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The road ahead for India's Carbon Credit Trading Scheme

Preparing for financial integration, sectoral expansion, and global engagement

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List of abbreviations

Acronym	Full form	Acronym	Full form
BEE	Bureau of Energy Efficiency	**GDAM**	Green Day-Ahead Market
BM	Bharat Methodologies	**JI**	Joint implementation
BOF	Basic oxygen furnace	**K-ETS**	Korea Emissions Trading Scheme
BRSR	Business responsibility and sustainability reporting	**K-MSR**	Korea Market Stability Reserve
CBAM	Carbon Border Adjustment Mechanism	**KDB**	Korea Development Bank
CBDR-RC	Common but differentiated responsibilities and respective capabilities	**KOC**	Korean Offset Credits
CCC	Carbon credit certificate	**LNG**	Liquefied natural gas
CCER	China Certified Emission Reductions	**MACC**	Marginal abatement cost curve
CCfDs	Carbon contracts for difference	**MCX**	Multi Commodity Exchange of India
CCTS	Carbon Credit Trading Scheme	**MFN**	Most favoured nation
CCUS	Carbon capture, utilisation and storage	**MiFID II**	Markets in Financial Instruments Directive II
CDM	Clean Development Mechanism	**MSME**	Micro, small and medium enterprises
CER	Certified emission reduction	**MRV**	Monitoring, reporting, and verification
CERC	Central Electricity Regulatory Commission	**NCDEX**	National Commodity and Derivatives Exchange
COP	Conference of the Parties	**NDC**	Nationally determined contribution
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation	**NSE**	National Stock Exchange
DISCOM	Distribution company	**OBA**	Output-based allocation
EMO	Environmental merit order	**ODS**	Ozone-depleting substances
ESCerts	Energy Saving Certificates	**PAT**	Perform, Achieve and Trade
ESG	Environmental, social, and governance	**PLI**	Production-linked incentive
ESMA	European Securities and Markets Authority	**PPA**	Power purchase agreement
ETS	Emissions Trading System	**RCO**	Renewable consumption obligation
EU	European Union	**RGGI**	Regional Greenhouse Gas Initiative
EUA	European Union Allowance	**SBTi**	Science Based Targets initiative
EV	Electric vehicle	**SCRA**	Securities Contracts (Regulation) Act
FAME	Faster Adoption and Manufacturing of Electric Vehicles	**SEBI**	Securities and Exchange Board of India
FTA	Free trade agreement	**TIER**	Technology Innovation and Emissions Reduction
IBK	Industrial Bank of Korea	**UNFCCC**	United Nations Framework Convention on Climate Change
ICVCM	Integrity Council for the Voluntary Carbon Market	**VAT**	Value added tax
ISDA	International Swaps and Derivatives Association	**VCM**	Voluntary carbon market
ITMO	Internationally transferred mitigation outcome	**VCMI**	Voluntary Carbon Market Integrity Initiative
JCM	Joint Crediting Mechanism	**WTO**	World Trade Organization

Key findings

India's compliance carbon market under the Carbon Credit Trading Scheme (CCTS) is into its operational phase. What determines its trajectory now are design choices on sequencing; and the window to shape them is before path dependencies harden. Priority should be given to foundational elements, including credible stringency, robust monitoring, reporting and verification (MRV) systems, and genuine enforcement. More advanced features should be designed early but introduced only as the market matures.

Every major emissions trading system has begun with compliance entities only, and the CCTS is well placed in doing the same. Financial intermediation is what eventually turns a compliance market into one with continuous price discovery and hedging. The legal framework for it already exists in India and can be designed into the system now for activation once the market's foundations are established.

The power sector's exclusion from the initial phase of CCTS simplifies implementation while recognising the complexities of electricity market regulation. As the scheme evolves, future integration will call for a view of where carbon pricing fits among the measures available for the sector, alongside careful consideration of electricity market regulation, dispatch decisions, cost recovery mechanisms, and regulatory coordination, drawing on international experience.

Irrespective of the ongoing international discussions around the European Union's Carbon Border Adjustment Mechanism (CBAM), a credible domestic carbon market can strengthen India's long-term industrial competitiveness. International experience points to the design choices — from benchmark calibration to the eventual role of auctioning — that shape how much carbon value is recognised and retained at home, as options to weigh over time.

Executive summary

India's Carbon Credit Trading Scheme (CCTS) is entering a decisive period. With compliance obligations now in effect, the initial architecture of the market — comprising intensity-based targets, baseline-and-credit allocation framework, facility-level benchmarks, and a price corridor — has been laid down. The next phase will now be defined by more consequential questions. How will the market deepen its liquidity and attract the participants needed for robust price discovery? How can the power sector, which accounts for roughly 40% of national emissions, be brought within the compliance boundary without creating new conflicts with electricity tariff regulation? What role should offset mechanisms and international carbon credits play, and at what point? How should baselines evolve as companion policies independently reduce emissions in covered sectors? And how should India position the CCTS to withstand scrutiny under the European Union's (EU) Carbon Border Adjustment Mechanism (CBAM) while advancing its own strategic interests under Article 6 of the Paris Agreement?

These are not hypothetical questions, but design choices that regulators, policymakers, and market participants will confront over the next two to five years. The answers will determine whether the CCTS produces a carbon price signal strong enough to guide capital-intensive industrial investment over 15- to 30-year horizons, or whether it settles into an administrative compliance exercise with limited influence on India's decarbonisation trajectory.

This paper serves as a knowledge repository that identifies, discusses, and attempts to answer some of these critical and pertinent questions confronting the design, governance, institutional architecture, and international positioning of India's compliance carbon market. It does so at a moment when regulatory choices are actively being shaped, path dependencies have not yet hardened, and India retains the advantage of learning from the costly missteps of earlier movers.

The analysis is organised around four themes. On financial market participation, it examines when and how financial intermediaries — whose presence will be critical to improve liquidity and continuous price discovery — can be brought into the market through well-designed market-making rules and oversight, drawing on evidence that such participants account for roughly 65% of secondary market activity in the EU Emissions Trading System (ETS). On power sector integration, it analyses the regulatory and institutional conditions required to embed carbon costs into dispatch and merit-order decisions within India's statutory tariff determination process, without requiring full retail price pass-through. Recent reforms in the Republic of South Korea have demonstrated that such an approach is both feasible and consequential. On international dimensions, the report assesses how India's domestic carbon price interacts with the EU's CBAM, and what the country must do to establish a credible equivalence claim. Lastly, it looks at how the emerging Bharat Methodologies under the offset mechanism could be used for Article 6 cooperation as bilateral agreements take shape.

These four themes represent some of the most consequential open design questions facing the CCTS. Without financial intermediation, the scheme will struggle to produce the continuous, forward-looking price signal that industrial firms need to justify capital commitments spanning decades. Without power sector integration, the market would operate without its largest potential source of compliance demand and exclude the sector where carbon pricing has the most immediate effect on

dispatch and investment decisions. Without deliberate alignment between the CCTS design and CBAM’s deduction framework, the architecture mismatch between India’s intensity-based system and CBAM’s per-tonne carbon cost logic could prevent domestic compliance efforts from being translated into meaningful deductions at the EU border. This would leave exporters exposed to the full CBAM liability even as they bear costs under the domestic scheme. And without a deliberately sequenced offset policy, cheap external credits could flood the compliance market before a credible carbon price has been established, while India’s most valuable international asset — the ability to authorise and sell high-integrity carbon credits under Article 6 — goes underleveraged.

In each case, the foundations of a functioning market must come first: Credible stringency; robust monitoring, reporting, and verification (MRV); and genuine enforcement. More advanced features should be designed early but activated only once the foundations are holding firm. The window for shaping these choices is now, before path dependencies harden and the costs of correction rise.

Throughout, the report draws on the conceptual and empirical foundations established in the two preceding papers in this series. The first paper, ‘Strengthening India's carbon market’ (October 2025), argued that CCTS should embed a price or supply adjustment mechanism — comprising consignment auctions, vintage-based credit classification, and a price corridor — from the outset. Drawing on evidence from the EU ETS, Alberta's Technology Innovation and Emissions Reduction (TIER) system, and Australia's Safeguard Mechanism, it showed that delayed intervention invariably proves costlier and more politically contentious than preventive design. The second paper, ‘Potential drivers of carbon price formation in the CCTS’ (June 2026), mapped the supply, demand, and institutional forces that will shape India's carbon price. It identified benchmark calibration, power sector exclusion, companion policy interactions, and early-stage liquidity constraints as the primary determinants of whether the market produces a credible and investment-grade signal. This third and final paper builds on both to examine the questions that will define the CCTS's next phase of evolution and its long-term viability as the centrepiece of India's climate policy architecture.

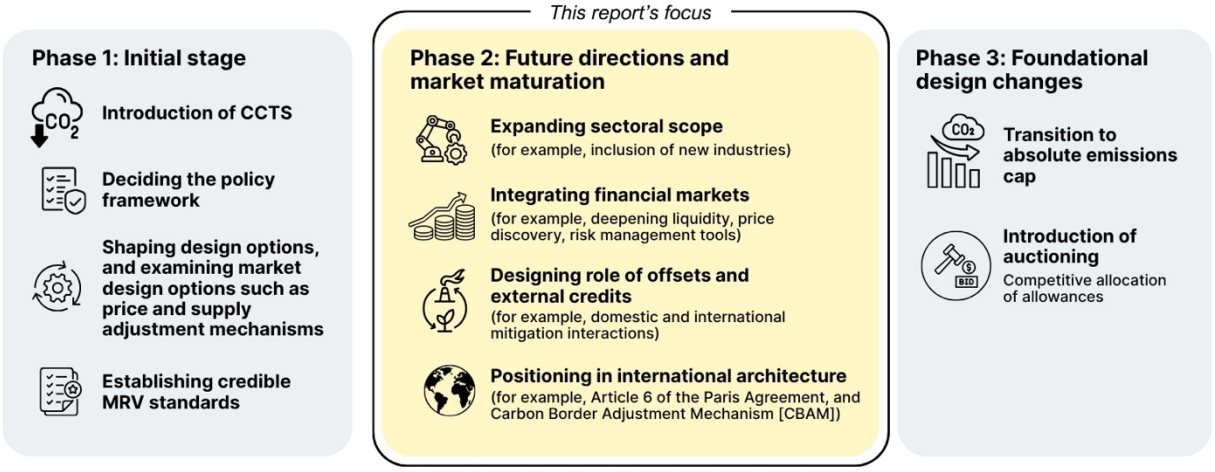
1. Introduction

India’s Carbon Credit Trading Scheme (CCTS) marks a significant step in the country’s transition toward market-based climate policy. Intensity targets have been announced for seven sectors, accounting for approximately 490 obligated entities and covering an estimated 700 million metric tonnes of carbon dioxide equivalent ($MtCO_2e$) annually. With the forthcoming inclusion of the iron and steel, and fertiliser sectors, the system's coverage is expected to expand significantly, cementing its position as one of the largest emerging carbon markets among developing economies.[1]

This report is the third in a series examining the evolution of India’s carbon market. The first report[2] addressed price stability and the role of supply-adjustment mechanisms; the second report[3] examined the broader factors shaping price formation in emissions trading systems. Those discussions focused on the foundational architecture needed to produce a credible price signal. The present report turns to the medium- and longer-term design questions that will determine the CCTS’s trajectory, effectiveness, and international standing.

Carbon markets typically follow a process of institutional sequencing. They rarely launch in their final form, but evolve as regulators, firms, and institutions accumulate experience and as the conditions in which the market operates change. Evidence from existing systems suggests that prioritising the foundational characteristics of a functioning market, including credible monitoring, reporting, and verification (MRV), sufficient sectoral coverage, and mechanisms that support liquidity and price discovery, is more effective at delivering emission reductions over the medium to long term than setting the most demanding targets at the outset. Establishing these foundations early allows the market to mature and to interact credibly with the wider policy environment.

Figure 1: The three phases of CCTS development



The report is structured around four interconnected themes that together define this next phase of development (as shown in Figure 1):

[1] ICAP. Compliance obligations under India's Carbon Credit Trading Scheme enter into force for seven sectors. 30 March 2026.
[2] IEEFA. Strengthening India's carbon market: The case for a stability mechanism in India's CCTS. 30 October 2025.
[3] IEEFA. Potential drivers of carbon price formation in the CCTS: Design and market dynamics in the Indian carbon market. 4 June 2026.

- **Financial market participation:** How and when financial intermediaries should be integrated into the CCTS to deepen liquidity, support price discovery, and provide risk-management instruments.
- **Sectoral expansion:** The case for broadening the CCTS to cover more of India's emissions, including the implications of incorporating the power sector.
- **The EU's Carbon Border Adjustment Mechanism (CBAM):** How an intensity-based domestic scheme interacts with a border carbon charge and what design decisions India must make in response.
- **Offsets and Article 6 of the Paris Agreement:** How domestic offset architecture and international carbon market rules create both opportunities and risks for India's carbon market and its sovereign mitigation budget.

A common thread across all four themes is the expectation that benchmark stringency will increase over time, in line with India's evolving national climate commitments. A progressively tightening trajectory is essential to sustaining a meaningful carbon price signal and gives each of these developments their purpose. As such, it is treated as part of the context for this phase rather than as a separate theme.

Other possible future evolutions of the system, including greater reliance on auctioning or a transition from intensity-based targets toward an absolute cap, are important but represent longer-term structural changes beyond the immediate scope of this report.

2. Financial market interactions with India's CCTS

Key question: How should financial participation in India's carbon market evolve as the market matures?

The question is not whether financial institutions should eventually participate in the CCTS, but when and through what sequence of institutional reforms. Financial intermediation does occur in mature carbon markets and adds genuine value, but that value is conditional on market design. Where caps or the emission reduction targets are stringent and credible, compliance entities face genuine abatement pressure and will trade, but global experience shows that targets are frequently set with insufficient stringency. When allowances are overallocated, trading may collapse from a lack of scarcity, not a lack of intermediaries.[4]

The Korea ETS (K-ETS) illustrates this: An oversupply of allowances during its third planning period removed meaningful abatement pressure from covered firms and produced, as a consequence, subdued prices and thin trading activity. When entities hold surplus allowances without having achieved equivalent reductions, the scheme's primary purpose of driving emissions reductions is compromised before the question of trading efficiency even arises. Yet even where emission allowances are scarce, markets restricted to compliance entities have struggled. The K-ETS faced immediate liquidity problems at launch, with exchange trading effectively halting for eight months,

[4] Trading volume is not, strictly speaking, the primary objective of an emissions trading system, meaningful emissions reductions are. However, trading activity has an important bearing on that goal: Liquid markets produce continuous price signals that incentivise abatement investment beyond the compliance deadline, whereas thin or episodic trading limits the ETS to a periodic settlement mechanism with little dynamic effect on firm-level decarbonisation decisions.

attributed partly to the exclusion of third-party financial participants. Korea's response confirmed the problem. Beginning in Phase 3, the government progressively opened the market to financial intermediaries and signalled plans for futures markets. Financial intermediaries thus serve essential functions, but their benefits materialise only when specific conditions are met. These include:

- A credible scarcity signal.
- Legal clarity on the traded unit.
- Robust MRV and enforcement frameworks are constitutive of the property right[5] embodied in a carbon credit — ensuring it represents a genuine, verifiable emissions outcome — and cannot be substituted by any trading or market mechanism downstream.
- Adequate trading infrastructure, which can initially take bilateral or over-the-counter forms rather than requiring a formal exchange.
- Calibrated oversight of market participants.

2.1. Why carbon markets need financial intermediation

The private financial system contributes to the low-carbon transition in two related but distinct ways. The first is broad capital allocation. Under this, institutional investors, infrastructure funds, and green bond markets channel investment toward low-carbon assets in response to carbon price signals, even without direct participation in carbon trading. The second, and the focus of this section, is financial intermediation within the carbon market itself.[6] Financial institutions, including banks, brokers, asset managers, and specialised trading firms, intermediate carbon assets, enhance market liquidity, and provide the risk-management services essential for price discovery and hedging.[7] Their participation also expands the universe of carbon-linked financial products: Forwards, futures, options, swaps, and more novel instruments such as performance-linked bonds and carbon contracts for difference, some of which are already being deployed. Global carbon markets have grown to a value of approximately USD949 billion (as of 2024), placing them firmly on the radar of institutional investors.[8]

For the carbon price to influence real-economy investment decisions, the market must generate sufficient trading volume to support continuous price discovery, not merely clear balances at periodic compliance deadlines. Compliance markets with regular, well-established trading cycles can still fail to produce reliable price signals if volumes remain too thin to reflect the full range of information on supply, demand, and abatement costs. A firm evaluating a low-carbon process technology faces a capital commitment with a payback period measured in decades. That decision requires firms to form expectations about carbon prices over horizons of five, 10, or 20 years. Liquid futures markets, sustained by continuous intermediary participation, provide that information. Thin spot trading at periodic intervals does not. Prices formed in low-volume sessions reflect the positions

[5] Under the Coase Theorem (Coase, 1960), assigning well-defined property rights over pollution enables market actors to internalise externalities and reach efficient outcomes through voluntary exchange. Carbon credits operationalise this logic, but the theorem's efficiency result is contingent on property rights being clearly specified and credibly enforced — a function that only robust MRV and institutional frameworks can perform.

[6] De Haas, Ralph, and Popov, Alexander. Finance and carbon emissions. 2019.

[7] Johanna Cludius, Hannah Galster, Seán Healy, Viktoria Noka, and Long Lam. The Role of Financial Operators in the ETS Market and the Incidence of Their Activities in Determining the Allowances' Price. European Parliament. 2022.

[8] Reuters. Global carbon markets value hit record $949 billion last year - LSEG. 12 February 2024.

of whoever happens to be trading that day rather than the market's aggregate assessment of future scarcity. Continuous pricing also underpins the hedging that project finance requires: Lenders financing decarbonisation investments typically need carbon cost exposure to be hedged as a condition of lending, and that hedging requires counterparties willing to take positions beyond the immediate compliance window.

The institutional foundations of a carbon market remain the responsibility of governments, not financial intermediaries. Governments create and maintain scarcity through target-setting and cap trajectories; define the legal nature and enforceability of carbon credits; and protect market integrity through MRV, registries, and credible penalties. Financial institutions are not a substitute for these foundations. They become valuable once those foundations are in place, completing the market by providing liquidity, enabling hedging, and translating a policy-created asset into a continuously priced instrument, much as intermediaries do in physical commodity markets.[9]

> **Financial institutions do not create the scarcity that makes a carbon price meaningful, governments do. But once that scarcity exists, intermediaries are what turn a compliance obligation into a continuously priced, tradeable asset.**

2.2. What financial intermediaries do, and what they need to do it

Financial institution participation in carbon markets has developed in distinct phases, reflecting the degree to which these markets exhibit the characteristics of financeable assets. Early engagement was catalytic rather than commercial. Structures like the World Bank's Prototype Carbon Fund (operational from 2000) provided financial institutions with their first exposure to delivery, governance, and verification risks in carbon credit cash flows.[10] Broader participation became feasible only once three conditions aligned: Policy action created regulated demand; MRV frameworks converted emissions reductions into standardised, verifiable units whose integrity could be independently assessed; and compliance entities generated demand for intermediation beyond end-of-period spot purchases.

Financial institutions engage with carbon markets through three core functions:

- The first is **liquidity provision**. Without market makers providing continuous two-way pricing, trading tends to concentrate around compliance deadlines, and price signals remain noisy.[11] By taking on risk and offering immediacy, intermediaries absorb temporary order imbalances and lower execution risk. When buyers' and sellers' prices converge, price discovery strengthens, enabling prices to better reflect market participants' expectations about future abatement costs and long-term policy stringency.[12]

- The second function is **risk management**. Carbon compliance creates an exposure for firms that is similar to an obligation to purchase a regulated commodity. Financial intermediaries respond by offering forward and futures positions that allow these firms to hedge against

[9] Duffie, D. Dynamic Asset Pricing Theory: Third edition. Princeton University Press. 2001.
[10] The World Bank. The Prototype Carbon Fund. 2004.
[11] Johanna Cludius, Hannah Galster, Seán Healy, Viktoria Noka, and Long Lam. The role of financial operators in the ETS market and the incidence of their activities in determining the allowances' price. European Parliament. 2022.
[12] Kim, Jihun, and Kwangwoo Park. Improving liquidity in emission trading schemes. Journal of Futures Markets. 1 June 2021.

price risk and manage compliance costs over time. Between 2011 and 2022, EU ETS carbon assets delivered annualised returns of 16.6% with a volatility of 51%, making carbon the most volatile asset class in the comparison set while exhibiting low correlations to traditional assets.[13] This volatility creates direct cost-management challenges for compliance entities and strong demand for hedging instruments.

- The third function is **delivery assurance**. In carbon markets, intermediaries aggregate and warehouse units from multiple sellers, ensuring that buyers with approaching compliance deadlines can access supply when needed without having to depend on bilateral negotiation. In a market like the CCTS, where carbon credit certificates (CCCs) are earned only by entities that outperform their intensity benchmarks, supply is inherently fragmented across obligated entities with varying performance profiles. The aggregation function that intermediaries perform is what brings that dispersed supply together and makes it reliably accessible to deficit entities.

These functions are not automatic consequences of market openness. They develop only once primary supply mechanisms, legal classification, and oversight frameworks reduce regulatory and political risk to levels compatible with balance-sheet exposure. The concern that financial participants amplify rather than absorb volatility is not unreasonable, but EU ETS experience does not support it. The European Securities and Markets Authority (ESMA) found no evidence that intermediation drove allowance prices away from fundamentals.[14] The stabilising effect, however, is a product of deliberate market architecture rather than an inherent property of financial participation, and it is the quality of that architecture — the legal standing of the traded unit, the credibility of supply mechanisms, the robustness of MRV, and the calibration of oversight — that determines whether intermediaries deepen the market or withdraw when policy signals soften.

2.3. How market architecture determines intermediary impact: Evidence from the EU, South Korea, and China

Comparative evidence shows that simply allowing financial actors to trade carbon units does not produce effective intermediation. What matters is whether the underlying market architecture meets six prerequisites: A credible scarcity signal; a price-forming primary supply mechanism; clear legal status for the traded unit; adequate trading infrastructure and derivatives capacity; a supervised framework for financial participation; and, where offsets15 are permitted, an offset integration policy that preserves rather than undermines scarcity.

Table 1 tests these six prerequisites against three compliance systems at different stages of institutional maturity. The EU ETS shows what becomes possible when all six conditions are met. The South Korea ETS shows the cost of getting them wrong initially and then course correcting. The China National ETS shows a system still building the foundational architecture.

[13] MSCI (2022). Carbon Markets: An Emerging Derivatives Class. 28 June 2022.
[14] ESMA. EU carbon markets 2025. 22 October 2025.
[15] Carbon offsets are mechanisms through which buyers fund efforts that remove or avoid greenhouse gas (GHG) emissions in one place to 'offset' GHG emissions elsewhere on Earth.

Table 1: Market architecture and financial intermediation across key ETS

Dimension	EU ETS	South Korea ETS	China National ETS
Scarcity signal	Absolute emissions cap declined according to a legislated trajectory; Market Stability Reserve adjusted supply through transparent, rule-based triggers.	Absolute emissions cap. However, weak initial targets produced significant overallocation and minimal abatement pressure in early phases. The allocation method compounded this but was not the primary cause. Prices and activity recovered in Phase 3 (2021–2025) as target stringency increased. A quantity-based Market Stability Reserve (K-MSR), approved in April 2026, automatically adjusted auction supply based on pre-announced thresholds (detailed operating rules are being finalised). This is distinct from the existing price-based committee stabilisation mechanism and from the government-designated market makers (Korea Development Bank [KDB] and Industrial Bank of Korea [IBK]) that have provided bid-ask continuity since Phase 2.	Intensity-based output-linked system rather than an absolute cap, meaning total allowable emissions could expand with output growth even under tight per-unit benchmarks. In practice, early benchmarks were lenient, as evidenced by high banking levels and persistently low prices. August 2025 guidelines have directed transition to absolute caps from 2027.
Primary supply	Predominantly auctioned (~57% of general allowances in Phase 4)[16], with free allocation remaining significant for industrial sectors and phasing out for CBAM-covered goods by 2034. ~10 financial intermediaries account for ~90% of auctioned purchases and redistributed through secondary markets.	Predominantly free allocation; auction share ~10% in Phase 3, too small to anchor broad-based secondary market pricing.	Fully free under output-based benchmarks. August 2025 guidelines have directed introduction of paid allocation with a mixed approach targeted by 2030.
Financial participation	Open to compliance entities and non-compliance actors. Allowances classified as financial instruments under Markets in Financial Instruments Directive II (MiFID II) from January 2018.	Phased opening; early restriction to compliance entities directly contributed to persistent illiquidity. KDB designated as market maker in June 2019.	August 2025 guidelines directed the opening of participation of banks and financial institutions. Allowances not classified as financial instruments.

[16] European Commission. Auctioning of allowances.

Trading infrastructure	Highly developed exchange-based spot and derivatives markets including futures and options on multiple tenors.	Exchange-based spot trading with government-held reserves supporting market-maker bid-ask continuity; no exchange-traded derivatives.	Spot-only at the national level; no derivatives. Regional pilots tested broader product variety.
Observed impact	Financial participation deepened liquidity, narrowed spreads, and supported forward price formation. In 2024, European Union Allowance (EUA) derivatives exceeded USD1 trillion (INR94 trillion)[17] in notional value — roughly 10 times the value of annual physical allowance surrenders — illustrating the depth of financial intermediation relative to underlying compliance flows.	Early exclusion impaired price formation and eroded market confidence; targeted reforms eventually restored functioning at a significant cost in terms of time and institutional credibility.	Data integrity maintained under a restricted model, but limited participation constrained liquidity, suppressed price signals, and prevented meaningful forward curve development.

These cases illustrate what the comparative literature on carbon market design confirms: Financial intermediation is an outcome of deliberate architectural choices, including how scarcity is legislated, how supply reaches the market, what legal status the unit carries, what products can be traded, and what oversight governs participation.[18,19,20]

2.4. From architecture to financial instruments: What becomes possible

The first, most mature instrument category is exchange-traded carbon derivatives. In the EU ETS, futures and options on allowances account for the bulk of trading activity. Their functioning depends on fungible units, structured compliance demand, financial-instrument classification, and clearing infrastructure.[21] India briefly hosted Carbon Emission Reduction (CER) futures on the Multi Commodity Exchange of India (MCX) and the National Commodity and Derivatives Exchange (NCDEX) in 2008, though trading was discontinued because domestic compliance entities had no regulatory obligation to hold or surrender CERs, eliminating the demand base that derivatives require. The lesson is not about the nature of the underlying unit but about the necessity of a structured compliance obligation. Without regulated entities facing genuine abatement pressure, there is no durable demand for derivatives, regardless of how the underlying credit is defined.[22]

[17] Markets Media. ICE Environmental Market Trading Reaches Record. 2 February 2026.
[18] Johanna Cludius, Hannah Galster, Seán Healy, Viktoria Noka, and Long Lam. The Role of Financial Operators in the ETS Market and the Incidence of Their Activities in Determining the Allowances' Price. European Parliament. 2022.
[19] Kim, Jihun, and Kwangwoo Park. Improving liquidity in emission trading schemes. Journal of Futures Markets. 1 June 2021.
[20] European Commission. Auctioning of allowances.
[21] Clearing infrastructure is the system, such as National Stock Exchange (NSE) Clearing or Indian Clearing Corporation Limited (ICCL) at Bombay Stock Exchange (BSE) in India, that ensures trades are settled safely and counterparties meet their obligations.
[22] Cyril Amarchand Mangaldas. Evolution of Environmental Attributes in India. 25 May 2022.

The second category encompasses structured carbon-linked financial products that do not require deep derivatives markets but do require clear legal status for carbon units.[23,24] These include carbon-backed loans, outcome-linked bonds, long-term offtake agreements, and Carbon Contracts for Difference (CCfDs), which are government-backed instruments deployed by Germany, the Netherlands, and the UK to de-risk industrial decarbonisation.[25] CCfDs become more effective as the underlying compliance market matures and produces an observable, continuous price signal. Standardised contractual frameworks such as the International Swaps and Derivatives Association (ISDA) 2022 Verified Carbon Credit Definitions reduce friction across these instruments.[26]

Beyond these two categories, a set of capital markets instruments sit at the periphery of the carbon market rather than within it. The transition linker, proposed by Erlandsson (2024)[27] as a theoretical sovereign bond, adjusts its coupon based on a country's progress toward its climate targets. Similarly, a corporate carbon-indexed step-up bond links a company's financing costs to emissions performance. Neither instrument requires carbon units to be held, traded, or surrendered, and neither emerges directly from compliance market architecture. They are included here not as carbon market instruments in the conventional sense but to mark the outer boundary of what a credible domestic carbon price enables. As the CCTS matures and produces a continuous, observable price signal, instruments whose pricing depends on climate credibility become easier to structure and more attractive to investors.

2.5. Assessing the CCTS's readiness for financial intermediation

The CCTS does not currently permit financial intermediaries to participate, with trading restricted to obligated entities. If offset provisions are eventually introduced, participation could expand to include non-obligated project developers. However, the integration of offsets into compliance markets has produced mixed outcomes internationally and remains an open design question for the CCTS. Additionally, CCCs will not be classified as financial instruments in the initial stage, reflecting a sequencing approach consistent with the phased implementation seen in other emissions trading systems.

In terms of legal status, Securities and Exchange Board of India (SEBI) has classified carbon credits as goods under the Securities Contracts (Regulation) Act (SCRA), meaning any derivative on a CCC would be a commodity derivative regulated by SEBI.[28] Central Electricity Regulatory Commission's (CERC) regulations confine CCC trading to spot contracts on power exchanges, while the Supreme Court's 2021 settlement grants SEBI jurisdiction over financial derivatives. This dual-regulator model was operationalised when India launched electricity futures on MCX and the National Stock Exchange (NSE) in July 2025.[29] The same pathway should exist for CCC derivatives in future.

[23] Commodity Futures Trading Commission. EDF CFTC Response. 7 October 2022.
[24] World Bank. The Legal Nature of Carbon Credits. 15 March 2023.
[25] Federal Ministry for Economic Affairs and Climate Action, Germany. Habeck presents first carbon contracts for difference. 15 October 2024.
[26] ISDA. 2022 ISDA Verified Carbon Credit Transaction Definitions. 2022.
[27] Erlandsson, U.G. Transition linkers. 2024.
[28] SEBI. List of Commodities Notified under SCRA. 28 September 2016.
[29] Mondaq. Electricity Futures Contracts: A New Era for India's Power Market. 31 July 2025.

A further source of uncertainty is the tax treatment of CCC transactions, which will need clarification before financial participation becomes commercially viable.[30] Several jurisdictions have addressed similar ambiguities proactively. In the EU, spot allowance transactions are subject to a reverse-charge value-added tax (VAT) mechanism while carbon derivatives are exempt from VAT because they are seen as financial instruments.[31] The UK applies a zero VAT rate to carbon futures traded on terminal markets[32], and New Zealand also applies a zero VAT rate on emissions unit transactions entirely.[33] These approaches provide a practical reference point for India as it develops a coherent fiscal framework for CCC transactions.

When trading begins, the primary determinant of market functioning will be whether targets are set with sufficient stringency and whether MRV and enforcement are robust. Global experience is clear on this point: Markets fail first from weak scarcity and inadequate enforcement, not from the absence of financial intermediaries. The US programme for the phasedown of lead[34] and the New Zealand ETS both functioned with limited financial intermediation because genuine compliance pressure existed and was enforced. Where scarcity is real and enforcement credible, even bilateral or broker-facilitated trading can provide meaningful liquidity. In the New Zealand ETS, brokers operate primarily as matchmakers rather than as principals. They connect buyers and sellers without taking units onto their own balance sheets, reducing transaction costs and improving price transparency without requiring the regulatory infrastructure that full financial participation demands.[35] This transaction model offers a practical intermediate step that India could adopt in the CCTS's early phases, expanding market access and improving liquidity between compliance deadlines well ahead of any decision to open the market to full intermediary participation. That said, the CCTS will initially lack hedging instruments to generate forward price signals and intermediaries to aggregate units for deficit entities. These gaps will matter more as the market matures and firms seek to incorporate carbon costs into long-horizon investment decisions, which is why the pathway toward eventual financial integration should be designed now, even if activation comes later.

> **Markets fail first from weak scarcity and inadequate enforcement, not from the absence of financial intermediaries. But even where scarcity is real, confining participation indefinitely to obligated entities risks the thin trading and floor-price outcomes that characterised India's own PAT scheme for over a decade.**

India's carbon market does not need sophisticated financial intermediation on day one, but it does need credible targets, robust enforcement, and a clear pathway for participation to deepen — and the time to design that pathway is before the market opens, not after.

[30] Section 115BBG of the Income Tax Act imposes a 10% tax on income from the transfer of carbon credits defined as units validated by the UNFCCC. CCCs issued under the CCTS are domestic instruments issued by BEE, not UNFCCC-validated units. Whether CCC transfer income will be treated as business income, capital receipt, or brought under 115BBG remains an open question. The GST position is similarly unclear. See: Cyril Amarchand Mangaldas. Evolution of Environmental Attributes in India. 25 May 2022; AZB & Partners. Sale of Renewable Energy Certificates Not Covered Under Section 115BBG – Oust Taxability by Holding It a Capital Receipt. 30 June 2023.

[31] Emissions-EUETS. Fiscal Treatment of Emission Allowances. 23 November 2021.

[32] UK Parliament. VAT Update on UK emissions trading scheme. 5 July 2021.

[33] New Zealand Inland Revenue. Tax Treatment of Transactions in Emissions Units. 2009.

[34] Richard G. Newell and Kristian Rogers. The U.S. Experience with the Phasedown of Lead in Gasoline. June 2003.

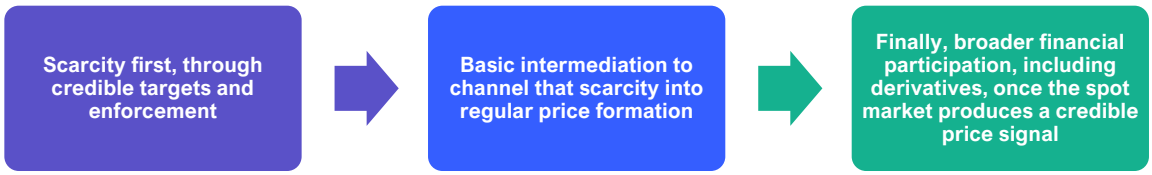
[35] Ministry of Environment – New Zealand. Liquidity and Prices in the New Zealand Emissions Trading Scheme: The Role of Government. 1 December 2007.

Furthermore, the comparison of CCTS with the Perform, Achieve and Trade (PAT) scheme is instructive but should not be overstated. PAT's poor outcomes — in which only around 3.4 million of the 5.2 million Energy Saving Certificates (ESCerts) mandated for purchase were actually transacted, all at the floor price — reflected primarily weak target-setting, uneven MRV, and insufficient enforcement.[36,37] These failures prevented genuine scarcity from emerging. Restricted participation and spot-only trading compounded the effect but were not its cause. The CCTS introduces genuine improvements on these foundations through a relatively more rigorous MRV framework. Whether those improvements translate into effective market functioning depends on two conditions that remain to be demonstrated: Targets set with sufficient stringency to generate real abatement pressure, and enforcement credible enough to make compliance obligations binding in practice. Even where those conditions hold, confining participation to obligated entities creates a meaningful risk of thin trading and limited price discovery between compliance deadlines.

Carbon cost exposure is already materialising. CBAM entered its definitive phase in January 2026, and its design implications for Indian exporters are discussed in detail in Section 4. SEBI's Business Responsibility and Sustainability Reporting (BRSR) Core framework additionally requires the top 1,000 listed entities to make ESG disclosures, with greenhouse gas (GHG) emissions among the key performance indicators.[38] As this assurance requirement expands alongside the CCTS becoming operational, the carbon performance of obligated entities will become increasingly visible to equity analysts and credit-rating agencies, adding a market-discipline dimension to compliance incentives that did not exist under PAT.

2.6. What comes next: Sequencing financial participation in the CCTS

Financial participation in the CCTS must be built in stages:



The preparation for later stages should begin now, even as the market focuses on establishing its foundational credibility.

The first problem to solve is the absence of a reference price. As currently designed, the CCTS is a baseline-and-credit system with no auctions; when trading begins, secondary market participants will have no price anchor.[39] A consignment auction mechanism (discussed in detail in the first report in this series),[40] requiring a defined percentage of earned CCCs to clear through a centralised, regulator-managed auction at regular intervals, could fill this gap, much as primary auctions in the EU ETS help anchor secondary market pricing. Vintage-based eligibility rules should accompany this

[36] Prayas (Energy Group). PAT III: New Cycle, Old Issues. 14 March 2025.
[37] Prayas (Energy Group). Not a PAT on the back, yet. 25 May 2023.
[38] SEBI. BRSR Core - Framework for assurance and ESG disclosures for value chain. 12 July 2023.
[39] Or also a clear view of total credit supply.
[40] IEEFA. Strengthening India's carbon market: The case for a stability mechanism in India's CCTS. 30 October 2025.

early, to prevent credits accumulated during low-stringency target phases from flooding future compliance periods.

> **The legal architecture for financial integration, from SEBI's classification of carbon credits as commodities to the CERC-SEBI framework tested through electricity futures, already exists. The risk is not that India moves too fast but that it waits too long to activate it.**

Even with a reference price in place, the market will not function effectively if trading remains restricted to obligated entities. The CCTS, as designed, permits unlimited banking but confines participation to compliance buyers and sellers, a combination that, if left unchanged, risks producing hoarding and illiquidity. Surplus entities with no external counterparties have little incentive to sell before compliance deadlines. Exchange trading in the K-ETS effectively halted for eight months after launch, with the exclusion of third-party participants compounding the overallocation problems discussed in Section 2.3. Korea's eventual response was to designate state-backed market makers to restore bid-ask continuity. India should incorporate this into the design rather than treat it as a corrective intervention later. Admitting banks, brokers, and designated market makers, subject to holding limits and position reporting, is what would convert a compliance registry into a functioning market. The third step, launching CCC derivatives, would not require new legislation. The CERC-SEBI jurisdictional model underpinned by SEBI's classification of carbon credits as goods under the SCRA has already been operationalised through electricity futures. CCC futures could follow the same pathway once spot market liquidity is sufficient to support it. Before that stage, however, the tax treatment of CCC transactions, currently ambiguous under both Section 115BBG[41] and Goods and Services Tax (GST), will need to be resolved.

3. Beyond industry: Integrating the power sector into India's CCTS

Key question: How should India sequence the expansion of its carbon market, and what does including the power sector require?

India's CCTS establishes intensity targets across multiple energy-intensive industrial sectors, obligating a broad base of entities. With the forthcoming inclusion of heavy industries like iron and steel, the scheme's emissions coverage will expand significantly to capture a substantial share of the country's total GHG emissions.[42,43]

Expanding the CCTS to cover more of India's economy is both necessary and inevitable. Broader coverage improves the environmental effectiveness of the carbon price, deepens liquidity, and strengthens the market's price discovery function. The initial design reflects practical sequencing: Sectors with established MRV infrastructure, mature benchmarking methodologies, and

[41] RMLNLU. The legal conundrums involving taxability of carbon credits under section 115BBG. 15 September 2022.
[42] Asia Society Policy Institute (ASPI). Strengthening India's carbon credit trading scheme by inclusion of the Power Sector. 10 September 2025.
[43] Using India's national GHG emissions of ~4,133 $MtCO_2e$, the covered baseline corresponds to 17% of India's emissions.

concentrated emission sources are easiest to include first. But as the system consolidates, regulators will face increasing pressure to extend its reach.

Among the candidate sectors, the power sector stands out as the most consequential. Electricity generation accounts for nearly 40% of India's GHG emissions[44] and is central to economy-wide decarbonisation pathways, yet the CCTS in its current form excludes it. The sector also offers significant mitigation opportunities through accelerated renewable integration, improved flexibility, retirement or reduced utilisation of inefficient coal assets, and investments in storage and grid modernisation. One must also note here that carbon pricing is neither the only nor always the most direct instrument for realising these gains. Much of the sector's decarbonisation will also come from capacity planning, procurement, and targeted support for renewables, storage, and flexibility, and from reforming the structures that may keep inefficient plants running regardless of their economics. What a carbon price does that these measures do not is act on the merit order itself. By loading the cost of emissions onto the variable generation cost that governs dispatch, it moves higher-emitting plants toward the end of the order. The design challenge is ensuring that this signal reaches dispatch, rather than being blunted by contracting and tariff arrangements that insulate a plant's economics from how much it actually runs.

Early inclusion can also help shape long-term investment decisions. Given the long asset life of power infrastructure, delaying carbon price signals may increase the risk of locking in emissions-intensive investments that could become uneconomic or stranded under future climate regulation. Sector-specific policies, including renewable consumption obligations (RCOs), the PAT scheme, and national targets of 500 gigawatts (GW) of non-fossil capacity and 50% renewable generation, are already driving emissions reductions in the sector. These provide a basis for phased integration rather than an argument against eventual inclusion.

> **The initial exclusion of the power sector from India's CCTS reflects transitional and structural constraints rather than a lack of policy ambition. With a coal-dominant generation fleet operating under long-term power purchase agreements (PPAs), regulated tariffs, and financially stressed distribution companies, integrating carbon costs requires careful alignment of dispatch rules, tariff pass-through mechanisms, and consumer safeguards to avoid unintended financial and affordability disruptions.**

Administrative readiness also matters, establishing robust MRV systems across a large and diverse power fleet adds complexity, and several jurisdictions have sequenced ETS expansion according to sectoral readiness and data availability.[45] As an example, PAT uses normalisation factors adjustments that account for differences in operating conditions such as plant load, fuel quality, and ambient conditions to ensure fair comparison of performance across plants.

This improves comparability across a heterogeneous fleet but also introduces methodological complexity not aligned with the standardised emissions accounting typically required for carbon market integration. In some cases, factors currently adjusted for under PAT may also influence

[44] Power Line. Powering the green transition: Imperative of including TTPs in the Carbon Credit Trading Scheme. 23 July 2025.
[45] International Journal of Electrical Power and Energy Systems. Carbon trading markets: literature review on mechanisms, accounting, and market models coupled with energy markets. January 2026.

operational efficiency and emissions intensity in ways that carbon pricing is intended to reveal. As a result, aligning these methodologies with a standardised MRV framework for the CCTS will require careful design choices regarding which adjustments remain appropriate under a carbon market.

A phased approach to strengthen and harmonise MRV systems may be warranted prior to full inclusion of the power sector in the CCTS. This could involve initially aligning emissions accounting methodologies, improving data consistency, and building institutional capacity. Such an approach would allow India to build on existing systems while ensuring credibility and robustness in emissions measurement.

However, excluding the power sector limits early allowance demand and weakens carbon-price formation. Carbon markets function most effectively when they cover major emitting sectors because the breadth of coverage directly influences liquidity, abatement options, and price discovery. Without participation from the largest emitting sector, mitigation flexibility and trading volumes remain constrained, reducing incentives for low-carbon investment across covered sectors.[46]

At the same time, the operational characteristics of the power sector can, over time, support more active market participation. Unlike industrial sectors, where emissions change relatively gradually, power plants adjust output frequently to meet demand, which can lead to more regular changes in emissions positions and create the potential for more frequent trading. However, given the currently limited level of market participation, these benefits are unlikely to materialise immediately. Improvements in liquidity will depend on expanding overall participation and ensuring that market design supports active trading.

The case for eventual power sector inclusion rests on three structural considerations.[47]

Table 2: Core rationale for power sector inclusion in the CCTS

Emissions coverage	Mitigation potential	Policy coherence
The power sector is typically the largest source of emissions in fossil-fuel-dominated energy systems, contributing roughly 40% of carbon emissions globally. Excluding such a large source from carbon pricing weakens overall mitigation incentives, as generators do not directly face carbon costs or corresponding incentives to shift dispatch, improve operational efficiency, or accelerate investment in lower-emission technologies. As a result, the environmental effectiveness of the ETS is reduced	The electricity sector offers cost-effective mitigation pathways through dispatch shifts, fuel switching, renewable substitution, and efficiency improvements. Carbon pricing directly alters marginal generation costs, enabling relatively rapid emissions reductions compared with slower industrial process changes.	Excluding electricity generation from carbon pricing creates some distortion, though less pronounced in India's case since the CCTS already accounts for Scope 2 emissions in obligated sectors. This means, industries can reduce their intensity targets by sourcing cleaner electricity through instruments like the Green Day-Ahead Market (GDAM) or round-the-clock renewable contracts. That said, Scope 2 accounting only addresses the consumption side. Without the power sector itself facing a carbon price, dispatch decisions remain

[46] International Journal of Electrical Power and Energy Systems. Carbon trading markets: literature review on mechanisms, accounting, and market models coupled with energy markets. January 2026.
[47] International Journal of Electrical Power and Energy Systems. Carbon trading markets: literature review on mechanisms, accounting, and market models coupled with energy markets. January 2026.

when major emitting sectors remain outside its scope.		insulated from the signal, weakening the incentive to shift generation away from high-emission sources, but also to improve efficiency within the thermal fleet. Full inclusion would align both production and consumption signals, producing a more coherent decarbonisation pathway across sectors.

Unlike trade-exposed industrial sectors, electricity generation typically faces limited international competitiveness and carbon leakage concerns, which has often made allowance auctioning more feasible in power-sector carbon markets. Given the sector's large emissions footprint and allowance demand, auctioning electricity-sector allowances has historically generated a significant share of carbon market revenues in major systems.

It is estimated that including the power sector in India's CCTS and introducing auctioning could generate more than USD500 billion (INR47.3 lakh crore) in revenues by 2050, creating substantial resources for clean-energy investment, consumer protection, targeted transition programmes, and just transition measures for workers, communities, and regions.[48]

This revenue potential has a direct energy security dimension relevant specifically to the power sector. India is the world's second-largest coal importer, and its power system remains heavily dependent on thermal coal. Carbon pricing that accelerates renewable deployment and reduces coal-fired utilisation would, over time, structurally reduce coal import volumes and their associated fiscal and balance-of-payments exposure. Coal import prices have remained elevated since the Russia-Ukraine conflict triggered global fuel switching. Additionally, recent[49] global coal price stress has reinforced India's exposure to this dependency. Auction revenues could be used to support measures that reduce exposure to imported fossil fuel price volatility over time, including targeted support for clean energy deployment, grid modernisation, and other transition-enabling infrastructure.

Similar volatility has been observed in gas and coal markets. Global LNG prices surged nearly 70% following supply disruptions, while coal prices also rose as countries switched to coal in response to gas shortages.[50]

In this context, if India introduces the auctioning of allowances in future phases of the CCTS, as many mature carbon markets have done, the revenues generated could provide a significant domestic source of public finance. Auctioning proceeds accrue to the state (general budget or ring-fenced), where they could be directed toward consumer protection, targeted transition measures, or other energy transition priorities. Their scale will depend on market design, credit prices, auction volumes, and the pace of emissions reduction, making them potentially important but not necessarily stable or long-term. In the power sector, auctioning also carries a distributional dimension that will need careful handling. The generators purchasing allowances upfront sit within a value chain that is financially stressed, so recycling a meaningful share of revenue back to these participants would

[48] ASPI. Strengthening India's carbon credit trading scheme by inclusion of the power sector. September 2025.
[49] Petroleum Planning and Analysis Cell. International Prices of Crude Oil (Indian Basket), Petrol and Diesel. 23 March 2026.
[50] Oil Price. Asia Hikes Coal Use as Middle East War Chokes Gas Supply. 18 March 2026.

ease the transition without weakening the incentive to abate. The design would also need to reckon with the sector's cross-subsidy structure, under which commercial and industrial (C&I) consumers pay tariffs well above the average cost of supply to subsidise other users: Layering a carbon cost onto their already high tariffs could erode the cross-subsidy base that keeps distribution utilities solvent, so revenue recycling should be designed with these dynamics in mind.

3.1. How carbon pricing works in a regulated power system

Concerns about including the power sector are often rooted in the assumption that carbon markets require fully competitive electricity markets to function effectively. This view is shaped largely by the European experience, but nuances from China and Korea highlight that parallel evolution of carbon and power markets should not be confused with causation. In practice, the link between carbon markets and power markets operates via cost pass-through rather than market liberalisation. A carbon price raises the variable cost of emitting generators. If this cost is recognised in dispatch decisions, lower-emitting plants are used more frequently. If carbon costs are reflected in tariffs, consumers and investors receive signals which influence efficiency, demand, and technology choices. Neither mechanism inherently requires competitive wholesale markets, both require cost-reflectivity. India’s power system already operates on cost-based dispatch principles, and tariff regulation routinely accommodates changes in fuel costs, making it institutionally closer to enabling carbon cost pass-through than is often acknowledged.[51]

3.2. Lessons from other countries

International experience shows that liberalised electricity markets are not a prerequisite for including power generation in carbon markets. The decisive factor has not been the degree of market liberalisation, but whether carbon costs are credibly embedded into dispatch decisions, investment incentives, and, where appropriate, retail tariffs.

The EU ETS: From its inception, the EU ETS included electricity generation in fully liberalised wholesale markets, where generators incorporate carbon costs into their bids. However, in the early years, the extent of cost pass-through depended on national market structures and regulatory arrangements, particularly in countries where electricity market liberalisation was still underway.

Early phases of the EU ETS also highlighted an important allocation lesson: Free allocation to electricity generators, combined with cost pass-through, resulted in significant windfall gains for power companies in some markets. As markets matured and carbon prices strengthened after 2018, following the introduction of the Market Stability Reserve, coal generation declined and power-sector emissions fell by roughly half compared to 2005 levels.[52]

China’s national ETS: This was launched in 2021 with the power sector as its sole covered sector, despite operating a highly regulated electricity system characterised by administratively determined tariffs and limited cost pass-through. In this context, intensity-based benchmarks tied to emissions per unit of electricity generated allowed compliance obligations to expand with electricity demand, reducing concerns about supply constraints or price volatility. This illustrates that even in systems

[51] ASPI. Effective Interaction Between India's Carbon Credit Trading Scheme and The Power Market. 14 January 2026.
[52] ASPI. Strengthening India's carbon credit trading scheme by inclusion of the power sector. September 2025.

where cost pass-through is constrained, power sector inclusion remains possible through alternative market design choices. As reforms in China's power sector progress and market-based pricing expands, the ETS is also evolving toward tighter constraints, including movement away from fully intensity-based allocation and toward an absolute cap structure.

The Korea ETS: The scheme included power generators from 2015 despite regulated tariffs.[53] In early phases, carbon costs did not flow into dispatch decisions, and market impact was limited. Korea subsequently introduced an Environmental Merit Order (EMO) system in 2022, incorporating carbon costs into dispatch and partially passing them through to retail electricity prices.[54,55] Korea's experience highlights two distinct considerations for regulated markets such as India. First, carbon costs need to influence dispatch, tariffs, or investment decisions to create meaningful incentives for emissions reduction. Second, where generators cannot fully pass through these costs, mechanisms such as emissions benchmarks or transitional allocation approaches may be needed to manage financial burdens while preserving incentives for efficiency improvements.

California's Cap and Trade programme: This covers both in-state generation and electricity imports, with regulated utilities auctioning allocated allowances and returning revenues to consumers through electricity bill credits. This approach allowed carbon costs to be reflected in electricity prices while cushioning impacts on end consumers through targeted rebates, thereby preserving the carbon price signal. Carbon pricing can therefore influence dispatch decisions, operational efficiency, and longer-term investment choices while moderating distributional impacts.

New Zealand ETS: This scheme covered electricity sector emissions from the outset through an upstream design, under which suppliers of coal, gas, and other fossil fuels used in electricity generation are covered under the ETS rather than individual power plants. This reduces administrative complexity while still exposing the power sector to carbon costs. Importantly, the energy sector does not receive free allowances, as it is not considered trade-exposed and is able to pass carbon costs through to consumers.

Regional Greenhouse Gas Initiative (RGGI): Launched in 2009, this included the power sector from inception through a cap-and-trade system covering fossil fuel power plants across participating northeastern US states. Unlike the early EU ETS, RGGI relied primarily on auctioning rather than free allocation. Operating in relatively competitive electricity markets, generators were generally able to pass carbon costs through to electricity prices.

> **India's electricity market may not be fully competitive like Europe's, but neither were China's or South Korea's when they launched their ETSs. India's regulated framework offers relevant instruments, including change-in-law clauses in long-term PPAs and tariff structures that can pass carbon costs through to the energy charge while maintaining consumer protection. The design task is to ensure that cost is reflected in the charge that governs dispatch, so the carbon price shapes how plants are run and not only who bears the cost.**

[53] Asian Development Bank. The Korea Emissions Trading Scheme. November 2018.
[54] International Carbon Action Partnership. Korea Emissions Trading System (K-ETS). 2015.
[55] ASPI. Korea Study Tour on ETS Design and Implementation.

3.3. Instruments in place, coordination still needed: India's path to power sector inclusion

Including electricity in India's CCTS is not simply a question of sectoral expansion, but of how carbon pricing can support multiple policy objectives simultaneously. These include strengthening mitigation incentives, avoiding lock-in of high-emission assets, improving long-term investment signals, modernising the power sector, generating public revenues, and improving policy coherence across climate and electricity regulation. At the same time, inclusion must protect electricity affordability, maintain supply reliability, and enable a manageable transition for generators, consumers, and workers affected by higher carbon costs.

Carbon pricing affects electricity systems through two main channels. First, it influences supply-side decisions by increasing the relative cost of high-emission generation, affecting dispatch, encouraging operational efficiency improvements, improving fuel choices where feasible, and strengthening incentives for lower-emission and renewable generation in future procurement and investment decisions. Second, where carbon costs are reflected in retail tariffs, carbon pricing can also affect electricity demand and encourage greater efficiency and demand response. This second channel may initially be weaker in India due to regulated retail tariffs, while the first may be partly constrained by long-term PPAs, dispatch arrangements, and limited cost pass-through.

Box 1: Expected impacts on emissions, carbon price, and policy coherence

Including the power sector in India's CCTS would have economy-wide effects. Once power producers face a carbon price, coal generation becomes relatively more expensive, encouraging lower utilisation of the most high-emitting units and improving the competitiveness of renewables and efficient plants. Given long-term PPAs and regulated tariffs, operational changes may be gradual. The stronger impacts would emerge through investment and retirement decisions, making new coal less attractive, accelerating efficiency upgrades, and bringing forward the retirement of older plants. Carbon pricing thus shapes not just how the system runs today but how it is built over the next decade.

Power sector inclusion would also strengthen the carbon market itself. Electricity generators are large, consistent emitters whose participation would deepen allowance demand, improve liquidity, and produce a more stable and credible carbon price. It would equally improve policy coherence, reinforcing renewable targets, supporting dispatch reform, and creating incentives for storage and demand response. Rather than operating as a standalone compliance tool, the CCTS would become a coordinating signal across climate policy, power sector reform, and investment planning.

What remains missing in India's case is regulatory coordination and clarity: Effective inclusion requires alignment between carbon market authorities, power system operators, and electricity regulators at both central and state levels.

The conclusion is straightforward. Perfect power markets are not a prerequisite. What matters is the ability to reflect carbon costs in operational and economic decisions, achievable through regulatory instruments even in partially liberalised systems. Prolonged exclusion eases early implementation but risks weakening price signals, constraining emissions reductions, and undermining the CCTS's long-term credibility.

The current exclusion of the power sector also creates design complexity within the CCTS. Scope 2 emissions are currently included within industrial obligations, partly compensating for the absence of direct power sector coverage by incentivising cleaner electricity procurement. However, if electricity generation is directly covered, emissions would be priced at source, raising questions about the continued role of Scope 2 compliance obligations for industry. Revisiting this interaction could simplify system administration, reduce overlapping obligations, and create a clearer carbon price signal across the electricity value chain.

India's regulatory framework contains the necessary instruments, but how they are applied will decide whether a carbon price does more than shift who bears the cost. Most PPAs follow a two-part tariff structure of fixed capacity charges and variable energy charges, and include change-in-law provisions that let generators recover additional costs, such as carbon compliance costs, with utilities in turn recovering these from end consumers through regulated retail tariffs.[56] This protects generators and distribution companies (DISCOMs) from financial stress, but recovery alone does not create a dispatch effect. Merit order dispatch ranks plants by their variable charge, so a carbon cost alters dispatch only if it is built into the variable charge on which scheduling is based. Recovered instead as a separate line item or a retrospective true-up, it leaves the scheduled variable charge unchanged: the generator is made whole, but its place in the merit order, and therefore how much it runs, does not move, and the environmental rationale for the carbon price falls away. The signal operates only when the carbon cost enters the variable generation cost itself. Higher-emission generators then carry a higher variable charge, slip down the merit order, and lose dispatch competitiveness, which rewards operational efficiency and improves the relative standing of lower-emission and renewable generation in future procurement and investment. Auction revenues can then be recycled to offset tariff increases, support vulnerable consumers, and invest in clean energy infrastructure, easing the cost burden while preserving this signal rather than replacing it.

The question, therefore, is not whether the power sector should be included, but how inclusion can be sequenced and designed to balance mitigation, affordability, equity, and reliability objectives. This requires early clarity on allocation approaches, treatment of Scope 2 emissions, cost pass-through arrangements, and consumer protection mechanisms. A phased inclusion pathway, supported by stronger coordination between carbon market authorities, electricity regulators, system operators, and state governments, would allow India to expand the CCTS while preserving system stability and strengthening long-term market credibility.

[56] This also allows for demand response.

4. Carbon border adjustment and India's carbon market: Interaction, incentives, and the design imperative

Key question: How should India's carbon market respond to the rise of carbon border measures, and what would it take to convert an external compliance cost into a domestic policy instrument?

The EU's CBAM, which entered its definitive phase in January 2026, is among the first instruments of its kind to operationalise a carbon price at an international trade border. Its core logic is that, as the EU phases out free allocation of allowances under its ETS, EU producers face rising domestic carbon costs that non-EU producers, in jurisdictions without comparable carbon pricing, do not bear. CBAM is designed to close this asymmetry by ensuring that import of covered goods faces an equivalent carbon cost at the EU border, restoring competitive parity for EU industry. CBAM achieves this by requiring EU importers of covered goods to surrender certificates, the price of which is linked to the weekly average EU ETS allowance. A deduction can be available only where a carbon price — in the form of a tax, levy, fee, or emission allowances under the ETS — has been effectively paid in the country of production on the GHG embedded in those goods.[57] The sectors in scope, including iron and steel, aluminium, cement, fertilisers, hydrogen, and electricity, are the most trade-exposed, carbon-intensive industries within the EU ETS and the ones most vulnerable to carbon leakage.[58] By 2034, when free allocation is fully phased out, CBAM will impose the full cost of embedded carbon on every tonne of these goods entering EU customs territory.

4.1. India's exposure: Concentrated, structural, and growing

India's overall macroeconomic exposure to CBAM is, by most estimates, modest. CBAM-exposed exports to the EU account for approximately 0.2% of India's GDP, and modelling by the Centre for Social and Economic Progress projects a GDP decline of between 0.02 and 0.03 percentage points over 2026 to 2030.[59] But aggregate figures conceal a more uncomfortable sectoral reality. Iron and steel alone constitute roughly 90% of India's CBAM-exposed EU exports, and India is expected to bear approximately 18% of total CBAM certificate costs globally, nearly double its share of EU import value. This disproportionate exposure reflects production technology: The majority of Indian steel is produced through the blast furnace and basic oxygen furnace (BOF) route, generating approximately 2.5 tonnes of CO_2 per tonne of steel against an EU benchmark of closer to 1.8 tonnes.[60]

The early evidence from the transitional reporting phase is striking. India's steel and aluminium exports to the EU fell 24.4% in financial year (FY) 2025 before any financial obligation even existed, with steel alone accounting for a 35.1% decline.[61] European buyers, anticipating cost implications

[57] European Commission. Carbon Border Adjustment Mechanism.
[58] Carbon leakage refers to the relocation of emissions-intensive production from jurisdictions with stricter climate policies to those with weaker or no carbon constraints, resulting in little or no reduction in global emissions.
[59] Centre for Social and Economic Progress. Assessing the Distributional Implications of the EU's CBAM on India: A CGE Analysis. 11 August 2025.
[60] Umweltbundesamt. (German Environment Agency). Development of the iron and steelmaking sector under the EU ETS: Overview and country-level analysis from 2005 to 2019. 2024.
[61] Financial Express. CBAM already hurting India's exports to EU: GTRI. 21 September 2025.

and the administrative burden of sourcing emissions data from high-intensity suppliers, began reorienting supply chains toward low-emitting producers in Turkey, South Korea, and the UK. When CBAM is fully phased in by 2034, the projected import charge on Indian steel could reach approximately EUR243 (INR26,100) per tonne under medium carbon price scenarios[62], a cost that would require either significant price reductions or wholesale production transformation.

> **India may seek exemptions. However, CBAM's logic does not leave room for bespoke carve-outs without undermining the mechanism's fundamental design. The more consequential question is whether India can shape its own carbon market architecture to make deductions available and revenue retention possible.**

4.2. The architecture mismatch: Why CCTS does not automatically resolve CBAM exposure

India's CCTS is a significant step in institutionalising domestic carbon pricing. An intensity-based system avoids the imposition of absolute emissions caps on an economy still expanding its industrial base and avoids penalising growth. For domestic climate policy purposes, it is defensible and well-calibrated. The problem is that CBAM operates on a fundamentally different logic.

The core idea of CBAM is straightforward: Every producer selling into the EU market, whether based in the EU or outside, should pay an equivalent carbon price per tonne of embedded emissions, so that no producer gains a competitive edge by avoiding carbon costs. This requires the EU to recognise carbon prices effectively paid in third countries and deduct them from the CBAM bill at the border. Whether CCTS produces such a recognisable price, and at what level, is a question of design rather than category. The CBAM Regulation defines carbon price broadly. Article 3(29) covers any monetary amount paid as a tax, levy, fee, or through ETS allowances calculated on covered GHG, and Article 9 ties the deduction to whatever has been "effectively paid" in the country of origin. CCTS is not categorically excluded.

The structural issue lies elsewhere. CCTS prices only the deviation between actual emissions and the sectoral benchmark; emissions below the benchmark are implicitly free. This is functionally equivalent to free allocation under the EU ETS and it is precisely the feature that the EU is phasing out, alongside the phase-in of CBAM, to ensure paid carbon costs rise to a level that supports cross-border equivalence by 2034. Where CCTS benchmarks are calibrated such that most firms can meet or beat them through routine abatement, the average payment per tonne of CO_2 across covered sectors becomes small.

The European Commission launched a call for evidence on third-country price deduction methodology in August 2025. The synopsis of stakeholder responses has since been published, but the implementing acts setting out the recognition framework are still in development.[63] But the design challenge for CCTS is upstream of methodology. The question is not how to evidence small

[62] Global Efficiency Intelligence. The Impact of the EU CBAM on Global Steel Trade. March 2025
[63] As of 15 May 2026.

payments cleanly, but whether the system is calibrated to produce payments large enough to translate into meaningful CBAM deductions in the first place.

This may create a double burden risk. Indian exporters may face compliance obligations and costs under CCTS while simultaneously bearing the full CBAM liability at the EU border with no deduction mechanism bridging the two. At the same time, a second-order effect may emerge whereby efforts to comply with increasingly stringent CCTS benchmarks reduce the emissions intensity of production, thereby lowering the embedded emissions associated with exported goods and, in turn, reducing CBAM certificate obligations. The call for evidence on how carbon prices paid under different compliance schemes can be deducted from CBAM obligations acknowledges this design tension.[64]

There is also a price gap dimension. Domestic carbon credit prices under CCTS are currently estimated in the range of USD11–15 (around INR1,040–1,420), against EU ETS prices of approximately USD80–90 per tonne (around INR7,560–8,510) in 2025 with projections indicating a rise to around USD130 (INR12,290) by 2030. Even if the EU were to recognise CCTS credits as a deductible carbon price, the quantum of the deduction would be negligible relative to the CBAM liability, even when accounting for the CBAM factor and the output-based allocation (OBA) induced spreading out of carbon costs.[65,66]

Box 2: The contested legitimacy of CBAM and India's diplomatic position

India's formal response to CBAM has been one of principled opposition with attempts to negotiate. India has characterised CBAM as 'unilateral, arbitrary, and a trade barrier', raised concerns at the World Trade Organization (WTO) between 2020 and 2024, and at the 29th Conference of the Parties (COP29) in Baku in 2024. The BASIC grouping of Brazil, South Africa, India, and China has collectively argued that such measures violate the United Nations Framework Convention on Climate Change's (UNFCCC) principle of common but differentiated responsibilities and respective capabilities (CBDR-RC) and undermine the nationally determined approach of the Paris Agreement.

India's per-capita emissions remain far below EU levels, its development trajectory requires continued industrial expansion, and its fiscal capacity to fund green transitions is constrained relative to economies that have already completed theirs. Russia formally initiated WTO dispute settlement proceedings against CBAM in May 2025, and India had earlier signalled intent to pursue similar action. In practice, however, India's stance has shifted from

[64] As per the synopsis report on the call for evidence released in May 2026, stakeholder responses to the consultation make this design tension explicit. EU respondents pushed for strict exclusion of rebates, indirect support, and any cost component offset by compensatory mechanisms when calculating the net carbon price, while third-country respondents pressed for comprehensive deductions of all carbon-related costs borne abroad.

[65] Some degree of carbon price divergence could be expected across jurisdictions because marginal abatement costs, technological readiness, and development priorities vary between advanced and emerging economies.

[66] 'CBAM factor' refers to the gradual phase-in of CBAM obligations alongside the phased withdrawal of free allocation under the EU ETS, which reduces the effective share of embedded emissions subject to CBAM costs during the transition period. 'OBA' mechanisms distribute free allowances relative to benchmarked output levels, thereby lowering effective carbon cost exposure for efficient producers and, in some cases, indirectly moderating equilibrium allowance prices through reduced allowance demand and altered market scarcity conditions.

confrontation to structured engagement. The EU-India Free Trade Agreement, concluded on 27 January 2026, contains a CBAM annexe establishing the following: A Most Favoured Nation obligation requiring that any flexibilities the EU grants to other third countries on CBAM be extended on no less favourable terms to Indian goods; a technical dialogue track covering recognition of carbon prices effectively paid in India, mutual recognition of verifier accreditation bodies, and information exchange on default values and embedded emissions methodology; and a structured partnership platform established under a separate memorandum of understanding (MoU), combining financial support, technical assistance, and capacity building. India did not secure exemptions or a determination that CCTS qualifies for deductions, but the FTA channels the relationship into technical cooperation rather than dispute, and the technical dialogue track is precisely the channel through which the deduction question of Section 4.2 will be evaluated.[67]

There is, however, a counterargument that deserves engagement. CBAM does treat domestic and foreign producers identically when selling into the EU, and the deduction mechanism in Article 9 rewards countries with their own carbon price on the production of covered goods. The underlying carbon-leakage concern is also genuine. As the EU tightens its own carbon price, EU producers face a real risk of being undercut by imports from jurisdictions without comparable pricing, and addressing this is a legitimate policy objective India should engage with on its merits rather than dismiss as protectionism. Several discussions within India have noted that diplomatic energy devoted to seeking CBAM exemptions may be better directed toward strengthening the CCTS to the point where its credibility is sufficient to generate deductions at the border. From this perspective, CBAM's challenge to India is less a trade grievance to be resolved diplomatically and more a market design opportunity to be resolved institutionally.

4.3. CBAM as a design pressure and the path forward

CBAM is demonstrating 'impact effectiveness' by accelerating the diffusion of carbon pricing systems among EU trading partners, though how much of this is directly attributable to CBAM is hard to isolate. Turkey passed its Climate Law in July 2025 establishing a national ETS aligned with EU rules, with explicit CBAM compatibility as a stated objective; Vietnam launched its compliance ETS pilot in mid-2025 covering power, steel, and cement; Brazil legislated its national emissions trading system in late 2024 with mandatory participation from 2027. These jurisdictions, alongside South Korea's longer-established K-ETS, are positioned to seek Article 9 recognition for their carbon pricing — a first-mover advantage with real consequences for Indian exporters who compete against them in the EU market. The UK's CBAM enters force in January 2027, and Canada, Australia, and Japan are at various stages of developing parallel measures, suggesting the architecture of carbon border adjustments will widen rather than narrow over the coming decade.

[67] The Annex commits the parties to a structured technical dialogue and most favoured nation (MFN) treatment but does not in itself recognise CCTS as a qualifying carbon pricing regime under Article 9 of Regulation (EU) 2023/956. Recognition is contingent on the technical exchanges contemplated in Article 3 of the annexe.

Three design imperatives follow. First, India needs to resolve the equivalence question bilaterally with the EU and engage on the call for evidence on third-country carbon price deduction methodologies.[68,69] Second, the CCTS must develop price discovery sufficient to generate meaningful CBAM deductions, which requires sustained institutional investment in target stringency, market liquidity, and MRV integrity along with a strong focus on price stability. Third, India must decide whether the carbon revenue question is a fiscal priority. If it is, then the strategic case for accelerating domestic carbon pricing, primarily by tightening CCTS benchmarks and introducing auctioning of a share of allowances, with a separate carbon tax as a complementary option, and retaining revenue within India's green transition financing is as strong as the climate case. Reducing the implicit subsidy embedded in generous benchmarks is generally a less economically distortive route to recognisable per-tonne carbon costs than maintaining loose benchmarks alongside high credit prices.

> **The question for India is not whether CBAM can be resisted but whether India's carbon market architecture can evolve quickly enough to convert an external compliance cost into a domestic fiscal and industrial policy instrument.**

4.4. Structural asymmetries and the MSME challenge

Any analysis that focuses only on sectoral aggregates risks missing a critical distributional dimension. CBAM's compliance requirements, specifically the need for facility-level MRV of embedded emissions, create asymmetric burdens across India's industrial landscape. Large, export-oriented producers have the capital, data systems, and technical capacity to invest in CBAM compliance and potentially to demonstrate emissions intensities below EU benchmarks. Smaller exporters and MSMEs in export supply chains face a different reality. The administrative burden of facility-level emissions reporting and third-party verification is, for many, effectively prohibitive. Firms that cannot supply verified emissions data default to conservative EU reference values, which by design assume high carbon intensity and therefore maximise the CBAM liability. This creates a mechanism through which CBAM may disproportionately squeeze out smaller, less-capitalised Indian exporters even when their actual emissions intensity is competitive. These distributional concerns sit within a broader, unresolved debate over how embedded emissions should be measured in the first place, including the treatment of indirect emissions, the recognition of clean-grid advantages, and the alignment of CBAM's accounting boundaries with the scope-based conventions used elsewhere.

Emerging multilateral venues, notably the Open Coalition on Compliance Carbon Markets recently launched, are where these methodological questions and the broader interoperability of carbon pricing systems will increasingly be negotiated, and India's absence from such platforms could be a strategic gap worth closing.

[68] An emerging venue is also the Open Coalition on Compliance Carbon Markets, which is explicitly tasked with promoting interoperability of compliance carbon markets and convergence on MRV, accounting methodologies, and verification standards where such discussions are happening.

[69] On 13 May 2026, the European Commission published the draft implementing act on the recognition of carbon prices paid in third countries — the regulation that operationalises Article 9 of the CBAM Regulation. The draft confirms full deduction of domestic ETS or carbon tax payments in third countries with no additional EU quality requirements, and permits the use of Article 6.2 and 6.4 authorised credits to cover up to 10% of reported embedded emissions.

Also, India's CCTS faces an analogous verification challenge. Building MRV capacity rapidly and extending it to the facilities where it is genuinely needed is not just a CBAM compliance priority[70], it is a prerequisite for the CCTS to function as a credible market and for India to be taken seriously as a carbon pricing jurisdiction in EU deduction assessments.

5. Offsets and external credits

Offsets are tradable emission reduction units created when activities reduce or remove GHG outside the compliance boundary of an ETS. Each credit represents one tonne of carbon dioxide equivalent (CO_2e) avoided or removed, certified by a government, a government-accredited body, or by an independent standard. Unlike allowances, offsets bring reductions from other sectors or jurisdictions into the carbon finance framework. In India, offset credits would operate through a distinct mechanism established under the Indian Carbon Market (ICM). The ICM consists of two non-fungible components: The compliance market and a government-certified offset mechanism with its own Bureau of Energy Efficiency (BEE)-approved methodologies, adapted from international standards, including the Clean Development Mechanism (CDM). Both fall under the broader ICM architecture and may be integrated in the future, as hinted in the recent CERC regulation of 27 February 2026.

Jurisdictions employ offsets for three main reasons:

- To contain compliance costs by creating a pool of potentially lower cost credits.
- To expand mitigation incentives to sectors outside the ETS boundary.
- To pursue co-benefits by shaping offset protocols to support wider goals such as land restoration, rural livelihoods, or air quality improvements.

At the same time, challenges are significant. Environmental integrity is the most immediate concern, since ensuring additionality, robust accounting, adequate baselines, permanence, and the prevention of leakage are not simple tasks. Double counting is another risk, though primarily an accounting challenge rather than an environmental one. Corresponding adjustments under Article 6 of the Paris Agreement can structurally resolve both concerns for any cross-border transactions, which is relevant for India's outbound authorisation of internationally transferred mitigation outcomes (ITMO). Transaction costs are high, and there are also political economy trade-offs. Once a sector is brought into the offset system, it can become harder to shift it into the compliance market without resistance. At the same time, in some cases, well-designed crediting mechanisms can help build foundational MRV infrastructure. They can support verifier ecosystems, accreditation protocols, and registry systems, that ease later inclusion in compliance pricing, even if the underlying measurement architecture often has to be substantially adapted for compliance use. The political economy of the crediting-to-compliance transition is also smoother when phase-out and phase-in are signalled credibly from the outset.

[70] Smart point-of-regulation design substantially reduces the MRV burden on MSMEs. Energy-related emissions can be covered upstream through carbon pricing on fuels and electricity generation, embedding the carbon cost in MSMEs' fuel bills and tariffs without requiring facility-level monitoring. The genuine MRV-extension challenge is, therefore, concentrated at large process-emission facilities not currently covered by CCTS, at supply chains feeding CBAM-covered exports (where larger exporters will require verified upstream emissions data), and at the small set of process-intensive MSMEs that export directly to the EU.

5.1. Domestic versus international offsets

Domestic offsets are increasingly preferred in ETS design. They are easier to monitor and verify, help build local institutional capacity, and ensure that co-benefits remain within the jurisdiction.

The Korean Offset Credits (KOC), China Certified Emission Reductions (CCER), and California's domestic protocols are prominent examples. Lack of environmental integrity of individual credits becomes a cost sharing issue rather than an environmental concern when a domestic market is within a country with a clear national commitment. Any shortfall in emission reductions within the market must be made up by reductions elsewhere to meet commitments that are measured top-down through an emissions inventory. This can allow for simpler methodologies with lower transaction costs and potentially much greater reductions. The New Zealand forest crediting approach is a key example of this.

International offsets, by contrast, expand the pool of low-cost abatement opportunities. Under the Kyoto Protocol, CDM credits were used extensively in systems like the EU ETS and the New Zealand ETS. Yet these experiences revealed serious risks, including oversupply, depressed carbon prices, undermined domestic abatement incentives, and concerns about additionality. Both the EU ETS's and New Zealand's markets effectively collapsed as a result of CDM imports. New Zealand was forced to reset the market to exclude all international credits in 2015. The EU ETS progressively restricted and eventually banned international credits from 2021.

The broader trend reflects a clear lesson: International offsets can ease short-term compliance but create risks, including environmental integrity concerns, dependency on external abatement, and exposure to global market volatility. There is now growing recognition that credit imports require active host-system gatekeeping, through eligibility lists, quality filters, and authorisation protocols administered by the importing jurisdiction rather than reliance on external standards' quality assessments alone.[71]

Table 3: International experience with offsets in ETS

Jurisdiction	Experience	Key lesson
EU ETS	Heavy reliance on CDM/joint implementation (JI) in early phases; later restricted to Least Developed Countries and banned from 2021.	Lack of quantity restrictions on international offsets depressed prices and raised integrity concerns; shift to domestic-only strengthened market credibility.
New Zealand ETS	Unlimited certified emission reduction (CER) imports before 2015 ultimately led to near-zero prices. Allowances issued for reforestation.	Unrestricted imports can wipe out domestic abatement and destroy confidence; system later excluded international offsets.

[71] The EU's 2040 climate framework illustrates how far this gatekeeping logic has travelled. The EU is considering allowing them back from 2036 but capped at 5% of 1990 net emissions, ringfenced from ETS compliance, and likely administered through a central reserve model under active discussion in EU policy circles, whereby credits would be procured and held against quality criteria stricter than Article 6.4, with additional supply released to the market only if triggers such as price spikes or sectoral underperformance are hit.

		Large forestry response. Has created new issues with demand-supply balance and concern about biodiversity.
Korea ETS	KOC central in Phase I; international offsets allowed only under strict conditions and cut to 5% by Phase III.	Strong preference for domestic offsets; cautious and capped opening to international credits preserves integrity.
China ETS	CCER programme institutionalised from CDM methodologies; domestic projects eligible for up to 5% of compliance.[72]	Domestic offsets linked to national policy goals; kept as complementary, not dominant.
California & Québec	Prescriptive domestic protocols (forestry, livestock methane, ODS, mine methane) with 4–6% usage limit; California now retires one allowance for every offset credit used for compliance, preventing offset use from expanding total supply.	Integrity prioritised via strict protocols, buffer pools, and local co-benefits. The allowance-retirement mechanism is a structurally elegant feature India could consider if it later introduces limited offsetting, particularly given that CCTS's current challenge is lack of stringency rather than excess scarcity.

5.2. CCTS and offsets

India is building a domestic offset architecture anchored in its upcoming carbon registry. The government is developing 'Bharat Methodologies' (BM), drawing on international guidance on baselines, additionality, and double-counting safeguards, with 10 sectoral scopes in view spanning energy, industry, waste, agriculture, forestry, and transport. The intent is deliberate: offsets can reinforce policy priorities, not merely provide compliance flexibility. Transport's inclusion, for instance, allows carbon finance to support the electric mobility transition.

The more consequential decision, however, is not whether to build a domestic offset architecture but what that architecture is for, and which standard its credits are designed to meet. That choice is wider than it appears. The global voluntary architecture is shifting toward higher integrity with initiatives such as the Integrity Council for the Voluntary Carbon Market (ICVCM) and the Voluntary Carbon Market Integrity Initiative (VCMI) raising benchmarks for credit quality and corporate use claims. These standards are calibrated to the voluntary market, where strict one-for-one equivalence between a credit and a tonne of avoided emissions is essential because no other policy lever holds the system together. Government-administered compliance systems face a different design question. Because the cap, stringency settings, and broader sectoral policies are also in play, the degree of per-credit integrity required from offsets becomes a design choice rather than a fixed standard, a dial that can be turned according to what the rest of the system is doing. That dial has a floor, however. Where offsets sit under a binding absolute cap, the ceiling itself absorbs a weak credit by forcing compensating reductions elsewhere, so overstatement is contained at the aggregate level. The CCTS offers no such backstop yet, being intensity-based rather than a fixed mass cap and, at present, closer to slack than to scarcity. For India, therefore, integrity at the credit level matters as

[72] The CCER mechanism is widely expected to be internationalised in due course as a sourcing channel for international credits that China can authorise for use against its NDC under Article 6, expanding its strategic role beyond domestic compliance.

much as integrity at the system level; the two are complements, not substitutes, until a binding constraint exists for the system to lean on.

Different jurisdictions have set this dial differently. California reinforces strict equivalence through allowance retirement alongside compliance offset use, while New Zealand has run a domestic forestry crediting framework since 2008 with simpler rules, accepting lower per-credit integrity in exchange for higher participation, lower administrative burden, and a stronger sectoral response. The outcome there has been so effective in driving reforestation that it now generates political backlash from pastoral and landscape interests, a striking inversion of the usual concern that "looser" rules underdeliver. The point for India is that quality benchmarks need not be the only legitimate reference point for domestic credits used in the CCTS; sector-specific calibration is workable and has been done before, though the systems that did it successfully leaned on a binding cap that India does not yet have.

This dial frames the strategic choice between two pathways, which policymakers should make explicitly because they are not equivalent.

An internationally aligned crediting architecture designs domestic credits to meet the standards associated with Article 6 transactions and evolving VCM expectations. Such credits can facilitate international fungibility, cross-border demand, and investor confidence, preserve the option of linking with other systems over time, and attract external finance for higher-cost mitigation. The cost of that credibility is real: More stringent additionality, MRV, and authorisation requirements; higher transaction costs; and potentially lower participation by smaller domestic actors.

A domestically oriented framework designs credits primarily to serve the objectives of the CCTS: Compliance flexibility, industrial transition, and domestic market liquidity. These credits would not need to replicate international offset standards in every respect, would carry lower costs, and could explicitly accept that they are not one-for-one fungible with internationally tradable units. Their integrity case is made at the system level, through quantitative caps, qualitative screens, buffer treatment, and the overall scarcity of the compliance market. This pathway can lower administrative burden and broaden participation, but it requires policymakers to define carefully how environmental integrity is preserved and how these credits relate to international market opportunities.

Transport is the clearest case for this second logic. Adoption of electric vehicles (EV) in India is already supported by multiple companion policies, including Faster Adoption and Manufacturing of Electric Vehicles (FAME), state EV policies, tax differentials, and the battery Production Linked Incentive (PLI), making strict additionality difficult to demonstrate credit by credit. A path could be to accept that transport credits may not represent one-for-one reductions, and to compensate at the system level by tightening the CCTS cap or intensity targets elsewhere so that aggregate ambition is preserved. What changes is not the outcome, but where integrity is delivered: At the credit level, or the system level.

These should not be presented as mutually exclusive end states. The pertinent question is one of cost against value. India will participate in the Article 6 market and the VCM regardless, and credits sold through those channels will have to meet international standards. A separate, domestically oriented instrument, therefore, involves additional administrative work upfront, and creating a second

instrument rather than relying on one. The case for incurring that add-on cost rests on whether the value it creates — through broader domestic participation, lower transaction costs, and methodologies suited to Indian compliance realities — will outweigh it.

A hybrid pathway, sequenced in time, is a plausible resolution. The CCTS is not yet ready to incorporate credits into the compliance market, as it is only in its first cycle and accurate assessment of market conditions cannot yet be made. This timing creates room to sequence the two tracks rather than build them at once.

Near term: Build the internationally credible track. India should prioritise the administrative and MRV systems needed to generate and transfer internationally credible credits, namely Article 6 units both with and without corresponding adjustments (authorised ITMOs and Mitigation Contribution Units). The immediate focus should be on establishing a coherent approach for higher-cost mitigation activities, such as green hydrogen; carbon capture, utilisation and storage (CCUS); sustainable aviation fuel; and low-carbon steel, financed internationally through Article 6. Since these are not among India's cheapest abatement options, authorising their international transfer comes at little cost to the country's nationally determined contribution (NDC) compliance, and they need not be linked directly to the CCTS.

In the future: Signal and design the domestic-compliance track. India should design the domestic crediting framework tailored to the needs of the CCTS, with lower transaction costs and methodologies better suited to domestic compliance objectives. Because the same agencies are likely to run both tracks, they cannot be established simultaneously. A realistic sequence would begin focused work on domestic CCTS crediting in the next few cycles. Even so, preparatory work, with credible and clear signalling, should begin immediately so the market can price the intent.

This sequencing is not merely about administrative convenience, it guards against a specific and immediate design risk. A domestic crediting system that marginally improves on older methodologies risks incurring significant administrative cost while delivering neither international credibility nor genuine domestic innovation. There are early signs of this pattern in current methodologies, which retain much of the cost of older CDM approaches with limited gain. If India chooses to develop a domestic crediting framework, the stronger course would be to give itself time to develop methodologies, in particular, jurisdictional and sectoral approaches, that are aligned with the long-term objectives of the CCTS.

Ultimately, the choice between these pathways should be evaluated against India's own priorities: Environmental integrity, industrial competitiveness, market liquidity, administrative feasibility, access to international finance, and alignment with the NDC and broader transition strategy.

The recommendation of this report is not a particular architecture, but that the choice be made deliberately and early, with the institutional sequencing it implies.

5.3. Sequencing the use of offsets in CCTS

A central design question is when offsets should be allowed into compliance. Introducing offsets too early may weaken price discovery and distort signals about in-sector mitigation. A phased approach offers a way to sequence offset use without undermining market credibility.

Table 4: Phased sequencing of offsets in the CCTS

Phase	Role of offsets	Rationale
Phase 1: Discovery (first 1–2 cycles)	No offsets in compliance; focus on registry development, methodology testing, and building MRV capacity. Compliance entities can still earn credits by over-performing their targets.	Channel the early incentive to generate sellable credits toward beyond-target reductions, rather than diluting it through external offset supply. Early-cycle compliance prices, given likely banking, will not fully reveal marginal abatement costs, but will give relative sectoral abatement signals. An early demand-side pull from government-induced procurement of high-integrity domestic credits will help build methodology pipelines and offsetting experience before any linkage to compliance.
Phase 2: Calibration (once sectoral MACCs mature)	Limited domestic offsets (for example, 3–5% of compliance), targeted to sectors aligned with policy priorities. Could have per-credit integrity calibrated by sector: Stricter rules where additionality is clear and MRV is mature (waste, forestry); simpler rules where the priority is mobilising sectoral response (transport), compensated by tighter cap or intensity settings elsewhere to preserve system-level ambition.	Use offsets to channel finance into policy-priority sectors and ease compliance in high-cost segments. Calibrating per-credit integrity by sector, rather than applying a uniform standard, allows the system to match offset rules to what each sector requires, while system-level adjustments hold aggregate ambition constant.
Phase 3: Expansion (longer term)	International Article 6 credits remain outside CCTS compliance. India's role internationally is as an authoriser and seller of high-integrity ITMOs, with these credits structurally segregated from those used in CCTS to prevent double counting and protect domestic compliance demand.[73]	India's marginal abatement cost is below major buyer markets, so importing credits is economically unjustified in the near term. The strategic opportunity is outbound: authorising and selling separate, high-integrity ITMOs internationally while preserving CCTS-eligible mitigation for domestic compliance.

5.4. Offsets and credit supply-demand dynamics

Admitting credits from outside the compliance boundary expands the pool of available units. Offsets give firms access to lower-cost compliance, but in a system where domestic prices are already low,

[73] Limited inbound use of international credits in CCTS compliance could be considered in the future and if and when conditions warrant, for example if domestic MAC in hard-to-abate sectors rises significantly above international supply, if specific credit categories (such as engineered removals) are needed but not yet produced domestically at scale, or for managing compliance volatility subject to the same integrity and segregation rules.

as India's CCTS is likely to be in its early cycles, this cost-containment feature can become a structural risk. Abundant offsets flood the market, depress allowance prices and, in extreme cases, displace domestic abatement almost entirely. The EU ETS and New Zealand ETS illustrate this dynamic.

Quantitative caps (typically 3–10% of compliance obligations) and qualitative criteria are the standard disciplines. Their design logic is specific: Where caps bind, offsets trade at a discount to allowances, keeping allowance prices, not offset prices, as the anchoring market signal. This is what distinguishes a well-functioning offset regime from one that hollows out the compliance market. These dynamics shape the phased approach to offset integration set out above.

> **Offsets must be treated not as an automatic source of cheap supply but as a carefully sequenced policy lever, one that can complement the CCTS without weakening its core function of driving sustained decarbonisation.**

Box 3: Strategic priorities across India's carbon credit channels

The preceding discussion has focused on the design of the CCTS compliance market and the integration of offsets within it. CCTS sits within a broader Indian carbon credit ecosystem that also includes a domestic voluntary offset market for non-obligated entities, and outbound participation in international Article 6 markets. These three channels differ in scale, in what drives them, in who participates, and in how they relate to one another. How they are designed, separated, and sequenced will shape both India's domestic decarbonisation and its strategic position in global carbon markets. The argument of this report is that they should be approached not simultaneously but as a sequenced hybrid: The internationally credible track built first, the domestic-compliance track designed and signalled now but established later.

Lane A: CCTS compliance is the price anchor for Indian carbon. Indian industries with binding emission targets must buy or sell CCTS units to meet their obligations, and this non-discretionary demand is what makes Lane A the dominant signal. Lane A prices are determined, above all, by government policy and target stringency, eligible-credit rules, and allocation design. As the preceding discussion has set out, if and when offsets are admitted into CCTS compliance, the rules for which offsets qualify will be a sovereign Indian government decision, calibrated to compliance architecture and policy objectives, not automatically inherited from voluntary-market integrity standards. The degree of per-credit integrity demanded is therefore set at the system level, and where it is set determines how much domestic abatement deterrence India is willing to accept in exchange for cost containment. Offset admission is consequently a later step, deferred until CCTS price discovery has stabilised over its first cycles.

Lane B: The domestic voluntary offset market for non-obligated entities has its legal architecture in place but is not yet operational at scale. Demand is unproven. How many Indian corporates will buy these credits for ESG or SBTi-aligned claims and at what prices,

remain empirical questions shaped by external frameworks. The ICVCM Core Carbon Principles screen credit supply for additionality and quantification rigour; the VCMI Claims Code of Practice constrains when companies can make climate claims; and the SBTi Net-Zero Standard restricts offset use to the residual neutralisation at net-zero, with its draft Ongoing Emission Recognition pathway potentially expanding demand for high-integrity credits against unabated transition-period emissions. These frameworks tilt corporate demand toward durable removals. Recent voluntary market data show core carbon principles (CCP)-eligible credits at USD15–40/tCO_2e (around INR1,420–3,780) against USD1–8/tCO_2e (around INR95–760) for non-CCP avoidance credits, with engineered removals reaching USD100–600/tCO_2e (around INR9,460–56,730). Lane B is currently non-fungible with CCTS, and even if the two are later linked, the credits used by obligated entities will not necessarily be the same products corporates buy for voluntary claims. Compliance demand favours the cheapest eligible credit, while voluntary demand places a higher value on claims credibility and premium attributes.

Lane C: Outbound participation in international Article 6 markets is the channel through which India authorises and sells high-integrity ITMOs. Two distinct demand sources now anchor this lane. The first is bilateral arrangements such as the Japan Joint Crediting Mechanism (JCM), where buyer countries use credits toward their own NDCs. The second is CBAM-deduction use, where producers exporting to the EU can use authorised credits to offset up to 10% of CBAM-reported embedded emissions under the implementing rules giving effect to Article 9 of the CBAM Regulation. Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) represents a third, smaller demand source. Across all uses, every authorised ITMO permanently reduces India's NDC inventory and shifts the remaining burden onto more expensive domestic options. This is the cross-border counterpart of abatement deterrence: Cheap mitigation exported abroad is mitigation foreclosed at home. Lane C, therefore, requires quantity limits, quality screens, and authorisation protocols that respond to the multiple, structurally different demand channels now defining this market, while ensuring India does not export cheap mitigation it will need for its own targets. Authorising these higher-cost abatement activities has limited implications for NDC compliance, making this the natural first track to build.

Sequencing across the lanes follows the hybrid logic. The near-term priority is the internationally credible track: Establishing the MRV, authorisation, and quality-screening systems that Lane C requires, focused on higher-cost mitigation financed through Article 6, while Lane A price discovery is stabilised through credible CCTS stringency and Lane B infrastructure for high-integrity domestic offsets is built. The domestic-compliance track — admitting offsets into Lane A under methodologies tailored to Indian compliance realities — is the later step. It should be designed and signalled now, so the market can price the intent, but implemented only once the CCTS has matured over its first cycles and the agencies that run all three lanes have the capacity to take it on. Done deliberately, the three-lane architecture delivers scarcity preservation in Lane A, quality differentiation in Lane B, and disciplined, patient outbound participation in Lane C, supporting both domestic

decarbonisation and India's strategic position in global carbon markets over the medium-to-long term.

6. Conclusion

India's CCTS is no longer a question of intent but of sequence. The architecture is in place, the first sectors are covered, and iron and steel will soon take coverage past 800MtCO_2e. The decisions that will determine whether the CCTS becomes a credible, durable market are now design decisions, and most of them depend on timing rather than on a binary choice between competing models. A single logic runs through this report. In each of the four themes, the foundations of a functioning market — credible stringency, robust MRV, and genuine enforcement — must come first, while the more advanced features are designed early but activated later, once those foundations hold.

That logic resolves each theme in turn:

- Financial participation is a matter of when, not if. Markets fail first from weak scarcity and inadequate enforcement, not from an absence of intermediaries. India should establish a reference price, admit brokers and designated market makers under appropriate oversight, and prepare the pathway to derivatives now, so that liquidity can deepen as the spot market matures rather than being retrofitted after the fact.

- The power sector is the most consequential expansion ahead. Competitive electricity markets are not a prerequisite, cost-reflectivity is. India already has the instruments and the binding constraints are regulatory coordination, the treatment of Scope 2 emissions, and a phased MRV alignment. Early signalling matters most here, given the long asset life of power infrastructure and the risk of locking in emissions-intensive investment.

- CBAM is best understood not as a trade grievance to be resisted but as a design pressure to be answered institutionally. The decisive question is whether the CCTS can be calibrated — through tighter benchmarks and a measured move toward auctioning — to produce a carbon price large enough to translate into recognisable deductions at the border. Done well, this converts an external compliance cost into a domestic fiscal and industrial instrument.

- Offsets call for deliberate sequencing rather than a single architecture. India should build the internationally credible track first, authorising high-integrity ITMOs for higher-cost mitigation, and design and signal the domestic-compliance track now while standing it up later. Integrity, as the experience of California and New Zealand shows, is a dial that can be set at the credit level or the system level. The choice should be made consciously, sector by sector, and where it is set looser at the credit level it must be backed by the system-level stringency that compensates for it.

Underlying all four is a single condition: Benchmark stringency must rise over time along a committed trajectory. This is not an incidental assumption but the first-order decision, since it is

currently the weakest part of the system. That tightening trajectory will give each development its purpose. Without a credible and strengthening price signal, deeper financial participation, broader coverage, CBAM alignment, and offset integration lose their force. With one, each reinforces the others.

The recommendation of this report is therefore not a particular endpoint but a discipline of sequence — build the foundations that produce a credible price, design the next phase before it is needed, and signal intent early enough for the market to price it.

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