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Lessons for Structuring India's Carbon Market to Support a Cost-Efficient Energy Transition

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At its core, a carbon market based on the cap-and-trade principle limits the total emissions of regulated entities in targeted sectors—allowing entities with emissions above the cap to buy emission allowance certificates in lieu of actual reductions themselves, while letting those below the cap sell such certificates for their surplus reduction. By doing so, a carbon market can make it more cost-efficient for individual companies to decarbonize, as it provides them with the option of trading emission certificates with other companies facing lower marginal abatement costs.[1] In emerging and developing economies, such as India, where access to finance for the energy transition is a challenge, carbon markets can be a valuable tool for meeting climate goals more cost-effectively.

Following this principle and under the purview of India's 2001 Energy Conservation Act and 1986 Environment (Protection) Act, the country's Ministry of Power issued an official notification of a Carbon Credit Trading Scheme (CCTS) in June 2023.[2] The notification marked a major step toward developing a domestic carbon market that is expected to include both a cap-and-trade-based emissions trading system (ETS) applied to specified regulated entities within high-emitting sectors (see appendix Table A-2) and carbon offsets generated from projects outside the scope of the ETS. Further details regarding the cap-and-trade segment of the market were released in October 2023 and more is likely to follow, particularly regarding carbon offsets.[3]

The CCTS notification builds on India's previous efforts to use market-based mechanisms to support its energy transition. The 2008 National Action Plan on Climate Change was the first initiative that

included "a market-based mechanism for trading in certified energy savings in energy-intensive large industries," which eventually led to the Perform, Achieve, and Trade (PAT) scheme in April 2012.[4] Designed as a cap-and-trade scheme, this program sets energy efficiency targets for industrial units in 13 energy-intensive sectors, such as iron and steel, aluminum, cement, fertilizers, and thermal power plants, and issues tradable energy savings certificates (ESCerts) for energy savings with each ESCert representing one ton of oil equivalent.[5]

A similar market-based mechanism to promote renewable electricity generation by electricity distribution companies was instituted by the Ministry of Power in 2010 via renewable purchase obligations (RPOs).[6] Companies that are unable to meet their RPO can comply by purchasing renewable energy certificates (RECs) from other distributors that have exceeded their RPOs. Over time, the market for RECs has been deepened and widened by lowering the access limit to allow more companies and individuals to participate voluntarily, removing market segmentation between various forms of renewable sources, and waiving certain taxes related to interstate transmission charges.[7]

The European Union's upcoming imposition of carbon tariffs on imports has added urgency for India to consolidate and formalize its various cap-and-trade programs[8] into an economywide comprehensive carbon market. The EU's carbon border adjustment mechanism (CBAM) will apply a carbon price based on its ETS to imported goods to keep its domestic industries competitive vis-à-vis foreign companies while simultaneously preventing carbon leakage, or the offshoring of production to locations with limited emission constraints, such as either a low or no price on carbon.[9]

Tariffs based on CBAM have the potential to impact India's exports to the EU quite profoundly. BNEF, for example, estimates that by the time CBAM is fully implemented in 2034, the carbon tariff could increase the cost of importing steel from India by almost 90%.[10] Since CBAM takes into account the carbon price in the exporting country, having a carbon market would allow India to claim at least partial credit commensurate with its domestic carbon price.

This commentary considers India's new CCTS in a global context and offers thoughts on the different features of the final market structure and the remaining gaps that need to be filled. It draws lessons from cap-and-trade regimes around the world to identify potential pitfalls to avoid and best practices to adopt for developing a successful carbon market in India.

Takeaways from Foreign ETS Efforts

Currently, there are 36 ETSs in force around the world.[11] (Important characteristics of the carbon markets in a few selected countries are listed in the tables of the appendix.) By the end of 2023, the

total value of traded global markets for regulated carbon permits or ETSs reached $950 billion, with the EU ETS representing 87% of the global total.[12]

Since it is in the most advanced stage globally, the EU ETS is often used as a benchmark for others. While the US does not have a national carbon market, California's ETS and the Regional Greenhouse Gas Initiative (RGGI) have grown in importance as regional markets. China's ETS is still in its infancy but dwarfs other jurisdictions in terms of the sheer amount of greenhouse gas emissions it regulates: 5,000 $MtCO_2e$ (million tons of carbon dioxide equivalent) versus 1,400 $MtCO_2e$ for the EU.[13] However, China employs a distinctive structural design that makes it not directly comparable to ETSs from other jurisdictions (details of these systems are included in the tables of the appendix).

Key features of India's carbon market compared with others around the world are highlighted below, with more information provided in the appendix tables.

Phasing in the Cap-and-Trade System

The success of several cap-and-trade systems, including the EU and California ETS, has demonstrated the value of starting with free allowance allocations but with strict emission reporting requirements. The full implementation of the program could then be phased in by gradually reducing free allocations while increasing sales of allowances via auctions, with the collected revenues directed to the jurisdiction's government.[14] If there are any shortfalls, a company would need to buy allowances from a broker or trader in the carbon market. Such a gradual approach allows for political support to build and provides time for companies that fall under the mandate to adjust to the new policy.[15]

Given that the EU's CBAM tariffs will start being applied in 2026, time is running short as far as impacting India's exports, and the authorities appear to be acting accordingly by trying to get the carbon market operational before then. It was reported that companies in four sectors—iron and steel, cement, petrochemicals, and paper and pulp—would start trading on the carbon market as early as April 2025.[16] India's experience with cap-and-trade schemes should smooth the transition. Elements of the PAT and REC schemes—including program design and regulation—have been refined and expanded over the years with the PAT scheme, for example, in its sixth cycle. Lessons learned from the shortcomings of these schemes, including long compliance cycles, lenient targets, lack of data transparency, excess supply of allowances, and no penalties for noncompliance, should help minimize issues in transitioning to the new CCTS regime.[17] Moreover, since the agency in charge of rolling out the CCTS—the Bureau of Energy Efficiency—is also the one that administers the PAT scheme, the design and implementation of the new carbon market can benefit from over a decade of institutional experience.

Basing the Compliance Market on Emissions Intensity or Levels

Most cap-and-trade systems aim to lower emissions by enforcing a quantitative limit on the maximum emissions allowed, with the cap lowered over time (see Table A-2 in the appendix). Facilities covered by the regulation need to find a way to limit their emissions within the cap by switching to low-carbon technologies or fuels and buying allowance permits for the excess, if the emissions remain above the cap, either in auctions or in the carbon market.

For a cap-and-trade scheme to be effective, the emissions cap and its reduction trajectory need to be chosen carefully based on available technology and in consultation with the industry to ensure compliance as well as alignment with climate goals. It also needs to be specified whether the cap is on emissions intensity or the aggregate emissions volume. For countries with growing economies and increasing energy demand, especially in the developing world, emissions are generally not expected to peak in the coming years. For this reason, China chose to cap emissions intensity rather than volume, and India has indicated the same.[18] Using intensity-based emissions caps is controversial because of questions about their effectiveness in achieving emissions reduction. Indeed, recommendations have been made to gradually shift China's ETS toward a cap-and-trade system based on the absolute level of emissions.[19] For India to add credibility to the market, it would be appropriate to lay out a path for switching from an intensity-based to a level-based cap-and-trade program.

Managing the Supply of Permits and Carbon Price Volatility

It is important to manage the supply of carbon credits in the market. Excess supply can lead to a low price of carbon, diminishing the impact of the regulation on emissions. On the other hand, if prices rise too quickly, political support for the policy may be dampened due to the resulting elevated prices for consumers and the adverse impact on the profitability of companies.

As a case in point, the carbon price in the EU ETS languished at a low level primarily because of an oversupply of carbon allowances—reducing its effectiveness for encouraging decarbonization—until a few years ago. The overallocation was due to a lack of accurate emissions data in the first phase, from 2005–07,[20] and weak demand as a result of the economic crisis in the second phase, from 2008–12. In the third phase, from 2013–20, the increased deployment of renewables,[21] energy efficiency standards, and the inclusion of certified emission reduction (CER) credits arising from the Kyoto Protocol's clean development mechanism (CDM) weighed on the carbon price, keeping it low.[22] Introduction in the fourth phase (2021–30) of a market stability reserve (MSR) mechanism—which helps manage supply within a corridor by injecting or removing allowances as necessary—along with a boost of liquidity from an influx of new financial market actors, helped successfully anchor prices in the EU.[23]

Other approaches have been used by different jurisdictions to tackle this issue (see appendix Table A-2). RGGI, which covers several northeast US states, employs a reservation price in allowance auctions, thus effectively setting a price floor. California extends this idea further by using a price collar. Similarly, the REC program in India has provisions for a floor and a forbearance price[24] as well as the ability to suspend trading.[25] Given the low carbon prices in both the PAT and REC schemes,[26] India could consider the EU's MSR approach since it has been the most successful among all the ETSs and the EU ETS itself arrived at it after experimenting with other approaches.

While excessive price volatility is not desired, it's important to point out that the price is not always a complete determinant of a program's success. As an early indication, in a simulation exercise run by the World Resources Institute[27] for the Indian CCTS, the clearing price was 800 rupees, or just under $10 per ton of CO_2, which is much lower than the current price in the EU ETS of almost $75 per ton. However, this may not be a major impediment to decarbonization—if the impacted industries view the proposed carbon legislation as a credible sign of the government's desire to impose a cost on externalities in the long run, then overall emissions should drop even if the carbon price is low, as was demonstrated for the EU ETS in its early years.[28]

Allocating Revenues

To be consistent with the ultimate objective, revenues raised from emissions permit auctions would ideally be directed toward decarbonization efforts. However, sometimes to gain political backing and/or address the impacts of carbon prices on poorer households, the revenues may be disbursed to the population. Revenues raised from RGGI finance government programs aimed at reducing energy demand and emissions, including energy efficiency and renewable energy, along with providing direct energy bill assistance.[29] California directs collected revenue to the GHG Reduction Fund, while New Zealand does so to a Climate Emergency Response Fund. In contrast, the EU directs a large majority of its auctioning revenues to support national government budgets.[30] Similarly, to make it politically viable, Canada's national carbon pricing law enacted in 2018 features an annually rising carbon price with 90% of revenues rebated to households.[31] Irrespective of whether the revenues are directed toward decarbonization or distributed to the public, to add transparency, India needs to specify clearly how the revenues raised from carbon allowance auctions will be utilized and the reasoning behind the choice.

Incorporating Carbon Offsets

Many jurisdictions allow the use of carbon offsets generated via voluntary emission avoidance or removal but limit the proportion of offsets allowed (see Table A-3 in the appendix). California, for example, caps its offset quota at 4% of the compliance scheme, with the added restriction that at

least half of the offsets must provide direct environmental benefits to the state. There are several jurisdictions though—including the EU, New Zealand, and the United Kingdom—that explicitly forbid the use of offsets. The EU ETS initially allowed credits such as CERs and emission reduction units that were created through the provisions of the Kyoto Protocol relating to the CDM and Joint Implementation programs, respectively.[32] However, these credits were disallowed at the end of the third phase in 2020, partly because a surplus of these credits hurt carbon prices and partly because of concerns about the additionality and environmental integrity of some of the underlying projects.[33]

India's history with CDM projects and the potential of integrating with the global market for carbon credits envisioned under Article 6 of the Paris Agreement argue in favor of allowing carbon offsets.[34] A lesson for India to take away from others' experiences is to limit the number of offsets allowed to a small share of the compliance market; have proper monitoring, reporting, and verification policies in place to ensure carbon offsets generate real, additional, quantifiable, verifiable, unique, and permanent reductions in GHG emissions, especially in light of recent scandals;[35] and perform periodic audits of the credits to ascertain their integrity.

Preventing Abuse of the System

Since its launch in 2021, China's compliance carbon market has been beset with various problems such as data fabrication, collusion with third-party verification agencies to commit fraud, and the failure to surrender allowances by the due date.[36] The lack of market integrity has dampened liquidity that has weighed on the traded carbon price, which hovered under $10 per ton of CO_2 until last year. Similarly, during the trial period of the EU ETS from 2005–07, national governments were accused of abusing the system, leading to an increase in emissions.[37] Since then governance and enforcement of laws have strengthened in the EU (see appendix Table A-1). In China, the State Council—the chief administrative authority—recently approved legislation to govern the compliance market by imposing greater fines, increasing coordination among governing bodies, and improving the accounting of emissions.[38] Indeed, anticipation of new regulations imposing stringent penalties and fewer free allowances has led carbon prices in China to reach a record this year, albeit still under $12 per ton of CO_2.[39]

While the governance structure has been detailed as part of India's carbon market announcement, the role of different bodies must be distilled and streamlined to prevent confusion from the perceived overlap of their respective authorities. Moreover, given the record of poor compliance with RPO targets due to a lack of enforcement of penalties,[40] India needs to lay out and follow through with specific punitive measures for noncompliance.

Conclusion

As India prepares to launch an ambitious and comprehensive carbon market, knowledge accumulated from the country's development and management of its PAT and REC schemes is invaluable. Learning from the challenges faced by other countries, even if circumstances were different, could also help India implement an effective and credible institutional structure for its carbon market that will complement the country's broader decarbonization strategy.

Appendix A

Table A-1: Governance structure of carbon markets

	EU	California	RGGI	Brazil	Mexico	Indonesia	China	India
Regulator	European Commission	California Air Resources Board (CARB)	Each of the 10 states currently in RGGI[a]	"Multiple led by Ministry of the Environment"	Ministry of Environment and Natural Resources (SEMARNAT)	Multiple led by Ministry of Environment and Forestry (MoEF)	Ministry of Ecology and Environment (MEE)	Central Electicity Regulatory Commission (CERC)
Oversight Body	European Commission	California Air Resources Board (CARB)	Each state in RGGI	Inter-ministerial Climate Change Committee	SEMARNAT	Multiple led by Ministry of Energy and Mineral Resources (MEMR)	MEE, provincial-level MEE subsidiaries, and municipal-level authorities	National Steering Committee comprising 18 ministries
Market Administrator	EU member states, Iceland, Lichtenstein, Norway, and Northern Ireland	California Air Resources Board (CARB)	RGGI, Potomac Economics, and Enel X (auctions)	ETS administrator body	SEMARNAT	MoEF	MEE	Bureau of Energy Efficiency (BEE)
Revenue Use	Disbursed to member states and creation of Innovation and Modernisation Funds	Greenhouse Gas Reduction Fund	Consumer benefit programs	Not yet specified	SEMARNAT is developing institutional arrangements to manage revenues during the operational phase	Indonesian Environment Fund	National ETS Fund (not yet created)	Not yet specified
Verification	By independent accredited verifiers annually	Indepdent 3rd Party Verification of Emission Reports	US EPA s Clean Air Markets Division database and RGGI CO Allowance Tracking System (RGGI COATS)	Not yet specified	Independent accredited verifiers for emissions and recognized protocols for offsets	Verrified by third-party verifier that's accredited by the Komite Akreditasi Nasional (KAN)	Provincial-level environmental authorities to organize the verification of GHG reports	Accredited carbon verification agency

	EU	California	RGGI	Brazil	Mexico	Indonesia	China	India
Non-Compliance Rules	Pay an excess emissions penalty (EUR 100/ton) in addition to surrendering allowances not submitted	Submit 3 additional compliance instruments for each missed along with financial penalties	If required allowances are not surrendered, submit 3x and additional penalties may be imposed by each state	Punishable by fines and embargoes	Loss of banking privledges of unused allowances	Carbon tax will apply to entities who fail to meet their allowance obligations (to begin 2025)	Fines	CERC, but details not provided yet
Registry	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Registration Body	European Commission	WCI, Intercontinental Exchange (ICE), CME group, and Nodal Exchange platforms	N/A	Not yet specified	National Emissions Registry (RENE)	Financial Services Authority (OJK) will oversee IDX (hosted by the Indonesia Stock Exchange)	China Carbon Emissions Registration and National Center for Climate Change Strategy and International Cooperation	Grid Controller of India Ltd. ICM Registry
International Registry Link	No	Yes	No	No	Yes	No	No	Yes
Operational From	2005	2012	2009	2026	2020	2023	2021	2026

Note: Brazil's legislation has not yet passed; Mexico and Indonesia are in the pilot phase; India is in the process of designing the framework.
[a]Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont, and Virginia.
Source: See endnote 41.

Table A-2: Details of cap-and-trade schemes

	EU	California	RGGI	Brazil	Mexico	Indonesia	China	India
Cap-and-Trade	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Level or Intensity Based	Level	Level	Level	Level	Level	Intensity	Intensity	Intensity
Compliance Obligations	Yes	Yes, for entitites emitting >25,000 tCO_2e per year	Yes, for fossil fuel electricity generating units >25 MW (15 MW in NY)	Yes, for entities emitting >25,000 tCO_2e per year	Yes, for entities emitting >100,000 tCO_2e per year	Yes, for coal-fired power plants connected to PLN grid with capacity >25 MW	Yes, for >26,000 tCO_2 per year	Yes, for designated consumers (direct and indirect emissions)
Frequency	Annual	Annual	1–3 years	Annual	Annual	Annual	Annual	Annual
Reporting Obligations	Yes	Yes, >10 $MtCO_2e$ per year	Yes	Yes, >10,000 tCO_2e per year	Yes	Yes	Yes	Yes
Frequency	Annual	Annual	Quarterly	Annual	Annual	Annual	Annual	Annual
Sectors Included	Power, industry, aviation, maritime	Power, industry, transportation, buildings	Power	Not yet specified	Fixed sources in energy and industry[a]	Coal-fired power plants/ oil and gas from 2028	Power generation with plans to expand	Power, industry, transportation, buildings, refineries
Sectors Excluded	Everything not listed	Everything not listed	Everything not listed	Agriculture, Land Use, Forestry	Everything not listed	Everything not listed	Everything not listed	Biomass and everything not listed
Emissions Covered	CO_2, N_20, PFCs, HFCs, SF_6	CO^2, CH_4, N_2O, SF_6, HFCs, PFCs, NF_3, other fluorinated GHGs	CO_2	Not yet specified	Direct CO_2 from fixed sources	CO_2, CH_4, N_2O	CO_2	CO_2, PFCs
Emission Targets by 2030	At least 55% reduction from 1990 GHG levels	40% reduction from 1990 baseline	30% reduction in power sector emissions from 2020 emissions cap (2017 Model Rule)	53.1% reduction from 2005 GHG levels by 2030	Unconditional 35% below BAU GHG emissions baseline (updated NDC)	31.9–43.2% reduction below BAU (including LULUCF) by 2030	65% reduction in CO_2 emissions per unit GDP compared to 2005; peak CO_2 emissions by 2030	45% reduction in emissions intensity below 2005 levels

	EU	California	RGGI	Brazil	Mexico	Indonesia	China	India
Emission Targets, other	Net zero by 2050	85% reduction from 1990 baseline and net zero by 2045	Each state has its own emissions reduction target	Net zero by 2050	50% below 2000 GHG level by 2050 (aspirational)	Net zero by 2060	Net zero by 2060	Net zero by 2070
Cap Adjustment Mechanism	Decreases every year (2024–2027) by 4.3%, and 4.4% after 2028	~4% cap reduction YoY	~3% cap reduction YoY	Not yet specified	Not yet specified	Technical ceiling emissions approvals (PTBAE) will be adjusted YoY	Bottom-Up Cap - changes with actual production levels	Not yet specified
Allocation Method	Auctions (57%), free allocations for benchmarking and to prevent carbon leakage	Quarterly auctions (50%), free allocation, and free allocation with consignment	Quarterly auctions (4%), "set-aside" accounts	Not yet specified	Free allocation based on verified emissions, auctions from reserve allowances if needed	Free allocation (benchmarking), auctions in future years	Free allocation: output-based benchmarking, auctioning planned in future	Not yet specified
Market Stability Provision	Yes, via market stability reserve (MSR) based on pre-defined thresholds of allowances in circulation	Allowance price containment reserve (APCR) [two tiers + price ceiling reserves]	Cost containment reserve (CCR) and emission containment reserve (ECR)	Not yet specified	3 allowance reserves: auction reserve, new entrants' reserve, and general reserve	The minister and director general may conduct additional auctions as needed	Buy-back, auctioning, or adjusting the rules related to CCER use[b]	Not yet specified
Reserve/ Floor Price	None, but MSR triggered at pre-defined thresholds	$24.04 (increases 5% + CPI measured inflation per year)	$2.56 per short ton in 2024, increasing by 2.5% per year (to reflect inflation)	Not yet specified	$0 (pilot phase)	Not yet specified	Not yet specified	Not yet specified
% Emissions Covered	38%	76%	14%	Not yet specified	40%	Not yet specified	40%	15% (by 2030)

Note: Brazil's legislation has not yet passed; Mexico and Indonesia are in the pilot phase; India is in the process of designing the framework.

[a]*Automobile manufacturing, cement, lime, chemicals, food and beverages, glass, iron and steel, metals, mining, petrochemicals, and pulp and paper.*

[b]*Necessary triggers and specifics of this mechanism are yet to be defined.*

Source: See endnote 41.

Table A-3: Details of carbon taxes and offsets

	EU	California	RGGI	Brazil	Mexico	Indonesia	China	India
Carbon Tax	No	No	No	No	Yes	Yes (2025)	No	Yes (fuel excise tax)
Fixed or Variable	N/A	N/A	N/A	N/A	Fixed	Variable	N/A	Variable
Current Price	N/A	N/A	N/A	N/A	$3.50 per tCO_2	Aligned with state's domestic carbon price	N/A	$0.16+ per liter
Taxable Products	N/A	N/A	N/A	N/A	Fossil fuel emissions above natural gas	Not yet specified	N/A	Petrol and diesel
Carbon Offsets Allowed	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Percent Allowed	N/A	4% (2021–2025) 6% (2026–2030)	Up to 3.3%	Not yet specified	Up to 10%	No limit	Up to 5%	Not yet specified
Allow REDD+	N/A	No	No	Yes	Not yet specified	Not yet specified	Not yet specified	Not yet specified
Allow CDM	N/A	No	No	Not yet specified	Yes	Yes	Not yet specified	Not yet specified
Allow Article 6.2 Credits	N/A	No	No	Yes, with approval from designated authority	Not yet specified	Yes	Not yet specified	Not yet specified
Allow Article 6.4 Credits	N/A	No	No	Yes	Not yet specified	Not yet specified	Not yet specified	Not yet specified

	EU	California	RGGI	Brazil	Mexico	Indonesia	China	India
Includes Rights of Indigenous/ Local communities	N/A	Yes	No	Yes	Not yet specified	Not yet specified	Not yet specified	Not yet specified
Export Restriction	N/A	No	No	No	Not yet specified	No	Not yet specified	No

Note: Brazil's legislation has not yet passed; Mexico and Indonesia are in the pilot phase; India is in the process of designing the framework.
Source: See endnote 41.

Notes

1. International Carbon Action Partnership, *Emissions Trading in Practice: A Handbook on Design and Implementation*, 2nd edition, The World Bank, April 2021, https://icapcarbonaction.com/system/files/document/ets-handbook-2020_finalweb.pdf; Aman Malik et al., "Implications of an Emissions Trading Scheme for India's Net-zero Strategy: A Modelling-based Assessment," CEEW Working Paper, October 2023, https://www.ceew.in/sites/default/files/implications-of-carbon-credit-trading-scheme-in-indias-net-zero-strategy.pdf.

2. Ministry of Power, Government of India, "Notification on India's Carbon Credit Trading Scheme, 2023," June 28, 2023, https://beeindia.gov.in/sites/default/files/CCTS.pdf.

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5. Bureau of Energy Efficiency, Ministry of Power, Government of India, "Energy Savings Certificates (ESCerts)," https://escerts.gov.in/PortalUser/Login?ReturnUrl=%2F.

6. Ministry of New and Renewable Energy, Government of India, "Strategic Plan for New and Renewable Energy Sector for the Period 2011–17," February 2011, https://faolex.fao.org/docs/pdf/ind204664.pdf.

7. Ministry of Power, Government of India, "Ministry of Power Formulates Several Steps to Deepen the Market for Green Electricity and to Provide Competitive Price Signals," February 9, 2023, https://pib.gov.in/PressReleasePage.aspx?PRID=1897770.

8. Aside from the cap-and-trade schemes, the Ministry of Environment, Forest, and Climate Change announced another innovative market-based approach to enable environment-positive actions beyond simply carbon emissions by issuing tradable green credits for certain pre-specified activities. The ministry released a notification on India's draft Green Credit Programme Implementation Rules 2023. The program aims to create a market-based mechanism for providing incentives in the form of green credits to individuals, Farmer Producer Organizations, private sector producers, and other types of entities and to enable a

mass movement around environment-positive actions and realize the vision of "Mission LiFE" (Lifestyle for Environment [LiFE] Movement). The goal is to encourage private sector entities to fulfill their existing obligations under other legal frameworks by undertaking activities that align with the generation and acquisition of green credits. Several sectors have been identified for the implementation of the program including tree plantation, water, sustainable agriculture, waste management, air pollution, mangrove conservation, Ecomark, and sustainable building and infrastructure. In the initial implementation phase, two to three activities from the sectors indicated above will be considered for designing and piloting. More activities will be added from the selected sectors in subsequent phases. Thresholds and benchmarks shall be developed for each Green Credit activity for generating and issuance of Green Credits. See Ministry of Environment, Forest and Climate Change, Government of India, "Draft Green Credit Programme Implementation Rules 2023," June 2023, https://moef.gov.in/wp-content/uploads/2023/06/Draft-GCP-Notification-Inviting-Comments-27062023.pdf and Ministry of Environment, Forest and Climate Change, Government of India, "Mission Lifestyle for Environment," https://missionlife-moefcc.nic.in/.

9. Taxation and Customs Union, "Carbon Border Adjustment Mechanism," European Commission, 2023, https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en.

10. Antoine Vagneur-Jones, "EU Targets Steel Imports with Carbon Border Tariffs," *Bloomberg TV*, January 29, 2023, https://www.bloomberg.com/news/videos/2024-01-29/eu-targets-steel-imports-with-carbon-border-tariff.

11. International Carbon Action Partnership, "Emissions Trading Worldwide: 2024 ICAP Status Report," April 10, 2024, https://icapcarbonaction.com/en/publications/emissions-trading-worldwide-2024-icap-status-report; World Bank, "State and Trends of Carbon Pricing 2023," May 2023, https://openknowledge.worldbank.org/entities/publication/58f2a409-9bb7-4ee6-899d-be47835c838f.

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13. International Carbon Action Partnership, "Compare ETS," March 2024, https://icapcarbonaction.com/en/compare/55/43.

14. The periodic auction process, which is overseen and managed by the ETS, is the main method through which regulated companies can directly buy the carbon allowances they need. Auctions can generate significant revenues for the ETS's jurisdiction; for example, auctioning revenues

for the EU ETS amounted to 38.8 billion euros in 2022. See European Environment Agency, "Use of Auctioning Revenues Generated Under the EU Emissions Trading System," December 19, 2023, https://www.eea.europa.eu/en/analysis/indicators/use-of-auctioning-revenues-generated.

15. Richard Schmalensee and Robert N. Stavins, "Lessons Learned from Three Decades of Experience with Cap and Trade," *Review of Environmental Economics and Policy* (Winter 2017): 59–79, https://www.journals.uchicago.edu/doi/epdf/10.1093/reep/rew017.

16. Sarita Chaganti Singh, "India to Set Emission Reduction Mandates for 4 Sectors, to Start Carbon Trading from 2025—Sources," *Reuters*, September 26, 2023, https://www.reuters.com/sustainability/climate-energy/india-set-emission-reduction-mandates-4-sectors-start-carbon-trading-2025-2023-09-26/.

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18. Ministry of Power, Government of India, "Detailed Procedure for Compliance Mechanism under CCTS," October 2023, https://beeindia.gov.in/sites/default/files/Draft_Compliance_Procedure_October_2023.pdf.

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