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Steps Toward Creation of a Carbon Market in India

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1. Overview of climate change policy

Prime Minister Modi declared that India aims to achieve net-zero emissions by 2070 at the United Nations Framework Convention on Climate Change (UNFCCC) COP26 (Conference of the Parties 26) meeting in 2021³. India's latest Nationally Determined Contributions (NDCs) strengthened ambitions compared with the NDCs submitted in 2015, reduction of greenhouse gas (GHG) emission intensity per unit of gross domestic product (GDP) by 45% compared to the 2005 level and realization of 50% of power generation capacity from non-fossil fuel power by 2030⁴. While India previously focused on promoting energy savings and expansion of renewable energy as core policy drivers, currently it has added the national hydrogen plan and other initiatives as new efforts too.

The Indian government realizes the importance of creating a market mechanism needed to reduce GHG emissions and developing a domestic carbon market in pursuit of the attainment of NDCs and other goals. Furthermore, it discusses the necessity of basing the creation of a carbon market on knowledge related to certificate trading for the PAT (Perform, Achieve and Trade) program, an existing economic method that promotes energy savings, and the RPO (Renewable Purchase Obligation) program⁵.

2. Design of Emission Trading System (ETS)

2.1. Overview of the program

2.1.1. Policy direction related to the carbon market

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³ Ministry of External Affairs (2021) National Statement by Prime Minister Shri Narendra Modi at COP26 Summit in Glasgow (November 2, 2021)

⁴ Press Information Bureau (2022b) Cabinet approves India's Updated Nationally Determined Contribution to be communicated to the United Nations Framework Convention on Climate Change (August 3, 2022). Additionally, India advocated a goal of "reducing GHG emission intensity per unit of GDP by 33-35% of the 2005 level by 2030" in the 2015 NDC.

⁵ BEE (Bureau of Energy Efficiency • Ministry of Power) (2021) National Carbon Market (Draft Blue Print for Stakeholder Consultation)

According to the Indian Press Information Bureau, Minister of Power Singh mentioned the creation of a national carbon market framework aimed at promoting energy savings by companies and reducing CO₂ emissions in October 2021⁶. At the same time, the Ministry of Power's Bureau of Energy Efficiency (BEE) announced the "National Carbon Market: Draft Blue Print for Stakeholder Consultation," proposing a three-phase plan for transition from the PAT program to an ETS program⁷ (refer to 2.1.3 for details). India started legal preparation for creation of a national carbon market at the end of 2022 (Table 1).

The Indian government revised The Energy Conservation Act (The Energy Conservation (Amendment) Act, 2022)⁸, the foundational law for establishment of the carbon market, and issued a Notification of the Ministry of Power related to a Carbon Credit Trading Scheme (CCTS 2023; hereinafter, carbon market program) in June 2023⁹ (refer to 2.1.4 for details). These actions offer an outline of the program, while program interpretation and details are likely to come in future disclosure of related rules and other measures. The legal preparation did not specifically discuss the method of transition from the above-mentioned PAT program to ETS or formation of a voluntary carbon market (VCM).

Table 1: Main policy trends related to the creation of the Indian carbon market

Oct. 2021	Ministry of Power's BEE announced "National Carbon Market: Draft Blue Print for Stakeholder Consultation"
Aug. 2022	Indian Parliament's Lower House (Lok Sabha) passed the revised Energy Conservation Act
Oct. 2022	Government conducted stakeholder consultation on the draft policy paper on Indian Carbon Market (ICM)
Dec. 2022	Indian Parliament's Upper House (Rajya Sabha) approved the revised Energy Conservation Act, the foundational law for establishment of the carbon market
Jun. 2023	Government announced an overview of the method for setting the target for GHG emission intensity in a Ministry of Power Notification
Nov. 2023	BEE announced a draft of "Detailed Procedure for Compliance Mechanism under CCTS"

Source: Compiled by the authors

⁶ Press Information Bureau (2021) Power Minister calls for enhanced action on energy efficiency by States (October 22, 2021)

⁷ BEE (Bureau of Energy Efficiency, Ministry of Power) (2021)

⁸ Ministry of Law and Justice (2022) The Energy Conservation Act, 2001 (52 of 2001); Press Information Bureau (2022c) Creation of Carbon Markets (December 15, 2022)

⁹ Ministry of Power (2023) Gazette notification for Indian Carbon Market (June 28, 2023)

2.1.2. Experience of market and certificate mechanisms: Trading schemes for energy saving certificates and renewable energy certificates

As explained above, India has two existing certificate trading systems aimed at promoting energy savings and deployment of renewable energies, and these programs have the potential to serve as the foundation of a carbon market. One is Energy Saving Certificates (ESCerts) under the PAT program that promotes energy savings, and the other is issuance and trading of Renewable Energy Certificates (RECs) under the RPO program.

In designing the carbon market, there was a discussion¹⁰ of the need to leverage the experience with existing certificate trading and to review fungibility between the carbon market and the two certificate trading programs. The following description hence presents an overview of the two programs.

The PAT program is based on the revised Energy Conservation Act (Revised Energy Conservation Act 2010) and aims to curtail energy usage utilizing “energy intensity (toe/t)” and “baseline production volume (t).” It issues notification as an ordinance of the goal of “energy intensity” and “baseline production volume” to individual energy consumers (Designated Consumers, DCs). After completion of each regulatory cycle, reporting and verification of attainment of the energy intensity goals occur using forms stipulated in an ordinance, and the authority issues ESCerts (unit: toe (tonne of oil equivalent)) for the surplus portion to DCs. DCs have an obligation to undergo a verification once every three years by BEE-accredited verifiers as required in MRV (Monitoring, Reporting, Verification). If the energy intensity goal is not met, the specific DC either purchases ESCerts or pays energy costs for non-compliance volume or a penalty. ESCerts are traded on the Indian Energy Exchange (IEX) or Power Exchange India Limited (PXIL)¹¹.

According to the Indian Press Information Bureau, India is currently implementing the Seventh Cycle (fiscal years 2022–2025), and the regulations apply to 509 DCs with an energy saving effect of roughly 6 Mtoe¹². This program applies to 13 industries: steel, aluminum, cement, chlor-alkali, fertilizer, oil refineries, petrochemical products, paper/pulp, railway, textiles, thermal-fired power plants, Power Distribution Companies (DISCOMs), and

¹⁰ BEE (Bureau of Energy Efficiency, Ministry of Power) (2021)

¹¹ For more details, Yanagi et al. (2013) compiled an overview of the PAT program focused on elimination of energy conservation barriers based on the Ministry of Power Notification (Yanagi, Miki, Fuyuhiko Noda, and Momoko Aoshima (2013) “Outline of the PAT (Perform, Achieve and Trade) scheme introduced in India and its contribution to overcome barrier to energy efficiency activities” Energy System, Economics, and Environment Conference Presentations 29). The Ministry of Law and Justice stores various revisions to The Energy Conservation Act 2001 and related ordinances, etc. (Ministry of Law and Justice (2022))

¹² DCs and target sectors differ in each cycle. During the periods, the lowest number of DCs was 106, and the highest number was 621. Over 1,000 businesses are registered.

commercial buildings (hotels).

The RPO program, meanwhile, was rolled out to promote high-volume installations of renewable energy. It requires DISCOMs, autoproducers with no less than 1 MW of installed capacity, and electricity consumers with not less than 1 MVA who procure from conventional fossil fuels through open access¹³ to acquire a certain percentage of power from renewable energy power. If obligations are not met, these entities must procure RECs (unit: MWh) issued to renewable energy power producers via the markets, i.e. IEX, PXIL, etc. REC trading takes place within the floor and forbearance prices decided by the Central Electricity Regulatory Commission (CERC)¹⁴. However, regulated industries are requesting flexibility in response to the recent sharp decline in renewable energy costs¹⁵.

2.1.3. “National Carbon Market: Draft Blue Print for Stakeholder Consultation” – Creation of a voluntary carbon market

The “National Carbon Market: Draft Blue Print for Stakeholder Consultation” disclosed in October 2021 proposed a three-phase process for transition from the existing program to a voluntary carbon market. However, it is unclear to what extent it might affect the full-fledged program design in the future.

This document presents support in realizing the NDC through formation of a Voluntary Carbon Market (VCM) while also solving problems such as surplus issuance of certificates under the PAT program.

① Phase-1 (short term): Increasing demand in the VCM and conversion of ESCerts and RECs to emission reduction units

This phase seeks to expand the VCM to businesses without obligations in addition to DCs, increasing demand for certificates. It enables conversion of ESCerts and RECs to emission

¹³ India’s power sector reform made it possible for the power consumers who consume 1MW or more to select power suppliers in addition to purchasing power from DISCOMs. “Open access” means “non-discriminatory provision for the use of transmission lines or distribution system or associated facilities with such lines or system by any licensee or consumer or a person engaged in generation in accordance with the regulations.” Additionally, “Green Open Access Rules 2022” notified on June 6, 2022 lowered the limit of open access trading of green energy from 1MW to 100kW and thereby enabled smaller consumers to also purchase renewable energy via open access. (Ministry of Law and Justice (2003) The Electricity Act, 2003; Press Information Bureau (2022a) Another Major Reform to promote Renewable Energy through Green Energy Open Access (June 7, 2022); Sharma, Nikhil (2019) Open access. New Delhi: Council on Energy, Environment and Water (CEEW).)

¹⁴ Ministry of New and Renewable Energy (nd) National Portal for Renewable Purchase Obligation (RPO); Singh and Chaturvedi (2023)

¹⁵ Central Electricity Regulatory Commission (2022) Stakeholders commented on draft CERE (Terms and Conditions for Renewable Energy Certificates for Renewable Energy Generation) Regulations, 2022: Ministry of Power

reduction units (ERUs; one ERU is equivalent to one metric tonne of CO₂ equivalent) for interchangeability of trading units for voluntary market buyers and sellers.

$$\text{ERU (Nos)} = \text{Conversion factor of specific DC} \times \text{ESCerts (Nos.)}$$

Notes:

Conversion factor of a specific DCs (tonne of CO₂ equivalent emission per Mtoe)
= Annual CO₂ emissions by DCs in target year ÷ [(SEC¹⁶ target – SEC actual in target year) x Production baseline year]

Annual CO₂ emissions by DCs in target year
= [{Emission factor of fuel 1 (tonne of CO₂ per tonne of fuel) x Quantity of fuel 1 consumed in target year (tonne)}
+ {Emission factor of fuel 2 (tonne of CO₂ per tonne of fuel) x Quantity of fuel 2 used in target year (tonne)}
+ {Emission factor of electricity used (tonne of CO₂ per million units) x Quantity of electricity used in target year (million units)}
+ {Emission factor of fuel N (tonne of CO₂ per tonne of fuel) x Quantity consumed in target year (tonne)}

② Phase-2 (medium term): Increasing supply in the VCM

This phase aims to increase the supply volume of ERUs being traded by opening the VCM to sellers other than DCs too, and permitting the registration of emission reduction projects and issuing ERUs.

③ Phase-3 (long term): Transition to a Cap-and-Trade System

This phase involves setting GHG emission intensity for specific entities. The “business as usual (BAU)” emissions for the initial target period will be determined using the expected sectoral growth. To ensure alignment with the NDCs, it introduces an NDCs-alignment coefficient (NAC) as an index for reducing GHG emissions compared to BAU. The proposal assigns emission intensity goals to DCs without changing the fundamental structure or mechanism of the PAT program.

Furthermore, the BEE implemented a stakeholder consultation based on the draft policy paper on the Indian Carbon Market (ICM) on October 19, 2022¹⁷.

2.1.4. Legal framework for the Indian carbon market

① The Energy Conservation (Amendment) Act, 2022 (December 2022)

The Energy Conservation (Amendment) Act, 2022 implemented at end-2022 incorporated the carbon market and carbon credit certificate.

This revised Act stipulates the following points: (1) assignment of carbon market design to

¹⁶ SEC refers to energy consumption intensity under the PAT program.

¹⁷ Singh, Nishtha and Vaibhav Chaturvedi (2023) Understanding Carbon Markets: Prospects for India and Stakeholder Perspectives. New Delhi: Council on Energy, Environment and Water (CEEW)

the central government based on discussions with the BEE (Article 14), (2) enabling the government and authorities with jurisdiction to issue carbon credit certificates to businesses, and (3) enabling registered businesses to purchase and sell carbon credit certificates (Article 14AA).

The Act also stipulates registered entities as “any entity, including designated consumers, registered for carbon credit trading scheme…” and that “any other person may also purchase energy saving certificate or carbon credit certificate on voluntary basis” (Article 14A). It hence widens market access by approving new market entrants in addition to the existing DCs under PAT program. Meanwhile, it simply lists “energy saving certificate” and “carbon credit certificate” and does not offer a detailed image of the program (Article 14A (2)).

② Ministry of Power Notification (June 2023)

The Ministry of Power’s Notification announced in June 2023 decided the roles of various organizations in the institutional framework of the carbon market in the following manner (Figure 1).

- The National Steering Committee for the Indian Carbon Market (hereinafter, Steering Committee) is a new organization formed by the central government that extends across ministries and agencies. Secretaries from the Ministry of Power and the Ministry of Environment, Forest and Climate Change (hereinafter, Ministry of Environment) shall serve as chairs. Other members include Joint Secretaries from various ministries and the Grid Controller of India Limited. The functions of the Steering Committee are governance and supervision of the carbon market. This scope covers recommending to BEE¹⁸ for the “formulation and finalisation of procedures for institutionalizing the Indian carbon market,” and “of the rules and regulations for the functions of Indian carbon market;” for the “formulation of specific greenhouse gases emission targets for the obligated entities,” etc. (Article 4).
- The BEE is the Administrator and shall “identify sectors and potential for reduction of greenhouse gases emissions in such sectors and recommend to the Ministry of Power.” Its roles include “developing trajectory and targets for the entities under compliance mechanism,” “accrediting the agencies in accordance with the approved procedure for accredited carbon verification agency,” and others (Article 5).
- The Central Electricity Regulatory Commission (CERC), which supervised REC trading, shall serve as the regulator that regulates trading activities for carbon credit certificates (Article 7).

¹⁸ “Bureau” in the original document.

- Grid Controller of India Limited is the carbon market registry and has data platform functions (Article 6). In addition to “undertaking registration of obligated or non-obligated entities” (Article 6(b)), it shall also “function as meta-registry,” which serves “data management including Market Based Mechanisms and National Inventory Management Systems,” and “transaction with features of establishing the linkages with any national or international registry of **any** market-based mechanism” (Article 2(j), 6(g), 6(h)).

Section 2.3 below explains “**any** market-based mechanism” (Article 6; meta-registry definition based on Article 2) (emphasis added by the authors).

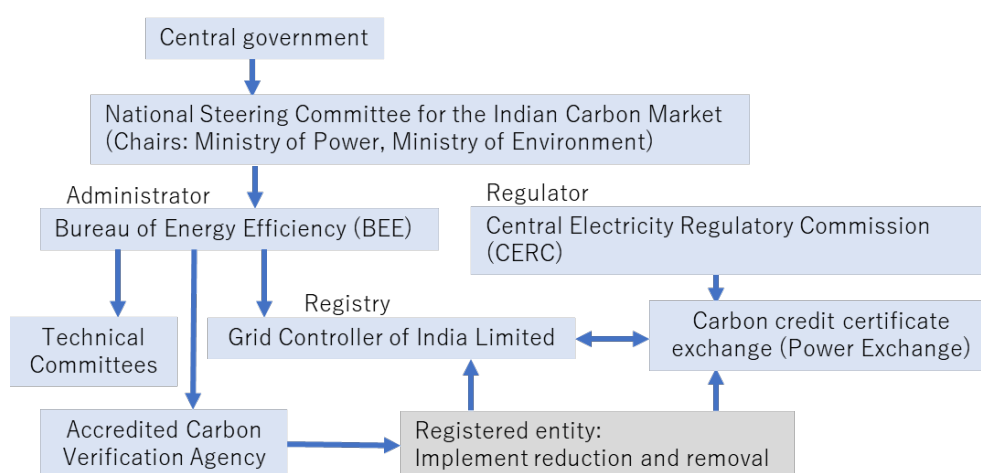


Figure 1: Image of governance for the Indian carbon market

Note: Image depicted by legislation at the current stage

Source: Prepared by the authors based on Ministry of Power (2023)

Preparations in setting goals for GHG emission intensity¹⁹ and launching the system shall proceed in the following manner.

Setting goals for GHG emission intensity in the carbon market (Article 11):

- ① The Ministry of Power shall decide the sectors and obligated entities in accordance with the BEE’s recommendation (BEE undertakes studies for recommending the targets “after taking into account all relevant aspects including available technologies and likely costs of their implementation”²⁰).

¹⁹ GHGs here refers to seven GHGs, including CO₂ and freon gases.

²⁰ Since it conducted a review and analysis of Best Available Technology by sector for the PAT program too, this experience should be useful.

- ② The Ministry of Power shall communicate the targets, which also factor in recommendations by the Steering Committee, to the Ministry of Environment.
- ③ The Ministry of Environment shall ultimately notify obligated entities and thereby create an obligation to comply with the targets. Furthermore, the Ministry of Power shall place obligations on obligated entities for non-fossil fuel energy consumption and energy intensity targets. The Ministry of Power may revise the Act.
- ④ Obligated entities shall receive the issuance of carbon credit certificates for exceeding the targets in accordance with the Steering Committee's recommendation²¹. Those who miss the targets shall purchase the carbon credit certificates from the carbon market.

The Act stipulates that further detailed procedures for operationalising the ICM, such as criteria for issuance of carbon credit certificate, validity, floor and forbearance prices, MRV, and other details shall take place in the future after discussions mainly by the Steering Committee (Article 12).

2.2. Allocation method (auction or free allocation)

The system adopts the target of intensity, not a scheme of allocating an emission allowance, which can be seen as affected by PAT and RPO programs. However, attention should be given to the central government and other authorities' power of issuing "carbon credit certificates" to entities.

2.3. Use of offset credits

It is currently unclear. However, it is worth noting that the Ministry of Power Notification arranges an international registry for operation of offset credits (all types of market-based mechanisms)²² and allows any voluntary registered entities²³.

3. Conclusion: Implications for GX ETS of Japan

²¹ The original text states "The obligated entities shall be issued carbon credit certificates."

²² This appears to include response to corresponding adjustments (Article 6.2 Avoidance of double counting) in the Paris Agreement.

²³ In February 2023, the Indian government announced a list of 13 technologies (including green hydrogen, green ammonia, and sustainable airline fuel (SAF)) to be considered for the bilateral/cooperative approaches under Article 6.2 mechanism of the Paris Agreement. It anticipates collaboration with international players in rollout of innovative technologies (Press Information Bureau (2023) Activities finalised to be considered for trading of carbon credits under Article 6.2 mechanism to facilitate transfer of emerging technologies and mobilise international finance in India, February 17, 2023).

India has completed legislation that defines the institutional framework of the carbon market in the above-mentioned two laws following discussions with stakeholders. It widened access to the carbon market to voluntary entities too, in addition to obligated entities, and does not rule out possible use of offset credits. Furthermore, the initiative stands out in terms of considering technologies and setting reduction targets based on PAT program experience (2.1.4).

In November 2023, the Indian government disclosed a draft proposal²⁴ of the “Detailed Procedure for Compliance Mechanism under CCTS.” It also presented a regulatory scope that covers not only direct emissions but also purchased electricity, steam, and other indirect emissions, setting reduction targets by intensity (tCO₂e/production materials-t), and the ability to reserve excess carbon certificates to the next cycle (banking). Additionally, it appears to have postponed its stance on REC utilization and proposed placing REC outside of the CCTS reporting obligation²⁵.

Regarding the discussion of incorporating existing energy savings and renewable energy measures in the voluntary market, the current regulations are as discussed in 2.1.3.

Program details depend on progress in the discussion of the above-mentioned draft proposal from November. India is likely to proceed with preparations toward the creation of a domestic carbon market with explicit carbon pricing that factors in experience from existing programs as a response to the EU’s carbon border adjustment measures (CBAM)²⁶ on track to begin CBAM certification charges in 2026.

²⁴ BEE (Bureau of Energy Efficiency, Ministry of Power) (2023) Detailed Procedure for Compliance Mechanism under CCTS

²⁵ This document does not elaborate on the above-mentioned conversion and utilization of ESCerts.

²⁶ Details covered in the following report: Yanagi, Miki (2022) “Chapter 9 Decarbonization and trade issues – Focus on carbon border adjustments measure” in Japan Economic Foundation’s “Toward building a rules-oriented international economic system – International Economy Series 1,” Japan Economic Foundation, pages 138-150, December 2022.

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