 3079-6105, ISSN (P): 3079-6091
Vol. 3, No. 9, 2026, 129-164

China's 15th Five-Year Plan: green transition, technological innovation, and the legal roadmap to achieve carbon neutrality by 2060

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Abstract

China's 15th Five-Year Plan (2026-2030), the first national planning framework operating fully within the 2060 carbon neutrality horizon, has been widely read as a shift from climate target-setting to institutional operationalization. This article tests that reading by drawing on ecological modernization theory and the emerging Chinese doctrine of foreign-related rule of law (涉外法治); it analyses three interlocking mechanisms: the administrative transition from energy dual control (能耗双控) to carbon emission dual control (碳排放双控); the expansion of the national Emissions Trading System to the steel, cement, and aluminum sectors from 2025 and the planned move to absolute caps by 2027; and a new blended-finance architecture built around the National Low-Carbon Transition Fund. The analysis finds that the institutional advance is real but narrower than the terminology suggests; yet the plan removes the binding energy-intensity target and elevates carbon intensity to binding status, while setting no economy-wide absolute emissions cap, so the total emissions limb of dual control remains aspirational outside the ETS. More consequentially, the revision of the carbon-intensity accounting methodology that produced a reported 17.7% reduction for the 14th FYP, against independent estimates closer to 12%, carries forward into the new target; under the revised methodology, a 17% intensity reduction across 2026-2030 is compatible with absolute emissions continuing to rise. The article's principal contribution is analytical rather than terminological. It proposes climate-related foreign-related law (气候涉外法治) as a bounded analytical category, defined by three cumulative criteria, and shows that China's ETS reforms, carbon accounting standards, and green Belt and Road investment norms satisfy these criteria in ways that ordinary accounts of domestic implementation do not capture. The category is offered as a framework for examining how planning-based legal systems simultaneously absorb, resist, and export international climate obligations.

Article History
Received 12 September
Revision 8 October
Accepted 4 November
Published 15 November
Corresponding Author*
OPEN ACCESS

Keywords
Carbon Neutrality, 15th Five-Year Plan, Emissions Trading System, Foreign-Related Rule of Law, Dual-Control System, Ecological Modernization.

1. Introduction

1.1 Background of the study

Climate change has become one of the central governance challenges of the twenty-first century. In response to increasing global environmental risks, the international community has gradually developed the UNFCCC multilateral climate governance framework centered on the Paris Agreement and the United Nations 2030 Agenda for

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Sustainable Development. Within this framework, states are expected to adopt domestic institutional and legal mechanisms to reduce greenhouse gas emissions while maintaining economic and social development. As the world's largest developing economy and its largest single emitter, accounting for roughly three-tenths of global greenhouse gas emissions, China occupies a decisive position in global climate governance (Climate Action Tracker, 2025a).

China's climate governance strategy has undergone a substantial transformation during the past two decades. Earlier stages of development primarily emphasized rapid industrialization and economic growth, often at the expense of environmental sustainability. Since the concept of ecological civilization was elevated to a national strategic objective and further institutionalized through the 2018 constitutional amendment, however, environmental governance has increasingly become integrated into China's broader modernization agenda (Chang et al., 2019). That integration is now visible in the ordinary machinery of the state rather than only in its declaratory politics (Gilley, 2012; Eaton & Kostka, 2014).

A major turning point emerged in September 2020, when President Xi Jinping announced at the 75th Session of the United Nations General Assembly that China would strive to peak carbon emissions before 2030 and achieve carbon neutrality before 2060 (Xi, 2020). These dual carbon goals reshaped China's long-term development strategy by linking industrial transformation, energy transition, technological innovation, and environmental governance within a unified policy framework. At the international level, the announcement also strengthened China's role in global climate diplomacy, signaling an intent to align its domestic environmental governance with its obligations under the Paris Agreement (UNFCCC, 2025).

A further milestone occurred in September 2025, when Xi announced China's updated 2035 Nationally Determined Contribution (NDC) at the United Nations Climate Summit in New York (Xi, 2025). For the first time, China committed to an absolute emissions-reduction target: a 7 to 10% decrease in economy-wide net greenhouse gas emissions from peak levels by 2035. China also pledged to raise the share of non-fossil fuels in total energy consumption to over 30% and to expand installed wind and solar capacity to more than 3,600 GW by 2035, more than six times the 2020 level. Formal submission to the UNFCCC followed on 3 November 2025 (UNFCCC, 2025). Analysts broadly welcomed the shift to absolute targets, though independent assessments, notably from the Climate Action Tracker (2025b) and the Asia Society Policy Institute (2025), noted that the target is unlikely to require additional policy effort beyond current trajectories and is not aligned with a 1.5°C pathway. The absence of a specified baseline year compounds the difficulty of assessing it.

Within this broader policy framework, the Five-Year Plans function as the primary instruments for translating long-term political commitments into concrete administrative, legal, and economic measures. The 15th Five-Year Plan (2026–2030), adopted by the National People's Congress in March 2026, is particularly important, as it marks the first full planning cycle operating between the 2030 carbon peaking target and the 2060 carbon neutrality objective (National People's Congress, 2026; Climate Policy Radar, 2026). Unlike previous plans that primarily set policy directions, the 15th FYP is expected to operationalize carbon neutrality through institutional reform, regulatory mechanisms, technological modernization, and coordinated governance structures.

The Plan sets a binding target to reduce CO_2 emissions per unit of GDP by 17% from 2025 to 2030, slightly below the 14th FYP's 18% target, which China fell short of (Center for Research on Energy and Clean Air, 2026). The shortfall is analyzed in Section 2.2. What matters more than the headline number, and what the existing commentary has been slow to draw out, is that the metric's accounting basis changed between the two plans. Once industrial process emissions are folded into the calculation, a 17% intensity reduction over 2026-2030 is compatible with absolute emissions continuing to rise, on Myllyvirta's estimate, by something in the range of 3 to 6% across the period (Carbon Brief, 2026). A target described as binding therefore constrains the ratio without constraining the quantity, which is a distinction the Plan's own language tends to blur.

That blurring extends to the dual-control framework itself. The 15th FYP formally shifts from controlling energy intensity and total energy consumption (能耗双控) to controlling carbon emission intensity and total carbon emissions (碳排放双控). The shift is genuine, and it changes what provincial officials are measured on. It should not, however, be read as the arrival of absolute carbon management at the national level. The Plan removes the binding energy-intensity target and elevates carbon intensity to binding status, but it sets no economy-wide cap on total emissions (Carbon Brief, 2026; Climate Action Tracker, 2026). The absolute-cap element of Chinese carbon governance currently lives inside the ETS, on a timetable set by a separate instrument, and is discussed in Section 2.3.

The Plan also emphasizes accelerating a comprehensive green transition and building a new type of energy system. It targets energy savings of more than 150 million tonnes of standard coal equivalent across key industries, aims to build approximately 100 national zero-carbon parks, and calls for offshore wind power to reach 100 GW and nuclear power to rise to 110 GW by 2030 (Green Finance & Development Center, 2026; Amoedo, 2026). It also promotes green finance, ecological restoration, low-carbon industrial transformation, and

sustainable technological innovation. A new National Low-Carbon Transition Fund replaces previous direct fiscal subsidies, and its governance structure is examined in Section 4.1.

The Plan demonstrates alignment with international sustainability frameworks, particularly the Paris Agreement and the United Nations Sustainable Development Goals, with a focus on SDG 7 (Affordable and Clean Energy), SDG 9 (Industry, Innovation and Infrastructure), and SDG 13 (Climate Action). By integrating climate mitigation, adaptation, green finance, and sustainable industrial transformation into national planning, China seeks to institutionalize a development model that combines economic modernization with long-term ecological sustainability.

1.2 Existing literature

Existing scholarship on China's environmental governance has extensively examined the evolution of ecological civilization, climate governance reforms, and the role of state planning in environmental modernization. Early studies primarily focused on pollution control and resource management during China's industrialization phase. More recent scholarship has shifted toward the institutional transformation of China's environmental governance system, particularly after the incorporation of ecological civilization into the national constitutional and political framework (Gilley, 2012; Chang et al., 2019). A substantial body of literature has analyzed the role of Five-Year Plans in shaping China's environmental and climate governance trajectory. Scholars generally argue that the 12th and 13th Five-Year Plans marked an important transition toward green development by introducing renewable energy targets, carbon-intensity reduction mechanisms, and pollution-control policies. The 14th FYP (2021–2025) has similarly been characterized as a critical stage in the institutionalization of China's dual carbon goals (National People's Congress, 2026; Tan et al., 2025).

Researchers have also paid considerable attention to China's carbon governance mechanisms, particularly the dual-control system and the national ETS. China launched the national ETS in July 2021, initially covering power generation with over 2,200 entities accounting for more than five billion tonnes of CO_2 annually (X. Zhang et al., 2025). Subsequent studies have examined how administrative regulation, market-based instruments, and state coordination interact within China's climate governance framework. Some scholars interpret China's governance model through the lens of ecological modernization theory (Lo, 2013; Mol et al., 2009). Others analyze China's climate strategy from a law-and-development perspective, emphasizing state-led governance and policy experimentation (Qi et al., 2020).

Scholars have further explored China's growing participation in global climate governance. Existing research demonstrates that China is increasingly aligning its domestic

climate policies with international frameworks such as the Paris Agreement and the SDGs. Particular attention has been devoted to China's NDCs, renewable energy expansion, including surpassing 1 TW of cumulative solar PV capacity in May 2025 (Ember, 2025), green finance initiatives, and participation in international climate diplomacy. China has also emerged as the dominant financier of the global clean energy transition, as discussed in Section 4.1.

Despite these contributions, several gaps remain. First, relatively little academic attention has been devoted to the 15th FYP as a formally adopted document, the first implementation-oriented framework operating fully within the carbon-neutrality horizon. Most existing studies still focus on China's pledges or on earlier planning cycles. Second, existing scholarship often emphasizes policy objectives while paying insufficient attention to the specific legal and institutional mechanisms through which carbon neutrality goals are operationalized, and to the gap between the vocabulary of those mechanisms and their actual constraining force. Third, current studies rarely examine the relationship between China's domestic climate governance mechanisms and the evolving international compliance landscape, including the European Union's Carbon Border Adjustment Mechanism (CBAM), which is creating significant regulatory pressure on Chinese exporters (De Stefano, 2026; Wu, 2023). Fourth, and most importantly for what follows, the existing literature has not examined China's climate governance through the lens of foreign-related rule of law (涉外法治), even though Paris Agreement transparency duties, CBAM compliance pressures, and Belt and Road environmental investment standards now constitute a substantial and growing body of legally structured international obligation to which Chinese domestic governance is actively adapting (Erie, 2023).

This article addresses those gaps by examining the 15th FYP as an integrated legal and governance framework. Rather than treating climate policies as isolated initiatives, it analyses how institutional innovation, energy transition, green finance, ecological governance, and international climate coordination operate together within China's planning-based system. Section 4.3 develops the foreign-related rule-of-law framing into a bounded analytical category and states the criteria by which it can be applied or refuted.

2. Legal Framework and Institutional Innovation

2.1 The Dual Control System

The 15th Five-Year Plan embeds climate objectives more directly into China's national development framework than any of its predecessors. Its most significant terminological shift

is the formal transition from the energy dual control system (能耗双控), which simultaneously controlled total energy consumption and energy intensity, to the carbon emission dual control system (碳排放双控), which addresses carbon emission intensity and total carbon emissions. The shift had been signaled in policy documents since 2024 and was formally anchored in the Plan (General Office of the CPC Central Committee & General Office of the State Council, 2025; Center for Research on Energy and Clean Air, 2026).

The change carries real legal and administrative implications. Under the previous framework, local governments were primarily assessed on the efficiency of energy consumption relative to economic output, meaning a province could meet its obligations even as its emissions grew, provided output grew faster. The carbon-emission framework redefines the object of control by integrating carbon obligations into industrial policy, investment approvals, and local government performance evaluation (Tan et al., 2025; Yi et al., 2026). Measuring what reaches the atmosphere rather than what is burned is not a trivial reform, and it removes a category of accounting slippage that had troubled the energy-based system.

The reform's scope, however, is narrower than its name implies, and this deserves emphasis because much of the early commentary has taken the terminology at face value. The Plan removes the binding energy-intensity target and elevates carbon intensity to binding status, but it does not impose an economy-wide ceiling on total emissions (Carbon Brief, 2026). The second limb of "dual control" therefore has no operative national expression outside the emissions trading system, where absolute caps are scheduled for selected sectors from 2027 under a separate instrument (General Office of the CPC Central Committee & General Office of the State Council, 2025). Read carefully: the 15th FYP institutionalizes a better metric rather than a harder constraint. That is progress, but it is progress of a particular and limited kind, and describing it as a move to absolute carbon management overstates what the document actually does.

The framework's principal value lies in vertical coordination. Under China's planning-based governance structure, implementation depends on whether provincial governments translate national targets into local administrative measures (Yi et al., 2026). The Plan therefore operates through performance evaluation systems, regulatory oversight, and administrative accountability mechanisms rather than through prohibition. There are still structural challenges; the most obvious is the tension between growth objectives and carbon-reduction obligations at the provincial level, a tension that a change of metric does not dissolve (Eaton & Kostka, 2014). A second concern is monitoring, reporting, and verification. The Plan places increasing emphasis on carbon accounting systems, emissions disclosure, and

unified statistical standards, including a national greenhouse gas emission factor database (National People's Congress, 2026). Without robust data governance infrastructure, carbon reduction targets risk becoming procedural rather than substantively enforceable, a risk that Section 2.2 shows to be more than hypothetical.

Strengthening the framework nonetheless reflects a broader evolution in China's environmental rule of law. Climate governance is no longer treated as an isolated environmental issue but as an integrated component of economic governance, industrial policy, and national modernization. Table 1 summarises the principal institutional reforms introduced under the Plan.

Table 1: Key Institutional Reforms under the 15th Five-Year Plan

Policy Area	Key Reform	Expected Impact
Dual-Control System	Shift to carbon-emission dual control	Stronger carbon governance
ETS Expansion	Expansion to steel, cement, and aluminium	Broader emissions coverage
Green Finance	National Low-Carbon Transition Fund	Mobilisation of private investment
Energy Transition	Development of new-type energy system	Reduction of fossil-fuel dependency

Source: *Compiled by the author from the 15th Five-Year Plan (National People's Congress, 2026), Ministry of Ecology and Environment (2025), Carbon Brief (2026), and Center for Research on Energy and Clean Air (2026).*

2.2 Policy Shortcomings

The Plan does not emerge from a policy vacuum. It is, in significant part, a response to documented institutional failures that characterized the 14th FYP (2021–2025). A systematic account of those failures is essential both to understand why the 15th FYP introduces the specific reforms it does and to evaluate whether those reforms are likely to work. The most fundamental shortcoming of the 14th FYP was its failure to achieve its principal climate target. The Plan set a binding carbon intensity reduction target of 18 percent relative to 2020 levels. Independent analysis puts actual improvement over 2021-2025 at approximately 12.4 percent, a shortfall of more than five percentage points (Center for Research on Energy and Clean Air, 2026). This is not a marginal miss. It places China off the emissions trajectory required for Paris Agreement compatibility and raises structural questions about the enforceability of intensity-based targets within China's administrative system.

A second and related shortcoming is the methodological controversy that followed. After the shortfall became apparent to analysts, authorities revised the carbon intensity calculation to include industrial process emissions alongside energy-related emissions. The revision produced a reported figure of 17.7 percent, close enough to the 18 percent target to

be read as substantial compliance, and has been criticized for obscuring the underlying performance gap (Carbon Brief, 2026; Center for Research on Energy and Clean Air, 2026). From a governance credibility standpoint, the episode is significant on its own terms: it demonstrates that the MRV infrastructure underpinning China's climate targets remains insufficiently institutionalized to resist post hoc methodological adjustment, a systemic risk to ETS integrity that Zeng et al. (2018) had identified before the market launched.

The episode's more important consequence, however, is prospective rather than retrospective, and it has received far less attention than it warrants. The revised methodology does not simply flatter the 14th FYP's record; it carries forward as the accounting basis for the 15th FYP's 17 percent target. Once industrial process emissions sit in the denominator, the same nominal reduction implies a materially weaker constraint on absolute emissions, leaving room for total emissions to grow by roughly 3 to 6 percent over 2026-2030 (Carbon Brief, 2026). The Climate Action Tracker (2026) reaches a similar conclusion, describing the methodological revision as weakening the stringency of targets and increasing uncertainty in tracking progress. A target that is binding in form can therefore be permissive in substance, and the mechanism by which that happens is accounting rather than ambition. This is, arguably, the single most consequential feature of the Plan's climate architecture, and it sits uneasily with the Plan's presentation of itself as tightening carbon governance.

A third shortcoming concerns the perverse implementation effects of energy dual control during the 14th FYP. The system required provinces to meet both total energy consumption and energy intensity targets simultaneously. As several provinces approached their consumption ceilings in late 2021, local governments rationed electricity to industrial users, disrupting manufacturing output and supply chains. The episode exposed a design flaw: administrative targets without adequate price signals or flexible compliance pathways generate sharp stop-go dynamics at the local level, undermining both economic stability and longer-term decarbonization planning (Tan et al., 2025). The transition to dual control of carbon emissions is a direct institutional response. As Eaton and Kostka (2014) argued more generally, changing the administrative metric does not, by itself, resolve the tension between local officials' growth incentives and central carbon mandates.

A fourth shortcoming involves the ETS data integrity crisis. Despite the formal launch of the national ETS in July 2021, covering over 2,200 power sector entities, the system quickly proved to rely on unreliable data. In 2022, the Ministry of Ecology and Environment released enforcement notices identifying third-party verification agencies and covered enterprises that had submitted falsified or manipulated emissions data. The scandal validated Zeng et al.'s

(2018) pre-launch warning that scarce carbon-content data, available at enterprise level for only 5.1 percent of firms surveyed, and the complete absence of oxidation factor data created systemic conditions for manipulation.

Two points deserve emphasis. The first is that the ETS operated for its first three years under ministerial-level measures alone, without State Council legislation and without adequate penalties for data fraud (International Carbon Action Partnership, 2025a). The second is that this gap has since been closed: the Interim Regulations on the Administration of Carbon Emissions Trading, promulgated on 25 January 2024 and effective from 1 May 2024, are China's first specialized climate legislation and introduced substantial penalties for falsified reporting (State Council, 2024). The regulatory vacuum was real, but it was a feature of the early 14th FYP period rather than of the whole of it, and the 15th FYP inherits a stronger legal foundation than the fraud episode alone would suggest.

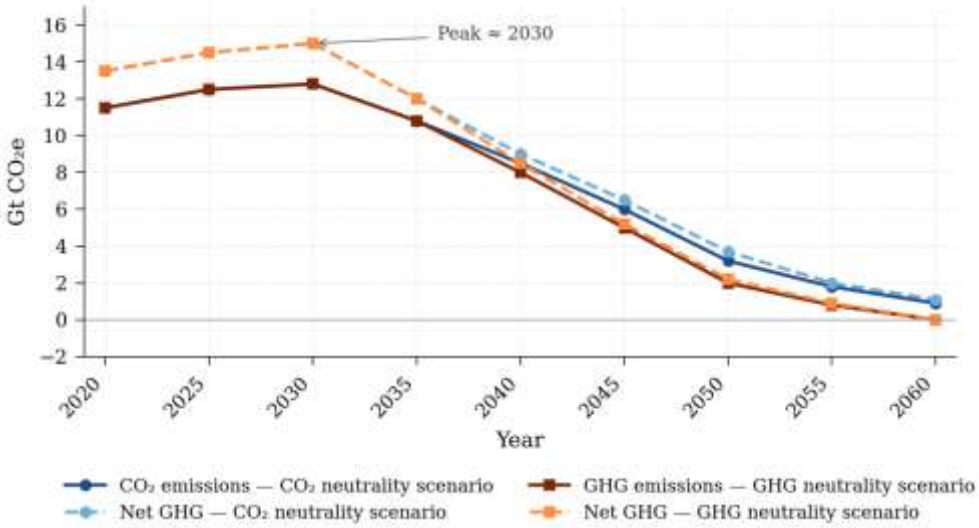
A fifth shortcoming is the continued expansion of coal power capacity, which sits awkwardly beside the dual carbon goals announced in 2020. Driven by energy security concerns following the 2021 power crisis and accelerated by the geopolitical pressures of 2022, China approved and commissioned over 100 GW of new coal-fired power during the 14th FYP period. The Plan's language requiring reasonable control over the scale and pace of coal power development proved insufficiently binding in the face of provincial energy security priorities. The 15th FYP does not restore that language; instead, it introduces capacity payments for coal-fired plants, which the Center for Research on Energy and Clean Air (2026) and Carbon Brief (2026) both identify as a governance gap that has been carried forward.

These shortcomings reveal a coherent pattern. The 14th FYP's climate governance framework was structurally constrained by the primacy of energy security and economic growth, by weak MRV institutions, and by insufficient mechanisms to enforce absolute limits. The 15th FYP's innovations, namely the shift to carbon-emission dual control, the mandatory transition to absolute caps within the ETS by 2027, strengthened data governance, and a new transition financing mechanism, are best understood as targeted responses to those specific failures. Whether the responses are proportionate to the failures is a different question. On the evidence of the accounting revision discussed above, at least one of them is not.

Figure 1 makes the stakes of the distinction between CO_2 neutrality and GHG neutrality visible. The two scenarios diverge only modestly to 2035 and then separate sharply, because non-CO_2 gases and residual industrial process emissions become the binding constraint once energy-related CO_2 has been largely eliminated. China's 2035 NDC is framed in net greenhouse gas terms, which places it on the more demanding of the two paths, yet the

15th FYP's headline target is expressed in CO_2 intensity alone. The Plan's instruments and the NDC's metric are therefore not fully commensurable, which complicates any assessment of whether the former delivers the latter.

Figure 1: CO_2 and net greenhouse gas (GHG) emission trajectories under CO_2 neutrality and GHG neutrality scenarios, 2020-2060 (Gt CO_2e).



Note: *Emissions include energy-related CO_2, industrial process CO_2, and non-CO_2 gases. Carbon sinks offset residual emissions. Dashed lines indicate net GHG trajectories inclusive of carbon removal. Blue series = CO_2 neutrality scenario; Orange series = GHG neutrality scenario. Circles = gross emissions; triangles = net GHG emissions.*

Source: *Du et al. (2026).*

2.3 National Emissions Trading System (ETS)

Alongside administrative regulation, the 15th Five-Year Plan strengthens market-based climate governance by expanding the national ETS. China launched the system in July 2021, initially covering power generation with over 2,200 entities (X. Zhang et al., 2025). It operates through the Shanghai Environment Exchange under the supervision of the Ministry of Ecology and Environment (2025), and since May 2024 has rested on State Council legislation rather than ministerial measures (State Council, 2024).

A pivotal expansion occurred in March 2025, when the Ministry released an implementation plan, approved by the State Council, extending coverage to the cement, steel,

and aluminum smelting industries with effect from the 2024 compliance year and a first compliance deadline at the end of 2025 (Ministry of Ecology and Environment, 2025). The expansion brought in approximately 1,500 additional enterprises and roughly three billion tonnes of CO_2e annually. Post-expansion, the ETS covers over 60 percent of China's CO_2 emissions, approximately eight billion tonnes annually, or roughly a fifth of global emissions, making it, by a wide margin, the world's largest carbon market (International Carbon Action Partnership, 2025a).

The expansion is structured in two phases. Phase 1 (2024-2026) aims to familiarize companies with ETS requirements and improve data quality through capacity building. Phase 2, starting in 2027, is intended to tighten the system through absolute caps and a diversified set of instruments. The joint Opinions of 25 August 2025 set out the roadmap: absolute caps for sectors with relatively stable emissions profiles from 2027, replacing the intensity-based allocation approach that has been criticized for permitting absolute emissions to grow with output, and a fully established national market combining free allocation and auctioning by 2030 (General Office of the CPC Central Committee & General Office of the State Council, 2025; Institute for Energy Economics and Financial Analysis, 2025).

Significant limitations nonetheless affect the system's effectiveness. As of March 2025, the national carbon price stood at approximately CNY 86.13 per tonne, roughly USD 11 to 13, well below the EU ETS price, which averaged around USD 80 per tonne over the first nine months of 2025 (International Emissions Trading Association, 2025). The gap has direct regulatory consequences given the EU's CBAM, whose legal dimensions are examined in Section 4.3 (Wu, 2023; De Stefano, 2026). Market projections suggest Chinese prices could average CNY 100 in 2025 and CNY 200 by 2030, but even the latter remains below the level that would materially alter investment decisions in emissions-intensive industry (ClearBlue Markets, n.d.). The point is worth stating plainly: an expansion of coverage without a corresponding rise in price expands the number of firms facing a signal too weak to act on. Figure 2 illustrates the expansion of ETS coverage following the 2025 sectoral inclusion.

2.4 Carbon Accounting and Data Governance

The 15th Five-Year Plan places growing emphasis on carbon accounting and data governance as foundational components of climate regulation. Key measures include unified carbon emissions statistical systems, enterprise disclosure requirements, product-level carbon footprint accounting rules, a product carbon identification certification system, a strengthened national greenhouse gas emission factor database, and standardized preparation of the national

greenhouse gas inventory (National People's Congress, 2026). These reforms address data reliability concerns that have historically undermined the ETS's credibility (Zeng et al., 2018).

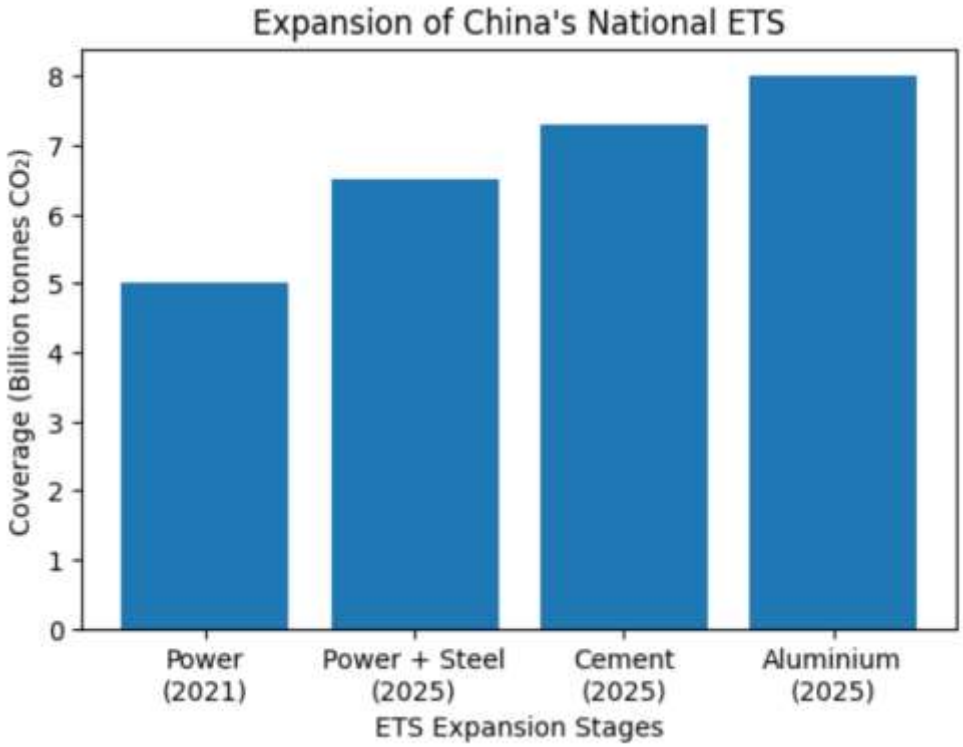
The foundational importance of reliable data for ETS governance was systematically documented by Zeng et al. (2018), who analyzed the data requirements and gaps facing China's national ETS during its construction phase. Their study identified six categories of ETS-relevant data: production data (product type and output), emissions data (energy and material activity data, calorific value, carbon content, and oxidation factor), technology data (process flow, capacity, mass balance), management data (organizational and operational boundaries), economic data (GDP, enterprise profit, output value), and policy data (regional and sectoral development targets). Energy consumption data were generally available at both the enterprise and installation levels, with surveyed enterprises reporting 100 percent availability of production and energy activity data. Critical gaps persisted in fuel carbon content, available at the enterprise level for only 5.1 percent of enterprises, and in oxidation factors, which were unavailable across all sectors. Such gaps risk miscalibrated caps, distorted allowance allocations, and unrepresentative verified emissions.

Zeng et al. (2018) further identified two cross-cutting challenges that remain directly relevant. On sectoral differences, the power generation, cement, and papermaking sectors scored substantially higher on data availability, with enterprise-level calorific value scores of 97.1, 100, and 99.1 percent respectively, than the petrochemical, non-ferrous metals, and chemical sectors, at 55.9, 46.4, and 43.1 percent. That heterogeneity matters considerably given the 2025 sectoral expansion described in Section 2.3, which brings industries with markedly weaker baseline data into the compliance framework (International Carbon Action Partnership, 2025a; Ministry of Ecology and Environment, 2025). On data quality, the study highlighted three sources of uncertainty: limited third-party verification coverage, reached by only 59 percent of surveyed enterprises; multiple conflicting internal data sources, where calorific values measured on a received rather than air-dried basis can produce differences of up to 8.3 percent in calculated emissions; and uneven monitoring and reporting capacity across the twenty-plus provinces outside the original seven pilot regions.

The long-term solutions proposed in response include tiered data collection requirements, under which enterprises begin reporting at enterprise level and progressively advance to installation and equipment levels as in the EU ETS; clarification of detailed data sources in MRV guidelines to prevent distortion through measurement-basis inconsistencies; advance capacity building before sectors are formally covered; and a rigorous third-party verification system encompassing ex ante, in-process, and ex post quality control. These

recommendations map closely onto the Plan's data governance agenda. The requirement that covered entities in the cement, steel, and aluminum sectors submit monthly emissions reports with supporting evidence reflects precisely the tiered, documented data-sourcing approach advocated by Zeng et al. (2018).

Figure 2: Expansion of China's National ETS Coverage after the 2025 Sectoral Expansion



Note: *Post-expansion ETS coverage ≈ 8 billion tonnes of CO_2, representing roughly 60 percent of China's national emissions and the largest carbon market globally by covered emissions.*

Source: *Compiled by the author from International Carbon Action Partnership (2025a), Ministry of Ecology and Environment (2025), and Institute for Energy Economics and Financial Analysis (2025).*

Data governance also plays a pivotal role in China's international regulatory adaptation. As Section 4.3 argues, CBAM compliance pressures drive these domestic reforms in part, since EU importers increasingly require transparent, standardized, and third-party-verified carbon accounting from Chinese suppliers (De Stefano, 2026; Institute for Energy Economics and Financial Analysis, 2025). The methodological revision discussed in Section 2.2 underlines the point from the opposite direction: the data infrastructure problems Zeng et al. (2018) identified continue to have regulatory and credibility implications well beyond the ETS's design phase, and they now bear directly on whether China's reported progress can be independently verified. Domestic reforms under the 15th FYP therefore serve two masters at

once, building a credible domestic carbon market while adapting to external disclosure standards.

2.5 Global Climate Governance Frameworks

The institutional innovations introduced under the 15th FYP demonstrate increasing alignment between China's domestic climate governance system and international frameworks. Under the Paris Agreement, the dual-control framework, ETS expansion, carbon accounting reforms, and energy transition policies collectively operationalize China's NDC commitments (UNFCCC, 2025). China's 2035 NDC, discussed in Section 1.1, was submitted to the UNFCCC in November 2025 and introduced the country's first absolute emissions-reduction commitment. While this represents a qualitative shift in China's international climate posture, independent analysts note that existing policies already place China on a trajectory to achieve comparable gross reductions without significant additional effort, and that the absence of a specified baseline year complicates transparency assessment (Climate Action Tracker, 2025b; Center for Strategic and International Studies, 2026).

The EU CBAM illustrates the growing interconnectedness of climate regulation with trade and industrial competitiveness; its legal dimensions are analyzed in Section 4.3. China's governance strategy under the 15th FYP reflects a dual objective: preserving policy flexibility consistent with its developmental priorities, while adapting domestic regulatory mechanisms to evolving international expectations.

Table 2: Comparison of emission trajectories and carbon sinks under CO_2 and GHG neutrality scenarios (Gt CO_2e)

Category	**CO_2 neutrality**			**GHG neutrality**	
Years	2035	2050	2060	2050	2060
CO_2 emissions	10.8	3.2	0.9	2.0	0.0
Energy-related CO_2	10.5	4.2	2.2	3.4	1.9
CCS & DACCS	-0.3	-1.2	-1.3	-1.5	-1.9
Industrial process CO_2	0.6	0.1	0.0	0.1	0.0
Non-CO_2 gas emissions	2.1	1.4	1.1	1.1	0.9
Carbon sink	-0.9	-0.9	-0.9	-0.9	-0.9

Net GHG emissions	12.0	3.7	1.1	2.2	0.0

Note: *Carbon sink data refer only to the forest ecosystem. CCS: carbon capture and storage; DACCS: direct air carbon capture and storage.*

Source: *Du et al. (2026).*

Two features of Table 2 bear on the argument. First, the forest carbon sink is held constant at 0.9 Gt across all scenarios and years, which means the modeled difference between CO_2 neutrality and GHG neutrality is driven almost entirely by engineered removal rather than by ecological restoration. That sits somewhat awkwardly with the prominence the 15th FYP gives to reforestation and wetland programs, discussed in Section 4.2. Second, non-CO_2 emissions still stand at 0.9 Gt in 2060 under the GHG neutrality scenario, offset rather than eliminated. The Plan's non-CO_2 target, 30 Mt CO_2e of mitigation capacity, is roughly three per cent of that residual, suggesting the current planning cycle is not where this problem is solved.

3. Energy Transition and Legal Framework

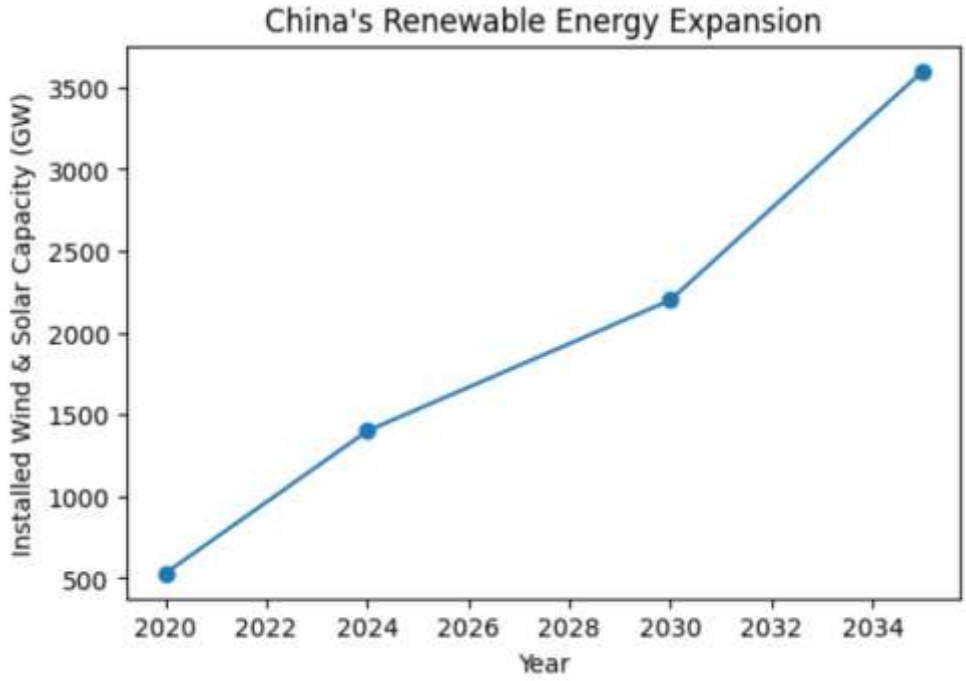
3.1 New-Type Energy System

The transformation of the energy system constitutes one of the central pillars of China's carbon neutrality strategy under the 15th FYP. The Plan introduces the concept of a new-type energy system as the technological and institutional foundation of the green transition, building on a deployment trajectory that has repeatedly outrun official targets. By the end of 2024, combined installed wind and solar capacity reached approximately 1,400 GW, surpassing the 2030 NDC target of 1,200 GW by six years. (Climate Action Tracker, 2025a). In May 2025, cumulative solar PV capacity alone passed 1 TW. During 2024, wind and solar together met 84 percent of the growth in China's electricity demand, and in the first half of 2025 clean generation exceeded demand growth for the first time, contributing to a 2 percent reduction in fossil fuel use (Ember, 2025; Z. Zhang et al., 2025).

The Plan's energy targets align with the 2035 NDC commitments set out in Section 1.1 and operationalize them through sectoral mandates: offshore wind reaching 100 GW and nuclear power rising to 110 GW by 2030, alongside development of green fuels such as ammonia and methanol derived from green hydrogen (Green Finance & Development Center, 2026; Amoedo, 2026). Projected Chinese solar manufacturing capacity of 1,255 GW in 2030 exceeds the global solar rollout figure in the IEA's Net Zero roadmap for the same year by around 65 percent, which underscores China's structural position in global clean energy supply chains (International Energy Agency, 2021; TaiyangNews, 2025).

The Plan adopts a graduated transition strategy under the build-before-breaking principle, ensuring that renewable infrastructure, storage, and grid reliability mechanisms achieve sufficient stability before coal-based generation is reduced at scale. Smart grid development, distributed energy systems, and advanced storage occupy a central position. The critical infrastructure constraint is curtailment: in the first four months of 2025, 6.8 percent of wind and 6.1 percent of solar generation were curtailed for grid reasons, with rates exceeding 10 percent in renewable-rich regions such as Xinjiang, Gansu, and Qinghai. The Plan calls for a unified national power market by 2029 to address these bottlenecks (Carbon Brief, 2026).

Figure 3: Growth of China's Combined Wind and Solar Capacity (2020-2035 Targets)



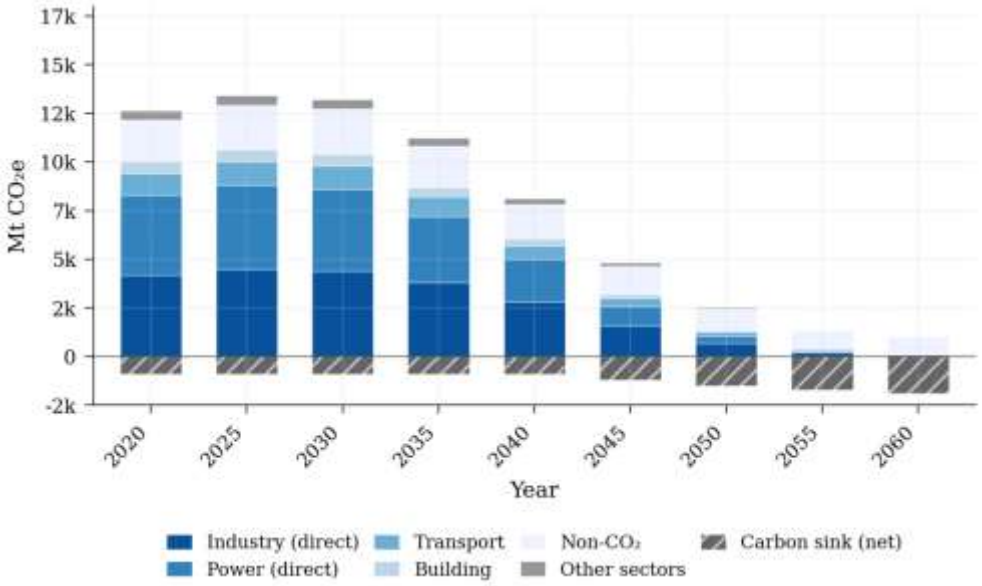
Note: *2024 combined wind and solar capacity ≈ 1,407 GW (solar ≈ 887 GW; wind ≈ 520 GW). 2035 target = 3,600 GW under China's updated 2035 NDC.*

Source: *Ember. (2025). China energy transition review 2025. https://ember-energy.org/latest-insights/china-energy-transition-review-2025/.*

The chemical sector presents a decarbonization challenge the Plan does not fully address. Emissions from the sector rose by 12 percent in 2025, driven by surging coal and oil feedstock consumption. The sector is slated for ETS integration by 2027, but in the interim the Plan relies chiefly on large-scale green hydrogen pilots. The coal governance gap identified in Section 2.2, namely the absence of binding caps on coal generation, likewise remains unresolved within the energy system framework (Center for Research on Energy and Clean Air, 2026).

Figure 3 shows why the 2035 capacity target attracts skeptical commentary. Extending the 2020-2024 build rate forward reaches roughly 3,600 GW without policy change, which means the headline pledge encodes the existing trajectory rather than accelerating it. The interesting constraint has shifted from deployment to absorption, and that is a grid and market-design question rather than a capacity one.

Figure 4: Sectoral emission structure under the GHG neutrality scenario, 2020-2060



Note: *Sectoral emissions include direct emissions only, excluding indirect emissions from purchased electricity and heat. Industrial process CO_2 is included within the industry sector total. The carbon sink category (hatched) represents net removal from the forest ecosystem, complemented by industrial CCS and DACCS.*

Source: *Du et al. (2026). Unit: Mt CO_2e.*

3.2 Energy Transition

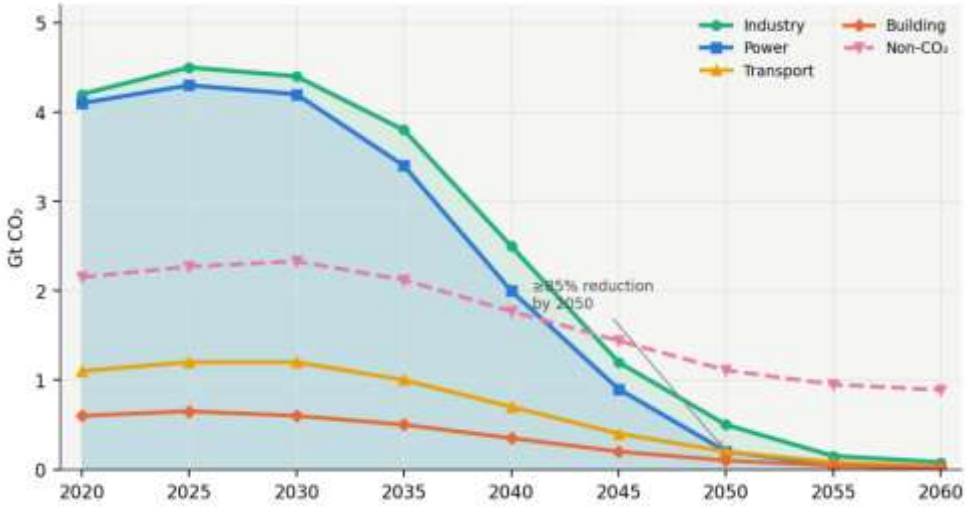
The transition toward a low-carbon energy system requires not only technological innovation but comprehensive legal and regulatory support. The 15th FYP emphasizes environmental regulation, coordination of industrial policy, and administrative governance to facilitate that transition. Stricter emissions standards, energy-efficiency requirements, industrial restructuring policies, and expanded oversight of high-emission industries are introduced, alongside strengthened energy-saving reviews and carbon-emission evaluations for fixed-asset investment projects (National People's Congress, 2026).

The Plan introduces several quantitative mandates: energy savings of more than 150 million tonnes of standard coal equivalent across key industries, covering thermal power, steel, non-ferrous metals, petrochemicals, chemicals, and building materials; replacement of coal consumption in the food, textile, and paper industries reaching 30 million tonnes per year; construction of approximately 100 national zero-carbon parks; and reduction of non-CO_2

greenhouse gas emissions, principally methane, nitrous oxide, and HFCs, by 30 million tonnes of CO_2 equivalent through targeted projects in coal mining, agriculture, waste, and chemicals (Green Finance & Development Center, 2026).

Energy security remains a paramount regulatory consideration. Geopolitical instability and concerns about supply chain resilience have reinforced the dual objective of promoting decarbonization while maintaining stable industrial production. As Section 2.2 argued, security considerations continue to shape regulatory design, creating persistent tension between grid stability requirements and the pace of coal phase-down (Center for Research on Energy and Clean Air, 2026).

Figure 5: Sectoral CO_2 and non-CO_2 emission trajectories under the GHG neutrality scenario, 2020-2060



Note: *Sectoral emissions are direct only, excluding indirect emissions from electricity and heat consumption. Non-CO_2 includes CH_4, N_2O, and F-gases. Shaded areas indicate contributions from the industry and power sectors. Dashed line = non-CO_2 trajectory.*

Source: *Du et al. (2026). Unit: Gt CO_2.*

Figures 4 and 5 together locate where the Plan's instruments do and do not reach. Power sector emissions fall steeply and early, which is where the ETS, the renewable mandates, and the grid reforms are concentrated. Industry, and within it the process emissions of cement and chemicals, declines later and more slowly, and the non-CO_2 trajectory is close to flat until the 2040s. The 15th FYP's regulatory apparatus is heavily weighted toward the part of the problem that the modeling suggests will resolve most readily on its own.

3.3 Green Industrial Transformation

Technological innovation is a primary driver of China's long-term carbon neutrality strategy. Chinese firms now account for a large and rapidly rising share of global clean energy

patent applications, and China's battery deployment tripled over three years, with more battery storage added in 2024 than in the United States and the European Union combined (Ember, 2025). These achievements position China as a dominant force in global clean technology supply chains.

The Plan identifies several strategic emerging industries as components of China's future development model: new energy technologies, advanced materials, artificial intelligence, robotics, semiconductor production, and low-altitude economic industries such as unmanned aerial systems and electrified aviation. It emphasizes technological self-reliance, including domestic innovation capacity in semiconductors, high-end manufacturing equipment, and advanced energy technologies (National People's Congress, 2026).

Integration of artificial intelligence and digital technologies into industrial systems is expected to improve energy efficiency, optimize production, and support emissions monitoring. The rapid expansion of electric vehicle manufacturing has, however, generated involutionary dynamics, with over 100 Chinese EV companies competing and average auto industry profit margins falling to approximately 4.4 percent by 2025, prompting the introduction of minimum price floors from 2026 (Green Finance & Development Center, 2026). The episode is a useful corrective to any straightforwardly celebratory account of green industrial policy: the same coordination capacity that produces rapid deployment can also produce overcapacity that the state must then intervene to unwind.

3.4 Sustainable Development Goals

The transformation of China's energy system under the 15th FYP aligns substantially with the United Nations SDGs. The expansion of renewable energy infrastructure and low-carbon industrial systems supports SDG 7, SDG 9, and SDG 13. In 2024, non-fossil sources already accounted for 19.8 per cent of China's primary energy mix, on track to surpass the 2030 goal of 25 per cent. Analysts note, though, that the 2035 NDC target of 30 per cent does not represent significant additional ambition beyond current trajectories (Climate Action Tracker, 2025b).

China's renewable expansion increasingly influences global technology costs. Ember (2025) finds that the surge in Chinese renewables and whole-economy electrification is reshaping global energy choices, with Chinese firms driving cost reductions in wind turbines, solar panels, storage batteries, and electric vehicles, and thereby accelerating transitions in emerging markets. By 2024, Chinese companies accounted for the majority of new global solar manufacturing capacity. Table 3 summarises the principal climate governance targets embedded in the framework.

Table 3: Major Climate Governance Targets and Indicators

Indicator	Value
Wind & Solar Capacity (2024)	1,400 GW
2035 Renewable Target	3,600 GW
ETS Coverage After Expansion	8 billion tonnes CO_2
Carbon Intensity Reduction Target	17% by 2030
Clean Energy Investment (2024)	USD 625 billion

Source: *Compiled by the author from the 15th Five-Year Plan (National People's Congress, 2026), UNFCCC (2025), Ember (2025), Green Finance & Development Center (2026), and Centre for Research on Energy and Clean Air (2026).*

4. Green Finance and Ecological Restoration

4.1 Green Finance

Green finance has emerged as one of the most important institutional mechanisms supporting China's carbon neutrality strategy. Clean energy investment reached approximately USD 625 billion in 2024, some 31 per cent of the global total, which indicates both the scale of capital mobilization required and the degree already achieved (Green Finance & Development Center, 2026). The Plan positions green finance as a central component of ecological modernization, promoting green credit systems, green bonds, sustainability-linked loans, carbon finance instruments, and climate-related investment mechanisms.

The notable institutional innovation is the National Low-Carbon Transition Fund, structured with central fiscal guidance and social capital as the main body, operating under a government-led but market-operated model (National People's Congress, 2026; Amoedo, 2026). This marks a deliberate shift away from direct fiscal subsidies toward a blended finance mechanism intended to mobilize private capital at greater scale while preserving central oversight. The design mirrors the approach used in semiconductor investment, where a national fund acts as a limited partner alongside specialized fund managers. Whether the analogy is reassuring is open to question. The semiconductor funds have been criticized for capital misallocation and for concentrating returns among politically connected managers, and the Fund's founding documents attach no emissions-performance condition to disbursements, leaving open the possibility that transition finance flows to firms rather than to transitions.

The development of green finance also reflects the increasing integration of environmental objectives into China's broader financial governance framework. Financial

institutions are expected to incorporate climate risks, environmental disclosure standards, and sustainability evaluation into investment decisions. Expanding mandatory disclosure, particularly for enterprises in ETS-covered sectors, is emerging as both a domestic regulatory priority and a competitiveness necessity, driven in significant part by the CBAM pressures examined in Section 4.3 (Liu et al., n.d.). One important regulatory challenge is preventing greenwashing and establishing unified standards defining green investment activity. Differences between China's Green Bond Endorsed Projects Catalog and international taxonomies such as the EU Taxonomy may create inconsistencies, and harmonization efforts continue within the International Platform on Sustainable Finance, of which China is a member (International Platform on Sustainable Finance, 2022).

4.2 Ecological Restoration and Environmental Rule of Law

The Plan places considerable emphasis on ecological restoration and on strengthening the rule of law in environmental governance. Key measures include non-CO_2 greenhouse gas control projects targeting 30 million tonnes CO_2e of mitigation capacity, approximately 100 national zero-carbon parks, expanded reforestation, and wetland restoration to enhance natural carbon sinks. China's forest stock volume surpassed 20 billion cubic meters by 2024, exceeding its 2030 NDC target ahead of schedule, and a new target of over 24 billion cubic meters has been set for 2035 (UNFCCC, 2025).

The Plan promotes comprehensive evaluation and assessment systems for carbon peaking and carbon neutrality, along with an industry carbon-emission control mechanism that clarifies management requirements in key sectors. Strengthening ecological governance requires comprehensive regulatory frameworks, and the Plan accordingly emphasizes expanded environmental supervision, integration of carbon considerations into environmental impact assessment, and enhanced legal accountability for ecological damage (National People's Congress, 2026). As Table 2 indicates, however, the modeled contribution of the forest sink to long-run neutrality is constant rather than increasing, suggesting that restoration programs matter more for biodiversity and local resilience than for the carbon arithmetic.

4.3 Foreign-Related Rule of Law as an Emerging Governance Framework

4.3.1 The empirical setting

The 15th FYP deepens China's engagement with international climate governance at a moment when the boundary between domestic regulatory law and international legal obligation is becoming difficult to maintain. China's climate diplomacy took on new dimensions with the submission of its 2035 NDC in November 2025, the first absolute

emissions-reduction commitment in the history of Chinese climate governance. The target's ambiguity about the baseline year and its insufficient alignment with 1.5°C pathways have drawn criticism from the Climate Action Tracker (2025b) and the Asia Society Policy Institute (2025), both of which note that it may be achievable under existing policy without significant additional domestic effort.

The interaction between domestic governance and international regulation is most visible in trade-related climate policy. The EU's CBAM entered full operational implementation in 2026, creating direct financial incentives for Chinese exporters to strengthen emissions transparency and for China to raise domestic carbon prices. Chinese steel and aluminum face substantial CBAM-related costs, which lends commercial urgency to ETS price convergence (De Stefano, 2026; Wu, 2023). China has objected to CBAM at the World Trade Organization on the grounds that it violates GATT non-discrimination principles (Legal Response International, 2025), while simultaneously accelerating domestic carbon market reforms to meet its requirements. China continues to emphasize the principle of common but differentiated responsibilities and respective capabilities in climate diplomacy, maintaining that developing economies require policy flexibility (He et al., 2020).

At the same time, through green technology leadership, the Belt and Road Green Development Initiative, and multilateral engagement, China actively shapes emerging norms in global climate governance (Kuyper & Kalfagianni, 2023). These dynamics suggest that China's international climate engagement is no longer adequately captured by a purely diplomatic or environmental lens. It is increasingly structured by and productive of legal obligations: treaty commitments, reporting frameworks, market-access regulations, and investment standards that operate simultaneously at domestic and international levels. That intersection is the domain of what Chinese governance discourse and legal scholarship term foreign-related rule of law (涉外法治).

4.3.2 The doctrinal frame and its blind spot

The foreign-related rule of law was formally elevated to a state priority in the Opinions of the CPC Central Committee on Strengthening the Work of Foreign-Related Rule of Law, issued in 2021. At the Politburo's collective study session of 27 November 2023, Xi Jinping articulated that China must participate actively in the reform and development of the global governance system and use legal methods to promote global governance, a formulation positioning law rather than diplomacy alone as the instrument of China's global engagement (Xi, 2023). Existing scholarship on the doctrine has focused principally on investment treaty arbitration, WTO dispute settlement, sanctions countermeasures, and jurisdictional conflict in

commercial litigation (Erie, 2023). Climate governance has not been analyzed through this framework, which is a gap in two literatures at once, since the climate governance literature has correspondingly ignored the doctrinal apparatus through which Chinese lawyers themselves conceptualize this activity (Zhu, 2022).

4.3.3 A bounded category

The argument advanced here is not merely that climate governance can be described in terms of foreign-related rule-of-law vocabulary. Almost any regulatory field with an international dimension could be described that way, and a category that admits everything explains nothing. Climate-related foreign-related law (气候涉外法治) is proposed as a bounded analytical category comprising domestic legal and regulatory instruments that satisfy three cumulative criteria.

First, the instrument must be externally conditioned: its content, timing, or stringency is determined in material part by a legal standard generated outside the Chinese legal system, whether by treaty, by another jurisdiction's unilateral regulation, or by a transnational standard-setting body. Mere international influence is insufficient; the criterion requires that removing the external standard would change the instrument. Second, the instrument must be domestically operative: it takes effect through ordinary Chinese administrative or regulatory channels, binding Chinese entities directly, rather than through the state's external conduct as a party to a treaty. This distinguishes the category from foreign policy and ordinary international law on treaty compliance. Third, the instrument must be bidirectionally oriented: it functions simultaneously as an act of compliance with, and as an act of participation in, the construction of the international standard in question. This is what separates the category from the ordinary domestic implementation of international obligations, which flows in only one direction.

Applying these criteria, three elements of the 15th FYP framework qualify. The MRV reforms, specifically the mandate to standardize the national greenhouse gas inventory and establish a unified emission factor database, are shaped in content by Article 13 of the Paris Agreement and its Enhanced Transparency Framework (UNFCCC, 2018); they operate through domestic reporting obligations on Chinese enterprises; and China's implementation practice feeds back into the ongoing elaboration of transparency modalities. The ETS reforms satisfy the criteria more sharply still: the timetable for absolute caps and the pressure toward price convergence are conditioned by CBAM, an instrument developed entirely outside China's legal system that nonetheless conditions market access for Chinese exporters; the

reforms bind Chinese installations domestically; and China simultaneously contests CBAM's legality at the WTO while conforming to it, which is participation in norm construction by other means. The green Belt and Road standards, including the Green Investment Principles and the BRI International Green Development Coalition guidelines, invert the direction: domestically generated norms projected into international investment governance, satisfying the third criterion from the outward side (Kuyper & Kalfagianni, 2023).

Several things fall outside the category, and that's what makes it useful. Domestic air quality regulation is not 气候涉外法治, however environmentally significant, because it fails the first criterion. China's NDC submission itself is not, because it fails the second criterion: it is an act of the state as a treaty party, not a domestically operative instrument. Chinese participation in COP negotiations fails on both counts. Product carbon footprint accounting rules, by contrast, are a marginal case worth watching, since they currently satisfy the first two criteria and may come to satisfy the third as Chinese standards begin to circulate in Southeast Asian and Gulf markets.

4.3.4 What the category explains

A reasonable objection is that this framework relabels what comparative environmental law already calls the domestic implementation of international obligations. Two things resist that objection. The first is the bidirectionality criterion, which captures a phenomenon that implementation accounts systematically miss: China's ETS reforms are simultaneously compliance with and contestation of CBAM, and any framework that codes them as one or the other loses the structure of the behaviour. The second is that the category tracks a doctrinal apparatus that Chinese officials and scholars actually use. Reading Chinese climate regulation through 涉外法治 rather than through implementation theory predicts which agencies lead, which instruments get legislative rather than merely administrative form, and why certain reforms accelerate when external regulatory deadlines approach rather than when domestic emissions data worsens. That is a falsifiable set of expectations, and the 2025-2027 ETS reform sequence offers a reasonably clean test.

The 15th FYP's institutional architecture, spanning ETS regulation, carbon disclosure standards, product carbon footprint accounting, and the National Low-Carbon Transition Fund, represents the most developed expression of the category to date. Its analysis is offered here as a contribution to both climate governance scholarship and the developing literature on Chinese international law, and as a framework that other researchers can apply, extend, or refute.

4.4 Domestic and International Compliance Relations

One of the more significant characteristics of the 15th FYP is the growing integration of domestic environmental governance with international climate compliance frameworks. The planned transition from intensity-based to absolute cap-based ETS allocation by 2027, stronger carbon accounting and disclosure systems, and the transition financing mechanism examined in Section 4.1 all reflect adaptation to international regulatory expectation while serving domestic objectives (National People's Congress, 2026).

China's experience demonstrates that climate governance pathways may differ across institutional systems while still contributing to international sustainability objectives. The Plan's model, combining centralized target-setting, market-based ETS mechanisms, and bottom-up local implementation, offers a distinctive form of state-led ecological modernization (Mol et al., 2009; Hajer, 1995). Long-term challenges include data transparency, regulatory fragmentation across sectors, and the need to ensure consistency between overseas Belt and Road investments and domestic environmental commitments.

5. Legal Pathways to Carbon Neutrality

5.1 Improving Carbon Governance

Implementing China's long-term carbon neutrality strategy requires not only policy coordination but the gradual development of a more comprehensive legal framework. Many climate policies continue to operate through administrative planning instruments and regulatory directives rather than through specialized climate legislation. The most significant exception is recent. For its first three years, the national ETS rested on the Measures for the Administration of Carbon Emission Trading (Trial), a ministerial instrument issued by the Ministry of Ecology and Environment in 2021. On 25 January 2024, the State Council promulgated the Interim Regulations on the Administration of Carbon Emissions Trading (碳排放权交易管理暂行条例), effective 1 May 2024, which elevated ETS governance from ministerial to State Council level and constitute China's first specialized legislation in the climate field (State Council, 2024; International Carbon Action Partnership, 2025a). The Regulations clarify supervisory competences, establish information-sharing and enforcement cooperation mechanisms, provide for the development of an emissions cap, and introduce substantial penalties for data falsification, thereby addressing the enforcement gap discussed in Section 2.2.

That development matters for the broader argument of this article. The move from ministerial measures to State Council regulation is precisely the kind of formal legal upgrading

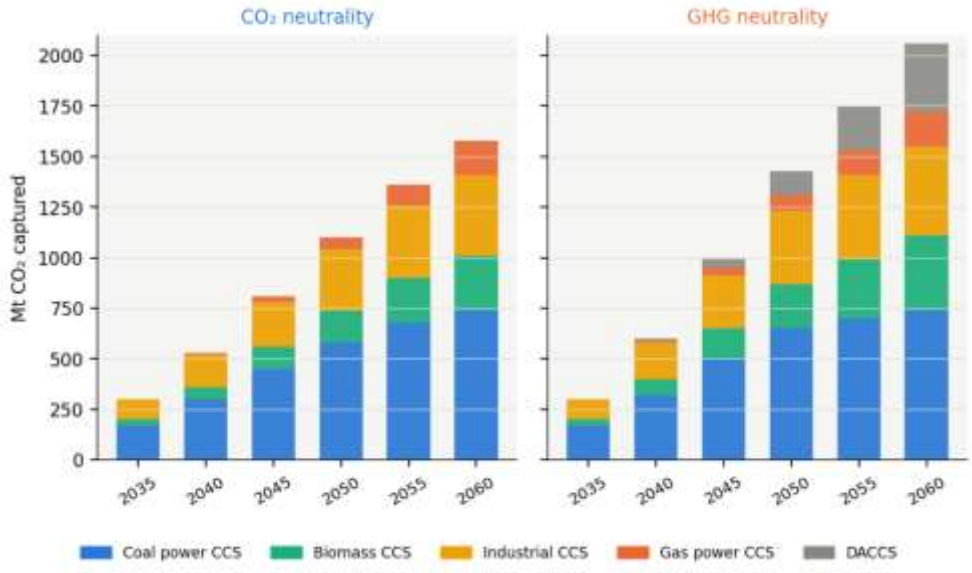
that a claim about climate rule of law requires as evidence, and it happened not at the outset of the ETS but in response to a data integrity crisis and to intensifying external scrutiny. Legal institutionalization here follows failure and follows external pressure, rather than preceding either.

Further tasks remain as the ETS expands into steel, cement, aluminum, and potentially chemicals by 2027; more detailed rules on permit allocation methodology, market supervision, emissions verification, compliance obligations, and dispute resolution will be needed. The planned shift to absolute caps from 2027 will require commensurate regulatory development to specify binding aggregate limits, since the Interim Regulations anticipate a cap but do not set one (National People's Congress, 2026).

Product-level carbon footprint accounting rules, together with the product carbon identification certification system mandated by the Plan, represent new legal frontiers in supply chain climate regulation. These measures, driven in part by CBAM compliance pressures analyzed in Section 4.3, signal a deepening integration of environmental legislation with commercial, financial, and trade regulation.

Figure 6 identifies a regulatory absence rather than a regulatory design. Deployment on the modeled scale would require a liability regime for geological storage, a legal characterization of stored CO_2, permitting rules for transport infrastructure, and a mechanism for crediting removals within the ETS. None of these exists in Chinese law, and the 15th FYP does not create them. For an article concerned with the legal roadmap to 2060, this is arguably the largest single gap in the current framework.

Figure 6: Required CCS and DACCS deployment under CO_2 neutrality and GHG neutrality scenarios, 2035-2060



Note: *GHG neutrality requires an additional 510 Mt CO_2 of capture capacity by 2060 relative to CO_2 neutrality, including 340 Mt from DACCS. Industrial CCS covers steel, cement, chemical, and other manufacturing sectors.*
Source: *Du et al. (2026). Unit: Mt CO_2 captured annually.*

5.2 Central-Local Coordination

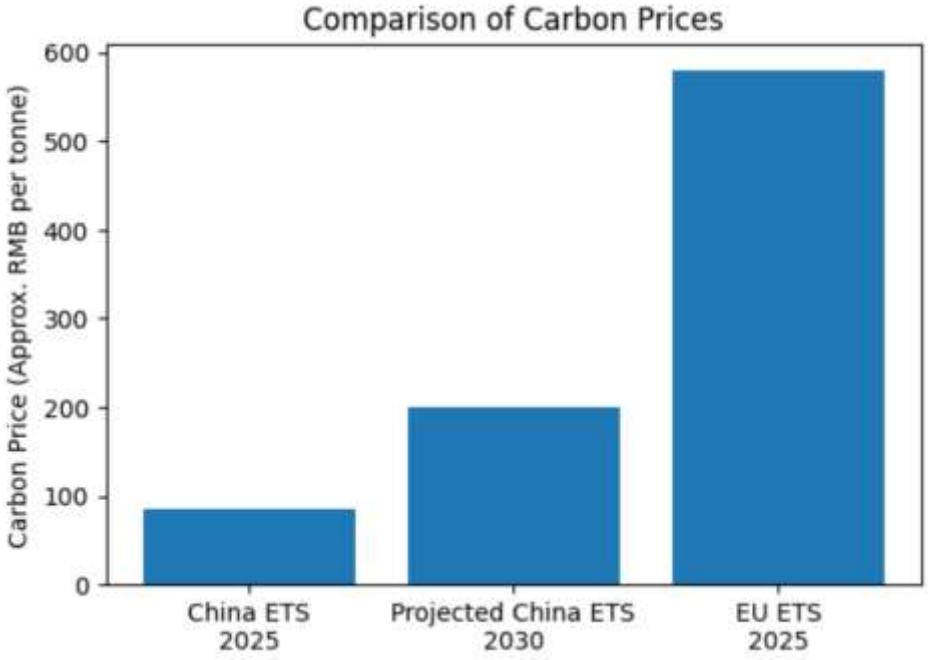
A central challenge concerns the relationship between national objectives and local implementation capacity. The transition to carbon emission dual control places new obligations on provincial governments. Provinces heavily reliant on coal production, heavy manufacturing, or energy-intensive industrial structures, such as Inner Mongolia, Shanxi, and Xinjiang, face greater difficulty decarbonizing rapidly while managing economic transition (National People's Congress, 2026). The coal governance gap analysed in Section 2.2, combined with capacity payments for coal plants, raises particular concerns about the sufficiency of constraint in exactly those provinces. Strengthening governance capacity, improving intergovernmental coordination, and enhancing regulatory supervision, including through the reformed evaluation and assessment system for carbon peaking and neutrality, remain essential priorities (Centre for Research on Energy and Clean Air, 2026).

5.3 Market Mechanisms and Green Financial Regulation

Market-based mechanisms are expected to play an increasingly important role in long-term decarbonization. ETS expansion to cover over 60 per cent of national emissions, combined with the planned shift to absolute caps by 2027, represents a significant strengthening of the carbon market's regulatory architecture. As Section 2.3 documented, however, the carbon price remains far below levels necessary to alter industrial investment decisions, and closing that gap through more ambitious cap-setting and credible enforcement is the central regulatory challenge ahead (International Emissions Trading Association, 2025; Institute for Energy Economics and Financial Analysis, 2025).

Market stabilization mechanisms to improve price predictability and investor confidence, improved allocation procedures, and stronger supervision of transactions are identified as priorities. The blended-finance model introduced through the National Low-Carbon Transition Fund may help mobilize the investment required for the 2060 pathway (Guo & Belahmidi, 2026). Green finance regulation will need to address greenwashing risk, harmonize with international taxonomies, and strengthen climate-related financial disclosure across listed companies and financial institutions.

Figure 7: Comparative Carbon Prices: China ETS and EU ETS (2025)



Note: *China ETS average ≈ CNY 86 per tonne in early 2025; projected ≈ CNY 200 per tonne by 2030; EU ETS ≈ EUR 70-80 per tonne during 2025. EU prices are presented as approximate RMB-equivalent conversions for comparative purposes.*

Source: *Compiled by the author from International Carbon Action Partnership (2025a), ClearBlue Markets (n.d.), and International Emissions Trading Association (2025).*

5.4 Future Directions for China's Climate Rule of Law

The 15th Five-Year Plan indicates that China's climate governance system is evolving toward a more institutionalized and law-based model, though unevenly. The shift to absolute ETS caps from 2027 will require legislative development beyond the Interim Regulations. Judicial participation through environmental courts, public-interest litigation, and ecological compensation claims is expected to expand, building on the pattern Zhu (2022) documents of Chinese judges contributing to climate governance in the absence of climate legislation. China's 2035 NDC commitments will also cascade into the 16th FYP (2031-2035), which will have to close the gap between current trajectories and Paris-compatible pathways (Climate Action Tracker, 2025b; UNFCCC, 2025).

International frameworks including CBAM, the ISSB standards, and IFRS S2 will continue to drive domestic regulatory reform. China's experience demonstrates how a large developing economy can pursue long-term decarbonization by combining centralized planning, market-based reform, technological innovation, and legal institutionalization (Liu et al., n.d.). The methodological transparency concerns discussed in Section 2.2 nonetheless

underscore that governance credibility depends on more than institutional expansion, and the analysis in Section 4.3 suggests that external verification pressure may prove a more reliable driver of transparency than domestic accountability mechanisms.

6. Discussion

6.1 Institutionalized Carbon Governance

The findings indicate that the 15th Five-Year Plan represents a significant, though qualified, transformation in China's climate governance framework. Early Chinese environmental governance concentrated on pollution control, energy efficiency, and resource management during rapid industrialization. The 15th FYP reflects a broader institutional transition toward long-term carbon governance embedded within national economic planning and state modernization. The formal transition from energy dual control to carbon-emission dual control is the clearest expression of that shift. Climate governance in China is no longer limited to improving energy efficiency but is increasingly aimed at regulating emissions through institutional and administrative mechanisms. Incorporating carbon governance into performance evaluation, industrial restructuring, emissions accounting, and financial governance demonstrates growing institutionalization (Centre for Research on Energy and Clean Air, 2026; Climate Action Tracker, 2026).

The qualification matters as much as the finding. As Sections 1.1 and 2.1 argued, the vocabulary of absolute control has outrun the instruments, and the accounting revision analysed in Section 2.2 means that the Plan's binding target constrains a ratio computed on a more permissive basis than its predecessor. What has been institutionalized is a governance apparatus, not yet a quantitative ceiling. That is a real achievement and a limited one, and the literature has tended to report the first without registering the second. Subject to that qualification, China's climate governance model is evolving toward an integrated form of climate rule of law in which administrative regulation, market mechanisms, technological governance, and planning instruments operate together. This supports arguments that environmental governance in China increasingly functions as part of a broader state modernization strategy rather than as an environmental protection agenda alone (Gilley, 2012; Eaton & Kostka, 2014).

6.2 Governance and Ecological Modernization

The study also contributes to debates concerning ecological modernization and state-led environmental governance. Ecological modernization theory holds that environmental protection and economic development can become mutually reinforcing through

technological innovation, institutional reform, and market transformation (Hajer, 1995; Mol et al., 2009). The 15th FYP displays several characteristics of that model: large-scale renewable expansion, green industrial transformation, technological upgrading, and green finance reform. China's version differs substantially from the liberal-market approaches on which the theory was largely built. Rather than relying primarily on decentralized market governance, China combines centralized planning, industrial policy, administrative coordination, and selective market mechanisms such as the ETS. The findings therefore suggest a distinctive planning-state variant of ecological modernization.

The variant is most visible in the coordination between industrial policy and climate governance. Renewable deployment, battery manufacturing, artificial intelligence integration, and green industrial transformation are treated not as environmental policies but as components of national economic competitiveness. Chinese climate governance thus reflects environmental objectives alongside geopolitical and developmental priorities, and the EV overcapacity episode discussed in Section 3.3 shows that the two can pull apart.

The findings also partially support arguments about authoritarian environmentalism, which emphasize the capacity of centralized systems to implement long-term environmental policy efficiently (Gilley, 2012). Administrative centralization does not, however, guarantee greater ambition or more effective implementation. Persistent tension between growth and decarbonization remains visible throughout the framework, and Eaton and Kostka's (2014) account of local officials' time horizons continues to describe the implementation problem accurately. One finding sits awkwardly with ecological modernization theory in either its liberal or its authoritarian variant. The theory assumes that measurement improves as institutions mature, because credible measurement is what allows environmental and economic goals to be reconciled.

The 14th FYP episode runs the other way: the measurement basis was revised, mid-cycle and after the shortfall was apparent, in a direction that improved the reported result. A governance system capable of adjusting its own metric retains a degree of freedom that the theory does not model, and it is precisely the degree of freedom that external verification requirements are designed to remove. That, in turn, is one reason the foreign-related dimension analysed in Section 4.3 may matter more for China's decarbonization than its domestic institutional architecture.

Beyond the metric question, the Plan's other limitations are by now familiar. The 14th FYP's 18 per cent target was missed, and the 15th FYP's 17 per cent target is both lower and computed differently. Independent analyses confirm that current trajectories remain

insufficient for alignment with 1.5°C (Centre for Research on Energy and Clean Air, 2026; Climate Action Tracker, 2025b). The ETS expansion is a major institutional development, but with prices at roughly a seventh of EU levels it functions more as a policy signal than as a binding economic constraint (Institute for Energy Economics and Financial Analysis, 2025; International Carbon Action Partnership, 2025a). Coal capacity payments and the absence of binding generation caps illustrate the continuing weight of energy security in regulatory design.

6.3 International Regulatory Pressures and Global Climate Governance

China's climate governance increasingly operates within an interconnected international regulatory environment. The Paris Agreement and China's 2035 NDC reshape domestic regulatory priorities. As Section 4.3 argued, CBAM functions not only as an external trade measure but as an indirect driver of domestic reform, traceable across carbon accounting, MRV frameworks, product-level carbon standards, and ETS pricing. At the same time, China is not merely adapting to international climate governance but increasingly shaping it. Through dominance in renewable manufacturing, battery supply chains, electric vehicles, and green finance, China now influences the global pace and cost structure of transition technologies (Ember, 2025).

Placing this alongside other large developing economies helps clarify what is and is not distinctive. India's Carbon Credit Trading Scheme, whose compliance obligations entered into force for seven energy-intensive sectors from the 2025-26 fiscal year, is like China's ETS: an intensity-based system that defers absolute limits (International Carbon Action Partnership, 2025b). Brazil took the opposite route: Law No. 15,042/2024 established the Brazilian Greenhouse Gas Emissions Trading System as a cap-and-trade mechanism from the outset, with statutory phasing across roughly six years before compliance obligations bite (International Carbon Action Partnership, 2024).

The comparison suggests that what distinguishes China is neither the choice of instrument nor the sequencing from intensity to absolute control, both of which India shares, but the fact that Chinese reform timetables track external market-access deadlines more closely than they track domestic legislative cycles. India's scheme responds primarily to domestic industrial policy; Brazil's to legislative politics; China's, on the evidence of the 2025-2027 ETS sequence, substantially to CBAM. That is a comparative claim the 气候涉外法治 framework generates and that further research could test properly. The findings therefore indicate a two-way interaction. International climate regulation increasingly shapes Chinese

domestic reform, while Chinese industrial transformation reshapes global energy markets and, through them, the conditions under which other states can decarbonize.

7. Conclusion

This article has argued that the 15th Five-Year Plan (2026-2030), adopted by the National People's Congress in March 2026, institutionalizes China's climate governance more thoroughly than any previous planning document while constraining absolute emissions less than its own vocabulary suggests. The Plan integrates administrative regulation, market mechanisms, technological modernization, green finance, and ecological governance. Through the formal transition to carbon emission dual control, the sectoral expansion of the national ETS examined in Section 2.3, the construction of a new-type energy system, the National Low-Carbon Transition Fund, and a binding 17 per cent carbon intensity reduction target, it operationalizes the 2060 commitment within a coordinated planning framework (National People's Congress, 2026; UNFCCC, 2025).

Three findings qualify that account. First, the total emissions limb of carbon dual control has no operative national expression: the Plan sets no economy-wide absolute cap, and absolute limits exist only inside the ETS on a 2027 timetable established by a separate instrument. Second, and more consequentially, the revision of the carbon-intensity accounting methodology carries forward from the 14th FYP into the new target, so that a nominally more modest 17 per cent reduction on a broader denominator is compatible with absolute emissions continuing to rise over the planning period. Third, the coal governance gap persists, with capacity payments introduced and no binding generation cap restored. Taken together, these suggest that the Plan's most important climate decisions were accounting decisions, made largely outside public debate, and that the literature's focus on headline targets has obscured them.

The article's analytical contribution is the proposal of climate-related foreign-related law (气候涉外法治) as a bounded category, defined by external conditioning, domestic operativeness, and bidirectional orientation. Applied to the 15th FYP, the category identifies why certain reforms accelerate as external regulatory deadlines approach rather than as domestic emissions data deteriorate, and it captures the simultaneous compliance and contestation that characterize China's response to CBAM. Whether the category travels to other developing economies is an open question that Section 6.3 sketches rather than settles.

Two instruments issued after this analysis was completed will require attention in subsequent work: the 15th Five-Year Carbon Peaking Action Plan, released by the State Council on 9 July 2026, and the 15th Five-Year National Climate Change Response Plan, co-

issued by the Ministry of Ecology and Environment and eighteen other agencies on 27 July 2026. The former speaks directly to the coal question identified here as unresolved. Future research should also examine regional variation in implementation, the evolving role of environmental courts and climate litigation, the interaction between China's ETS and international carbon markets under CBAM, and the legal framework for carbon dioxide storage that Section 5.1 identifies as absent. Such work may deepen understanding of how planning-based legal systems institutionalize long-term ecological modernization, and of how the gap between announced climate targets and underlying governance ambition can be more reliably assessed.

Availability of Data and Materials

No primary datasets were generated during this study. All data and materials used in this research are derived from publicly available sources, including official government documents, policy reports, legal texts, and international databases cited in the references section. Additional information is available from the author upon reasonable request.

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