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THE MINISTRY OF FINANCE

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Deliverable 2

Report on the Recommended Operational Model and Implementation Framework for Vietnam's Carbon Trade Exchange Pilot

VIETNAM CARBON TRADE EXCHANGE - PILOT PREPARATION WITH MINISTRY OF FINANCE

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DELIVERABLE 2 REPORT

Vietnam Carbon Trade Exchange

Pilot Preparation with Ministry of Finance, Phase 2

Report on the Recommended Operational Model and Implementation Framework for Vietnam's Carbon Trade Exchange Pilot

August 2025

COLOPHON AND DISCLAIMER

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ABBREVIATIONS

AB	Assembly Bill
APCR	Allowance Price Containment Reserve
ARP	Auction Reserve Price
CAP	Common Auction Platform
CARB	California Air Resources Board
CBAM	Carbon Border Adjustment Mechanism
CCA	Californian Carbon Allowance
CCER	China Certified Emission Reduction
CCERC	China Carbon Emissions Registration and Clearing Co., Ltd.
CCM	Cost Containment Mechanism
CCP	Central Counterparty
CCR	Cost Containment Reserve
CFTC	Commodity Futures Trading Commission
CITSS	Compliance Instrument Tracking System Service
CNY	Chinese Yuan
CTX	Carbon Trade Exchange
DESNZ	Department for Energy Security and Net Zero
DVP	Delivery versus Payment
ECC	European Commodity Clearing
EEA	European Environment Agency
EEX	European Energy Exchange
EPA	Environmental Protection Authority
ESMA	European Securities and Markets Authority
ETP	Southeast Asia Energy Transition Partnership
ETRS	Emissions Trading Registry System

ETS	Emissions Trading System
EU	European Union
EUA	European Union Allowance
EUTL	European Union Transaction Log
FCA	Financial Conduct Authority
GHG	Greenhouse Gas
GIR	Greenhouse Gas Inventory and Research Center of Korea
HNX	Hanoi Stock Exchange
ICE	Intercontinental Exchange
KCU	Korea Credit Unit
KRW	Korean Won
KRX	Korea Exchange
KYC	Know-Your-Customer
MAE	Ministry of Agriculture and Environment
MAR	Market Abuse Regulation
MEE	Ministry of Ecology and Environment of China
MiFID	Markets in Financial Instruments Directive
MoE	Ministry of Environment of Korea
MoEF	Ministry of Economy and Finance of Korea
MOF	Ministry of Finance of Vietnam
MOIT	Ministry of Industry and Trade of Vietnam
MRV	Monitoring, Reporting and Verification
MSR	Market Stability Reserve
NDC	Nationally Determined Contribution
NGMS	National Greenhouse Gas Management System
NRS	National Registry System

NZ ETS	New Zealand Emissions Trading Scheme
NZETR	New Zealand Emissions Trading Register
NZU	New Zealand Unit
NZX	New Zealand Stock Exchange
ORS	Offset Registry System
OTC	Over-the-counter
RTGS	Real-Time Gross Settlement
SAM	Supply Adjustment Mechanism
SB	Senate Bill
SEEE	Shanghai Environment and Energy Exchange
SLA	Service-Level Agreement
SSC	State Securities Commission of Vietnam
TAL	Trusted Account List
TMS	Target Management System
UK	United Kingdom
UNOPS	The United Nations Office for Project Services
VAT	Value Added Taxation
VNX	Vietnam Exchange
VSDC	Vietnam Securities Depository and Clearing Corporation
WCI	Western Climate Initiative

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EXECUTIVE SUMMARY

National context and project mandate

Vietnam has made significant steps in developing the legal and institutional framework for a national carbon market, aligning with its ambitious commitments to reduce greenhouse gas (GHG) emissions and achieve net zero by 2050. The 2020 Law on Environmental Protection and the subsequent Government Decree No. 06/2022/ND-CP dated 7 January 2022 and its amendment Decree No. 119/2025/ND-CP dated 9 June 2025 on mitigation of GHG emissions and protection of ozone layer provide the foundational legal basis for emissions trading, setting the stage for the establishment of the Vietnam Carbon Trade Exchange (CTX). In this framework, the Ministry of Finance (MOF) has been designated as the lead agency responsible for developing and operating the CTX, while the Ministry of Agriculture and Environment (MAE) is responsible for the national carbon credit registry and overseeing market compliance. According to the national roadmap, the CTX is scheduled to be piloted in 2025 and become fully operational by 2028.

Recognising the complexities of this undertaking, the Technical Assistance Project, "Vietnam Carbon Trade Exchange - Pilot Preparation with Ministry of Finance, Phase 2," was launched under the Southeast Asia Energy Transition Partnership (ETP). Building on the success of Phase 1, this initiative provides direct, strategic support to the MOF in designing and operationalising the CTX pilot model. Its primary mandate is to serve as a specialised, evidence-based analysis providing constructive and actionable recommendations to directly strengthen the latest available draft of the Draft Decree on the Domestic Carbon Trade Exchange, which is currently being finalised by the MOF.

The core value of this report lies in moving beyond a simple description of a proposed model. Instead, it conducts an in-depth, critical assessment of the framework outlined in the Draft Decree. By benchmarking the proposed model against the operational realities and lessons learned from six mature and relevant international carbon markets, the UK, EU, California, South Korea, New Zealand, and China, this analysis identifies key strategic gaps and provides a clear roadmap to enhance the resilience, efficiency, and credibility of Vietnam's CTX from its inception.

Key findings: Synthesis of identified strategic gaps

The analysis confirms that the decision to leverage Vietnam's existing securities market infrastructure is a sound and efficient strategy. However, the unique nature of a compliance-driven carbon market requires significant adaptation. The assessment has identified several foundational gaps in the current pilot model that require strategic attention to ensure a successful launch.

Gap1: Foundational governance and legal gaps

- **Governance coordination gap:** The proposed dual-governance model between MAE and the MOF lacks a binding, formal protocol for inter-agency coordination. This creates a risk of regulatory ambiguity, delayed crisis response, and potential conflicts in supervisory jurisdiction, particularly for complex issues like market manipulation that require both environmental and financial expertise.

- **Legal nature gap:** A critical ambiguity persists regarding the legal classification of a carbon unit under Vietnam's existing civil, commercial, and tax laws. This uncertainty creates significant barriers for market participants regarding accounting treatment, tax obligations, and the ability to use allowances as financial collateral, thereby hindering market development and investment.

Gap 2: Market design and liquidity gaps

- **Structural illiquidity risk:** The pilot design, which includes 100% free allocation and high compliance flexibility (e.g., borrowing and offsetting), significantly reduces the incentive for active trading. This creates a high risk of a nominal, illiquid market with weak price discovery, undermining the CTX's core function as a cost-optimisation tool.
- **Absence of market stability mechanisms:** The framework currently lacks proven, rules-based mechanisms (such as an Auction Reserve Price or a Cost Containment Mechanism) to manage market-wide price volatility. This leaves the nascent market vulnerable to extreme price swings that could erode both political and corporate confidence.

Gap 3: Systemic and operational gaps

- **Critical system interoperability gap:** The CTX's complete operational dependency on the MAE-managed National Registry System (NRS) without a formal Service-Level Agreement (SLA) creates a single point of failure. Any technical disruption or data discrepancy at the NRS could halt the entire market.
- **Insufficient market integrity framework:** The current model lacks proactive market integrity controls common in all mature markets, including quantifiable holding limits to prevent market concentration, daily price fluctuation limits to manage volatility, and a dedicated, real-time market surveillance system to detect and deter fraud and abuse.

The way forward: Phased implementation roadmap

To address the identified gaps and ensure the CTX evolves from a government-supported pilot into a self-sustaining, credible market platform, this report proposes a strategic, three-phase implementation roadmap. Each phase has distinct objectives and specific, actionable priorities, requiring close coordination between MOF and MAE.

Phase 1: Pre-launch and operational readiness (2025 – Q1 2026)

The immediate priority during this phase is to establish a robust legal and technical foundation before any trading activity begins.

- **Finalise the legal framework:** Following the promulgation of the Decree, a binding joint coordination regulation between the MOF and MAE must be issued to formalise coordination protocols, data-exchange procedures, and crisis-response mechanisms. Concurrently, official guidance must be issued on the legal nature of carbon units (covering accounting and tax treatment) to provide market certainty.
- **Ensure technical readiness:** A legally binding Service-Level Agreement (SLA) must be signed between MAE, HNX, and VSDC to guarantee the technical integrity and reliability of

the critical interface between the National Registry System (NRS) and the financial platforms.

- **Build market readiness:** A national training program should be launched for regulators, operators, and participating enterprises, complemented by mock-trading exercises to build practical capacity and confidence in the system before the official launch.

Phase 2: Pilot operation and system learning (2026 – 2028)

This phase focuses on testing market mechanisms, gathering empirical data, and facilitating adaptive learning in a controlled environment.

- **Integrate market stability tools:** To ensure an orderly market, introduce daily price fluctuation limits (e.g., ±10%). In parallel, conduct detailed studies to prepare for the implementation of an Auction Reserve Price (ARP) and a Cost Containment Mechanism (CCM) as needed.
- **Develop market surveillance capacity:** Under the authority of SSC, progressively develop and deploy a real-time market surveillance system to detect trading anomalies and safeguard market integrity.
- **Ensure transparency and continuous improvement:** Operate a public data dashboard disclosing daily trading information. Crucially, conduct a formal mid-term evaluation by the end of 2027 to assess performance and provide evidence for policy adjustments before the transition to full operation.

Phase 3: Full operation and integration (from 2029 onward)

The final phase aims to transform the CTX into a financially self-sustaining, rules-based market infrastructure that is ready for international integration.

- **Transition to financial self-sustainability:** Gradually introduce partial auctioning of allowances (starting with ~10%) and implement a pre-defined service fee schedule to ensure the CTX can cover its own operational and investment costs.
- **Scale the market:** Expand the ETS scope to include additional industrial sectors as per the approved roadmap, while also allowing the listing of high-quality domestic voluntary credits to diversify products and deepen liquidity.
- **Pursue international integration:** Begin the technical and regulatory work necessary to prepare the CTX for future bilateral or regional linkages, including potential participation in mechanisms under Article 6.2 of the Paris Agreement.

Conclusion

The timely approval of the Draft Decree is a critical next step to create irreversible momentum for Vietnam's carbon market. By integrating these evidence-based recommendations, MOF can significantly enhance the proposed model, ensuring the CTX pilot is not only launched successfully but is also built on a foundation of resilience, transparency, and credibility. A successful CTX will be more than a climate policy achievement; it will be a powerful instrument for economic modernisation, a clear signal of Vietnam's commitment to sustainable development, and a cornerstone of its future competitiveness in a greening global economy.

1 INTRODUCTION

1.1 Background

Vietnam is committed to achieving its ambitious climate goals, including the pledge to reach net zero emissions by 2050. A core instrument for meeting these commitments is the establishment of a domestic carbon market, designed to help the country achieve its Nationally Determined Contribution (NDC) in the most cost-effective manner. By applying carbon pricing and creating tradable emission units, the market will enable regulated entities to meet their compliance obligations at lower cost, while also stimulating investment in cleaner technologies.

The development of this market is firmly grounded in national legislation and policy. The 2020 Law on Environmental Protection (Article 139) and Decree No. 06/2022/ND-CP laid out the foundation and roadmap for carbon market development. Most importantly, the Prime Minister's Decision No. 232/QD-TTg (24 January 2025) confirmed the government's plan to establish a Carbon Trade Exchange (CTX) and assigned clear responsibilities to specific government bodies. This Decision provides both a legal and political mandate to move from high-level policy design to practical implementation of the CTX as the central platform for trading emission allowances and carbon credits.

A clear governance structure has been established to guide this process. The Ministry of Finance (MOF) leads the setup and operation of the CTX, while the Ministry of Agriculture and Environment (MAE) oversees the overall carbon market framework. The Hanoi Stock Exchange (HNX) operates the trading platform, and the Vietnam Securities Depository and Clearing Corporation (VSDC) manages clearing and settlement, leveraging decades of securities market expertise to ensure efficiency and reliability.

Recognising the need for a well-defined operational model, MOF is receiving technical assistance from the Southeast Asia Energy Transition Partnership (ETP) managed by the United Nations Office for Project Services (UNOPS). Phase 1 of this support, completed in 2024, assessed Vietnam's readiness and international lessons, recommending the use of existing securities infrastructure. It involved a detailed assessment of Vietnam's readiness, an analysis of international best practices, and delivered a critical recommendation: to leverage the existing infrastructure and expertise of Vietnam's securities market to build the CTX efficiently and transparently.

Building directly on those findings, the current project, titled "Vietnam Carbon Trade Exchange - Pilot Preparation with the Ministry of Finance" (Phase 2), commenced on 3 January 2025, shifting the focus from high-level strategy to detailed implementation. The goal of this project is to develop the specific operational design for the CTX and help equip MOF officials with the expertise needed for the upcoming pilot. The project's mandate and work plan were formally presented at the Inception Workshop on 22 April 2025. This key event brought together policymakers from MOF and other agencies with domestic and international experts to discuss Vietnam's development roadmap and present initial lessons learned from mature carbon markets in the UK, California, and China, thereby establishing a solid basis for stakeholder collaboration.

However, amidst a dynamic policy-making process, MOF released a Draft Decree on the domestic carbon trade exchange for public consultation on 27 March 2025. Recognising the critical

opportunity to provide direct and timely technical input into this legislative process, the project's focus was strategically adjusted. Therefore, the primary contribution of this report (Deliverable 2) is to serve as a specialised analysis providing constructive, evidence-based recommendations to strengthen and refine the most recent available draft of the Decree (as of July 2025). The ultimate aim is to support the MOF in ensuring that Vietnam's CTX model, upon its launch, is effective, robust, and aligned with international best practices.

1.2 Objectives and scope

This report presents the recommended operational model for the CTX during its pilot phase (2025–2028), providing an actionable framework for the MOF and its partners. The model covers key areas such as governance, transaction mechanisms, and risk management, aiming to provide the tools necessary to establish a credible and efficient pilot, paving the way for a strong national carbon market.

To develop this recommendation, the project's methodology combines a review of international best practices with deep local engagement. The work involves examining established carbon trading platforms to understand their governance structures, transaction mechanisms, and oversight processes. These international models are then assessed and adapted for Vietnam's specific context in parallel with direct consultations with key stakeholders from both the public and private sectors. The insights from this research and consultation will form the basis of a detailed proposed operational model, which will define key elements such as institutional roles, supervisory functions and risk mitigation strategies to ensure the pilot CTX can operate with transparency, efficiency, and accountability.

By clearly defining the operational framework for the CTX pilot, Deliverable 2 will provide critical input for the MOF and other stakeholders to strengthen Vietnam's carbon market development by ensuring effective governance, transparent transaction procedures, and alignment with national priorities and international best practices.

2 REVIEW OF INTERNATIONAL CARBON TRADING SYSTEMS

2.1 Selection of ETSs for the review of international carbon trading platform models

This section builds upon the international review from the ETP-MOF cooperation in Phase 1, providing an updated analysis that incorporates the most recent regulatory developments as of August 2025. Crucially, this analysis provides significant value additions by shifting focus from the high-level strategic models of Phase 1 to the granular operational realities of these systems.

To provide direct and practical inputs for Vietnam's CTX design, particularly for MOF, this review examines the selected international ETSs through several new, in-depth lenses that were not the focus of the previous report. The key value additions of this review include a focus on:

- **Financial integration and market linkages:** Analysing how carbon trading platforms are integrated with existing national financial infrastructure.

- **Detailed governance and supervision in practice:** Moving beyond identifying institutional roles to examining the specific mechanisms for market surveillance, risk management, and handling of violations.
- **Technical infrastructure and operational procedures:** Assessing detailed operational flows, including registry-to-exchange data synchronisation and settlement cycles.
- **Latest regulatory developments and their operational impact:** Evaluating how recent major policy shifts are impacting the day-to-day operations and governance of these exchanges.

This targeted, operational focus represents a deliberate progression from the high-level strategic assessment conducted in Phase 1 (which assessed international models based on broader criteria, including years of operation, contextual similarity, and traded volume, to identify a suitable strategic direction for Vietnam). By concentrating on these novel operational dimensions, this section aims to extract actionable lessons that can directly inform the detailed procedures and regulations for Vietnam's CTX pilot.

2.2 The United Kingdom ETS

2.2.1 Overview of the United Kingdom ETS

The UK ETS was launched on 1 January 2021, following its subsequent exit from the EU ETS. Designed to maintain a carbon pricing mechanism compatible with the UK's climate goals, the UK ETS builds upon the framework of the EU ETS but incorporates modifications reflecting domestic priorities. Its primary aim is to support the UK's legally binding commitment to achieve net zero greenhouse gas (GHG) emissions by 2050,[1] as mandated by the Climate Change Act 2008.[2]

The UK ETS has the following distinctive characteristics:

- Covering energy-intensive industries, the power sector, and domestic aviation, accounting for approximately one-third of the UK's total GHG emissions. Compliance entities are required to surrender allowances equivalent to their verified emissions on an annual basis.
- Setting an annually declining cap on total emissions from covered sources, aligned with the UK's carbon budgets and its NDC under the Paris Agreement. Initially, the cap was set 5% lower than the UK's notional share of the EU ETS cap to signal enhanced ambition. '
- Currently operating as a stand-alone scheme but the UK ETS is designed with a degree of flexibility to accommodate future linkages with other carbon pricing systems.

The UK ETS Authority conducts annual reviews to ensure the system's alignment with domestic carbon budgets and evolving climate targets. The first such review in 2023 proposed tighter caps and expanded sectoral coverage post-2026.

For Vietnam, the UK ETS represents a mature and institutionally robust carbon market that leverages prior experience under the EU ETS while integrating domestic UK priorities.

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[1] *UK Government. (2019). The Climate Change Act 2008 (2050 Target Amendment) Order 2019 (S.I. 2019/1056). The National Archives. Retrieved from https://www.legislation.gov.uk/uksi/2019/1056/contents/made.*

[2] *UK Government. (2008). The Climate Change Act 2008 (c. 27). The National Archives. Retrieved from https://www.legislation.gov.uk/ukpga/2008/27/contents.*

Box 1. Latest UK ETS developments (2024-2025)

The UK ETS has implemented significant reforms to align with the nation's net zero goal. In 2024, the cap trajectory was tightened by 30% for 2021–2030, aiming to cut annual allowed emissions from 156 $MtCO_2e$ in 2021 to ~50 $MtCO_2e$ by 2030. To smooth this transition, 53.5 million allowances from reserve pools will be auctioned between 2024 and 2027. The UK Government also proposed expanding coverage of the UK ETS: consultations were launched to include waste incineration (by 2028) and domestic maritime transport (from 2026), and to integrate engineered GHG removals into the scheme. Free allocation rules are being adjusted, with the next allocation period pushed from 2026 to 2027 to coincide with a new UK Carbon Border Adjustment Mechanism (CBAM). Methods to calculate carbon leakage risk and update free allowance allocation to affected sectors are concurrently under review.

Market stability and oversight mechanisms are likewise evolving. The UK ETS Authority reviewed its Cost Containment Mechanism (CCM) – which can release additional allowances if prices spike – and consulted on its design and on whether to maintain the Auction Reserve Price (ARP). A new Supply Adjustment Mechanism (SAM) was proposed in late 2023 to dynamically manage allowance supply. Oversight is being bolstered by treating UK carbon allowances as financial instruments, bringing them under financial market regulations. In May 2025, the UK and EU announced plans to link their ETSs, allowing mutual recognition of allowances and coordinated market rules.[3] The linkage framework calls for dynamic alignment of UK ETS rules with EU ETS provisions and reciprocal CBAM exemptions to prevent carbon leakage in trade. Technical negotiations to formalise this UK–EU ETS link are currently underway.

2.2.2 Legal and regulatory framework

The UK ETS is underpinned by a clear legal framework that was established following the UK's withdrawal from the EU. It replicates many EU ETS design features but adapts them to national priorities and governance structures. The framework rests on statutory instruments, regulatory oversight, and defined institutional roles.

The legal and institutional framework of the UK ETS consists of a combination of primary and secondary legislation, policy guidance, and operational arrangements overseen by designated regulatory bodies.

2.2.2.1 Legal basis

- The primary legal foundation is the Greenhouse Gas Emissions Trading Scheme Order 2020 (SI 2020/1265)[4], which created the UK ETS effective from 1 January 2021. It sets out the ETS design and provides the legal authority for allowance issuance, compliance obligations, enforcement provisions, and the operation of the UK Emissions Trading Registry.

[3] *International Carbon Action Partnership (ICAP). (2025, May 22). EU and UK commit to linking emissions trading systems in landmark cooperation agreement. Retrieved from https://icapcarbonaction.com/en/news/eu-and-uk-commit-linking-emissions-trading-systems-landmark-cooperation-agreement.*

[4] *UK Government. (2020). The GHG Emissions Trading Scheme Order 2020 (S.I. 2020/1265). The National Archives. Retrieved from https://www.legislation.gov.uk/uksi/2020/1265/contents/made.*

- Subsequent amendments, including the *Greenhouse Gas Emissions Trading Scheme (Amendment) Order 2020* and the *Auctioning Regulations 2021*, provide detailed rules on allocation, auctioning, registry operations, and enforcement.
- The scheme is embedded in the UK's broader climate strategy, aligning with the *Climate Change Act 2008 (as amended)* and the national Net Zero target by 2050.

2.2.2.2 Institutional responsibilities

The governance of the UK ETS is shared across several institutions, each with clearly defined mandates to ensure both environmental integrity and financial market stability. Together, they provide policy direction, regulatory oversight, market operations, and compliance enforcement.

- **UK ETS Authority** – The joint decision-making body comprising the UK Government (through the Department for Energy Security and Net Zero – DESNZ) and the devolved administrations of Scotland, Wales, and Northern Ireland. It sets the cap trajectory, market rules, and overall policy direction for the scheme.
- **Financial Conduct Authority (FCA)** – Supervises market behaviour under the Market Abuse Regulation (MAR). By classifying allowances as financial instruments, the UK ETS ensures that trading activity is subject to financial market law and strong anti-abuse safeguards.
- **Environment Agency (England)** and devolved environmental regulators – Oversee emissions, MRV, and compliance enforcement. They also administer the UK ETS Registry.
- **UK Emissions Trading Registry** – Developed on the basis of the EU Union Registry architecture and administered by the Environment Agency. It provides account management, transaction logging, and surrender of units. All UK Allowance (UKA) transactions are recorded in the registry, ensuring auditability and legal certainty of ownership. The registry also acts as the backbone of market transparency:
    - Public-facing information is limited, but regulators have full access to order books, position data, and registry balances.
    - All trades, whether via auctions, exchanges, or Over-the-counter (OTC), must be recorded in the registry to establish legal ownership and enable compliance verification.
- **Intercontinental Exchange (ICE) Futures Europe & ICE Clear Europe** – ICE operates the auction platform and secondary market trading venue, while ICE Clear Europe provides central counterparty (CCP) clearing and settlement. This structure leverages established financial market expertise and ensures that trading and settlement are conducted under robust risk management protocols.

2.2.2.3 Compliance and enforcement

Compliance obligations provide the environmental integrity of the system. Penalties are designed to create a strong deterrence.

- Regulated entities must report MRV emissions annually in line with the Monitoring and Reporting Regulations 2012 (as amended). The first major review in 2023 resulted in recommendations to tighten the emissions cap and expand coverage post-2026.[5]
- Verified reports that conform to the monitoring and reporting rules adopted for the UK ETS[6] must be submitted, and allowances surrendered, equal to verified emissions.
- Non-compliance results in financial penalties under the ETS Order and publication of the entity's name ("naming and shaming").

2.2.2.4 Governance features

The UK ETS incorporates adaptive governance features that strengthen credibility and accountability.

- Decision-making is shared between the central government and devolved administrations, ensuring broad political legitimacy.
- Carbon allowances are legally defined as financial instruments, placing their trading firmly under FCA supervision.
- Statutory review provisions require regular consultations and adjustments to caps, coverage, and market rules, ensuring the scheme remains aligned with evolving climate and economic policy.

2.2.3 Operation and infrastructure aspects

The operational design of the UK ETS integrates elements inherited from the EU ETS with bespoke features tailored to the post-Brexit objectives of the UK. Its architecture can be grouped into five main components: trading modes, registry and settlement, oversight and risk management, stability mechanisms, and participation rules.

2.2.3.1 Market participation, access, and liquidity

Participation in the UK ETS is restricted to verified entities, ensuring both market integrity and compliance credibility. Entities must register with the relevant national regulator and hold an account in the UK ETS Registry. The onboarding process includes Know-Your-Customer (KYC) checks, verification of beneficial ownership, and confirmation of legal standing, which are designed to prevent fraudulent access. Only authorised participants with active registry accounts may trade.

In addition, participants are obliged to submit verified annual emissions reports under the Monitoring and Reporting Regulations 2012 (as amended). This requirement links market access to demonstrated compliance obligations, ensuring that only regulated and accountable entities are able to engage in allowance transactions.

[5] *UK ETS Authority. (2023, December 18). UK ETS Authority 2023 Review (UK ETS Authority Report). UK Government. Retrieved from https://www.gov.uk/government/publications/uk-emissions-trading-scheme-review-2023.*

[6] *UK Government. (2021). The GHG Emissions Trading Scheme (Amendment) Order 2021 (S.I. 2021/1455). The National Archives. Retrieved from https://www.legislation.gov.uk/uksi/2021/1455/contents/made.*

To enhance liquidity, the UK ETS Authority introduced a Liquidity Programme in 2022. Under this programme, selected financial institutions act as market makers, required to provide continuous two-way quotes within defined spreads. This mechanism narrows bid–ask differentials, supports efficient price discovery, and helps stabilise trading conditions (UK ETS Authority, Market Stability and Liquidity Consultation, 2022).

2.2.3.2 Trading modes

The UK ETS combines primary auctions, secondary exchange trading, and OTC transactions.

- **In primary auctions**, conducted bi-weekly on ICE Futures Europe, participants submit sealed bids, and a uniform clearing price is determined. Successful bidders receive allowances directly into their registry accounts, with settlement cleared by ICE Clear Europe as CCP. Auction design follows the Greenhouse Gas Emissions Trading Scheme (Auctioning) Regulations 2021 (SI 2021/484)[7], and a transitional ARP fixed at £22 per tonne is maintained to prevent undervaluation.[8]
- **Secondary trading** occurs mainly on ICE Futures Europe, covering both spot and derivative products. Transactions are cleared through ICE Clear Europe, typically on a T+2 cycle under Delivery versus Payment (DVP) arrangements (see supra, Section 2.1.3).
- **OTC** trades remain permissible but must be reported to the registry. Transfers are validated against Trusted Account Lists (TALs) to ensure compliance tracking and fraud prevention (Auctioning Regulations 2021, Regulation 42)[9].

2.2.3.3 Registry and settlement

The UK ETS Registry (see also Section 2.2.2) is modelled on the EU Union Registry and administered by the Environment Agency. It records issuance, transfer, surrender, and cancellation of allowances. The system is closely integrated with trading and settlement infrastructure, enabling near real-time reconciliation. Security safeguards include two-factor authentication, 24-hour delays for new counterparties, and TAL verification (Auctioning Regulations 2021, Schedule 2). These measures enhance transparency and fraud prevention while ensuring that ownership rights are legally enforceable (cf. Armstrong DLW GmbH v Winnington Networks Ltd [2012] EWHC 10 (Ch))[10].

Settlement typically follows the DVP model, cleared through ICE Clear Europe as CCP, ensuring secure and timely transfer of both financial consideration and allowances.

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[7] *UK Government. (2021). The GHG Emissions Trading Scheme (Auctioning) Regulations 2021 (S.I. 2021/484). The National Archives. Retrieved from https://www.legislation.gov.uk/uksi/2021/484/contents/made ICE Futures Europe. (n.d.). Auctions for UK Emission Allowances. Retrieved July 2025, from https://www.ice.com/emissions/auctions/uk-emission-allowances.*

[8] *UK ETS Authority. (2023, December 18). UK ETS Authority 2023 Review (UK ETS Authority Report). UK Government. Retrieved from https://www.gov.uk/government/publications/uk-emissions-trading-scheme-review-2023.*

[9] *UK Government. (n.d.). UK Emissions Trading Registry. Retrieved July 2025, from https://view-emissions-trading-registry.service.gov.uk.*

[10] *High Court of Justice (Chancery Division). (2012). Armstrong DLW GmbH v Winnington Networks Ltd [2012] EWHC 10 (Ch). BAILII. Retrieved from https://www.bailii.org/ew/cases/EWHC/Ch/2012/10.html.*

2.2.3.4 Oversight and risk management

Oversight is divided between financial and environmental regulators:

- The **FCA** supervises trading conduct under the UK MAR (retained EU law), applying safeguards against insider dealing and market manipulation.[11]
- The **DESNZ** operates a surveillance platform that aggregates registry, trading, and clearing data to detect patterns such as wash trades, iceberg orders, or unusual cancellations (see supra, Section 2.1.2).
- **ICE Clear Europe** provides further safeguards through CCP clearing, imposing margin requirements, collateral calls, and stress testing. Market participants are obliged to submit Suspicious Transaction and Order Reports (STORs) in accordance with MAR requirements.

2.2.3.5 Market stability mechanisms

To contain volatility, the UK ETS applies several safeguards:

- **CCM** may trigger additional allowance auctions if prices exceed defined thresholds for a sustained period (Auctioning Regulations 2021, Regulation 47).
- **The transitional ARP** sets a minimum floor for auction bids (Auctioning Regulations 2021, Regulation 26).
- **A proposed SAM** would allow dynamic adjustment of auction volumes in response to market or macroeconomic shocks (UK ETS Authority consultation, 2022).

2.2.4 Lessons learned for the operational model for the CTX in Vietnam

The UK ETS provides a uniquely relevant and modern model for Vietnam. Having recently established its own standalone system by strategically leveraging existing financial market infrastructure, the UK faced many of the same institutional design questions that Vietnam is now seeking to answer. Its experience offers several in-depth lessons, particularly on establishing market confidence, ensuring robust governance from the outset, and managing the technical complexities of a hybrid environmental-financial market.

2.2.4.1 A practical blueprint for institutional mapping

The most critical lesson from the UK is its pragmatic approach to leveraging existing financial market infrastructure, providing a clear blueprint for assigning roles within Vietnam's landscape. The UK did not build a new trading system from scratch; instead, it integrated the carbon market into its world-class financial architecture. This practical institutional mapping would look as follows:

- **Financial Market Supervisor:** The role of the UK's Financial Conduct Authority (FCA) in overseeing market conduct, preventing abuse, and enforcing market integrity rules would be analogously performed by the State Securities Commission of Vietnam (SSC), leveraging its existing legal mandate and surveillance capabilities.

[11] *UK Government. (2019). The Market Abuse (Amendment) (EU Exit) Regulations 2019 (S.I. 2019/310). The National Archives. Retrieved from https://www.legislation.gov.uk/uksi/2019/310/contents/made.*

- **Auctioning and Trading Platform:** The function of the Intercontinental Exchange (ICE) as the designated auctioneer and primary secondary market operator would be taken on by HNX, utilising its established trading technology and operational experience.
- **Clearing and Settlement:** The critical role of ICE Clear Europe as the central counterparty (CCP) for clearing transactions and settling trades would be handled by VSDC, applying its proven processes for ensuring transactional integrity and mitigating counterparty risk.

This mapping provides a highly actionable starting point that aligns directly with the existing legal mandates of Vietnam's core financial institutions under the Law on Securities. It demonstrates a path to rapidly operationalise a CTX model by formally assigning these specific financial, trading, and settlement functions to Vietnam's existing, specialised market institutions.

2.2.4.2 Formalising inter-agency coordination to prevent governance gaps

The UK mitigated the risk of fragmented governance across its devolved administrations by forming the UK ETS Authority, a joint body that brings multiple government departments under a shared decision-making protocol. This ensures consistent policy and a unified response to market events.

Vietnam's proposed multi-agency model, with distinct and critical roles for MAE (environmental integrity, registry), MOF (financial policy), SSC (market supervision), HNX (trading), and VSDC (settlement), creates a similar risk of coordination gaps, conflicting regulations, or slow crisis response. It is critical to develop a formalised Inter-agency Coordination Protocol from the very beginning. This legal instrument, ideally a joint coordination regulation by MAE and MOF, should go beyond general cooperation. It must explicitly define decision-making hierarchies for different scenarios, establish formal procedures for joint inspections, create a working group for regular operational reviews, and detail a clear escalation pathway for resolving disputes to prevent regulatory gridlock.

2.2.4.3 Ensuring early legal clarity of carbon units as financial instruments

A cornerstone of the UK ETS's integrity is the legal certainty established by designating allowances as financial instruments. This single decision brought them under the full jurisdiction of the FCA, applying mature financial market rules against insider trading and manipulation. This proved vital for building market confidence and attracting institutional participation.

The legal status of carbon units in Vietnam is currently ambiguous. This creates significant uncertainty for corporate accounting (e.g., are they assets or inventory?), taxation (capital gains vs. income), and their potential use as collateral for financing, hindering market development.

Vietnam should prioritise providing early legal clarity. It is strongly recommended that the Draft Decree, or a subsequent guiding law, explicitly classifies carbon allowances as a specific type of regulated financial asset. This would formally and unambiguously empower the SSC to apply its existing supervisory tools and legal authority over trading conduct from day one, avoiding the legal grey areas that have plagued other nascent markets.

2.2.4.4 Proactively managing early market stability with clear, rules-based tools

Anticipating the challenges of a new, standalone market, the UK implemented stability mechanisms from its inception. These included a transitional Auction Reserve Price (ARP) to act as

a price floor and a Cost Containment Mechanism (CCM) to provide a soft ceiling by allowing for the release of additional allowances if prices spike.

Vietnam's pilot market, with a limited number of participants and 100% free allocation, will be highly susceptible to price volatility and illiquidity. Without clear price signals and stability tools, participants may be hesitant to trade, and the market could fail to achieve effective price discovery.

Provisions for clear, rules-based stability tools should be enhanced. Even if auctions are not applicable in the pilot phase, establishing an ARP and a CCM from the outset is still crucial. Publishing the transparent trigger conditions for these mechanisms provides predictability for businesses, builds market confidence, and signals that a framework exists to manage the extreme price volatility that can undermine a new market.

2.2.4.5 Guaranteeing technical infrastructure integrity with a binding agreement

The UK placed a strong emphasis on the technical linkage between its environmental registry and its financial trading and settlement platforms, using automated interfaces and real-time analytics for surveillance.

The connection between the NRS (managed by MAE) and the financial systems of HNX and VSDC is the single most critical technical point of potential failure for the entire CTX. A data discrepancy or system downtime at this interface could halt the entire market. A formal and legally binding Service-Level Agreement (SLA) should be established between MAE, HNX, and VSDC. This SLA is essential to define technical protocols, data exchange standards, minimum system uptime guarantees, joint procedures for handling technical incidents, and liability in case of failure, thereby ensuring the absolute operational credibility and resilience of the system.

2.3 The European Union ETS

2.3.1 Overview of the European ETS

The EU ETS is the world's largest and longest-running carbon market. It was established in 2005 under Directive 2003/87/EC as the cornerstone of the EU's climate policy and has since undergone successive reforms to align with the EU's increasing climate ambition[12].

The EU ETS was designed to help the Union meet its commitments under the Kyoto Protocol and later the Paris Agreement in a cost-effective way. Over time, it has evolved from a pilot project with a limited scope into a comprehensive market covering power generation, industry, and intra-EU aviation, accounting for around 40% of the EU's greenhouse gas emissions.

Policy development has been marked by successive trading phases:

- **Phase I (2005–2007):** Pilot phase, testing allocation and monitoring approaches.
- **Phase II (2008–2012):** Alignment with the Kyoto Protocol, expanded scope, and harmonised rules.

[12] *European Union. (2003, October 13). Directive 2003/87/EC of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowance trading within the Community. EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32003L0087.*

- **Phase III (2013–2020):** Centralised cap-setting at the EU level, increased use of auctioning, introduction of the Market Stability Reserve (MSR).
- **Phase IV (2021–2030):** Strengthening ambition under the European Green Deal and Fit for 55 package, with tighter caps, broader coverage, and preparation for linkage with the CBAM.

For Vietnam, the EU ETS is significant not only as the longest-operating example of an ETS but also because of its influence on international carbon market design and trade policy. The system illustrates how carbon markets can evolve over time, respond to crises (e.g., the 2008 financial crash, COVID-19), and remain central to long-term decarbonisation strategies.

Box 2. Latest EU ETS developments (2024-2025)

The EU ETS entered 2024 under an enhanced legislative framework that raises ambition and broadens scope. Reforms enacted through the 'Fit for 55' package further extend the EU ETS to new sectors, including maritime transport and buildings, with a separate ETS2 for road transport and buildings commencing in 2027[13].

The cap on emissions was rebased with a one-off cut of 90 million allowances in 2024 (and a further 27 million scheduled in 2026). This, along with a steeper annual reduction factor, puts the ETS on track for a -62% emissions reduction by 2030 (from 2005 levels)[14]. The ETS coverage expanded to maritime transport in 2024, bringing the EU's share of shipping emissions into the cap. In the aviation sector, free allowance allocation was cut by 25% in 2024 as a step toward phasing out free credits; additionally, from 2025, airlines must monitor and report non-CO_2 climate impacts under new rules. Meanwhile, the CBAM progressed through its transitional phase and is set to successively replace free industrial allowances from 2026 onward to guard against carbon leakage in trade.[15]

Market oversight and stability provisions have been reinforced. The MSR continues to withdraw surplus allowances, sustaining a robust price signal in 2023. Financial regulators confirmed that the carbon market remained stable and fundamentals-driven, with most transparency recommendations from 2022 now implemented. Auctions generated over €43 billion in 2023, revenues that Member States channel into climate action via the Innovation and Modernisation Funds.

The European Commission and UK Government have also agreed in principle to link the EU ETS and UK ETS. A 2025 draft agreement foresees mutual recognition of allowances, aligned cap

[13] *European Union. (2023, May 10). Directive (EU) 2023/959 of the European Parliament and of the Council amending Directive 2003/87/EC as regards the EU Emissions Trading System (ETS) and Decision (EU) 2015/1814. EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023L0959.*

[14] *European Commission. (2024, November 19). Report on the Functioning of the European Carbon Market in 2023 (COM (2024) 538 final). EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52024DC0538.*

[15] *European Union. (2023, May 10). Regulation (EU) 2023/956 of the European Parliament and of the Council establishing a carbon border adjustment mechanism. EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023R0956.*

trajectories (with the UK's at least as stringent), and CBAM exemptions for each other's exporters. Negotiations are underway to finalise this bilateral accord[16].

2.3.2 Legal and regulatory framework

The EU ETS is underpinned by a comprehensive legal and institutional framework that has evolved over two decades. It establishes clear authority at the EU level, coordination with Member States, and integration with financial regulation to safeguard both environmental integrity and market stability.

*2.3.2.1 **Legal Basis***

The EU ETS was established under Directive 2003/87/EC[17], which remains the core legal foundation of the system. Successive reforms have progressively tightened caps, broadened the scope, and adjusted allocation rules:

- Directive 2009/29/EC introduced harmonised EU-wide caps and auctioning as the default allocation method.
- Regulation (EU) 2015/757 and related legislation integrated aviation and shipping.
- The MSR Decision (2015/1814/EU) created a mechanism to address allowance surplus and strengthen the carbon price signal.
- The European Climate Law (Regulation (EU) 2021/1119) enshrined the EU's climate neutrality target by 2050 and required the ETS to align with at least a 55% net reduction in GHG emissions by 2030.
- The Fit for 55 package (2021–2023) significantly reformed the ETS by strengthening the cap trajectory, extending coverage to maritime transport, and creating a new ETS II for buildings and road transport that is set to become effective in 2027.[18]

2.3.2.2 Institutional responsibilities

Governance of the EU ETS combines EU-level coordination with implementation by Member States.

- **European Commission** – Sets the overall cap trajectory, proposes legislative reforms, oversees the Union Registry, and enforces compliance. It also operates the MSR.
- **Member States** – Designated national competent authorities (NCAs) implement MRV obligations, issue penalties, and manage auction revenues.
- **European Securities and Markets Authority (ESMA)** and national financial regulators – Supervise trading of emission allowances as financial instruments under the Markets in

[16] *International Carbon Action Partnership (ICAP). (2025, May 22). EU and UK commit to linking emissions trading systems in landmark cooperation agreement. Retrieved from https://icapcarbonaction.com/en/news/eu-and-uk-commit-linking-emissions-trading-systems-landmark-cooperation-agreement.*

[17] *European Union. (2003, October 13). Directive 2003/87/EC of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowance trading within the Community. EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32003L0087.*

[18] *European Union. (2023, May 10). Directive (EU) 2023/959 of the European Parliament and of the Council amending Directive 2003/87/EC as regards the EU Emissions Trading System (ETS) and Decision (EU) 2015/1814. EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023L0959.*

Financial Instruments Directive II (MiFID II) and MAR, applying safeguards against insider trading and market manipulation.

- **European Investment Bank (EIB) and European Energy Exchange (EEX)** – The EIB conducted auctions in earlier phases; currently, the EEX operates as the Common Auction Platform (CAP) under the Auctioning Regulation (EU No 1031/2010)[19], with clearing handled by European Commodity Clearing (ECC) as CCP.
- **Union Registry** – Operated by the Commission under the Registry Regulation (EU No 389/2013) [20], the Registry records issuance, transfer, surrender, and cancellation of allowances in a centralised account-based system.
- **Supporting institutions** – The European Environment Agency (EEA) compiles emissions data and evaluates ETS performance, while the European Climate Change Committee (CCC), composed of Member State representatives and chaired by the Commission, supports the development of delegated and implementing acts.

2.3.2.3 Compliance and enforcement

Compliance obligations ensure the environmental effectiveness of the ETS.

- Operators in covered sectors must monitor and report verified emissions annually in line with the MRV Regulation (2018/2066/EU) authorities.[21]
- Each April, operators must surrender allowances equal to their verified emissions for the preceding year. Emissions verification must be conducted by accredited third-party verifiers.[22]
- Non-compliance results in a penalty of €100 per tonne of CO_2-equivalent (indexed), in addition to the obligation to surrender missing allowances, with offenders also publicly named.
- Member State authorities enforce compliance, while the European Commission ensures harmonisation across jurisdictions.

2.3.2.4 Governance features

The EU ETS features a comprehensive monitoring and evaluation framework. National authorities are required to submit verified emissions data obtained from compliance entities annually, which are aggregated and reviewed by the Commission. In parallel, the EEA compiles and publishes

[19] *European Commission. (2010). Commission Regulation (EU) No 1031/2010.*

[20] *European Commission. (2013, May 2). Commission Regulation (EU) No 389/2013 establishing a Union Registry for the trading of GHG emission allowances. EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013R0389.*

[21] *European Commission. (2018, December 19). Commission Implementing Regulation (EU) 2018/2066 on the monitoring and reporting of GHG emissions pursuant to Directive 2003/87/EC. EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32018R2066.*

[22] *European Commission. (2018, December 19). Commission Implementing Regulation (EU) 2018/2067 on the verification of data and the accreditation of verifiers pursuant to Directive 2003/87/EC. EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32018R2067.*

analytical reports evaluating the environmental and economic performance of the ETS. Several governance features strengthen the robustness and adaptability of the EU ETS:

- **Centralised cap-setting** at the EU level ensures consistency across Member States.
- **Integration with financial regulation** recognises allowances as financial instruments, placing them under the supervision of ESMA and national regulators.
- **Statutory reviews and reforms** are conducted regularly (e.g. post-2021 Fit for 55 package), allowing adjustment of the cap trajectory, sectoral scope, and allocation methods.
- **Linkage provisions** in the Directive allow for connection with third-country systems; Switzerland has already linked its ETS to the EU ETS, and negotiations are underway with the UK (see supra, Section 2.2.2).

2.3.3 Operation and infrastructure aspects

The EU ETS has developed mature market infrastructures that ensure efficient trading, secure settlement, and robust safeguards against volatility and abuse.

2.3.3.1 Trading modes

- **Auctions** – Conducted primarily on the EEX as CAP, under the *Auctioning Regulation*. Some Member States (e.g. Germany, Poland) use their own platforms. EEX currently serves as the CAP and hosts auctions at regular intervals, conducted under a single-round, sealed-bid format.[23]
- **Secondary market** – Trading of European Union Allowances (EUAs) occurs on exchanges such as EEX (spot and derivatives) and other venues, ensuring liquidity and price discovery. Exchange-based trades are transparent and cleared through a CCP.
- **OTC trades** – Permitted but must be reported to the Union Registry to establish ownership and ensure compliance traceability, subject to post-trade transparency requirements under the European Market Infrastructure Regulation (EMIR).[24]

2.3.3.2 Registry and settlement

- All transactions are recorded in the Union Registry to establish legal ownership (Directive 2003/87/EC, Art. 19). The European Union Transaction Log (EUTL) – governed by the Registry Regulation[25] – publishes verified emissions data, free allocation records, and surrendered allowances annually. Auction results, including clearing prices, bid coverage ratios, and the number of successful bidders, are disclosed promptly by the CAP.

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[23] *European Commission. (2020, November 9). European Energy Exchange appointed as EU ETS Common Auction Platform from 2021. Retrieved from https://climate.ec.europa.eu/news-your-voice/news/european-energy-exchange-appointed-eu-ets-common-auction-platform-2021-2020-11-09_en.*

[24] *European Union. (2012, July 4). Regulation (EU) No 648/2012 of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories. EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32012R0648.*

[25] *European Commission. (2013, May 2). Commission Regulation (EU) No 389/2013 establishing a Union Registry for the trading of GHG emission allowances., Art. 6, referencing the mandate in Art. 20 of the EU ETS Directive. EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013R0389.*

- Security features include two-factor authentication, 26-hour transfer delays for new counterparties, and TALs.
- Settlement follows financial market standards, typically T+2 DVP, with clearing provided by ECC as CCP.
- EUTL complements the registry by validating and recording transactions, performing checks to prevent double-counting and secure compliance with caps.[26] EUTL discloses aggregated transaction data, including total transactions and units, without identifying buyer or seller.[27]

2.3.3.3 Oversight and risk management

Market oversight has been enhanced through the involvement of the ESMA and the Agency for the Cooperation of Energy Regulators (ACER), particularly following early incidents of fraud and abuse that undermined confidence in the system. These include Value Added Taxation (VAT) fraud schemes between 2008 and 2009 and phishing attacks in 2010, which prompted security upgrades and regulatory reforms.

- EUA trading is supervised under MiFID II and MAR[28], with ESMA and national regulators monitoring exchanges and intermediaries. These legal instruments empower ESMA and national financial regulators to investigate insider trading, manipulation, and false reporting in EUA markets.
- Market surveillance combines registry data and order book monitoring to detect manipulation (e.g. wash trades, layering).
- ECC applies margining, collateral requirements, and stress testing to mitigate counterparty risk. ECC provides real-time margining and risk modelling tools to participants. These include intraday risk limits, stress testing, and default fund contributions.
- Risk controls also include mandatory holding and position limits for some market actors, and stress testing of clearing systems.

2.3.3.4 Market stability mechanisms

The MSR has helped stabilise prices since its activation in 2019 and contributed to reducing the supply overhang that depressed allowance prices during much of the first three trading periods of the EU ETS.

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[26] *European Commission. (2013, May 2). Commission Regulation (EU) No 389/2013 establishing a Union Registry for the trading of GHG emission allowances., Arts. 100-104. EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013R0389.*

[27] *European Commission. (2013, May 2). Commission Regulation (EU) No 389/2013 establishing a Union Registry for the trading of GHG emission allowances. EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013R0389., According to Annex XIV (4) of the Registry Regulation, the information for each completed transaction recorded by the EUTL shall be displayed on 1 May of the third year after the recording of the information.*

[28] *European Union. (2014, May 15). Directive 2014/65/EU of the European Parliament and of the Council on markets in financial instruments (MiFID II). EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014L0065 European Union. (2014, April 16). Regulation (EU) No 596/2014 of the European Parliament and of the Council on market abuse (Market Abuse Regulation). EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014R0596.*

- **The MSR** adjusts auction volumes by withdrawing or releasing allowances depending on surplus thresholds (Decision (EU) 2015/1814)[29]. MSR automatically adjusts the volume of allowances available at auction based on the total number of allowances in circulation. It absorbs surplus allowances during periods of oversupply and releases additional allowances when prices rise rapidly. MSR triggers and thresholds are predefined, ensuring a rules-based response to market conditions. Additionally, an Article 29a intervention mechanism enables the Commission to propose additional measures if EUA prices increase excessively over a six-month period.
- **Exceptional measures** – The Commission may intervene under Directive 2003/87/EC, Art. 29a in case of severe market disturbances.
- Auction revenues (over €43 billion in 2023) are channelled into Member State budgets and EU climate funds (Innovation Fund, Modernisation Fund).

2.3.3.5 Market participation and liquidity

- Compliance entities include power, industry, and intra-EU aviation, while financial intermediaries enhance liquidity.
- Participation is limited to authorised entities with registry accounts, subject to KYC and legal verification.
- Exchanges such as EEX maintain market-making arrangements to ensure continuous two-way quotes and narrow bid–ask spreads.

2.3.4 Lessons learned for the operational model for the CTX in Vietnam

As the world's longest-running carbon market, the EU ETS offers invaluable lessons for Vietnam, especially from the challenges encountered during its early pilot phases. While Vietnam's CTX will operate on a smaller scale, the EU's experience provides a clear roadmap on what to adopt and what to avoid, particularly in the context of Vietnam's ongoing regulatory development.

1.1.1.1 A cautionary tale on over-allocation and the need for robust data

One of the most consequential mistakes in the EU ETS's pilot phase was the over-allocation of allowances, which led to a price collapse. This stemmed from a reliance on poor baseline data and initial challenges in corporate emissions reporting.

This is a critical and timely lesson as Vietnam prepares for its pilot phase, which will rely on the first few cycles of enterprise-level data collected under Decree 06/2022/ND-CP and its amendment Decree 119/2025/ND-CP. This initial data may not yet be fully robust, creating a significant risk of repeating the EU's mistake. To mitigate this risk, the allocation methodology within Vietnam's legal framework should be strengthened. Instead of relying solely on initial reported data, Vietnam can embed a conservative 'correction factor' into the initial allocation formula and mandate a formal data verification and adjustment period before the first compliance cycle is finalised.

[29] *European Union. (2015, October 6). Decision (EU) 2015/1814 of the European Parliament and of the Council concerning the establishment and operation of a market stability reserve for the Union GHG emission trading scheme. EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32015D1814.*

1.1.1.2 The critical need for early legal clarity and financial supervision

Another early challenge in the EU ETS was fraud and market abuse (e.g., VAT fraud, phishing attacks). These issues were gradually resolved by centralising the registry and, most importantly, by classifying allowances as financial instruments under its Markets in Financial Instruments Directive (MiFID II), which brought them under the jurisdiction of financial regulators.

The legal status of carbon units in Vietnam is currently ambiguous. This creates uncertainty for market participants and a potential supervisory gap. Vietnam should prioritise providing early legal clarity, ideally classifying allowances and credits as regulated financial assets. This would formally empower SSC to oversee trading conduct, prevent market manipulation, and apply existing financial market safeguards, thereby building market confidence from the outset.

1.1.1.3 Preventing coordination gaps in a multi-agency governance model

The EU experienced coordination lapses between the European Commission and national authorities in its early phases, which led it to centralise key functions like the Union Registry.

Vietnam's proposed model, with distinct roles for MAE, MOF, HNX, and VSDC, risks repeating these coordination challenges. While a multi-agency model is feasible, it is paramount to establish a formal inter-agency coordination protocol from the beginning. This protocol should define clear decision-making hierarchies, data-sharing agreements, and joint crisis-response procedures to prevent regulatory gaps and ensure seamless operation.

1.1.1.4 The value of automatic market stability mechanisms

In response to persistent allowance surpluses that depressed prices, the EU pioneered the Market Stability Reserve (MSR), an automatic, rules-based mechanism to adjust allowance supply. Vietnam's pilot market will likely face volatility.

While a complex mechanism like the MSR may not be needed immediately, the principle of having a pre-defined tool is crucial. Provisions for simpler market stability tools for the pilot phase, such as an auction reserve price (ARP) and a cost containment mechanism (CCM), should be developed. This would provide a predictable price corridor and signal to the market that a framework exists to manage extreme volatility.

1.1.1.5 Ensuring compliance through enforcement and transparency

The EU ETS established a strong compliance regime with penalties, third-party verification, and transparency through platforms like the European Union Transaction Log (EUTL), which publicly lists compliance data.

In Vietnam, where the compliance culture in environmental policy is still evolving, a strong and transparent enforcement mechanism is essential for market credibility. Vietnam should ensure its compliance framework includes not only financial penalties but also a "make-good" provision (requiring entities to surrender missing allowances). Furthermore, developing a public dashboard similar to the EUTL to display entity-level compliance status would create a powerful reputational deterrent and enhance public accountability.

2.4 The New Zealand ETS

2.4.1 Overview of the New Zealand ETS

The NZ ETS, launched in 2008, was the first national ETS to cover all sectors of the economy and all greenhouse gases. It is central to New Zealand's strategy to achieve net zero long-lived greenhouse gas emissions by 2050, as mandated in the Climate Change Response (Zero Carbon) Amendment Act 2019[30].

Initially criticised for weak price signals, the NZ ETS has undergone substantial reform since 2020. The reforms introduced a cap on emissions, strengthened auctioning, and created mechanisms to stabilise prices. The NZ ETS now covers approximately 50% of New Zealand's gross emissions, with particular importance given to energy, industrial processes, and forestry.

The scheme operates as a cap-and-trade system, although its cap is not absolute, as forest owners can generate new allowance supply (see below), and the NZ ETS initially included a relatively low price ceiling at NZ$25 per ton of CO_2e. Early design features permitted unlimited international offsets and led to historically low carbon prices.

A distinctive feature of the NZ ETS is the inclusion of forestry from the outset, making it the largest source of supply in the market aside from the government. Participants can earn New Zealand Units (NZUs) for sequestration through afforestation or reforestation. However, the dominance of forestry-generated units has at times led to speculative hoarding and price distortions, exacerbated by insufficient public data on market positions. These concerns culminated in a review and consultation process and were ultimately addressed by a series of reforms to the NZ ETS that entailed stronger oversight measures and limited the role of forestry and agriculture in the system.[31]

Box 3. New Zealand ETS latest developments (2024-2025)

New Zealand undertook notable ETS adjustments in 2024 to recalibrate supply and integrate policy shifts. In September 2024, the government updated the scheme's unit supply settings for 2025–2029, substantially lowering the annual cap. The 2025 cap was set at 19.1 million NZUs, down from 27.9 million the previous year. Correspondingly, the auction reserve price was raised to NZ$68 (≈US$41) per ton for 2025, and the CCR trigger price was set at NZ$193. These tighter limits come after weak demand in 2023 and 2024 – in fact, only two of the four scheduled auctions in 2024 reached a sale, with a total of 7 million units sold at the NZ$64 floor price. Unsold allowances

[30] *New Zealand Government. (2019). Climate Change Response (Zero Carbon) Amendment Act 2019 (Public Act 2019 No 61). New Zealand Legislation. Retrieved from https://www.legislation.govt.nz/act/public/2019/0061/latest/LMS183736.html.*

[31] *New Zealand Government. (2020). Climate Change Response (Emissions Trading Reform) Amendment Act 2020 (Public Act 2020 No 22). New Zealand Legislation. Retrieved from https://www.legislation.govt.nz/act/public/2020/0022/latest/whole.html New Zealand Government. (2020). Climate Change (Auctions, Limits, and Price Controls for Units) Regulations 2020 (LI 2020/264). New Zealand Legislation. Retrieved from https://www.legislation.govt.nz/regulation/public/2020/0264/latest/LMS375230.html New Zealand Government. (2022). Climate Change (Forestry) Regulations 2022 (SL 2022/266). New Zealand Legislation. Retrieved from https://legislation.govt.nz/regulation/public/2022/0266/24.0/whole.html New Zealand Government. (2024). Climate Change Response (Removal of Agricultural Emissions) Amendment Act 2024 (Public Act 2024 No 50). New Zealand Legislation. Retrieved from https://www.legislation.govt.nz/act/public/2024/0050/latest/whole.html.*

were not carried over, effectively cancelling excess supply and underscoring the need for stronger price support. The new cap and price settings aim to clear the surplus and put the NZ ETS on a trajectory consistent with the New Zealand emissions budget. Officials will also account for the large, banked unit stockpile and expected influx of forestry removal units when setting future caps, to ensure that the market is not oversupplied.

Policymakers have also refined allocation and coverage. In December 2024, New Zealand updated the industry free allocation baselines to reflect actual emissions intensity more accurately. This adjustment, effective from 2025, will modestly reduce free NZU entitlements for emissions-intensive trade-exposed sectors. A major development was the removal of agriculture from the ETS framework: the government repealed the pending requirement for agricultural processors to join the ETS in 2025. Instead, a separate farm-level emissions pricing mechanism will be designed outside the ETS, to be implemented by 2030. An interim Pastoral Sector Climate Partnership has been set up to develop this approach, replacing the previous He Waka Eke Noa initiative. Additionally, an expert panel was commissioned in 2024 to reassess the warming impact of biogenic methane, with its findings delivered in late 2024 to inform future methane targets and the role of agriculture in New Zealand's climate policy.[32]

2.4.2 Legal and regulatory framework

The Climate Change Commission plays an advisory role in setting emissions caps, price control parameters, and auction volumes.

The NZ ETS is grounded in a robust legal framework and administered by a clear set of institutions. Its governance reflects New Zealand's emphasis on transparency, forestry integration, and market stability.

2.4.2.1 Legal basis

The NZ ETS is built on a strong legislative foundation that has been progressively reformed to strengthen ambition and credibility.

- Established under the *Climate Change Response Act 2002*[33], providing the statutory authority for the ETS, which has undergone extensive amendments, notably through the Climate Change Response (Emissions Trading Reform) Amendment Act 2020[34].
- Significantly amended by the *Zero Carbon Amendment Act 2019*, which aligned the ETS with New Zealand's legally binding 2050 Net Zero target.
- Further regulations detail unit allocation, auctioning procedures, and monitoring and reporting obligations.
- The system operates exclusively with NZUs, which are recognised as the sole domestic compliance instrument.

[32] *International Carbon Action Partnership (ICAP). (n.d.). New Zealand Emissions Trading Scheme. Retrieved May 22, 2025, from https://icapcarbonaction.com/en/ets/new-zealand-emissions-trading-scheme.*

[33] *New Zealand Government. Public Act 2002 No. 40.*

[34] *New Zealand Government. (2020). Climate Change Response (Emissions Trading Reform) Amendment Act 2020 (Public Act 2020 No 22). New Zealand Legislation. Retrieved from https://www.legislation.govt.nz/act/public/2020/0022/latest/whole.html.*

2.4.2.2 Institutional responsibilities

Administration of the NZ ETS is shared among several agencies, with the Environmental Protection Authority (EPA) as the central operator.

- **Ministry for the Environment (MfE)**: Provides strategic policy direction, legislative proposals, and system reforms.
- **EPA**: Administers the ETS, operates the NZ Emissions Trading Register, and oversees compliance.
- **Ministry for Primary Industries (MPI)**: Responsible for forestry policy and methodologies, given forestry's dual role as a source and sink of emissions.
- **Treasury** – Advises on fiscal impacts, auction revenues, and long-term financial sustainability.
- **Registry Operator**: The EPA also serves as the operator of the national registry, recording ownership, transfers, issuance, and surrender of NZUs.
- **The Climate Change Commission:** An independent advisory body, plays a significant role in setting unit supply volumes and providing recommendations on auction reserve prices and market design.[35]

2.4.2.3 Compliance and enforcement

Compliance is central to ensuring the integrity of the NZ ETS, with clear obligations and penalties for non-performance.

- Covered entities must monitor and report annual emissions and surrender NZUs equal to their verified emissions by 31 May of the following year.
- Penalties for non-compliance include:
    - Make-good obligations (surrender of missing units).
    - Financial penalties proportional to the shortfall.
    - Public disclosure of non-compliant entities to reinforce deterrence.

2.4.3 Operation and infrastructure aspects

As already mentioned, the NZ ETS uses quarterly auctions managed by New Zealand Stock Exchange (NZX) Limited in partnership with EEX under a contract from the Ministry for the Environment. The Ministry sets auction parameters, such as volume and price floors, but NZX/EEX jointly operate the auction platform, where bidding occurs. Successful bidders' NZUs are then transferred to their New Zealand Emissions Trading Register (NZETR) accounts after payment to the ETS Auction Settlement Account within four business days. Auction payments are handled through commercial banks, with settlement finalised before NZUs are transferred in line with DVP principles.

[35] *New Zealand Government, Climate Change Commission. (n.d.). Climate Change Commission. Retrieved August 1, 2025, from https://www.climatecommission.govt.nz.*

The NZ ETS operates through a combination of government auctions, secondary trading, and forestry-based crediting. Its infrastructure reflects both New Zealand's small market size and its emphasis on flexibility and stability.

2.4.3.1 Trading modes

The NZ ETS provides multiple channels for allowance distribution and trading, with forestry credits as a unique feature. There is no default or mandatory CCP to enhance transactional security and systemic risk management in the secondary market.

- **Auctions**: Quarterly government auctions release NZUs into the market, governed by volume caps and price controls. Auction results are published on the Auction Noticeboard operated by the NZX jointly with EEX.[36]
- **Secondary trading**: NZUs are exchanged mainly through OTC brokers and bilateral agreements, as no centralised exchange platform has been established.
- **Forestry participation**: Forest owners earn NZUs for sequestration and can sell them into the system, making forestry a distinctive supply source.

2.4.3.2 Registry and settlement

The NZ ETS is supported by an electronic registry that ensures secure and transparent unit ownership.

- The NZETR, operated by the EPA, records issuance, transfers, surrender, and cancellation of NZUs. The NZ ETS Registry facilitates allowance holding and transfers, with recent updates enhancing registry security, transparency, and operational efficiency. Participants in the NZ ETS must register with the EPA and are allocated registry accounts through the system, which tracks ownership, transfers, and surrender of units.[37]
- All compliance entities and voluntary participants must maintain accounts in the registry.
- Settlement occurs electronically within the registry, with ownership updated in near real time to provide legal certainty.

2.4.3.3 Oversight and risk management

Oversight is centralised within the EPA, but broader financial regulation remains limited compared to larger ETSs.

- The EPA supervises compliance, trading conduct, and registry operations.
- The market prohibits short-selling and derivatives to reduce speculative risks.
- Transparency reforms are underway to strengthen monitoring and public disclosure of trading activity, large positions, impose holding limits, and mandate clearing through the Reserve Bank of New Zealand acting as CCP.

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[36] *NZX. (n.d.). Auction Noticeboard. Retrieved from https://www.etsauctions.govt.nz/public/auction_noticeboard.*

[37] *New Zealand Government. (2008). Climate Change (Unit Register) Regulations 2008 (SR 2008/357). New Zealand Legislation. Retrieved from https://www.legislation.govt.nz/regulation/public/2008/0357/latest/DLM1634227.html.*

- NZUs are not classified as financial products under the Financial Markets Conduct Act (FMC Act),[38] so secondary market trading is not regulated by the Financial Markets Authority (FMA) in the same way as equities or derivatives.

2.4.3.4 Market stability mechanisms

The NZ ETS employs supply-adjustment measures to maintain a credible price signal.

- **ARP:** Prevents sales below a confidential minimum threshold.
- **Cost Containment Reserve (CCR):** Releases additional NZUs into the market if prices exceed a defined trigger, functioning as a price ceiling.
- **Auction withdrawal volumes:** Units can be withheld from scheduled auctions if prices fall below a trigger, reducing downward pressure.

2.4.4 Lessons learned for the operational model for the CTX in Vietnam

As a relatively small carbon market with unique sectoral coverage, the NZ ETS offers several instructive lessons for Vietnam. The challenges New Zealand has faced, particularly regarding offset supply and market stability, could mirror those Vietnam is likely to encounter as it launches its CTX.

2.4.4.1 A cautionary lesson on managing forestry and offset supply

A major challenge for New Zealand was its initial reliance on an unrestricted supply of forestry units, which led to market saturation, price distortions, and undermined investor confidence. This is a highly relevant warning.

Vietnam has significant potential for forestry and land-use carbon projects. Notably, the recent Decree 119/2025/ND-CP allows entities to use offsets for up to 30% of their compliance obligation. While this provides flexibility, a limit this high, without strict quality controls, could still create a risk of market saturation by low-cost credits, potentially undermining the price signal for industrial abatement. The lesson from New Zealand is not just to set a limit, but to manage the quality and flow of credits within that limit. It is recommended that MAE develop stringent and specific technical guidelines for the eligibility, monitoring, and verification of all offset credits *before* they are permitted for use on the CTX. This should be codified in a guiding Circular that includes both qualitative standards (addressing permanence and additionality) and potentially phased-in quantitative limits to avoid the market imbalances seen in New Zealand's early years.

2.4.4.2 The need for price stability tools in a nascent market

The NZ ETS struggled with low liquidity and price volatility in its early phases. To address this, reforms were introduced, such as quarterly auctions with an auction reserve price (ARP) and a Cost Containment Reserve (CCR), which have helped manage risk and reduce speculation. Vietnam's pilot market will also be small and likely to face similar liquidity challenges.

The current Draft Decree is strong on operational risk but does not yet specify mechanisms for managing market-wide price stability. Learning from New Zealand's experience, Vietnam could

[38] *New Zealand Government. (2013). Financial Markets Conduct Act 2013 (Public Act 2013 No 69). New Zealand Legislation. Retrieved from https://www.legislation.govt.nz/act/public/2013/0069/latest/whole.html.*

benefit from adopting price controls from the outset. It is recommended that provisions to enable a pilot auction program and explicitly establish an ARP and a CCR can be developed to create a predictable price corridor, which is critical for building market confidence during the early trading period.

2.4.4.3 Ensuring market integrity without full financial classification

New Zealand's experience also highlights a trade-off: NZUs are not classified as financial instruments, which has resulted in "light market oversight" and calls for reform. However, to compensate, they are moving towards designating a trusted public-sector body to oversee clearing and settlement.

Vietnam's decision to use the existing securities infrastructure provides a stronger foundation, with VSDC designated to oversee clearing and settlement, directly aligning with the solution New Zealand is now moving towards. The lesson here is to fully empower the designated institutions. The Draft Decree should be reinforced with explicit language granting the SSC clear jurisdiction over market conduct surveillance and the VSDC sole authority over transaction clearing and settlement. This leverages Vietnam's existing strengths to avoid the oversight gaps experienced by New Zealand.

2.4.4.4 The value of a simple, well-coordinated governance framework

In institutional terms, New Zealand's relatively simple governance framework, with policy set by the Ministry for the Environment and administration handled by the EPA, has proven functional. This highlights the importance of simplifying regulatory responsibilities and ensuring clear coordination.

Vietnam's proposed multi-agency landscape is more fragmented. The key challenge, as identified in New Zealand's context, is ensuring seamless coordination between the agencies involved in registry (MAE), trading (HNX), settlement (VSDC), and supervision (SSC). This reinforces the critical need for a formal Inter-agency Coordination Protocol. This protocol, recommended in the gap analysis, is essential to maintaining consistency and confidence during the CTX pilot, ensuring that a more complex institutional structure does not lead to the coordination failures seen in other markets' early days.

2.5 The California ETS

2.5.1 Overview of the California ETS

The California Cap-and-Trade Program, launched in 2013, is a subnational ETS with one of the broadest scopes globally. It was authorised by the Global Warming Solutions Act Assembly Bill 32 (AB 32),[39] which set a statewide target to reduce GHG emissions to 1990 levels by 2020. Subsequent legislation, including Senate Bill 32 (SB 32),[40] extended these goals, committing the

[39] *California. (2006). Global Warming Solutions Act of 2006 (A.B. 32, Ch. 488, Stats. 2006). California Legislative Information. Retrieved from https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200520060AB32.*

[40] *California. (2016). Senate Bill 32: California Global Warming Solutions Act of 2006: Emissions Limit (S.B. 32, Ch. 249, Stats. 2016). California Legislative Information. Retrieved from https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB32.*

state to a 40% reduction below 1990 levels by 2030 and ultimately achieving net zero emissions by 2045.

The program is a cornerstone of California's climate strategy, operating alongside renewable energy mandates, low-carbon fuel standards, and energy efficiency measures. It is also the central mechanism for ensuring compliance with California's commitments under its Scoping Plan and NDC contribution to the Paris Agreement.

Key developments in the program's evolution include:

- **2013–2014 (Launch):** Initial coverage of power plants and large industrial facilities, with nearly all allowances allocated freely.
- **2015:** Expansion to cover transportation fuels and natural gas suppliers, increasing coverage to about 80% of California's emissions.
- **2017:** Extension of the program through 2030 via *AB 398*, adding provisions for cost-containment and market oversight.
- **2021 onwards:** Further tightening of the emissions cap, introduction of price containment reserves, and alignment with the state's 2045 carbon neutrality goal.

The California program is also notable for being linked with the **Québec ETS** (since 2014) and previously with Ontario (2017–2018), creating the Western Climate Initiative (WCI) - the first cross-border carbon market in North America.

As one of the most mature ETSs, California's system demonstrates how subnational jurisdictions can design, expand, and link a cap-and-trade system while balancing environmental ambition, economic growth, and political feasibility.

Box 3. California ETS latest developments (2024-2025)

California is refining its cap-and-trade system to meet increasingly stringent state-level climate targets. In 2024, state regulators rolled out draft amendments to the legislative framework to ensure the program can deliver emissions cuts of 48% below 1990 levels by 2030 and 85% by 2045, in line with California's updated climate goals. The proposed changes would tighten the allowance cap from 2026 onward and extend the declining cap trajectory through 2045. They also call for updating allocation rules (e.g. reducing free industry allowances) and adjusting offset credit provisions using the latest science to improve environmental integrity. Importantly, regulators plan a one-time increase in price containment reserve trigger prices and the price ceiling, to bolster the carbon price signal and ensure the system drives deeper decarbonisation. Enhanced market oversight measures are part of the package as well, aiming to improve transparency and guard against market manipulation as trading volumes grow. These reforms have been shaped through public workshops since 2023, and an economic impact analysis was released in April 2024 and is expected to be finalised by the California Air Resources Board (CARB).[41]

California's carbon market remains linked with Québec's ETS, holding joint allowance auctions. In March 2024, California, Québec, and Washington State issued a joint statement signalling interest

[41] *International Carbon Action Partnership (ICAP). (n.d.). USA California Cap-and-Trade Program. Retrieved August 1, 2025, from https://icapcarbonaction.com/en/ets/usa-california-cap-and-trade-program.*

in expanding linkage to include Washington's newly launched cap-and-invest program.[42] Such an addition would create a larger Western North America carbon market, increase liquidity and align emission targets across jurisdictions. California's program continues to utilise the WCI's Compliance Instrument Tracking System Service (CITSS) registry for tracking allowances and compliance instruments, and proceeds from allowance auctions (over $5 billion in 2024 alone) are invested in climate and equity programs within the state. Overall, the 2024–2025 enhancements in California are geared toward tightening the cap-and-trade system's alignment with long-term climate neutrality, while maintaining market stability and exploring broader cooperation through linked markets.

2.5.2 Legal and regulatory framework

The California Cap-and-Trade Program is grounded in a robust state legal framework that ensures both environmental integrity and enforceability.

2.5.2.1 Legal basis

California's ETS is grounded in state legislation that has evolved to strengthen ambition and extend program life.

- The program was established under the Global Warming Solutions Act of 2006 (AB 32), which mandated statewide emission reductions to 1990 levels by 2020.
- SB 32 (2016) strengthened ambition, requiring a 40% reduction below 1990 levels by 2030.
- AB 398 (2017) extended the program to 2030, embedding cost-containment mechanisms, allocation rules, and oversight provisions.

2.5.2.2 Institutional responsibilities

Program administration is led by California's environmental authority, supported by dedicated technical bodies.

- **CARB:** Primary regulator responsible for cap setting, allowance allocation, compliance enforcement, and oversight of trading activity, and publishing program evaluations. CARB is the lead implementing agency, charged with adopting regulations, issuing Californian Carbon Allowances (CCAs).
- **WCI, Inc.:** A non-profit organisation that administers joint auctions, manages the registry (CITSS), and supports linkage with Québec.
- **Offset Registries:** Approved third-party registries certify compliance-grade offset credits used within the program.

2.5.2.3 Compliance and enforcement

The program covers major sources of GHG emissions, including power generation, large industrial facilities, and fuel distribution. Compliance obligations are central to the program's credibility, with strict penalties for underperformance.

[42] *Washington State Department of Ecology. (2024, September 23). California, Québec and Washington to Begin Linkage Agreement Discussions. Retrieved from https://ecology.wa.gov/about-us/who-we-are/news/2024/california-quebec-and-washington-to-begin-linkage-agreement-discussions?utm_medium=email&utm_source=govdelivery.*

- Covered entities must submit verified annual emissions reports in line with CARB's Mandatory Reporting Regulation (MRR). Anti-abuse provisions include identity verification procedures, offset invalidation rules requiring replacement of non-compliant credits by the buyer, and aggregated holding limits for related entities to deter manipulation.
- Each November, allowances equal to prior-year verified emissions must be surrendered.
- Non-compliance incurs strict penalties: automatic surrender of four allowances per missing unit plus public disclosure.
- Market participants must submit annual GHG reports verified by accredited third parties. These provisions ensure high transparency and support informed oversight.

2.5.2.4 Governance features

California has embedded adaptive governance provisions to ensure durability and transparency.

- Legal authority is centralised in CARB, which has statutory independence and long-term climate planning authority.
- Linkage provisions under AB 32 allowed cross-border integration with Québec ETS (2014–present) and briefly with Ontario ETS (2017–2018). This linkage enables joint auctions, fungible allowances, and harmonised regulatory standards, providing a model for cross-jurisdictional cooperation and liquidity enhancement.
- Statutory review and scoping plan updates (every 5 years) allow program adjustments, aligning cap trajectories with evolving state climate goals.

2.5.3 Operation and infrastructure aspects

California's ETS has one of the most sophisticated operational infrastructures among subnational carbon markets, balancing auctioning, registry management, and stability measures.

2.5.3.1 Trading modes

Trading is conducted via auctions in the primary market as well as spot and derivative trading in the secondary market. Allowances are distributed through auctions and traded in both regulated exchanges and OTC markets.

- **Auctions:** Joint quarterly auctions with Québec, conducted by WCI, Inc., using a sealed-bid format.
- **Secondary market:** CCAs are actively traded on exchanges (ICE, Nodal Exchange, Chicago Mercantile Exchange) as well as through bilateral OTC transactions. OTC trades involve bilateral agreements, often facilitated by brokers, with prices negotiated privately and reported to CARB for CITSS recording. ICE provides the main platform for spot and futures trading, with trades settled via bank transfers and allowances transferred through CITSS. Clearing is optional for spot trades and mandatory for derivative contracts executed through ICE, with ICE Clear U.S.
- **Linkage:** California and Québec share fungible allowances, creating a larger and more liquid market.

2.5.3.2 Registry and settlement

A central registry system underpins market transparency and compliance tracking.

- The CITSS records issuance, transfers, holdings, and surrenders of allowances and offsets. The CITSS employs multi-factor authentication and permission-based access for security. It integrates both California and Québec participants, allowing fungibility of CCAs across jurisdictions and joint auctions and compliance.
- Settlement is electronic and integrated into CITSS, ensuring secure and legally enforceable ownership rights.
- Auction proceeds flow into California's Greenhouse Gas Reduction Fund, supporting climate and equity investments.

2.5.3.3 Oversight and risk management

Oversight responsibilities are divided between environmental regulators and financial supervisors. Market surveillance is jointly carried out by CARB, Monitoring Analytics and the Independent Emissions Market Advisory Committee (IEMAC). Other state and federal agencies, such as the California Independent System Operator (CAISO), the Commodity Futures Trading Commission (CFTC), and the Federal Energy Regulatory Commission (FERC), may also be consulted or have jurisdiction depending on the specific circumstances.

- CARB oversees compliance, registry operations, and offset integrity.
- WCI, Inc. ensures auction integrity and data security.
- Financial regulators, including the U.S. CFTC, supervise derivatives and exchange-traded products.

2.5.3.4 Market Stability Mechanisms

California employs multiple tools to manage allowance prices and provide cost certainty.

- **ARP:** Establishes a minimum bid price (US$23.71 in 2023, rising annually with inflation).
- **Allowance Price Containment Reserve (APCR):** Releases extra units at predefined price tiers if prices rise too high. The APCR stabilises prices by releasing additional CCAs at three fixed price tiers, adjusted annually for inflation. These tiers act as a 'soft ceiling' to mitigate price spikes while preserving market-based price discovery.
- **Hard price ceiling:** Authorises CARB to release or purchase units if allowance prices breach the ceiling.

At the lower end of this price corridor, the ARP, or floor price, rises annually by 5% plus inflation, preventing under pricing and supporting investor confidence. Historically, the APCR has not been triggered, as auction clearing prices have remained below tier thresholds. By contrast, however, the ARP consistently ensures bids meet the minimum price, shaping market stability and avoiding extremely low prices that erode the intended carbon price signal and revenue generation.

2.5.3.5 Participation and liquidity

Participation rules allow broad access while ensuring compliance obligations remain enforceable.

- Compliance entities include power plants, refineries, industrial facilities, and fuel suppliers, covering about 80% of California's emissions.
- Financial institutions and intermediaries may also participate, contributing to liquidity and efficient price discovery.
- The Québec linkage expands allowance supply and harmonises rules, supporting market depth and stability.

2.5.4 Lessons learned for the operational model for the CTX in Vietnam

California's Cap-and-Trade Program demonstrates how a subnational jurisdiction with limited international integration can design a robust, transparent, and well-regulated carbon market. The system has matured over time to address initial implementation challenges, including stakeholder mistrust, price instability, and concerns about market manipulation.

2.5.4.1 A proactive approach to managing market concentration

From its early stages, California anticipated the risk of market concentration, where a few large participants could potentially control allowance supply and manipulate prices. To counter this, the regulator (CARB) proactively imposed quantifiable holding limits.

This is a highly relevant lesson. Vietnam's pilot market will be small and potentially dominated by a few large state-owned enterprises (SOEs), creating a significant risk of market concentration and undermining fair competition. To ensure fair market access and prevent manipulation, it is recommended that the specific provisions defining quantifiable holding limits for all participant types should be clarified in the early stages. Furthermore, learning from California's practice, the operational regulations for the exchange should mandate identity verification and bid guarantees for auction participation to deter speculative or fraudulent bidding.

2.5.4.2 The critical role of a rules-based price stability corridor

A key feature of California's system is its ability to manage price volatility through a "price collar". This includes an Auction Reserve Price (ARP) (a floor price) and an Allowance Price Containment Reserve (APCR), which acts as a soft ceiling by releasing extra allowances at predefined price tiers.

Given the likely thin trading volumes during the pilot phase, Vietnam's CTX will be highly susceptible to price volatility. The current regulations lack specific, rules-based mechanisms to manage this risk. To ensure a smooth launch and build investor confidence, Vietnam should adopt a similar price collar. It is recommended that there should be provisions to establish an ARP for any future auctions and a tiered Price Containment Reserve. Having these transparent, trigger-based mechanisms in place from the outset will be instrumental in stabilising the market.

2.5.4.3 Enhancing credibility through independent technical oversight

California's system benefits from a high degree of oversight, notably from the Independent Emissions Market Advisory Committee (IEMAC), which provides impartial annual reports assessing market performance and recommending improvements.

Dual-governance model between MAE and MOF/SSC is reasonable in Vietnam's context, but could be strengthened by an independent technical body to increase credibility and provide unbiased advice. This would help build trust among market participants and the public. Vietnam could benefit from establishing a similar Technical Advisory Committee under the joint authority of MAE

and MOF. This committee, comprised of domestic and international experts, would be tasked with independently analysing market performance and providing public, evidence-based recommendations to inform future rule changes and policy adjustments.

2.5.4.4 Building trust through proactive transparency and public disclosure

California's model is built on proactive transparency. Key data, including auction results, entity-level compliance status, and verified emissions reports, are made public through accessible platforms like the Compliance Instrument Tracking System Service (CITSS).

To increase transparency, the CTX model should make the detailed information disclosure more specific and comprehensive to align with international best practices. To strengthen trust and encourage participation, the operational regulations for the CTX should mandate the creation of a public data dashboard. This dashboard should provide routine, easy-to-access information, including aggregated daily trading volumes and prices, auction clearing prices and participation statistics, and a searchable database of entity-level compliance status.

2.6 The Korea ETS

2.6.1 Overview of the Korea ETS

The K-ETS is Asia's first nationwide cap-and-trade program and remains one of the most comprehensive ETSs outside Europe. It was launched in January 2015 under the Act on the Allocation and Trading of GHG Emission Permits (Emissions Trading Act) as part of Korea's broader climate strategy to reduce emissions by 40% below 2018 levels by 2030 and achieve carbon neutrality by 2050.

The K-ETS was introduced to complement Korea's energy efficiency and renewable energy policies by placing a carbon price across key sectors. It covers about 70% of the country's national GHG emissions, including power, industry, buildings, and aviation.

The system has been implemented in multi-year phases, each introducing reforms to strengthen ambition and improve market functioning:

- **Phase I (2015–2017):** Pilot implementation, free allocation of nearly all allowances, and limited compliance flexibility.
- **Phase II (2018–2020):** Introduction of auctions, tighter caps, and expanded use of offsets.
- **Phase III (2021–2025):** Greater reliance on auctioning, strengthened monitoring and penalties, and inclusion of financial institutions as participants to enhance liquidity.
- **Phase IV (2026 onwards):** Planned reforms to align the ETS with Korea's 2050 net zero pathway, including tighter caps, broader sector coverage, and improved linkage potential.

The K-ETS plays a dual role: it is both a core instrument for achieving Korea's NDC under the Paris Agreement and a market signal to accelerate low-carbon investment. Its phased development demonstrates how a country can gradually strengthen an ETS, balancing industrial competitiveness with environmental ambition.

Box 4. K-ETS latest developments (2024-2025)

In February 2024, the Korean National Assembly adopted a partial amendment to the *Emissions Trading Act*, set to take effect on February 7, 2025. A central feature of these reforms is the broadening of eligible market participants. Whereas trading was previously confined largely to compliance entities and designated market makers, participation will now extend to financial institutions such as banks, insurers, and fund managers, with a longer-term roadmap to include retail investors. The amendment also establishes a legal foundation for carbon brokers and exchanges. Licensed brokers will be permitted to execute trades on behalf of clients, register trading accounts, and report transactions directly to the government, with such notifications carrying the same legal weight as compliance filings. In addition, the law introduces stricter allocation rules: previously, entities risked allowance cancellation only if their verified emissions fell below half of their allocation, but under the new framework, this threshold is reduced to 15 percent. In practice, this will significantly curtail opportunities for entities to hoard allowances or profit from excessive surpluses.

In December 2024, the government finalised the Fourth Basic Plan for the K-ETS, which sets the system's strategic direction for the next two allocation periods (2026–2030 and 2031–2035). Key structural reforms include a substantial increase in auctioning, particularly in the power sector, and a shift toward production-based benchmarks for free allocation, which will cover 75 percent of emissions subject to the scheme. The plan also introduces an automatic market stability mechanism, modelled on the EU's reserve system, designed to adjust supply in response to sustained price fluctuations. Auction eligibility will be expanded to include non-compliant traders such as market makers and other third-party participants, while banking rules will become more flexible. Revenues from allowance auctions will be earmarked to support industrial decarbonisation, technology deployment, and innovation financing.

2.6.2 Legal and regulatory framework

The K-ETS is anchored in a hierarchy of legal statutes that establish the system's authority and the principles for its fair operation.

2.6.2.1 Legal basis

The primary legislation provides a broad mandate for market regulation, which is then detailed in subordinate decrees and administrative plans.

- The Framework Act on Green Growth (Green Growth Act), later amended and reinforced through the Framework Act on Carbon Neutrality and Green Growth for Coping with Climate Crisis (Carbon Neutrality Act), firmly embedded the K-ETS at the centre of Korea's 2050 carbon neutrality strategy.
- First enacted in 2012 and most recently amended in February 2024, the Emissions Trading Act provides the comprehensive legal framework for the scheme's existence and operation.
    - Article 3 establishes the core principle that emission permits must be traded "fairly and transparently."
    - Mandates the creation of institutional infrastructure to support a regulated market.
- The Enforcement Decree of the Emissions Trading Act translates broad statutory principles into specific, enforceable rules.
    - Defines criteria for exchange membership and participation.

- Prescribes approved trading methods and procedures.
- Establishes rules for clearing and settlement of transactions.
- Requires public disclosure of trading information to enhance transparency.

- Complementary provisions under the Green Growth Act and the Carbon Neutrality Act provide the administrative backbone of the K-ETS.
  - Establish three registry systems: National Greenhouse Gas Management System (NGMS), Emissions Trading Registry System (ETRS), and Offset Registry System (ORS).
    - NGMS: manages emissions data, supports verification, and maintains statistics.
    - ETRS: records allowance allocation and transactions.
    - ORS: tracks offset credits from external reduction projects.
  - Article 25 of the Carbon Neutrality Act explicitly endorses the use of market mechanisms, reinforcing the market-based nature of the scheme.

2.6.2.2 Institutional responsibilities

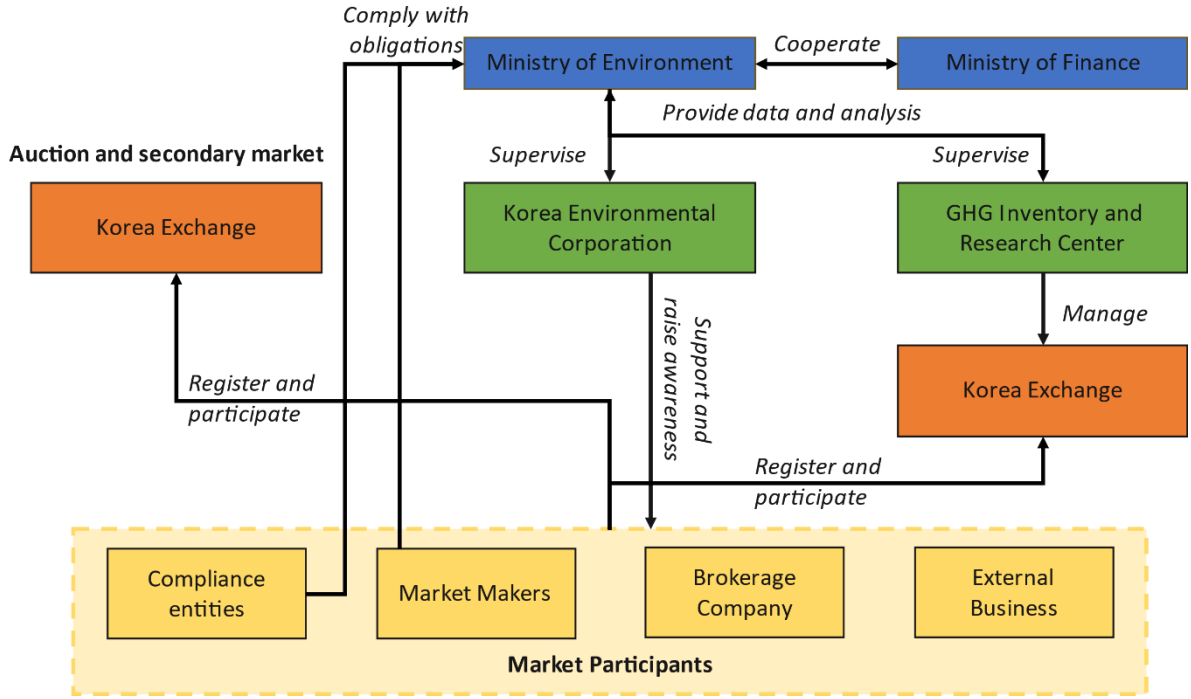
Key organisations include the Ministry of Environment (MoE)**,** Korea Exchange (KRX), K-eco, and the Greenhouse Gas Inventory and Research Center of Korea (GIR). These bodies collaborate to design and enforce new policies and initiatives related to the ETS. In addition to these core institutions, other stakeholders, referred to as market participants, are also involved, including entities subject to ETS regulations, developers of offset projects, and financial institutions.

- **MoE:** MoE holds the primary and overall responsibility for the operation and management of the K-ETS. Its key functions include:
  - Developing and establishing the detailed Allocation Plans for each commitment period, following consultations and deliberations by relevant committees.
  - Overseeing the comprehensive MRV framework. This includes the review and certification of annual emission reports submitted by covered entities, a process supported by the Emissions Certification Committee.
  - Initiating and managing market stabilisation measures to address price volatility or supply-demand imbalances and enforcing penalties for non-compliance.
  - Leading stakeholder engagement and system reforms, notably through the ETS Council, which was launched by the MoE to deliberate on potential ETS reforms and the future direction of the system in alignment with carbon neutrality goals.
- **Ministry of Economy and Finance:** The MoEF plays a significant strategic role, particularly in the broader economic and fiscal aspects of the K-ETS:
  - It was responsible for establishing the Emission Permits Allocation Committee, a key body in the allocation process.
  - The MoEF jointly establishes the overarching ten-year Master Plan for the ETS with the MoE, setting the long-term policy direction.
  - Notably, the MoEF briefly held overall responsibility for the K-ETS between June 2016 and January 2018, before it reverted to the MoE. This historical shift indicated evolving perspectives on the primary stewardship of the system and reflected different ministerial priorities concerning economic impacts versus environmental regulation.
- **GIR:** A research institute under the MoE established in 2010, being responsible for:
  - Compiling and updating the national GHG inventory, which monitors emissions from all sources across Korea.

- Delivering data and analytical insights to the government and relevant stakeholders to aid in the formulation and execution of the K-ETS.
- Carrying out research on GHG reduction technologies and related policy measures.

- **Korea Environmental Corporation:** K-eco is a public agency founded in 1985 under the MoE, with the mission of supporting sustainable development and protecting the environment. It plays a key role in assisting the MoE with tasks related to the allocation and cancellation of emission allowances.
- **KRX:** South Korea's sole centralised exchange, established in March 1956, operates three equity trading markets: the Main Board (KOSPI), the Korean Securities Dealers Automated Quotations (KOSDAQ) market, and the Korea New Exchange (KONEX) markets. The KRX Emissions Market, a part of the derivatives division's commodity market, opened on 12 January 2015.
- **Market stakeholders**
  - Compliance firms: Entities that are legally required by law to participate in the ETS.
  - Project developers: Companies that implement emission reduction activities that generate offset credits.
  - Market makers: Financial firms such as banks and securities firms that are contractually obligated by the MoE to provide liquidity to the market.
  - Securities firms: Non-obligated trading parties that can buy and sell allowances within the allowed holding positions.

Overall, the institutional framework in K-ETS is demonstrated in the figure below.



Source: CTX Phase 1 – Second Milestone Report, ETP/UNOPS (2024)

2.6.2.3 Compliance and enforcement

- Emitters can acquire emission permits through several channels, including purchasing them on the market, receiving free allocations from the government, or generating them

via offset projects. The K-ETS operates with a flexible trading period for permits, customised according to the permit type, allowing sufficient time for compliance.

- The K-ETS participation threshold applies to companies with total annual emissions of 125,000 tons of CO_2e or more, or facilities with annual emissions exceeding 25,000 tons of CO_2e.

2.6.3 Operation and infrastructure aspects

2.6.3.1 Registry and Trading

K-ETS has been implemented through a multi-phase structure, reflecting an adaptive management strategy that allows regulatory authorities to gradually assess the market's performance while flexibly adjusting the system design to align with the country's evolving climate goals. Under the K-ETS, transactions are carried out through two main registry systems: (i) ORS and (ii) ETRS. ORS is a public platform designed to document and manage information related to carbon offset projects, such as project plans, certification records, and other pertinent data, in order to support the issuance, transfer, and retirement of offset credits. Its key functions include:

- Recording and overseeing processes related to external projects, including application submissions, feasibility assessments, registration, monitoring, verification, and certification.
- Managing the issuance, transfer, retirement, and conversion of certified offset credits.
- Performing additional tasks as designated by the MoE.

Under the ORS, there are several accounts which are demonstrated in the table below.

Table 1: Account types under the ORS in the K-ETS

No.	Account Type	Description
1	Issuance Account	Issues certified credits derived from a project (maintains one independent account for each project)
2	Holding Account	Keeps the certified credits of a project participant (allocates one independent account for each project participant)
3	Cancellation Account	Records transferred, credit cancellation transferred from a Holding Account (Supervised by the MoE)
4	Offset Credit Account	Hold Korea Credit Units (KCUs) obtained by ETS Compliance entities (maintains one independent account for each ETS compliance entity)
5	Forest Deposit Account	Allocate a specific portion of emission reductions from forest projects to prevent the loss of CO_2 in the forest sector
6	Disposal Account	Manages the disposal of certified credits obtained by ETS Compliance entities post-transfer to KCUs

Source: ICAO (2018)

ETRS is a registry for the trading of emissions permits under the ETS. It is responsible for recording and maintaining the following data, among others:

- Total number of emissions permits by commitment period and compliance year.

- Account of emission permits under the name of each business entity eligible for allocation, and other private persons or corporations and the number of emissions permits they each hold.
- Account for the management of emission permits in reserve (additional allocation of emission allowances, market-making activities, market stabilisation reserves, etc.).
- Amount of emission permits transferred/cancelled.
- Quantity of emission permits submitted.
- The carryover/borrowing amount of emission permits.
- The quantity of offset credits.
- The emission plan and verification report.
- The total number of emissions permits by commitment period and compliance year, GHG-certified emissions.

Overall, transactions involving emission permit trading and auctions are recorded in ETRS, while offset credit transactions are documented in ORS. The figure below shows a refined summary of the necessary infrastructure for CTX within K-ETS.

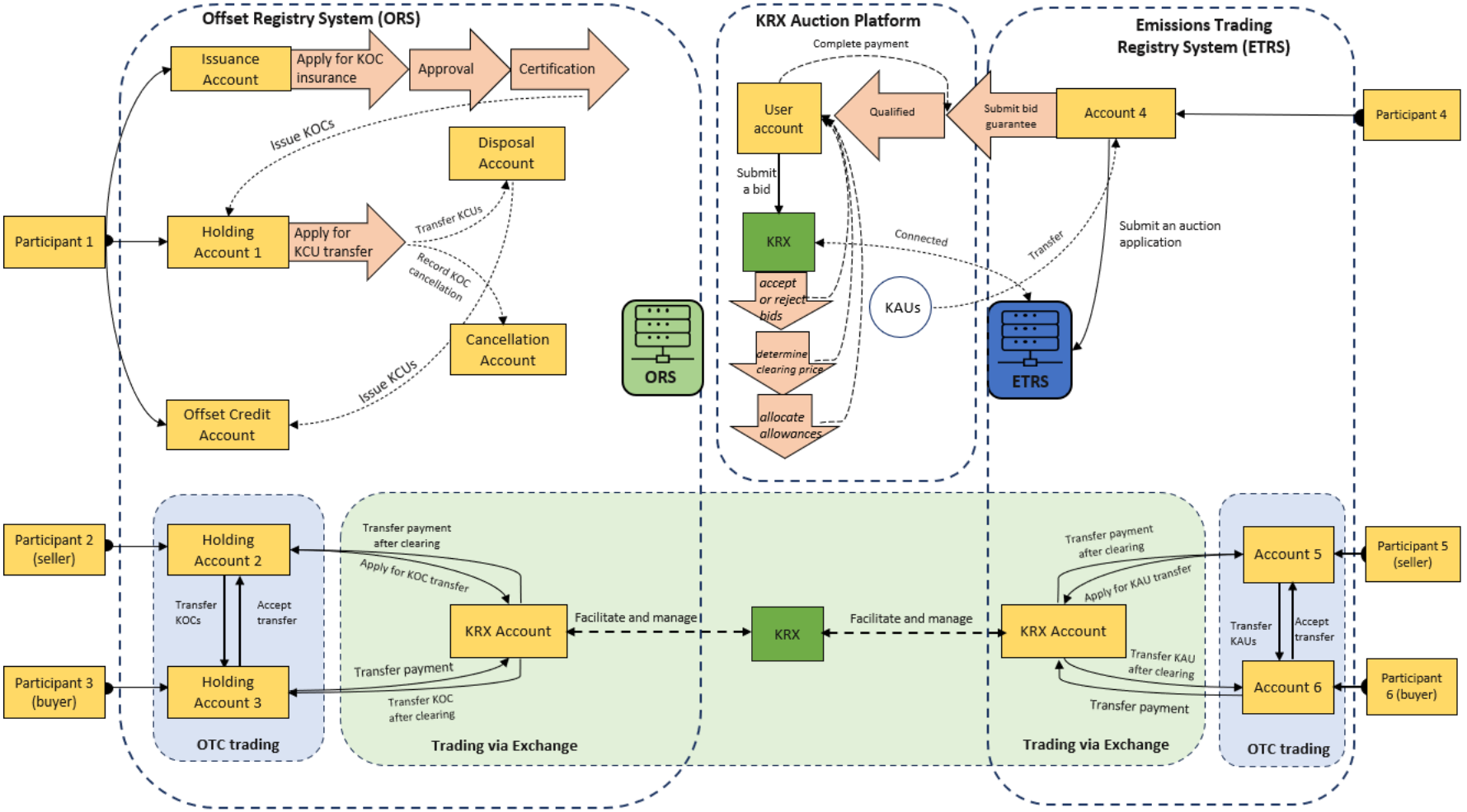


Figure 1: Overall CTX infrastructure in the K-ETS

Source: CTX Phase 1 – Second Milestone Report, ETP/UNOPS (2024)

2.6.3.2 Surveillance tools and systems

These systems are designed to ensure accurate emissions accounting, track the lifecycle of every allowance, and monitor trading activity for signs of abuse.

- Government's 2023 revitalisation plan: toward an integrated oversight system[43].
  - Envisions a new surveillance framework modelled on mature financial markets.
  - Core feature: integration of currently fragmented datasets into a single oversight platform.
  - Allows regulators to cross-reference datasets, enabling detection of sophisticated anomalies that would remain invisible within siloed systems.
    - NGMS: emissions reporting and compliance data.
    - ETRS: allowance allocation, holdings, and transfer records.
    - KRX: real-time auction and secondary market trading data.
  - Examples of enhanced detection capabilities
    - Financial distress/manipulation flags: automatically identifying firms with a growing emissions deficit that are nonetheless selling allowances.
    - Collusion detection: spotting patterns of coordinated bidding behaviour in auctions or synchronised trading among multiple entities.
    - Anomalous activity alerts: flagging unexpected concentration of trades, unusual volumes, or timing patterns suggestive of manipulation.
  - Strategic significance
    - Marks a shift from static compliance auditing to dynamic market surveillance.
    - Enhances regulators' ability to deter misconduct by making detection more proactive and sophisticated.
    - Strengthens both the environmental credibility and the financial integrity of the K-ETS.
    - Positions Korea's system closer to international best practice, where emissions markets are supervised with tools adapted from securities and derivatives oversight.

2.6.3.3 Transparency requirements and data disclosure

The scheme's transparency framework comprises both publicly disclosed data released by regulatory authorities and specific disclosure obligations imposed on covered entities, as outlined below:

- **Market and Trading Data:** The KRX provides public access to essential market data, including current and historical allowance prices and transaction volumes. This information is vital for participants to make informed trading decisions and for analysts to assess market trends.
- **Auction Results:** The results of the regular government auctions of allowances are disclosed, providing a clear signal of the market-clearing price for a significant tranche of the allowance supply.

[43] *Kim & Chang. (n.d.). [Legal insight 1 - Unspecified Title for reference 45]. Retrieved from https://www.kimchang.com/en/insights/detail.kc?sch_section=4&idx=28418*

- **Official Reports and Plans:** Master Plans and Allocation Plans, which detail the rules, cap, and allocation methods for each phase, are developed through a process that includes public hearings and are published in advance. Furthermore, the GIR regularly publishes comprehensive operational reports that include a wealth of information, such as aggregated statistics on allowance allocations, certified emissions by sector, market performance indicators, and the results of surveys conducted with participating companies.
- **Registry Information:** The emissions trading registry is designed to be accessible to the public and contains separate accounts to record the allowances held by each person, ensuring transparency in who holds the right to emit.
- **Emissions Monitoring and Reporting:** Participants are required to establish and submit detailed monitoring plans for their emissions. Based on these plans, they must compile an annual emissions inventory, which is submitted to the government by the end of March each year.
- **Voluntary Corporate Disclosure:** Many large Korean corporations participate in global voluntary disclosure initiatives. They frequently publish detailed sustainability reports and respond to the Carbon Disclosure Project (CDP) questionnaire, providing additional public information on their carbon performance, risk management strategies, and investments in emissions reduction technologies.

2.6.3.4 Penalties for misconduct

The K-ETS employs a robust enforcement regime with significant financial penalties for non-compliance. The penalty structure is designed to be a powerful economic disincentive against exceeding emissions caps. As the market evolves, this framework is being expanded to include penalties for market abuse and other forms of fraudulent behaviour, reflecting the scheme's dual identity as both an environmental regulation and a financial market.

- Penalties for environmental non-compliance
  - Administrative fines are the primary enforcement tool when entities fail to surrender sufficient allowances to cover verified emissions.
  - Equals up to three times the average market price of allowances during the relevant compliance year, ensuring fines are always set higher than the cost of purchasing allowances on the market.
  - Penalty cap: KRW 100,000 per tonne of CO_2e uncovered. Functions as a de facto compliance cost ceiling, giving firms certainty about maximum potential liability[44].
- Emerging framework for penalties against market misconduct
  - Current reforms are extending enforcement beyond emissions compliance to cover fraudulent and manipulative trading behaviour.
  - Reflects the financial-market orientation of the K-ETS, particularly as surveillance capabilities expand.
  - Misconduct penalties are expected to be separate from environmental non-compliance fines and designed to punish malicious intent.

[44] *Kim & Chang. (n.d.). [Legal insight 2 - Unspecified Title for reference 46]. Retrieved from https://www.kimchang.com/en/insights/detail.kc?sch_section=4&idx=28562*

- Likely components of the new misconduct penalty regime:
  - Confiscation of illicit gains: ensuring no participant profits from manipulation or abuse.
  - Significant monetary fines: potentially calculated as multiples of illicit profits to amplify deterrent effect.
  - Trading restrictions: suspension or permanent revocation of rights to participate in the K-ETS market.
  - Personal accountability: fines or professional bans for individuals found directly responsible for misconduct.
- Strategic importance of expanded penalties
  - Strengthens the credibility of the K-ETS by ensuring it is not only environmentally effective but also financially fair.
  - Shifts the system from a compliance-focused regime to a full-spectrum enforcement model, covering both emissions obligations and trading behaviour.
  - Aligns Korea's system more closely with international best practices, where environmental markets are policed with financial-market-style sanctions.

2.6.4 Lessons learned for the operational model for the CTX in Vietnam

The development and evolution of the K-ETS, as Asia's first nationwide cap-and-trade program, provide Vietnam with a valuable reference point for building its own CTX. Korea's experience demonstrates that the success of an ETS depends not only on its environmental ambition but also on the robustness of its legal foundation, the credibility of its MRV systems, the inclusiveness of its governance, and the degree of stakeholder preparedness. For Vietnam, adapting these lessons will be essential to ensure that the CTX is both environmentally effective and economically credible, while also serving as a practical tool to achieve national climate targets and international obligations.

2.6.4.1 The critical value of a preparatory MRV phase

The single most important lesson from Korea is the strategic value of its Target Management System (TMS), which was implemented before the ETS launch. The TMS was a mandatory reporting scheme that forced companies to build capacity in monitoring, reporting, and verifying (MRV) their emissions before a financial price was applied. This smoothed the transition and ensured the ETS was built on a foundation of relatively reliable data.

Vietnam is currently in a similar preparatory stage, with enterprises beginning their first GHG inventories under Decree 06/2022/ND-CP and its amendment Decree 119/2025/ND-CP. There is a high risk of poor data quality and low enterprise capacity in these initial years. While Vietnam has not implemented a formal pre-ETS system like the TMS, the lesson is to treat the CTX pilot phase as a preparatory MRV phase. The primary objective should not be active trading but rather perfecting the MRV system. It is recommended that the guiding regulations for the pilot phase focus on rigorous data verification, intensive capacity building for enterprises, and using this period to establish a credible emissions baseline for the full operational phase.

2.6.4.2 Building stakeholder readiness through dedicated support

Korea recognised that a new, complex regulation requires continuous support for the private sector. They established a national helpdesk and knowledge hub to provide ongoing guidance to firms on compliance, reporting obligations, and carbon asset management.

As for Vietnamese enterprises, particularly in the initially covered sectors of power, steel, and cement, they will face a steep learning curve. A lack of accessible, official guidance can lead to non-compliance, inaccurate reporting, and mistrust in the system. It is recommended that the MAE, as the lead environmental regulator, establish a National CTX Helpdesk. This should be a staffed, official resource (not just a website) tasked with answering technical questions from regulated entities, providing standardised reporting templates, and disseminating best practices, thereby accelerating stakeholder preparedness.

2.6.4.3 The power of a phased, adaptive regulatory framework

The K-ETS has evolved significantly across its multi-year phases, starting with 100% free allocation and gradually introducing auctions and expanding third-party participation. This "learning-by-doing" approach allowed regulators to refine the system based on real-world market performance.

Vietnam's roadmap already wisely adopts a phased approach (pilot then full operation). The key is to formalise this adaptive capacity within the legal framework itself. To ensure flexibility, the regulatory framework should include a specific provision mandating a formal statutory review of the pilot phase. For example, it could require a comprehensive report to be submitted to the Prime Minister after two years of operation, evaluating the pilot's performance and providing concrete recommendations for adjusting rules (e.g., introducing auctions, tightening caps) for the full operational phase.

2.6.4.4 The necessity of a clear and stable legal framework

Korea's experience shows the importance of a clear, stable legal framework that defines roles and responsibilities to ensure inter-ministerial coordination (e.g., between the Ministry of Environment and the Ministry of Economy and Finance).

Vietnam's multi-agency model (MAE, MOF) creates a potential risk of jurisdictional ambiguity and coordination gaps. The lesson from Korea reinforces the critical need for a formal Inter-agency Coordination Protocol. This legal instrument is essential for defining responsibilities, data-sharing protocols, and joint enforcement procedures between MAE, MOF, and other relevant ministries to ensure the CTX operates smoothly.

2.7 The China ETS

2.7.1 Overview of the China ETS

China's national ETS is the world's largest carbon market by covered emissions and serves as the cornerstone of the country's strategy to achieve carbon peaking before 2030 and carbon neutrality by 2060. Its development followed a deliberate, phased trajectory, beginning with capacity building through the Clean Development Mechanism (CDM) under the Kyoto Protocol. This was followed by the launch of seven provincial and municipal pilot markets between 2013 and 2014,

in Beijing, Tianjin, Shanghai, Chongqing, Hubei, Guangdong, and Shenzhen, which provided invaluable, diverse experience in market design and regulation.

Building on these foundations, the national ETS officially commenced trading in July 2021. The system was launched under the authority of the Ministry of Ecology and Environment (MEE), which assumed responsibility for climate policy from the National Development and Reform Commission (NDRC) in 2018. Initially, the ETS covered only the power generation sector, encompassing over 2,100 entities and accounting for approximately 4.5 billion tonnes of CO_2, or over 40% of China's national emissions.

A defining characteristic of the China ETS is its use of a rate-based, or intensity-based, cap-and-trade design. Rather than setting an absolute, mass-based cap on emissions, the system allocates allowances based on industry-specific emissions intensity benchmarks (e.g., tonnes of CO_2 per megawatt-hour of electricity produced). An entity's final allowance allocation is determined by multiplying its actual output by the relevant benchmark. This design creates a flexible emissions cap that adjusts with economic output, balancing environmental objectives with economic stability, and effectively functions as a tradable performance standard. All allowances are currently distributed for free to mitigate the economic burden on covered enterprises.

Since its launch, the market has demonstrated operational stability and high compliance. The compliance rate for the first cycle exceeded 99.5%, and the second cycle saw significant increases in trading volume (up 19%) and turnover (up 89%), indicating growing market maturity. Carbon prices have remained resilient, fluctuating between 40–100 CNY (approximately US$6–14) per tonne, with an average price of 66 CNY (US$9), aligning with policy expectations and reflecting the marginal abatement costs of the power sector.

The market's operational stability and maturing price signals, along with its characteristic compliance-driven trading patterns, are clearly illustrated in the historical data below.

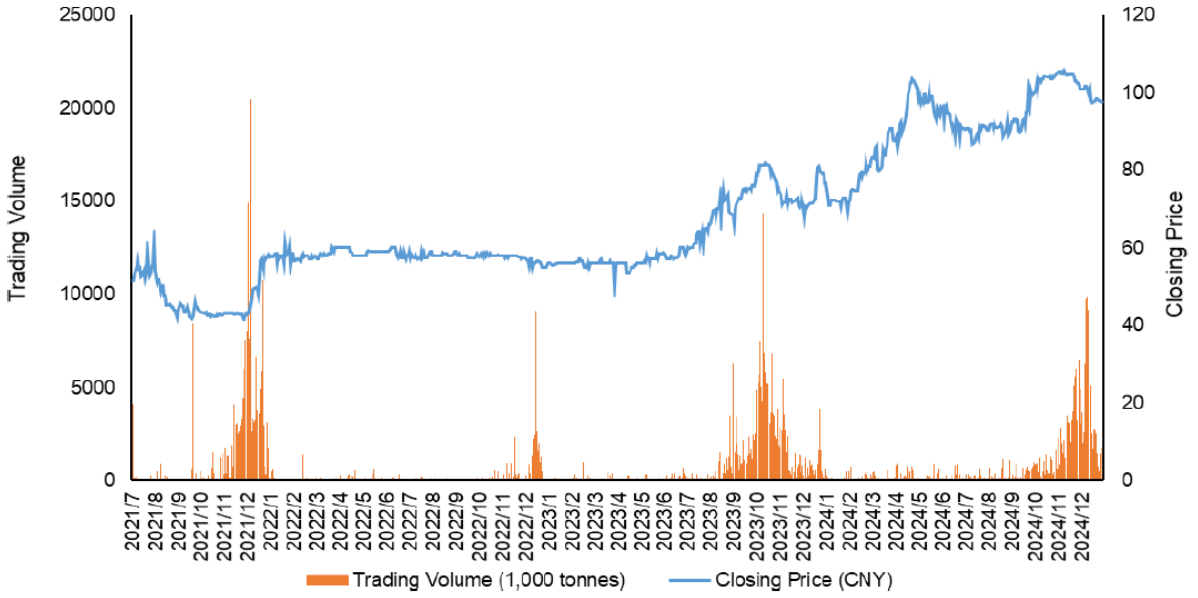


Figure 2: Trading volume and price dynamics of China's National ETS

The chart highlights the resilience of the carbon price, which has remained relatively stable before showing a steady upward trend, even amidst significant spikes in trading volume. These surges in activity, primarily concentrated at the end of each compliance period (e.g., late 2021 and late 2023), demonstrate the compliance-driven nature of the market. The ability of the price to absorb these volume shocks without collapsing demonstrates growing market maturity and confidence.

This deliberate, phased development trajectory, from regional pilots to a unified national system, is summarised in the timeline below.

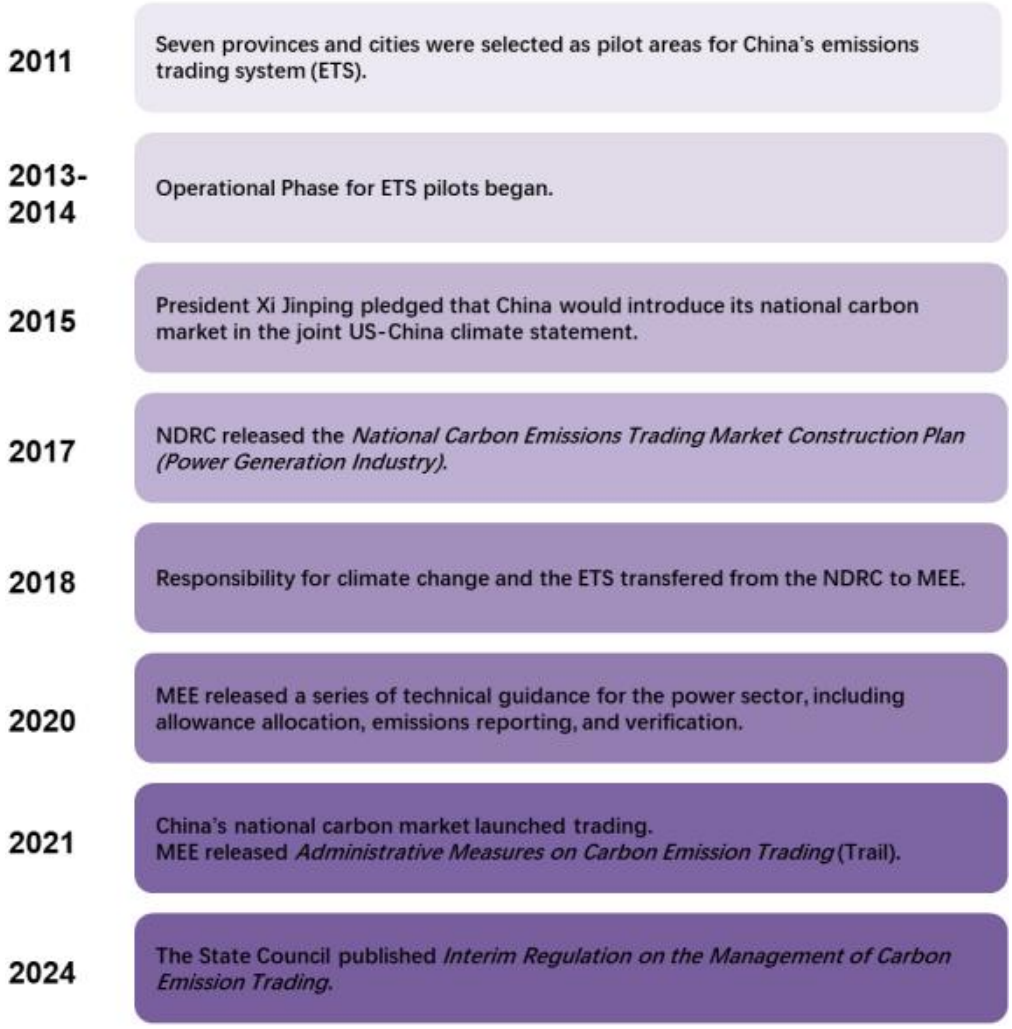


Figure 3: An overview of the development of China's ETS

Source: Compiled by the Consultant

Box 5. Latest China ETS developments (2024-2025)

China's national ETS is undergoing a significant expansion and refinement phase. In March 2025, MEE, with approval from the State Council, officially announced the expansion of the ETS to include the steel, cement, and aluminium sectors. This move, effective for the 2024 compliance year with a deadline at the end of 2025, will add approximately 1,500 new enterprises and an additional 3 billion tonnes of CO_2 to the system. The expansion brings total coverage to roughly 8 billion tonnes, representing approximately 60% of China's national emissions and 15% of global

emissions. Future expansion is planned for other key sectors, including petrochemicals, chemicals, and aviation.

To address long-term stability and liquidity, the MEE introduced allowance banking provisions in 2024. These rules permit surplus entities to carry forward unused allowances from the 2019-2024 periods into the 2025 compliance year. The mechanism includes a base banking allowance of 10,000 tonnes plus a trading-linked volume equivalent to 1.5 times an entity's net sales, a design intended to incentivise market participation while preventing hoarding.

Furthermore, the legal framework was significantly strengthened with the enactment of the Interim Regulations on the Administration of Carbon Emission Trading in 2024. As the first administrative regulation issued by the State Council for the carbon market, it elevates the legal authority of the ETS, clarifies institutional responsibilities, and introduces stricter penalties for misconduct, providing a more robust foundation for future development and enforcement.

2.7.2 Legal and regulatory framework

The legal architecture of the China ETS is a comprehensive, multi-level system designed to provide the institutional foundation for the market's governance, supervision, and long-term development. Recognising the need for a dynamic and evolving framework, authorities have layered high-level administrative regulations with specific departmental rules and technical standards. This structure establishes a clear hierarchy of authority, clarifies the roles and responsibilities of all key entities, and institutes the compliance and enforcement mechanisms necessary for the standardised and orderly operation of the world's largest carbon market. The hierarchy of this legal framework is visualised in the figure below.

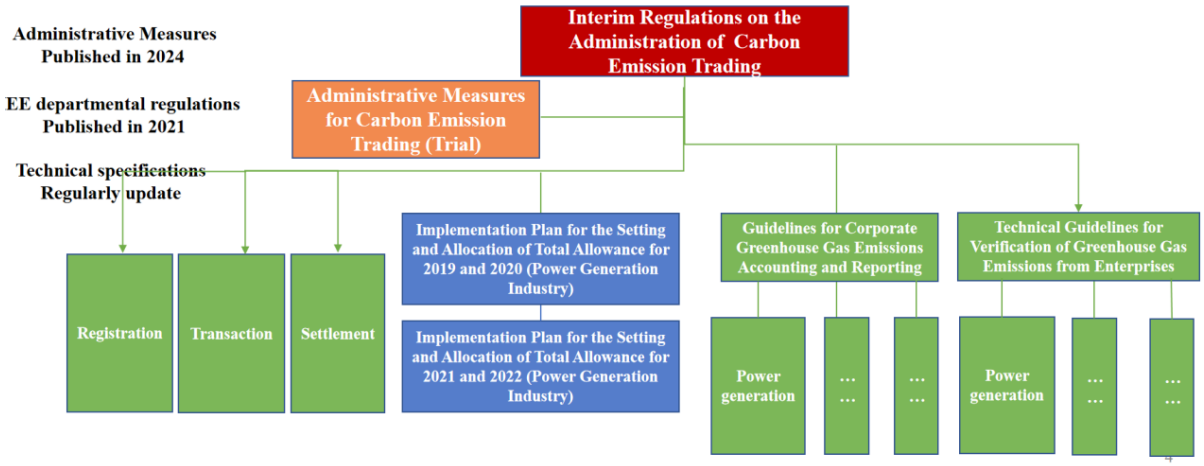


Figure 4: Legal and regulatory framework of China ETS

Source: Compiled by the Consultant

2.7.2.1 Legal Basis

The system is anchored in a tiered legal structure that provides both high-level authority and granular operational guidance, which has been progressively strengthened since the market's inception.

- The Interim Regulations on the Administration of Carbon Emission Trading (2024) serve as the highest-level legal instrument. As China's first administrative regulation for the carbon market issued by the State Council, it elevates the ETS's legal standing, formally establishes the MEE as the core national regulator, and provides an unambiguous legal basis for enforcement and penalties.
- The Administrative Measures for Carbon Emission Trading (Trial) acts as the foundational departmental regulation. It translates the high-level principles of the Interim Regulations into a core rulebook, outlining the multi-tiered governance structure, key market principles, methodologies for allowance allocation, and the technical requirements for MRV.
- This framework is further supplemented by a series of detailed departmental rules that govern specific market functions, including the Registration rules, Trading rules, and Settlement rules. These documents provide specific, granular procedures for the registry, exchange, and clearing operations, ensuring consistent and standardised execution of daily activities.

The structure of the Interim Regulation is outlined in Figure 4.

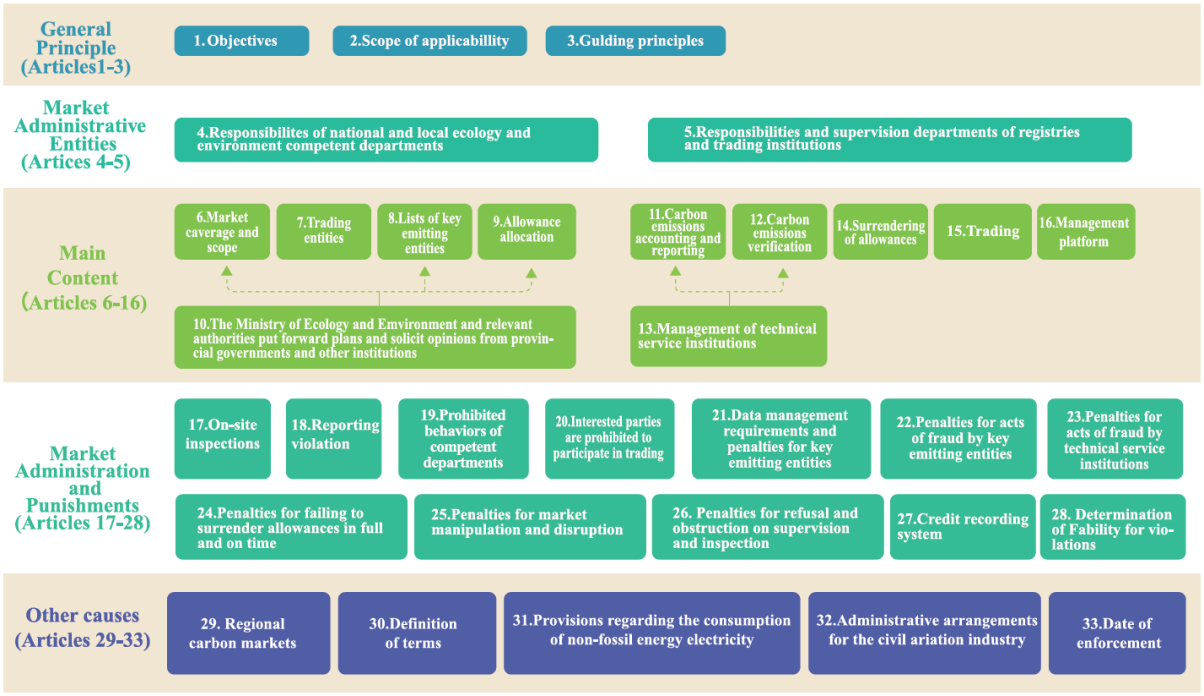


Figure 5: Framework of the Interim Regulation of China ETS

Source: MEE of the People's Republic of China, 2024

2.7.2.2 Institutional responsibilities

The governance of the China ETS is centralised at the national level, with a clear division of labour between the primary regulator, provincial implementing bodies, and various supporting technical institutions. The figure below illustrates the roles and responsibilities of these key parties within the overall governance structure, showing the flow of authority and services.

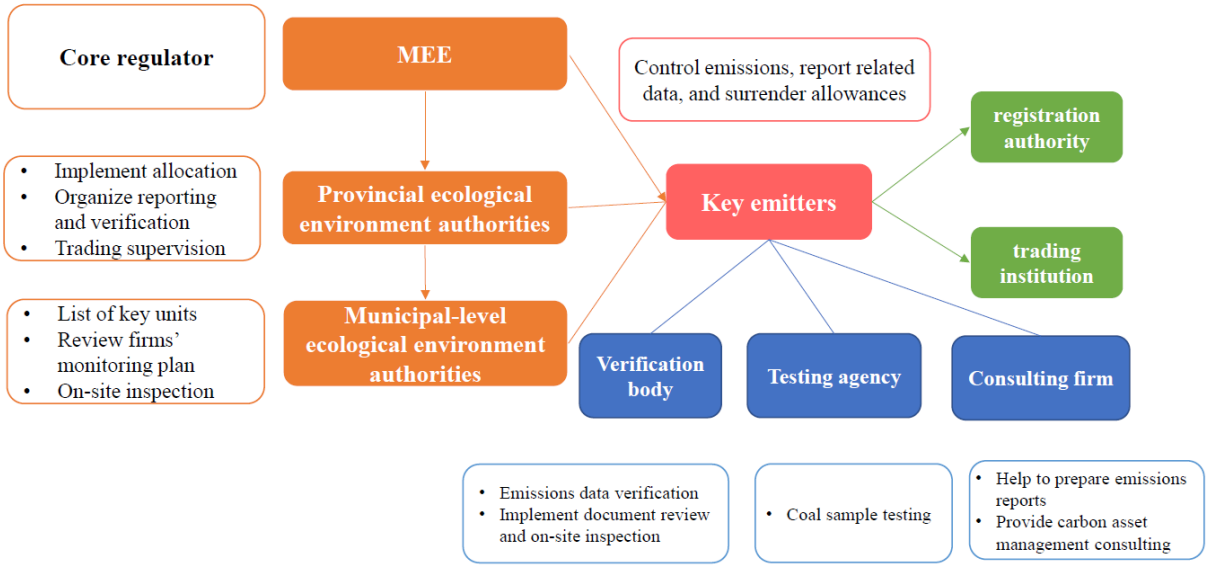


Figure 6: Parties and responsibilities in China's ETS governance model

Source: Compiled by the Consultant

As illustrated, the key institutional actors and their primary responsibilities are:

- **MEE:** As the primary national regulator, the MEE is responsible for the overall strategic direction of the ETS. Its mandate includes setting the national emissions caps and industry benchmarks, approving all allowance allocation plans, supervising the entire market for compliance and stability, and officially designating the national trading and registration institutions.
- **Provincial/Municipal Ecological and Environmental Authorities:** These bodies act as the on-the-ground implementation and enforcement arm of the MEE. Their responsibilities include compiling and managing the official list of key covered emitters within their jurisdictions, overseeing local data verification to ensure accuracy, and enforcing compliance at the enterprise level.
- **Shanghai Environment and Energy Exchange (SEEE):** Formally designated as the national trading institution, the SEEE is responsible for the operational integrity of the market. It builds and maintains the trading platform, organises all transactions, conducts real-time market monitoring for irregularities, and manages the public disclosure of all market information.
- **China Carbon Emissions Registration and Clearing Co., Ltd. (CCERC):** Formally designated as the national registration institution, the CCERC operates and maintains the unified national registry. This registry, based in Wuhan, functions as the definitive legal ledger for all allowances, securely tracking their issuance, holding, transfer, surrender, and cancellation.

Figure 5 illustrates the interconnected, dual-hub operational model that these institutions form.

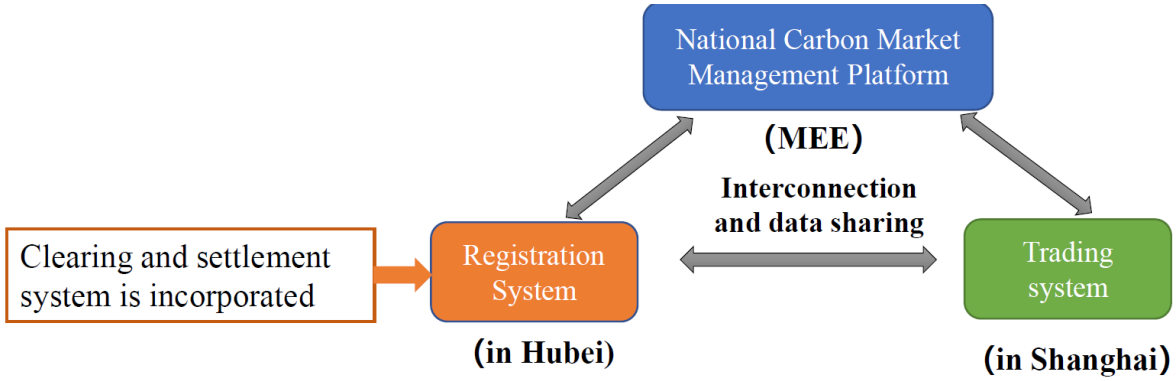


Figure 7: Inter-institutional coordination of China ETS

Source: Compiled by the Consultant

While this dual-hub model forms the core operational backbone, it is part of a much larger, systematic framework that encompasses the full lifecycle of policy, compliance, and supervision. The figure below, from China's MEE, provides a comprehensive view of this complete architecture, illustrating how all key actors and processes interact within the National ETS.

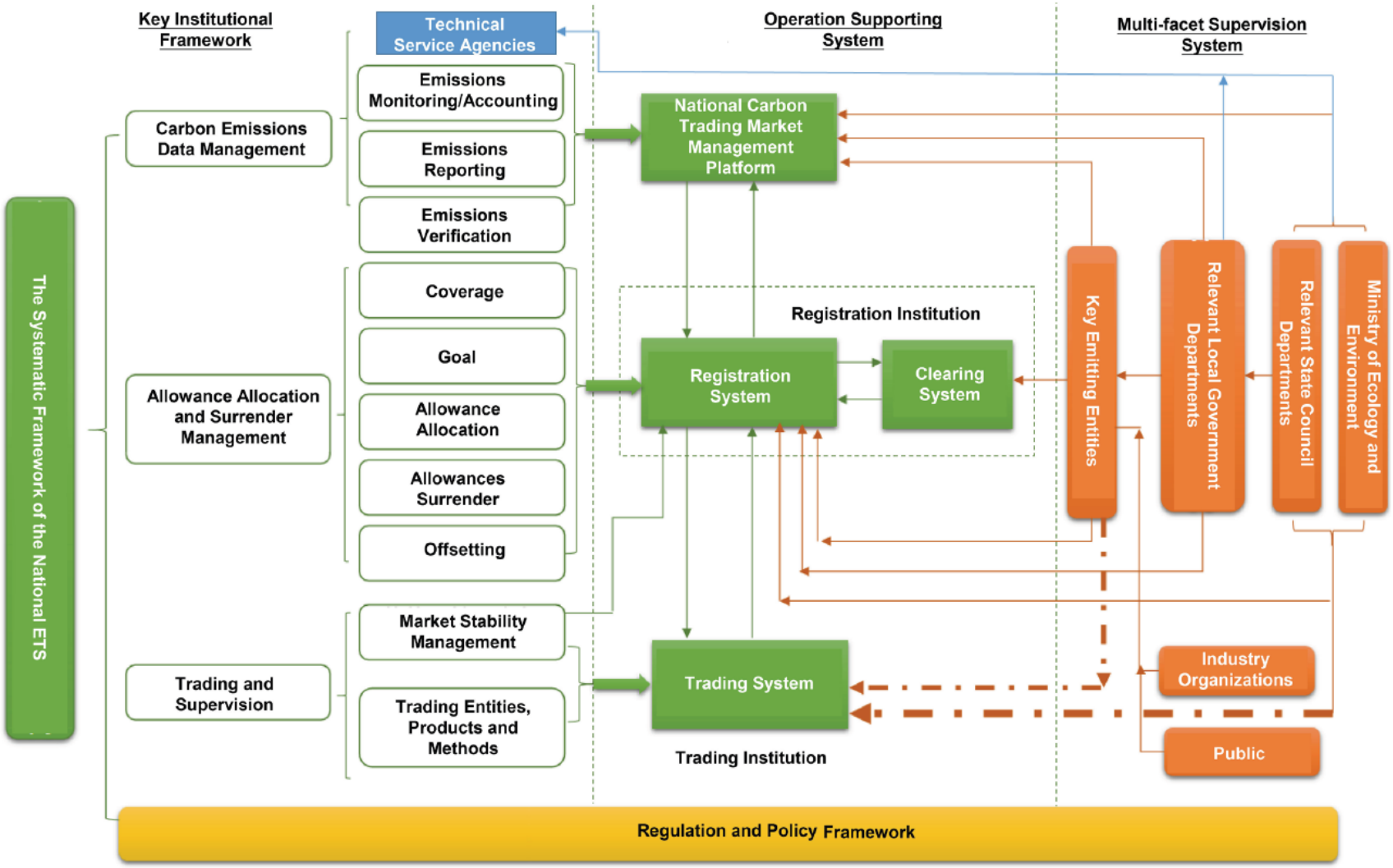


Figure 8: The systematic framework of the China National ETS

Source: MEE of the People's Republic of China, 2024

As shown in the architecture diagram, the framework is structured around four key pillars:

1. **A key institutional framework:** This pillar defines the core policy and management functions, including data management, allowance allocation, and overall trading supervision.
2. **An operation supporting system:** This represents the technical backbone of the market, encompassing the National Carbon Trading Market Management Platform, the Registration System (and Clearing System), and the Trading System.
3. **A multi-facet supervision system:** This illustrates the multi-layered oversight structure, involving not only the core government regulators (MEE, relevant departments) but also industry organisations and the public.
4. **A regulation and policy framework:** This foundational pillar underpins the entire system, providing the legal authority and rules for all activities.

This comprehensive and integrated architecture ensures that all aspects of the market, from policy setting and MRV to trading and compliance, are interconnected and subject to a coherent governance structure. The following sections will delve into the specific operational details of these components.

2.7.2.3 Compliance and enforcement

The framework is designed to ensure the environmental integrity of the ETS through a rigorous, multi-stage compliance cycle and a stringent enforcement regime with significant penalties for non-compliance and misconduct.

- **Compliance obligations:** Covered entities, primarily those with annual direct emissions reaching 26,000 metric tons of CO_2 equivalent, must follow a strict compliance cycle. This includes implementing robust monitoring plans, submitting annual emissions reports that are verified by an accredited third-party institution, and ultimately surrendering a sufficient number of allowances to cover their total verified emissions for the preceding year.
- **Market conduct:** The Interim Regulations explicitly prohibit all forms of market abuse. This includes insider trading, the dissemination of false or misleading information, and market manipulation tactics such as spoofing (placing bids with the intent to cancel) or wash trades (self-trading to create a false impression of market activity).
- **Penalties and sanctions:** Non-compliance and misconduct are met with severe repercussions. For market manipulation, violators face fines of one to ten times their illicit profits, or a fine of between 500,000 and 5,000,000 CNY if there are no illegal gains. Accountability extends directly to individuals, as responsible managers and other personnel at a sanctioned entity can receive personal fines. Furthermore, to prevent conflicts of interest, all personnel associated with the MEE, the trading and registration institutions, and affiliated verification bodies are explicitly forbidden from holding or trading carbon emission allowances.

2.7.2.4 Governance features

Several key governance principles are embedded in the system's design to ensure its adaptability, transparency, and long-term effectiveness in achieving China's climate goals.

- **Centralised governance:** A core feature is the unified national system under the MEE's authority. This approach was deliberately chosen over a fragmented, inter-linked system to ensure consistent standards, prevent regulatory arbitrage between regions, and enhance the efficiency of national oversight, learning directly from the varied experiences of the pilot phase.
- **Systematic monitoring and evaluation:** The framework includes a mandate for continuous improvement. The MEE conducts annual assessments of the carbon market's operational status, evaluating key performance indicators such as market liquidity, price formation efficiency, compliance rates, and actual emission reduction outcomes. This feedback loop is used to systematically review and refine market design and policies.
- **Information disclosure and transparency:** The SEEE is required to ensure a high degree of market transparency. This is achieved through the systematic daily publication of key trading information, including price movements, transaction volumes, and market dynamics, thereby empowering participants with reliable data and fostering public confidence in the market's integrity.
- **Phased sectoral expansion:** The market is designed for gradual and systematic expansion. The inclusion of new industrial sectors is guided by a clear methodology that prioritises industries based on specific criteria, including the scale of their emissions, their technical decarbonisation potential, the quality and verifiability of their data, and the maturity of their emissions accounting methods.

2.7.3 Operation and infrastructure aspects

The operational architecture of the China ETS is built upon a sophisticated dual-hub model designed to ensure efficiency, security, and transparency across the national market. Under this arrangement, SEEE operates the centralised trading system, while CCERC in Wuhan manages the national registry. The seamless, real-time integration of these two centres is crucial for the integrity of all transactions, from trade execution to final settlement.

2.7.3.1 Trading modes

All transactions in the China ETS are conducted exclusively through the national trading system operated by the SEEE, which supports several distinct trading mechanisms tailored to different market needs. The primary products traded are carbon emission allowances and China Certified Emission Reductions (CCERs).

- **Agreement transaction:** This is the most common trading mode and is divided into two types to accommodate different trade sizes and objectives:
    - **Listed agreement transaction:** Used for routine, smaller-volume secondary market trading. Orders are submitted to the system for negotiation and confirmation by a counterparty, with a maximum order size of less than 100,000

tonnes and a trading price that must remain within a ±10% fluctuation limit from the previous day's closing price.

- **Bulk agreement transaction:** Designed for large-volume trades negotiated directly between two parties. It requires a minimum order size of 100,000 tonnes and allows for a wider ±30% price fluctuation limit, providing greater flexibility for significant transactions.

- **One-way bidding:** This mechanism allows a single seller to offer a large volume of allowances, with multiple buyers submitting competitive quotes. It serves as an efficient method for executing large sales and is being developed as a potential framework for future government allowance auctions.

The market operates on a T+1 basis, meaning allowances purchased on a given trading day (T) cannot be resold until the following trading day (T+1).

The following table summarises the key operational parameters for each trading mechanism.

Table 2: Comparison of trading mechanisms in China's ETS

Feature	Listed Agreement Transaction	Bulk Agreement Transaction	One-Way Bidding
Primary Use	Routine secondary market trading	Large-volume trades are negotiated directly between parties	Large sales and a potential method for allowance allocation in the future
Order Size	Maximum of 100,000 tonnes	Minimum of 100,000 tonnes	Varies based on the seller's application
Price Fluctuation Limit	±10% from the previous day's closing price	±30% from the previous day's closing price	Determined by bidding process (uniform or bid price)
Execution	Order submitted to the system for negotiation and confirmation by a counterparty	Parties directly negotiate and confirm the price and volume via the system	A seller initiates a bid, and multiple buyers submit quotes to be finalised

Source: Compiled by the Consultant

2.7.3.2 Registry and settlement

The integrity of allowance ownership and the security of all transactions are underpinned by a centralised registry and a robust settlement process that eliminates counterparty risk.

- **Centralised registry:** The CCERC operates the unified national registry, which serves as the definitive legal ledger for all allowances. It employs a strict real-name registration system and provides a comprehensive audit trail for the issuance, holding, transfer, and surrender of every unit. The seamless, real-time data synchronisation between the registry in Wuhan and the trading platform in Shanghai is critical for preventing double-counting and ensuring that only available allowances are traded.

- **Clearing and settlement:** The entire process is built on the fundamental principle of DVP, which guarantees that the transfer of allowances only occurs if and when the corresponding payment is made.
    - The system uses a gross settlement methodology, where each transaction is cleared and settled individually rather than being netted at the end of the day.
    - While clearing calculations are performed at the close of the trading day (T), the final, irrevocable settlement of both funds and allowances follows a T+1 cycle, with delivery completed on the next business day.
    - Qualified commercial banks act as designated settlement banks, holding participants' funds in secure, dedicated accounts managed by the registration institution.

2.7.3.3 Oversight and risk management

A multi-layered risk management framework is embedded within the market's operations to protect integrity, ensure stability, and prevent misconduct. Oversight is primarily conducted by the SEEE, with ultimate authority resting with the MEE.

- **Embedded risk controls:** The trading system has several built-in controls as a first line of defence. These include the hard price fluctuation limits (±10% and ±30%) on agreement transactions and maximum order size limits.
- **Market surveillance:** A cornerstone of the framework is proactive surveillance. The SEEE employs an electronic monitoring system to automatically detect anomalous trading behaviours, such as large-scale self-trading (wash trades), layering or spoofing tactics designed to manipulate prices, and other patterns indicative of market abuse.
- **Large trader reporting:** Participants whose holdings of allowances reach a specified threshold are required to submit a report to the trading institution, allowing regulators to monitor for potential market concentration.
- **Tiered enforcement:** When potential misconduct is flagged, the SEEE is empowered to deploy a tiered set of enforcement actions. Initial responses may include informal reminders or formal requests for information. If the activity persists or is deemed more severe, the institution can escalate its response to include issuing public warnings, restricting transfers, or, in the most serious cases, freezing a participant's accounts and assets.

2.7.3.4 Market stability mechanisms

In addition to real-time risk controls, the China ETS includes several mechanisms designed to manage broader market stability and contain costs, addressing both short-term volatility and longer-term supply-demand imbalances.

- **Price fluctuation limits:** The daily trading bands serve not only as a risk management tool but also as a key mechanism for ensuring short-term market stability by preventing excessive price swings.

- **Compliance flexibility (offsets):** The system allows regulated entities to use China CCERs to fulfil up to 5% of their compliance obligations. These offsets, sourced from approved domestic projects like renewable energy or forestry, act as a cost-containment measure by providing an alternative, often lower-cost, source of compliance units.
- **Allowance banking:** To provide temporal flexibility, the MEE introduced allowance banking provisions in 2024. These rules permit entities with a surplus to carry forward unused allowances to future compliance years, which helps to smooth prices over time, enhance market liquidity, and alleviate compliance pressure for entities facing deficits.
- **Strategic reserve (planned):** Looking forward, authorities are developing a strategic allowance reserve. This would function as a macro-control instrument, allowing the MEE to intervene in the market, likely by auctioning supplementary allowances, during periods of extreme scarcity or sharp, sustained price surges to ensure long-term stability.

2.7.4 Lessons learned for the operational model for the CTX in Vietnam

Based on China's experience in developing the world's largest carbon market, from its early pilot phase to its current national operation, several critical lessons can be drawn for the design and implementation of Vietnam's CTX. While Vietnam's context differs, China's pragmatic approach provides a valuable regional blueprint. The following lessons are particularly relevant for the design and implementation of the CTX.

2.7.4.1 A strong, multi-level legal foundation is crucial

China's success is anchored in a robust legal hierarchy, evolving from ministry-level rules to a high-level State Council regulation. This provided the necessary authority to unify standards and enforce compliance.

Vietnam is on a similar path, having established the foundation consisting of Decree 06/2022/ND-CP with its amendment Decree 119/2025/ND-CP and now developing a specific Decree for the CTX. The lesson is to see the Draft Decree not as the final step, but as a critical primary regulation. It must be followed by detailed supporting Circulars that outline specific operational standards for the exchange, from membership qualifications and trading rules to risk management protocols, creating a comprehensive and enforceable legal framework.

2.7.4.2 A centralised market architecture validates Vietnam's chosen path

China deliberately shifted from fragmented regional pilots to a unified national system with a single trading platform (SEEE) and a single registry (CCERC). This was crucial for creating a liquid market with a consistent price signal.

Vietnam's proposed model, which designates HNX as the single trading platform and VSDC for settlement, connected to a single NRS, follows this same centralised principle. China's success validates Vietnam's chosen path. The actionable lesson is to fully commit to this centralised model by ensuring robust, seamless technical and legal integration between the designated institutions. A binding Service-Level Agreement (SLA) between MAE, HNX, and VSDC is essential to guarantee the data integrity and operational reliability that makes a centralised model effective.

2.7.4.3 A flexible, intensity-based cap is suitable for a growing economy

China's use of a rate-based (intensity-based) cap, where allowances are tied to production output, offers a model for balancing economic growth with climate goals. This flexible cap allows for economic output to grow without automatically breaching the emissions limit.

As a developing economy with strong growth targets, Vietnam faces the same challenge of avoiding overly rigid emissions caps that could stifle industry. For the pilot phase and potentially beyond, Vietnam should seriously consider adopting an intensity-based allocation methodology similar to China's. This approach, which functions as a tradable performance standard, would be well-suited to Vietnam's economic context and would align environmental objectives with industrial development.

2.7.4.4 A pragmatic approach to initial price discovery

A unique and pragmatic lesson from China is the role government agencies played in facilitating initial price formation. By hosting pre-launch negotiations with key state-owned enterprises, authorities helped establish a consensus on an initial price, which provided a stable floor for the market's opening.

Vietnam's pilot market will be thin, illiquid, and will lack a natural price discovery mechanism at the start. This creates a high risk of extreme price volatility or a market with no trades at all. MOF and MAE could adopt a similar "hands-on" approach. It is recommended to host a facilitated, non-binding dialogue between the key entities participating in the pilot (especially large SOEs) to build consensus on a reasonable starting price range before trading officially begins. This pragmatic step can ensure a stable launch and build early market confidence.

2.7.4.5 A state-affiliated exchange model ensures policy alignment

China's trading platform (SEEE) operates as a state-affiliated entity, prioritising national climate objectives over pure profit maximisation. This ensures strong policy alignment and operational stability.

Vietnam's proposed model, using the state-owned HNX and VSDC, perfectly mirrors this approach. The lesson from China is that this is the correct institutional model for Vietnam's context. The actionable part is to ensure these state-affiliated bodies are given clear policy mandates and adequate resources, recognising their role is not purely commercial but is also to serve national climate objectives. This reinforces the need for strong and sustained political and institutional support.

2.8 Synthesis of international experiences and key lessons for Vietnam

The detailed review of the six international ETSs in the preceding sections provides a wealth of experience relevant to the development of Vietnam's CTX. While each system is tailored to its specific national or regional context, a comparative analysis reveals convergent themes and best practices that are critical for designing an effective and credible carbon market.

To facilitate a clear, side-by-side comparison of the operational architectures of these systems, the table below summarises their key features.

The following table consolidates the most critical lessons, both positive blueprints and cautionary tales, from each jurisdiction. For every lesson, it provides a direct rationale explaining its specific relevance to Vietnam's current context and proposes a concrete, actionable implication to inform the design of the CTX.

Table 3: Summary of lessons drawn from international ETS models and their applicability for Vietnam

ETS model	Key lesson learned	Rationale / direct relevance to Vietnam	Specific, actionable implications for Vietnam
UK ETS	Leverage existing financial infrastructure for rapid and cost-effective deployment.	Vietnam's strategy to use the HNX and VSDC aligns perfectly with this best practice, avoiding the high costs and long timelines of building new systems from scratch.	Formalise the institutional mapping: Vietnam should explicitly assign market supervision to the SSC, trading/auctioning functions to HNX, and clearing/settlement to VSDC.
	Formalise inter-agency coordination from the outset to prevent governance gaps.	Vietnam's dual-ministry governance model (MAE and MOF) creates a high risk of regulatory overlap or gaps without a clear protocol.	Establish a binding Inter-agency Coordination Protocol to define decision-making hierarchies and joint enforcement procedures.
EU ETS	(Cautionary Tale) Over-allocation in the pilot phase due to poor baseline data leads to price collapse and erodes market credibility.	Vietnam's pilot will rely on newly collected enterprise data, which carries a high risk of being incomplete or inaccurate, mirroring the EU's initial challenge.	Embed a "conservative correction factor" into the initial allocation methodology and mandate a formal data verification period before the first compliance cycle is finalised.
	Automatic, rules-based market stability mechanisms (like the MSR) are crucial for long-term price stability and supply management.	While an MSR is complex for a pilot, the principle of having a pre-defined tool to manage volatility is critical for building market confidence.	Integrate simpler stability tools from the start: The framework should include provisions for an Auction Reserve Price (ARP) and a Cost Containment Mechanism (CCM) to create a predictable price corridor.
NZ ETS	(Cautionary Tale) An unrestricted supply of offsets (especially from forestry) can saturate the market and suppress the carbon price, undermining industrial abatement efforts.	Vietnam's legal framework allows for a high offset usage limit (up to 30%), creating a similar risk of market saturation by potentially low-cost credits.	Prioritise offset quality over quantity: MAE must issue stringent technical guidelines for offset eligibility (covering additionality, permanence, etc.) before allowing them for compliance use on the CTX.

California ETS	Proactively manage market concentration risk by imposing quantifiable holding limits to prevent manipulation by large entities.	Vietnam's pilot market will be small and potentially dominated by a few large State-Owned Enterprises (SOEs), creating a high risk of market concentration.	Define quantifiable holding limits within the CTX operational regulations for all participant types to ensure fair market access and prevent hoarding.
	Build trust through independent oversight and proactive data transparency via public platforms.	Enhancing credibility beyond government bodies is key to building public and investor confidence in a new market.	Establish an independent Technical Advisory Committee to provide impartial analysis and create a public data dashboard showing prices, volumes, and compliance status.
K-ETS	The value of a mandatory, preparatory MRV phase (via the Target Management System) before the ETS launch is to ensure data quality and build enterprise capacity.	Vietnamese enterprises are new to GHG accounting, and the initial data quality is a significant risk to the credibility of the pilot phase.	Treat the pilot phase as an "MRV Perfection Phase": The primary objective should be to establish a reliable emissions baseline and build enterprise capacity, rather than focusing on high trading volumes.
China ETS	An intensity-based allocation model (tCO2 per unit of production) is highly suitable for growing economies, balancing climate goals with economic development.	As a developing economy with strong growth targets, Vietnam faces a similar challenge of avoiding overly rigid caps that could stifle industrial output.	Seriously consider adopting an intensity-based allocation methodology for key industrial sectors to provide flexibility and align environmental policy with economic reality.
	A pragmatic, government-facilitated approach to initial price discovery can ensure a stable market launch in a thin, illiquid market.	Vietnam's pilot market will lack a natural price discovery mechanism at the start, creating a high risk of extreme volatility or no trading at all.	Host a facilitated, non-binding dialogue between MAE, MOF, and key pilot entities to build consensus on a reasonable starting price range before trading officially begins.

Source: Compiled by the Consultant

As the table demonstrates, a successful strategy for Vietnam will not come from adopting a single international model, but rather from creating a hybrid system that selectively integrates these proven solutions. The lessons provide a clear, evidence-based foundation for the detailed assessment of Vietnam's national context and the specific provisions of the Draft Decree that will be undertaken in the subsequent sections of this report.

3 ASSESSMENT OF THE NATIONAL CONTEXT AND RELEVANT FRAMEWORKS

To effectively apply the lessons from international experience, it is essential to first ground the analysis in Vietnam's specific national context. This section provides that assessment by examining the two foundational pillars upon which the CTX will be built: (1) the existing operational model of the national securities market, and (2) the legal and institutional framework for the domestic carbon market.

An in-depth analysis of the securities market is critical, as the national strategy, reinforced by the Draft Decree, is to leverage this proven infrastructure for the CTX. Similarly, understanding the current carbon market framework is necessary to identify the legal mandates and institutional roles already in place. This foundational assessment will provide the domestic context required for an analysis of the model proposed in the Draft Decree in the subsequent section.

3.1 Assessment of the national securities market operational model

3.1.1 Leveraging the national securities market for the CTX model

The decision to designate HNX and VSDC as the primary operators of the CTX is a strategic measure that leverages Vietnam's established financial market infrastructure. This approach provides significant advantages, including accelerating the implementation timeline, reducing initial investment costs, and mitigating operational risks by building upon a mature regulatory and technical foundation developed over two decades.

However, realising the full potential of this model requires a detailed analysis to identify which components of the securities market framework can be directly inherited and which require significant adaptation to address the unique characteristics of a compliance-driven carbon market. The following assessment provides this analysis, focusing on the legal framework, operational infrastructure, and supervisory mechanisms to offer recommendations for a successful transition from inheritance to adaptation.

The institutional arrangements of the stock exchange in Vietnam are presented in the figure below:

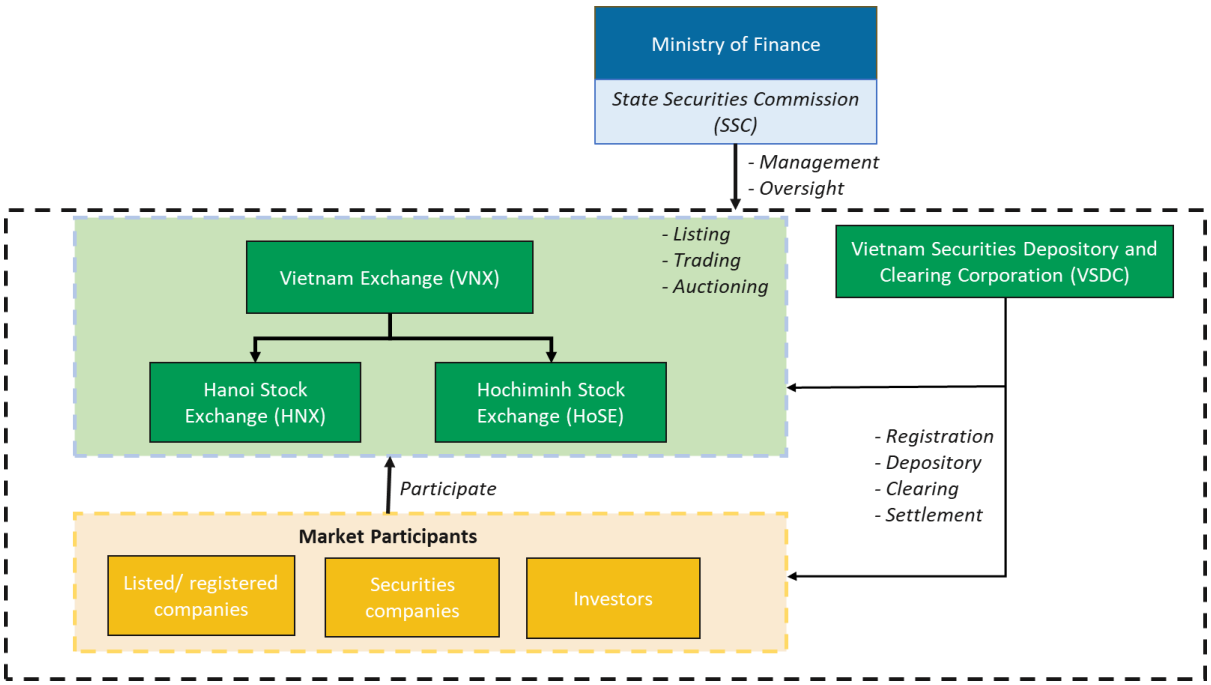


Figure 9: Institutional arrangements of the stock exchange in Vietnam

Source: CTX Phase 1 – Second Milestone Report, ETP/UNOPS (2024)

The following figure shows the infrastructure requirements for the stock exchange in Vietnam and its operational flow.

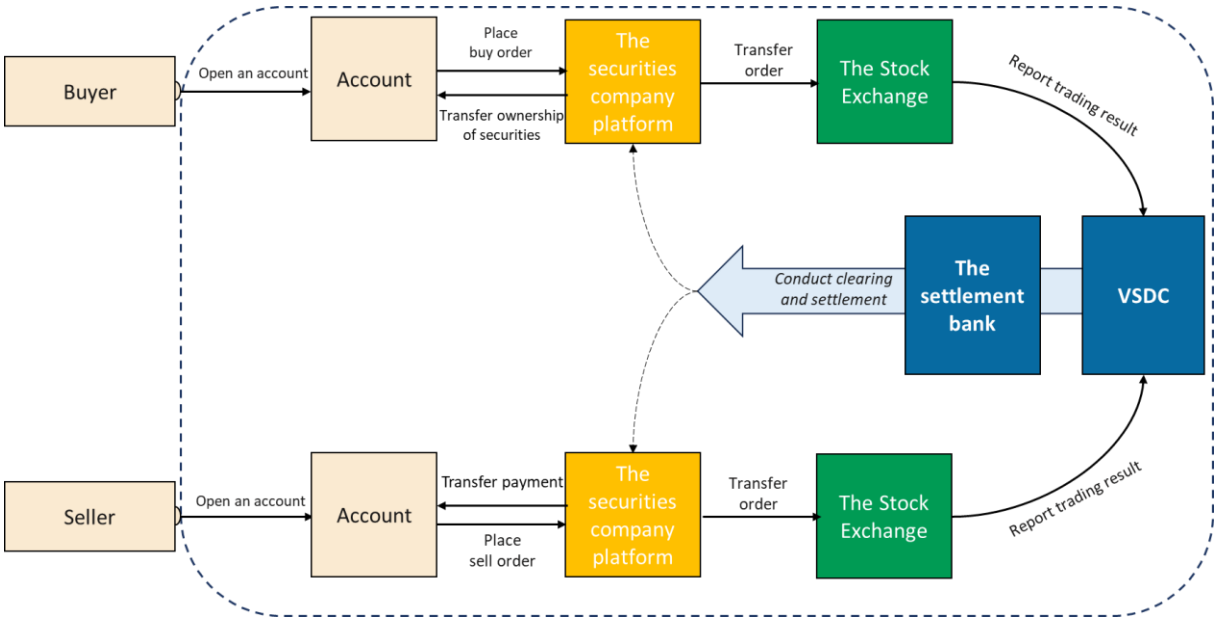


Figure 10: Infrastructure requirements of the stock exchange in Vietnam

Source: CTX Phase 1 – Second Milestone Report, ETP/UNOPS (2024)

3.1.2 Legal and institutional framework

The legal and institutional framework governing Vietnam's securities market provides a highly valuable and proven model for the CTX. This framework is built upon a comprehensive legal

hierarchy, anchored by the Law on Securities, which codifies core principles of transparency, fairness, and investor protection. Supporting decrees and circulars have standardised key operational processes, from listing and trading to clearing and settlement, creating a predictable and reliable environment for market participants.

Institutionally, the model is characterised by a clear demarcation of responsibilities among specialised entities. SSC provides state management and oversight; the stock exchanges organise and operate the trading markets; and the VSDC manages all post-trade infrastructure, including depository, clearing, and settlement services. This specialised structure allows the CTX to leverage the distinct capabilities of each institution:

- HNX's extensive experience in operating markets for diverse financial products, and
- VSDC's critical function is in managing settlement risk and ensuring transactional integrity through the DVP principle. This entire framework forms a solid foundation for the governance and operation of the CTX.

3.1.3 Supervision, risk management, and violation handling

The securities market provides a mature framework for supervision and risk management, encompassing transaction surveillance, operational resilience, and enforcement. While this framework is a critical asset for the CTX, it requires adaptation to address the specific risk profile of a carbon market.

Key inherited mechanisms include:

- **Market integrity and surveillance:** The principles of mandatory information disclosure and the proven transaction surveillance capabilities of the SSC and HNX are foundational for ensuring market integrity. However, the focus of this surveillance must be calibrated from monitoring speculative financial trading to identifying behaviours unique to a compliance market, such as the potential for strategic withholding of allowances to influence prices.
- **Operational resilience and risk mitigation:** Valuable lessons from past operational incidents, such as trading system overloads and cybersecurity events, have led to strengthened protocols for system capacity and security, providing a more resilient infrastructure for the CTX. Likewise, VSDC's established mechanisms for managing settlement risk, including the Clearing Fund and Settlement Support Fund, offer a proven model to protect the CTX from counterparty defaults.
- **Enforcement framework:** The existing administrative sanctions regime offers a strong legal basis for enforcement. For the CTX, effective violation handling will necessitate a coordinated approach, requiring a formal inter-agency protocol to manage cases that may involve both market conduct violations (under the SSC's purview) and issues related to the integrity of carbon units (under MAE's purview).

3.1.4 Conclusion and identified adaptation gaps

In conclusion, Vietnam's securities market operational model provides an invaluable legal foundation, technical infrastructure, and supervisory experience for the establishment of the CTX.

However, a direct replication of this model is not feasible due to the fundamental differences between a financial market and an environmental compliance market.

The assessment has highlighted several critical gaps and points of adaptation that must be addressed, including:

- **The nature of the asset:** The distinction between a regulatory instrument (carbon unit) and a financial instrument (security).
- **Dependency on an external system:** The necessity of integrating with and synchronising with the National Registry System (NRS) as the root ledger.
- **Requirement for specific functionalities:** The need to develop entirely new, ETS-specific functions (e.g., surrendering, banking, and borrowing allowances).
- **Market dynamics and behaviour:** The difference in participant motivation (compliance-driven vs. investment-driven) requires a tailored approach to supervision and liquidity enhancement.

These structural gaps and their potential impacts will be analysed in further detail in Section 5 on gap analysis and challenges.

3.2 Legal and institutional framework for the carbon market and the CTX in Vietnam

3.2.1 Legal foundation and ongoing refinement

The development of a domestic carbon market is a cornerstone of Vietnam's national strategy to achieve net zero emissions by 2050. This goal is anchored in the Law on Environmental Protection No. 72/2020/QH14, issued by the National Assembly on 17 November 2020, which mandates the creation of a domestic carbon market to help meet the country's climate targets in a cost-efficient manner.

The legal framework has been built through a progressive sequence of regulations that add increasing operational detail:

- **Decree No. 06/2022/ND-CP**, issued by the Government on 7 January 2022, on mitigation of GHG emissions and protection of the Ozone Layer. This foundational decree provided the first detailed roadmap for the market's development, setting the initial strategic direction and timeline.
- **Decree No. 119/2025/ND-CP**, issued by the Government on 9 June 2025, amending and supplementing Decree No. 06/2022/ND-CP. This crucial amendment marks the transition from a conceptual phase to operational readiness. It formalises the core market infrastructure, defines the roles of the CTX and the NRS, and establishes detailed provisions for the pilot phase. Key provisions include:
    - **Initial sector coverage:** Targets high-emitting sectors, including thermal power, cement, and steel, for the pilot phase with around 150 entities.

- **Compliance flexibility:** Allows entities to use domestic offsets for up to 30% of their obligation and to borrow up to 15% of their allocated allowances within a compliance cycle.
- **Offsetting framework:** Grants MAE the authority to approve domestic offset methodologies, establishing the basis for a national pipeline of credit-generating projects.

Collectively, this progression of legal instruments, including the recently drafted Government Decree on the establishment and operation of the domestic carbon trade exchange (for which a first draft was made public for consultation on 27 March 2025), has continued to evolve. Subsequent revisions have created a multi-layered and increasingly specific regulatory foundation, providing essential clarity for regulators and market participants ahead of the pilot's launch.

3.2.2 Implementation roadmap

The national roadmap for the carbon market adopts a prudent, two-phase approach, ensuring a methodical transition from foundational work to full-scale operation. This strategy allows for systematic testing, capacity development, and refinement based on practical experience.

Phased implementation roadmap

- **Phase 1: Pilot implementation (through 2028):** This initial phase focuses on building core infrastructure, including the establishment and operation of the NRS. Its scope will be limited to select high-emitting sectors to test market mechanisms on a manageable scale. This phase will be complemented by extensive capacity building for both participating enterprises and relevant government agencies.
- **Phase 2: Full operation (from 2029):** Following a comprehensive assessment of the pilot, the market is scheduled to transition to full operation. Key activities will include launching allowance auctioning mechanisms, finalising the legal framework, expanding participation to additional sectors, and exploring opportunities for international market linkages.

3.2.3 Institutional arrangement

The national roadmap, as detailed in Decision No. 232/QD-TTg, establishes a coordinated institutional architecture designed to leverage the specialised expertise of key government ministries, market operators, and other stakeholders. The framework creates a clear division of responsibilities to ensure both the market's environmental integrity and its financial stability.

- **MAE:** Designated as the principal regulatory authority, MAE is responsible for the market's overall environmental integrity. Its core functions include managing the NRS, setting the technical standards for carbon units, developing allocation plans, and approving domestic carbon crediting projects and methodologies.
- **MOF:** Acting through SSC, MOF serves as the lead authority for financial governance and trading oversight. Its responsibilities include supervising market conduct on the CTX, preventing misconduct such as market manipulation, and safeguarding the integrity of all trading operations to ensure a fair and transparent market.

- **Market operators:** The technical operation of the exchange is delegated to established market institutions, thereby leveraging existing infrastructure and deep operational experience. HNX will operate the trading platform, while the VSDC will manage all depository and transaction settlement functions.
- **Line ministries:** The framework is further supported by line ministries, such as MOIT and the Ministry of Construction. These ministries are responsible for developing the crucial sector-specific MRV guidelines that are essential for establishing emission baselines and ensuring accurate data collection within their respective industries.
- **Market participants:** The governing and operational architecture is completed by the active roles of market participants. The broader ecosystem includes:
    - **Regulated installations:** As the core compliance entities, these participants must manage their obligations by making strategic decisions on whether to invest in internal emissions reduction or to utilise the CTX to purchase necessary allowances or credits.
    - **Investors and intermediaries:** This group, including brokerage firms that provide market access, is essential for enhancing market liquidity and promoting investment.
    - **Verification bodies:** These accredited third-party entities play a critical role in ensuring the integrity and accuracy of emissions data.
    - **Project developers:** This group will generate the supply of domestic carbon credits by developing and implementing offset projects, contributing to investment in low-carbon technologies.

The success of this multi-pillared architecture will depend on robust coordination between all entities, particularly between MAE and MOF, to ensure harmonised policy and effective market management.

3.2.4 Conclusion and implementation challenges

The legal and institutional framework for Vietnam's carbon market, built upon the Law on Environmental Protection and subsequent Decrees, has established a robust foundation and a clear roadmap for the pilot and operational phases of the CTX. However, the successful implementation of the pilot phase hinges on proactively managing key strategic and operational challenges.

This review has revealed several primary challenges and potential risks that must be addressed, including:

- **Legal and asset readiness risks:** The ambiguity in the legal definition of a carbon unit and the dependency on the timely allocation of allowances by MAE.
- **System integrity and interoperability risks:** The CTX's complete reliance on data from the NRS necessitates a stringent technical assurance mechanism.
- **Market liquidity risks:** The pilot phase design, which includes 100% free allocation and high compliance flexibility, may reduce the immediate pressure to trade.

- **Coordinated supervision challenges:** The functional distribution of oversight between different authorities requires a formal coordination protocol to be effective.

These challenges and their multifaceted impacts on the success of the pilot phase will be analysed in detail in Section 5 on gap analysis and challenges.

4 THE CTX OPERATIONAL MODEL PROPOSED IN THE LATEST DRAFT DECREE

The operational model for the CTX pilot phase, analysed in detail in this section, is based on the framework established in the current Draft Decree on the Domestic Carbon Trade Exchange (as of July 2025), which was developed by the MOF.

This decree outlines a sophisticated framework that strategically leverages Vietnam's existing financial market institutions, an efficient approach with the potential to accelerate implementation, which also aligns with the core recommendation made in Phase 1 of this project.

The purpose of this section, therefore, is to provide a clear and objective overview of this proposed model. It will detail the governance framework, operational procedures, and institutional roles as outlined in the Draft Decree. This overview will establish a crucial baseline, presenting the "as-is" regulatory proposal that will then be subject to in-depth analysis in the subsequent sections of this report.

4.1 Governance and infrastructure framework

The proposed operational model for the CTX pilot establishes a framework that strategically leverages Vietnam's existing financial market institutions. It is built upon a hybrid governance structure and an integrated technical architecture designed to ensure both environmental integrity and financial market stability. This integrated infrastructure underpins the operational framework, enabling centralised management, transparent trading, and secure settlement of carbon units.

4.1.1 Governance and regulatory oversight

The framework in the Draft Decree establishes a clear dual-governance structure, distributing responsibilities between the environmental and financial authorities to ensure comprehensive oversight.

- **MAE:** Positioned as the primary market regulator, MAE is responsible for the overall management and environmental integrity of the carbon market. The Draft Decree grants MAE ultimate authority over market stability, including the power to temporarily suspend trading activities and to lead the supervision of market conduct.
- **MOF (the financial governance authority):** While the Draft Decree broadly assigns financial governance to the MOF, it is crucial to clarify the distinct yet coordinated functional roles of the specialised departments within MOF. The successful implementation of the CTX will depend on this internal coordination:
    - **SSC:** As the core market supervisor operating under MOF, SSC would be responsible for the day-to-day financial integrity of the CTX. Its functions would

include overseeing the operational regulations of HNX and VSDC, conducting real-time surveillance to prevent market manipulation, and enforcing rules against trading members.

- **Legal Department:** As the primary drafter, this department's ongoing role is to lead the finalisation of the Draft Decree and develop future guiding circulars, ensuring the entire legal architecture for the CTX is robust and consistent.

4.1.2 Operational and technical architecture

The model's technical architecture is modular and strategically integrated, following a clear sequence from asset registration to trading and settlement. Operational responsibilities are clearly delegated to seasoned market operators.

The process begins with the NRS, managed by MAE, which serves as the definitive master ledger where carbon units are first registered and issued a domestic code. These validated units are then deposited into the VSDC's system, making them eligible for secure trading on the HNX platform. This flow, with the NRS as the ultimate source of truth, is fundamental to maintaining market integrity.

Specific operational roles are assigned as follows:

- **HNX:** Operating under the supervision of the Vietnam Exchange (VNX), the HNX is responsible for building and operating the trading system for carbon units.
- **VSDC:** The VSDC is assigned the critical roles of managing the depository and settlement systems for carbon units that have been transferred from the NRS.
- **Securities companies:** These firms will act as intermediaries, providing market access for participants by becoming carbon trading and depository members of the exchange.

This integrated infrastructure underpins the operational framework of the CTX, enabling centralised management, transparent trading, and secure settlement of carbon assets, as visually represented in the figure below.

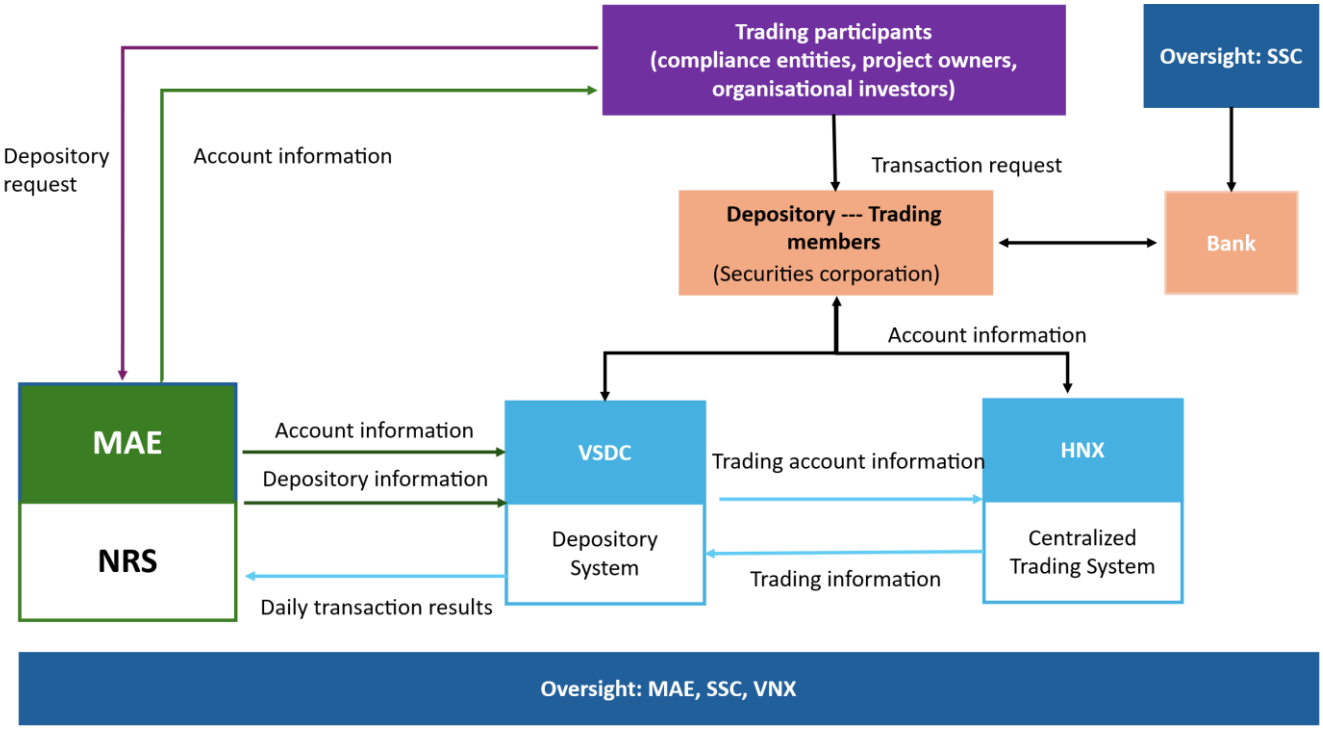


Figure 11: Proposed operational model for the CTX pilot in Vietnam

Source: Elaborated by the Consultant based on the Draft Decree

4.2 Operational framework and procedures

The Draft Decree provides a detailed operational framework that logically adapts well-established securities market procedures for the CTX, defining a clear lifecycle for carbon units from depository through to final settlement.

4.2.1 Depository and ownership transfer

The framework establishes a clear two-stage process to make carbon units eligible for trading and to ensure the integrity of ownership records.

- **Registration on the NRS:** Carbon units must first be registered on the NRS, which is under the management of the MAE. This step validates the unit and assigns it a domestic code.
- **Depository at the VSDC:** To become eligible for trading, these registered units must then be deposited from the NRS into a designated account at VSDC.

The VSDC is responsible for managing all depository functions for these traded units. Following settlement, it executes the final ownership transfer and is required to report these changes back to MAE daily. This ensures the NRS is continuously updated and remains the definitive master ledger.

4.2.2 Trading procedures

Trading procedures are built on a core principle of pre-validation to ensure market integrity, as mandated by Article 15 of the Draft Decree.

Participants must have sufficient funds or carbon units in their accounts before placing an order. All transactions will be executed on the HNX platform through securities companies acting as

trading members. These members are responsible for ensuring the validity of their clients' orders before they are sent to the exchange. After a trade is matched, the HNX provides the results to the VSDC to initiate the settlement process.

4.2.3 Clearing and settlement

The model for clearing and settlement, detailed in Article 16 of the Draft Decree, is highly specific and designed to minimise risk during the pilot phase.

- **Settlement method:** The VSDC will conduct settlement on a real-time gross settlement (RTGS) basis, meaning each transaction is settled individually and immediately upon execution.
- **Core principle:** The process operates on a strict DVP principle, ensuring the simultaneous exchange of carbon units and funds.
- **CCP exclusion:** It is explicitly stated that a CCP mechanism will not be applied during the pilot phase.
- **Failure procedures:** The framework is strengthened by clear procedures for transaction cancellation in the event of a settlement failure, for example, due to insufficient funds or units in a participant's account.

4.3 Supervision and reporting framework

The Draft Decree establishes a comprehensive, multi-layered framework for supervision and reporting, which is essential for maintaining market integrity. A key feature of this framework is the designation of MAE as the primary market regulator, with a clear hierarchy of supervisory responsibilities distributed across the institutional structure.

4.3.1 Regulatory oversight structure

The decree establishes a clear division of top-level oversight responsibilities between the environmental and financial authorities, as detailed in article 33.

- **MAE:** As the primary market regulator, MAE holds top-level oversight. Its responsibilities include the primary supervision of trading activities to detect and handle market manipulation, ensuring the integrity of the carbon units being traded, and leading inspections of the market operators (HNX, VSDC).
- **SSC:** The role of the SSC is defined as one of coordination with MAE. It is responsible for providing official opinions on operational regulations and participating in joint inspections of the market operators.

4.3.2 Multi-layered market surveillance

This primary oversight is supported by multiple layers of market supervision performed by the operators and members.

- **Exchange-level surveillance:** VNX and HNX are responsible for conducting real-time transaction surveillance to detect unusual trading activity. VNX is required to report surveillance results directly to MAE.

- **Depository surveillance:** VSDC is responsible for supervising its depository members to ensure their compliance with all depository and settlement rules.
- **Member-level surveillance:** Trading members, such as securities companies, form the first line of supervision, with a duty to monitor their clients' transactions for compliance and report any suspicious activity.

4.3.3 Reporting and information disclosure

The framework is reinforced by a clear reporting and disclosure regime to ensure information flows efficiently to regulators and the public.

- **Regulatory reporting:** Article 31 mandates a clear upward flow of information. Market members must submit reports to the market operators (HNX and VSDC), who in turn submit periodic consolidated reports to MAE.
- **Public disclosure:** To ensure market transparency, Article 32 requires operators to publicly disclose key market information. This includes aggregate trading data as well as information on any violations committed by market members.

While the decree provides a strong framework for regulatory supervision and compliance monitoring, a dedicated monitoring and evaluation (M&E) system will be beneficial to assess the pilot's overall success against its strategic objectives.

4.4 Market stability and risk management framework

The Draft Decree establishes a robust framework for managing risk during the pilot phase, primarily by adapting proven mechanisms from the securities market to address operational, settlement, and conduct-related risks.

- **Settlement and counterparty risk management:** The framework provides strong measures for managing settlement and counterparty risk through a combination of real-time processing and clear failure procedures.
    - **RTGS:** As detailed in Article 16, the core mechanism is the use of RTGS combined with a strict DVP principle. This ensures that each transaction is settled individually and simultaneously, which effectively eliminates counterparty risk at the transaction level.
    - **Settlement failure procedures:** To manage settlement failures, Article 17 outlines a clear process for transaction cancellation if a party cannot meet its obligations, providing a reliable and immediate backstop.
- **Operational and conduct risk management:** The framework includes several layers of control to manage operational disruptions and member conduct.
    - **Market suspension authority:** Articles 29 and 30 grant MAE the authority to temporarily halt market activities in the event of major disruptions, such as technical failures or other force majeure events. This provides a critical safety switch to protect the market's integrity.

- **Member conduct and discipline:** VNX and VSDC have the power to suspend or terminate members for violations of market rules, as stipulated in Articles 20, 21, 24, and 25. This is reinforced by the requirement for public disclosure of member violations under Article 32, which enhances accountability.

While the framework is strong on managing operational and settlement risks, it does not yet include specific mechanisms for managing broader market price stability, such as price collars or an MSR. The introduction of such tools could be a key consideration for future development as the market matures beyond the pilot phase.

4.4.1 Comparative analysis with international ETSs

Following the detailed analysis of the proposed operational model for Vietnam's CTX, the table below provides a comparative overview of the key design features of the CTX pilot model against several established international ETSs.

Table 4: Comparative overview of key ETS operation features

Feature	EU ETS	UK ETS	California ETS	South Korea ETS	New Zealand ETS	China ETS	Vietnam CTX (proposed)
Primary governance body	European Commission & ESMA (financial)	UK ETS Authority & FCA (financial)	CARB (environmental agency)	MoE & MoEF	EPA & the ministry for the environment	MEE	MAE (environmental) & MOF/SSC (financial)
Legal nature of allowances	Financial instrument (under MiFID II)	Financial instrument	Regulated commodity	Regulated commodity/permit	Not a financial product	Traded commodity	Undefined
Trading platform	Existing financial exchange (EEX)	Existing financial exchange (ICE)	Auctions via WCI, Inc.; secondary via commodity exchanges	Existing financial exchange (KRX)	Auctions via NZX/EEX; secondary mainly OTC	Dedicated exchange (SEEE)	Existing financial exchange (HNX)
Settlement & clearing model	Mandatory CCP (via ECC), T+2	Mandatory CCP (via ICE Clear Europe), T+2	Optional CCP (for spot trades)	No mandatory CCP	No mandatory CCP	No CCP, T+1	No CCP, real-time gross settlement (RTGS)
Primary trading method	Auctions & continuous order matching	Auctions & continuous order matching	Auctions & secondary market	Auctions & secondary market	Auctions & OTC transactions	Negotiated transactions (listed & bulk)	Negotiated transactions (initially)
Market stability mechanisms	MSR (market stability reserve)	CCM, ARP	APCR, ARP	Price limits & govt. intervention;	CCR, ARP	Daily price fluctuation limits	None yet defined

				automatic mechanism planned			
Role of financial intermediaries	Fully integrated	Fully integrated	Regulated participation	Expanding participation (since 2024 reform)	Participation via OTC brokers	Not permitted in the initial phase	Permitted (as securities companies)

Source: Compiled by the Consultant

The comparative analysis reveals that Vietnam's proposed pilot model is a hybrid, adopting a cautious, phased approach while remaining open to future integration with more advanced market practices.

- **The cautious approach:** The decision to forgo a CCP and initially focus on negotiated transactions aligns with the controlled, compliance-focused model seen in the early phase of China's ETS. This approach prioritises simplicity and stability during the initial years of operation.
- **Future-ready positioning:** However, by permitting securities companies to act as financial intermediaries from the outset, Vietnam's model strategically positions itself for enhanced liquidity in the future, a feature common to mature markets like the EU and UK.

This benchmarking starkly highlights the strategic challenges, underscoring the need for a clear roadmap to evolve the market, starting with a simple and controlled model before progressively introducing more sophisticated mechanisms such as auctions, continuous trading, and market stability tools. Navigating this evolution is the core challenge that the recommendations in the following chapter will address.

5 ANALYSIS OF KEY GAPS AND STRATEGIC IMPLICATIONS FOR THE PROPOSED CTX PILOT MODEL IMPLEMENTATION

This section synthesises the critical issues identified in the updated analysis of the CTX pilot model, taking into account the improvements reflected in the latest draft of the Decree (as of July 2025) and drawing on new insights from international experiences. The analysis is structured thematically, covering foundational governance issues, market design, operational vulnerabilities, transparency gaps, and financial sustainability challenges. The focus is to identify causal links and potential second- and third-order impacts on the pilot's success and the long-term viability of Vietnam's carbon market. This section provides the core value addition of this report. It moves beyond describing the provisions of the Draft Decree to conduct an in-depth, critical analysis of the proposed model.

5.1 Foundational governance and legal gaps

5.1.1 Governance coordination

The current model establishes a framework where MAE and SSC approve regulations and receive incident reports. This creates a system of vertical coordination between the operators (VNX, HNX, VSDC) and the regulators, alongside horizontal coordination among the operators themselves. However, this model, which is based on consultation and general information exchange, presents several foundational gaps.

- **Identified gaps:** While the current mechanism facilitates general communication, it lacks the necessary formal structures for decisive action in critical situations. The key gaps include:
    - **Lack of a binding protocol:** There is no binding process for joint decision-making between the key ministries, which could lead to delays during a crisis.

    - **Absence of clear escalation procedures:** The model does not yet define clear, escalated procedures for handling specific crisis scenarios, such as major data discrepancies between the NRS and the CTX, significant cybersecurity incidents, or complex market manipulation cases that cross jurisdictional lines.

- **Lessons from international experience:** International precedents highlight the importance of robust coordination. In Korea's K-ETS, initial gaps in inter-ministerial coordination led to delays and difficulties in regulatory adjustments. In contrast, mature markets like the EU, UK, and California emphasise the need for a clear lead agency and predefined crisis response protocols to maintain market confidence during periods of stress.

Without a more formalised inter-agency protocol for joint surveillance and enforcement, the fragmented nature of supervision could weaken the ability of regulators to respond in a timely and effective manner, potentially eroding market confidence.

5.1.2 Legal nature of carbon units

While the Draft Decree defines a carbon unit as a tradable commodity, it does not yet provide a clear classification for the asset under Vietnam's civil, commercial, financial, and tax laws. This ambiguity creates uncertainty as to whether a unit should be treated as an administrative permit or a financial asset, leading to several key legal and commercial challenges.

- **Key legal and commercial uncertainties:** Without a clear legal definition, market participants face significant unanswered questions in several critical areas:
    - **Accounting:** How companies should classify the value of allowances on their balance sheets (e.g., as intangible assets, inventory, or financial instruments).
    - **Taxation:** Whether profits from trading are taxed as capital gains or ordinary income, and if VAT regulations apply.
    - **Collateral:** Whether allowances can be accepted by banks and financial institutions as collateral for loans or other financing arrangements.
    - **Insolvency:** How allowances are treated in the event of bankruptcy or liquidation, and whether they are considered recoverable assets.
    - **Operational Readiness:** This lack of a clear legal definition also creates significant operational challenges for HNX and VSDC. Providing official guidance on the asset's classification is crucial to resolving uncertainties regarding their business procedures, accounting standards, and tax treatment for transactions.
- **Lessons from international experience:** International markets demonstrate the importance of legal clarity. The EU ETS, for example, reclassified allowances as financial instruments under its MiFID II directive, which enhanced market safeguards and integration. In contrast, legal ambiguity in Korea's K-ETS has been cited as a factor limiting financial innovation and market liquidity.

Finalising the legal classification of carbon units is a crucial step to managing legal risks and providing the certainty needed to promote effective trading, investment, and compliance activities.

5.2 Market design and liquidity considerations

5.2.1 Mitigating the risk of structural illiquidity

The fundamental market dynamics of the CTX must be understood: it will initially be a compliance-driven market motivated by the needs of a limited number of regulated entities, rather than the broad-based investment interest that drives liquidity in the equities market. This requires a tailored approach to fostering liquidity.

Given this context, the current pilot design presents a significant risk of low market liquidity, driven by a combination of three key design features that reduce the incentive for active trading.

- **Key contributing factors:** International experience shows that when entities can easily meet their obligations without trading, market activity remains low. The pilot phase design includes several factors that may reduce the immediate pressure on entities to trade, creating a risk of low liquidity and potentially turning the CTX into a nominal exchange used only for minimal compliance purposes. The primary factors are:
    - **100% free allocation:** Providing all allowances to entities at no cost removes the initial need to purchase them.
    - **High compliance flexibility:** Allowing entities to borrow up to 15% of their future allowances and use domestic offsets for up to 30% of their compliance obligations provides multiple alternatives to trading on the exchange.
    - **Reliance on negotiated transactions:** The absence of a centralised matching platform can increase transaction costs and widen bid-ask spreads, which can further discourage active trading.
- **Potential impact:** This combination of factors can lead to a situation where entities passively hold allowances and fulfil their compliance obligations with minimal participation on the exchange. This would result in several negative consequences for the market:
    - **Low market liquidity:** Trading volumes may be minimal, hindering the development of a vibrant market.
    - **Weak price discovery:** Without sufficient trading activity, the market cannot produce a transparent and reliable price signal.
    - **Limited cost optimisation:** Entities have fewer opportunities to find the most cost-effective ways to meet their emissions targets.

Therefore, building a centralised trading platform and applying appropriate allocation rules in the future are key conditions for promoting the liquidity and efficiency of the carbon market.

5.2.2 Price discovery gap

A core function of any exchange is to aggregate supply and demand to produce transparent and reliable price signals. The current Draft Decree, however, does not yet include provisions for key mechanisms that facilitate this process.

- **Key missing provisions:** The framework currently lacks specific regulations for:

    - **Continuous trading:** A system that allows for ongoing buying and selling throughout the trading day.
    - **Public price disclosure:** A formal mechanism to publicly disseminate price information to all stakeholders.
- **Consequences of an opaque market:** The absence of a credible, publicly available price signal creates significant barriers for the market's development. It hinders:
    - The ability of **compliance entities** to effectively plan and optimise their emissions reduction strategies.
    - The participation of **voluntary traders and financial institutions**, who rely on price data to engage with the market.
    - The future development of essential **risk management instruments**, such as forwards, futures, or options, which are critical in mature carbon markets.
- **Lessons from international experience:** Mature markets demonstrate that providing real-time price data, auction results, and quotes from the order book is fundamental to building market confidence, promoting liquidity, and supporting effective decision-making.

Without these elements, participants face a significant information gap, and the market will lack a clear reference price for current and future transactions. Establishing a transparent price discovery mechanism is therefore essential to promote market maturity and strengthen stakeholder confidence.

5.2.3 Lack of market stability mechanisms

The Draft Decree does not yet incorporate broader mechanisms for managing market-wide price stability. While strong on operational risk, the framework lacks tools like price floors, price ceilings, a CCR, or an MSR. These should be considered for future development as the market matures and trading activity increases.

- **Lessons from international experience:** Mature ETSs have implemented various rules-based mechanisms to manage price volatility and provide market predictability:
    - **EU ETS's MSR** automatically adjusts the supply of allowances at auction by withdrawing or releasing them based on predefined thresholds, helping to balance supply and demand.
    - **California's APCR** makes additional allowances available at fixed price tiers, acting as a soft price ceiling to mitigate sudden price spikes.
    - The **UK ETS's CCM** triggers a review and potential intervention by regulators if prices remain above specific thresholds for a sustained period.

Without such mechanisms, the CTX may be more exposed to excessive price volatility. This could erode both corporate and political support for the scheme, deter long-term investment by creating an unpredictable environment, and cause investors and compliance entities to view the market as unstable and high-risk, thereby slowing its development.

5.3 Systemic and operational vulnerabilities

5.3.1 NRS dependency

The NRS, operated by MAE, serves as the official master ledger for all carbon assets in Vietnam. Consequently, all operations of the CTX, including trade execution, clearing, and settlement, are wholly dependent on the continuous and accurate provision of data from the NRS. This creates a single point of failure and a significant operational vulnerability. The VSDC's role must transition from being the root registry (as in the securities market) to an operator that must synchronise with this external system of record, representing a major architectural shift.

- **Need for an SLA:** The current framework lacks a binding technical protocol to govern this critical interoperability. Without a formal Service-Level Agreement (SLA) between the operators, there are no guaranteed procedures for handling system incidents or disruptions. This agreement is essential to guarantee:
    - System uptime and data availability.
    - Real-time synchronisation between the registry and the trading platforms.
    - Clear protocols for handling system incidents or disruptions.
- **Lessons from international experience:** International precedents show that a formal and binding SLA is necessary to ensure market continuity and maintain stakeholder confidence. It helps to avoid market suspensions, unpaid transactions, or ownership disputes. The early phases of the EU ETS, for example, demonstrated that unexpected regulatory interventions or registry issues can cause significant market volatility and undermine the system's effectiveness in achieving its environmental objectives.

5.3.2 Holding and position concentration risk

The current framework does not yet include provisions for quantitative holding limits or large position reporting requirements for market participants.

- **Market concentration risk:** In a nascent market with expected low liquidity and a small number of participants, especially potentially large state-owned enterprises, this creates a significant vulnerability to market manipulation, cornering strategies, or price squeezes. The surveillance focus must be calibrated from monitoring speculative financial trading to identifying behaviours unique to a compliance market, such as the strategic withholding of allowances by a large emitter to influence prices.
- **Lessons from international experience:** Mature markets have implemented preventative measures to address concentration risk:
    - **UK ETS** applies a 25% cap on auction bidding volume and overall allowance holdings.
    - **California** actively monitors aggregated positions across both its spot and derivatives markets.
    - **China's ETS** requires a large-trader reporting system to enhance market transparency.

Introducing position limits and other transparency measures is necessary to mitigate systemic risk and promote the fair and orderly operation of the market.

5.3.3 Price volatility risk

The absence of price fluctuation limits, such as daily percentage bands or circuit breakers, leaves the CTX exposed to unchecked price swings and potential speculative volatility.

- **Price volatility risk:** Without protective mechanisms to manage daily volatility, the market could face extreme price swings. This would undermine predictability for compliance entities, increase hedging costs, and ultimately hinder participation from both compliance entities and financial investors.
- **Lessons from international experience:** Other national systems have implemented specific tools to manage daily volatility. China's ETS, for example, has implemented daily price movement limits (e.g., ±10%) to help stabilise trading, limit speculation, and maintain orderly market behaviour.

5.3.4 Market surveillance gaps

The legal framework does not yet include specific provisions for a proactive market surveillance system, including real-time transaction monitoring, anomaly detection, or a system of graduated sanctions for market abuse.

- **Market abuse and fraud risk**: International carbon markets have faced significant challenges, from VAT fraud and phishing attacks (EU ETS) to sophisticated manipulative trading like wash trades and spoofing (California, UK). This underscores the critical need for a robust surveillance system from the outset to prevent similar issues and build trust.
- **Lessons from international experience:** Establishing a credible surveillance system requires several key components that are common in mature markets:
    - **Proactive monitoring tools:** This includes real-time reporting data, algorithmic surveillance to automatically flag suspicious activity, and risk alert systems.
    - **Strong due diligence standards:** Implementing robust KYC and Anti-Money Laundering (AML) standards for all participants is essential to verify beneficial ownership and prevent illicit activities.
    - **Graduated enforcement mechanisms:** A clear and predictable system for handling violations is needed to ensure transparency and maintain public confidence, with sanctions ranging from private warnings and fines to temporary or permanent market bans.

5.4 Transparency and public disclosure gaps

The current Draft Decree does not yet include provisions requiring the routine publication of aggregated market data, such as trading volumes, price trends, compliance status, or participant statistics, through public dashboards or regular reports.

- **Consequences of limited transparency:** This information gap can lead to several negative outcomes:

    - It limits the ability of market participants, policymakers, and potential investors to monitor market conditions and assess fairness.
    - It reduces public confidence and the ability for external oversight.
    - It creates a lack of data that can hinder effective, evidence-based decision-making for all stakeholders.
- **Lessons from international experience:** Routine public disclosure is a foundational element of market integrity in all mature systems:
    - **EU and UK ETS** publish daily and weekly data on prices, volumes, and auction results.
    - **California's cap-and-trade system** maintains public registries of compliance status and detailed auction reports.
    - **China's ETS** provides daily updates on prices and trading volumes, along with periodic reports on market behaviour.

Mandating requirements for periodic public reports and a real-time public dashboard would significantly enhance transparency and accountability, aligning the CTX with international best practices.

5.5 Infrastructure and human capacity gaps

Despite legal and technical progress, significant institutional and human capacity gaps exist across the entire carbon market ecosystem. These gaps pose a potential risk to market integrity, the ability of entities to comply, and overall investor confidence.

- **Key challenges across the ecosystem:** Capacity gaps are present for all key stakeholder groups:
    - **Regulators (MAE, MOF, SSC):** These agencies need to transition from a policymaking role to one of active market supervision, which requires specialised capabilities in risk monitoring, detecting sophisticated market manipulation, and ensuring market integrity.
    - **Market operators (HNX, VSDC):** The operators require a deeper technical understanding of carbon-specific operations, including emissions accounting principles, compliance cycles, and the unique characteristics of allowances and credits.
    - **Intermediaries (Brokers, consultants):** This group is not yet fully trained to advise clients on this new and complex asset class, which carries unique financial and legal risks.
    - **Compliance entities:** These enterprises face the considerable challenge of building internal systems for GHG accounting, risk management, and trading strategies, often from a standing start.
- **Lessons from international experience:** Other jurisdictions have addressed these gaps proactively. The EU ETS, for example, established a Compliance Forum to provide regular

training and knowledge exchange. Similarly, both Korea and China have implemented mandatory capacity-building programs to improve data quality, reporting, and overall market readiness.

Establishing structured training and certification programs and strengthening inter-agency coordination will be essential to ensure all stakeholders are equipped to operate within the carbon market effectively and confidently.

5.6 Financial sustainability gap

While the Draft Decree includes a positive provision that allows for the establishment of service fees for the CTX, HNX, and VSDC, this is only set to apply *after* the pilot phase concludes. The framework does not yet define a long-term financial model, which is a key consideration for the operational sustainability of the market.

- **Key areas for future clarification:** To build a sustainable model, several key financial components need to be defined:
    - **A specific fee schedule** detailing items such as transaction fees, account maintenance fees, or issuance fees.
    - **A cost-recovery model** that balances the need for operational sustainability with market affordability for participants.
    - **A revenue reinvestment mechanism** to channel funds back into system upgrades, supervision activities, and capacity building.
- **Lessons from international experience:** International markets offer several models for financial sustainability:
    - **EU and UK ETS** utilise fee-based funding for registry and auction functions, reducing their reliance on state budgets.
    - **California** allocates a portion of its auction revenues to cover administrative costs and fund broader climate investments, enhancing public support for the scheme.
    - **Korea** applies a tiered fee schedule based on entity type to ensure fairness and support market development.

Without a clear and transparent financial framework, the CTX's operations may depend entirely on state budget allocations. This could expose essential functions like cybersecurity, technological innovation, and market surveillance to fiscal pressures and potential underfunding.

6 RECOMMENDATIONS FOR STRENGTHENING THE PROPOSED CTX PILOT MODEL IMPLEMENTATION

The To ensure that the CTX evolves from a government-supported pilot into a self-sustaining, credible market platform, recommendations are structured in three implementation phases: (i) Pre-launch and preparatory launch phase (2025 – Q1 2026) – Institutional, legal, and operational readiness preparation; (ii) Pilot operation (2026 – 2028) – Market testing and system learning; and (iii) Full operation and integration (from 2029 onward) – Self-sustainability and international

linkages. Each phase requires coordinated actions across governance, market design, operational systems, transparency, capacity-building, and financial sustainability under the leadership of the MOF and the MAE, with technical implementation by HNX, VSDC and supervision of operation by SSC.

6.1 Pre-launch and preparatory launch phase (2025 – Q1 2026) – Institutional, legal, and operational readiness preparation

The immediate priority during this phase is to secure full legal certainty, finalise the CTX regulatory instruments, and ensure system interoperability before any trading activity begins.

The promulgation of the Decree on the Domestic Carbon Exchange is crucial to launching the CTX platform and initiating Vietnam's Emissions Trading System (ETS). Following the Decree, a joint agreement between MAE and MOF should be issued to clarify institutional coordination, data-exchange procedures, and incident-response protocols. These instruments must also define the respective responsibilities of the two ministries for supervision, compliance, and financial reporting. The agreement should further provide for regular coordination meetings between MAE and MOF (SSC if this entity is assigned the oversight role) - on a quarterly basis - to review CTX implementation progress, address operational issues, and decide on any necessary regulatory adjustments.

Technical integration should be completed in line with the roadmap set under Decision No. 1162/QĐ-BNNMT. Under the Decision, the NRS will enter trial operation and official operation in late 2025. To guarantee seamless data exchange and system reliability, Service-Level Agreements (SLAs) must be signed between MAE, HNX, and VSDC covering data synchronisation, cybersecurity, and uptime standards, along with joint simulation exercises to test system resilience before market launch.

HNX and MOF should promptly develop and issue rules governing trading and depository members, while the SSC should formulate and promulgate regulations applicable to participating banks. Meanwhile, to operationalise market functions, HNX and VSDC should jointly develop Standard Operating Procedures (SOPs) for allowance registration, transfer, cancellation, and reconciliation between the registry and settlement systems.

In parallel, MOF should examine and prepare for detailed guidelines on taxation, accounting, and collateral eligibility of carbon units to resolve the existing "legal-nature" ambiguity that currently constrains participation and investment.

Capacity-building and outreach are critical to ensure market readiness:

- Organise a national training programme during 2025–2026 for regulators, market operators, and covered enterprises to introduce the CTX, explain its functions and interactions, and strengthen understanding of ETS compliance, trading procedures, and risk management.
- Establish a public information portal operated by HNX providing clear guidance on CTX functions, participation requirements, and user procedures to promote transparency and early stakeholder engagement.

- Conduct mock-trading exercises once the CTX platform becomes operational to allow regulators and enterprises to gain practical experience with its functionalities, thereby enhancing readiness and confidence ahead of full-scale implementation.

Finally, MOF should secure the public-investment budget required for CTX establishment pursuant to Article 77 of the 2024 Law on Public Investment, supplemented by development-partner resources (ETP, ADB, UK PACT) to cover system development, training, and communication costs.

6.2 Phase 2 – Pilot Operation (2026 – 2028): Market testing and system learning

The pilot phase aims to test the operational framework, build market liquidity, and generate empirical evidence for subsequent scaling-up while maintaining fiscal discipline.

Allowance allocation during this phase is 100% free for facilities in the three pilot sectors – thermal power, cement, and steel. Covered entities may borrow up to 15% of allocations and use domestic offsets for up to 30% of obligations. While this design provides a high degree of flexibility and eases the initial compliance burden for enterprises, it may also limit trading demand and reduce market liquidity during the early stages of operation. To ensure active market participation and effective price discovery, these compliance flexibilities should therefore be accompanied by complementary mechanisms that encourage actual trading activity on the CTX.

To ensure orderly trading, effective price discovery, and market confidence, HNX and MOF should study and propose appropriate market-stabilisation measures. These could include a daily price-fluctuation band (for example, ±10 percent), an Auction Reserve Price (ARP) to prevent excessive price swings, and a Cost Containment Mechanism (CCM) designed to release or withhold allowances when market prices deviate significantly from expected ranges. A detailed assessment of the feasibility and design parameters of these tools should be conducted during the pilot phase, drawing on international best practices and domestic market data.

To strengthen price transparency and support evidence-based market development, MOF should undertake a dedicated study on pilot allowance auctions, representing up to 10 percent of total allocations, to test auction mechanisms and gauge market response before any official pilot auction, tentatively envisaged for 2029.

Operational resilience and market integrity should be treated as continuous priorities. Under SSC oversight, HNX should progressively develop and deploy a real-time market-surveillance system capable of aggregating registry, trading, and settlement data to detect anomalies and ensure compliance. The feasibility of quantitative holding limits, for instance, restricting any participant from controlling more than 10 percent of total issued units, should also be evaluated once sufficient market data becomes available. Meanwhile, VSDC should conduct regular stress tests and cybersecurity audits to safeguard the reliability of clearing and settlement systems.

Transparency will remain central to market credibility. HNX should operate a public information dashboard disclosing daily prices, volumes, and types of traded instruments, while MAE should publish quarterly compliance summaries covering surrendered allowances, borrowing, and offset use to keep stakeholders informed and promote public trust.

Institutional learning must occur continuously. Collaborate with MAE to organise annual mock-compliance exercises aimed at helping both regulators and enterprises test procedures and identify operational challenges. Experience from these exercises will inform procedural refinements and system upgrades. By the end of 2027, MOF and MAE should undertake a mid-term evaluation in accordance with the Public Investment Law to assess financial performance, market liquidity, and inter-agency coordination, providing evidence for any regulatory adjustments prior to the transition to full operation.

Capacity-building and outreach activities should continue in parallel to consolidate technical skills and ensure effective market participation across all actors:

- Expand the training programme launched in Phase 1 by developing advanced modules tailored to specific stakeholder groups, regulators, exchange operators, and compliance entities. The programme should address topics such as trading strategies, market surveillance, risk management, data reporting, and the use of carbon credits for compliance.
- Provide continuous technical assistance through the CTX Help Desk operated by HNX, allowing enterprises to resolve operational issues in real time and obtain guidance on account management, allowance transfers, and compliance reporting.
- Collaboration with MAE to organise refresher courses and targeted workshops after each compliance cycle to share lessons learned, highlight good practices, and disseminate updated regulatory guidance, thereby promoting consistent interpretation of market rules and strengthening compliance culture.
- Collaboration with MAE to issue regular communications and technical bulletins summarising market developments, trading statistics, and regulatory updates to maintain transparency and stakeholder confidence.
- Promote cross-agency learning and coordination through joint events among MAE, MOF, HNX, VSDC, and SSC, focusing on market oversight, incident-response procedures, and emerging international experiences relevant to Vietnam's ETS and CTX operation.
- Assess the effectiveness of capacity-building and outreach programmes as part of the 2027 mid-term evaluation, identifying evolving capacity needs and incorporating them into the design of the full-operation phase.

Financially, the CTX will require ongoing budgetary support during the pilot, as fee income will not yet offset operational costs. MOF and HNX should therefore prepare a draft fee schedule (including membership and transaction charges) for implementation after 2028, laying the foundation for gradual fiscal self-reliance.

6.3 Phase 3 – Full operation and integration (From 2029 Onward): Self-sustainability and international linkages

The final phase transforms the CTX from a publicly subsidised platform into a sustainable, rules-based market infrastructure capable of linking with regional and global systems.

From 2029 onward, the allocation system should move toward a hybrid approach, gradually auctioning a certain percentage of total allowances (starting around 10%). Auction revenues will be channelled in a consistent manner with WTO disciplines toward carbon-reduction investment and CTX maintenance. The approved fee schedule should take effect, applying moderate membership and transaction fees sufficient to cover annual operating expenses and ensure financial viability.

Regulatory refinement will consolidate the market's maturity. The CTX Decree and accompanying Circulars should be updated to codify the ARP and CCM as permanent market-stabilisation tools, formalise holding-limit provisions. Rules governing auctioning, fee collection, and cost-containment must remain compliant with Vietnam's obligations under the WTO (SCM and GATS) agreements.

The market's coverage should expand in accordance with Decision No. 232/QĐ-TTg, extending to additional sectors such as chemicals, refining, and transport. MAE should authorise the listing of high-quality domestic voluntary credits that meet approved methodologies, thereby diversifying products and deepening liquidity.

Simultaneously, Vietnam should begin international linkage efforts. MAE and MOF may negotiate bilateral recognition agreements or pilot Article 6.2 transfers once domestic MRV and registry systems demonstrate full reliability. Technical work toward interoperability with regional registries, especially within ASEAN, will enhance credibility and investor confidence.

A final evaluation by 2030 should assess the CTX's financial sustainability, socio-economic and environmental outcomes, and institutional performance. The results will feed into the Carbon Market Master Plan 2031–2035, ensuring continuous policy improvement and alignment with Vietnam's Net Zero pathway.

Through this sequencing, Vietnam can ensure that the CTX not only functions effectively as the core infrastructure for its domestic ETS but also evolves into a robust, transparent, and internationally recognised carbon-market platform supporting the nation's NDC targets and long-term Net Zero commitment.

7 CONCLUSIONS

Vietnam stands at a crucial moment in its climate journey, transitioning from high-level commitments to concrete implementation. The nation's ambitious pledge at COP26 to achieve net zero emissions by 2050 has been formalised into domestic policy. Within this strategic framework, the development of a domestic CTX has been identified as a cornerstone policy instrument, the primary market-based mechanism to drive cost-effective decarbonisation and mobilise green finance. It is against this backdrop of significant national ambition that the specific operational model for the CTX pilot phase must be assessed.

The proposed operational model for Vietnam's CTX pilot, as detailed in the latest available Draft Decree on domestic carbon trade exchange, represents a pragmatic and commendable first step. The timely approval of this decree will provide the foundational certainty and create irreversible momentum for market development. The decision to build upon the proven infrastructure of HNX and VSDC is a sound one; it de-risks the initial implementation, accelerates the development

timeline, and immediately embeds the CTX within a regulated and understood environment. This foundation provides Vietnam with a significant structural advantage.

This report has focused on identifying the critical areas where this inherited financial framework must be adapted for the unique needs of a carbon market. These pillars for success include formalising the dual-governance architecture through a binding protocol; providing definitive legal clarity on the nature of a carbon unit as the linchpin for private sector engagement; and designing a market structure with a clear evolutionary path towards greater liquidity and stability.

It is important to emphasise that the gaps identified and the recommendations that follow are intended not as an enhancement of the Draft Decree alone, but as broader considerations for all stakeholders involved in shaping Vietnam's overall carbon market policy framework.

By embracing these recommendations and international experiences, Vietnam has the opportunity to build a carbon market that is not only operationally resilient but also a powerful and effective instrument for national policy. In an era of increasing global trade pressures, such as CBAM, an efficient, transparent, and internationally credible carbon market is no longer just an environmental tool; it is a prerequisite for sustained economic competitiveness. The successful launch of the CTX will therefore be more than a climate policy achievement, it will be a clear signal to the international community of Vietnam's commitment to sustainable development and its emergence as a leader in the global green transition.