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सत्यमेव जयते

Government of India

Ministry of Environment,
Forest and Climate Change



Policy Paper on
**Indian Carbon
Market (ICM)**



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1. Introduction

1.1. Background

Since ratifying the Paris Agreement (PA), India has been at the forefront of climate action to meet the global climate goals through its ambitious Nationally Determined Contributions (NDC). India's NDCs, first announced in 2015, include the following quantitative goals:

- To reduce Greenhouse Gas (GHG) Emissions Intensity of its Gross Domestic Product (GDP) by 33 - 35 percent by 2030, from the 2005 level.
- To achieve about 40 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030 with the help of the transfer of technology and low-cost international finance including from the Green Climate Fund (GCF).
- To create an additional carbon sink of 2.5 billion to 3 billion tonnes of carbon dioxide equivalent through forest and tree cover by the year 2030.

Aligned with the announcements made at Conference of Parties (COP) 26 in Glasgow, India also submitted its updated NDC and it outlines following key updates:

- To put forward and further propagate a healthy and sustainable way of living based on traditions and values of conservation and moderation, including through a mass movement for 'LIFE' – 'Lifestyle for Environment' as a key to combating climate change
- To reduce Emissions Intensity of its GDP by 45 percent by 2030, from 2005 level
- To achieve about 50 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030, with the help of transfer of technology and low-cost international finance including from Green Climate Fund (GCF)

To facilitate the achievement of India's enhanced NDC targets, the Government has initiated the development of a domestic carbon market which will mobilize new mitigation opportunities through demand for emission credits by private and public entities.

Competitive markets can provide incentives to market actors to adopt low-cost options and attract technology and finance toward sustainable projects that generate green credits. Carbon Markets are expected to be a vehicle for mobilizing a significant portion of investments required by Indian economy to transition toward low-carbon pathways. To transition quickly to a low carbon economy, this policy document suggests that India should adopt a strategy to develop a domestic carbon market focused on meeting its NDCs. In the future, India may participate in the international carbon market created under Article 6 of the Paris Agreement (PA) to attract finance and technology for additional climate change actions. The rationale for the Indian Carbon Market (ICM), as well as the relationship between the ICM and the international carbon market under Article 6 of the Paris Agreement (PA) is outlined in the points below:

- a) India's recent announcement at COP26 aims for the reduction of GHG intensity of the economy by 45% from the 2005 level by 2030. While a range of national programmes and other planned climate actions will contribute towards the accomplishment of this GHG

intensity target, the target will likely require further GHG reduction actions from major energy-intensive sectors of the economy.

- b) Mitigation actions, whether at the level of plant, sector, or national economy (beyond a small set of energy efficiency interventions that pay for themselves), typically involve significant economic costs. The costs for emissions abatement across these must be minimized to ensure that the economy retains its competitiveness.
- c) A competitive market for carbon credits involving obligated entities (i.e., entities assigned individual GHG mitigation targets) as both buyers and sellers ensure that mitigation costs are minimized at plant, sector, and national economy levels.
- d) The domestic carbon market would involve the assignment of targets to obligated entities, besides monitoring, reporting, and verification (MRV) mechanisms for GHG reductions claimed the issue of carbon credits, and recording of trades, and enforcement, through transparent arrangements.
- e) The domestic market mechanism is distinct from the corresponding international carbon market arrangements under Article 6 of the PA and cannot substitute for the international markets for trading on the Article 6 market mechanisms. Neither can they be declared as “equivalent” under any provision of the PA. It follows that while carbon credits for trading in the ICM would be issued under domestic arrangements, those for international trading under Article 6 would need to be issued as per the international protocols.
- f) Targets assigned to obligated entities for national compliance would be aligned with the NDC target of improving GHG intensity of GDP. Any excess GHG mitigation actions above these targets may be eligible for carbon credits under the Article 6 mechanisms, provided the carbon certificates corresponding to such excess mitigation are compliant with the international standards and procedures.
- g) The Designated National Authority, (DNA) would decide whether Article 6 carbon credits, or unused Clean Development Mechanism (CDM) carbon credits, may be used for compliance by obligated entities.
- h) It is open to buyers of carbon credits in the voluntary carbon market, i.e., in which the credits are not to be used for compliance with regulation, to accept carbon credits from the ICM.

In this policy document, accordingly, we distinguish between two different streams of carbon credits, i.e., domestic carbon credits for the ICM (and voluntary purchases) issued by national authorities, and carbon credits issued under provisions of the Article 6 rulebook of the PA for the international carbon market. Interlinkages between the two may be possible, depending on the international rules, subject to be approved by DNA.

Specific sectors, such as Renewable Energy, Industrial Energy Efficiency (already commercialized technologies), and other GHG mitigation projects with a lower cost of carbon, may be preferentially reserved for the ICM. Depending on the market conditions in the ICM, National Designated Authority may provide permissions (Host Country Approvals) for credits preferentially reserved for the domestic market, to supply to international voluntary markets, or if compliant with the standards, to supply international carbon markets. The ICM’s mechanism would evolve along with the framing of the rules under the Article 6 mechanisms, to ensure the elimination of double counting and environmental integrity of all credits, whether used in domestic markets or traded internationally.

2. India's Experience with Carbon and Environmental Markets

The concept of national and global carbon markets gained momentum when the Kyoto Protocol came into effect in 2005, and the first large regional greenhouse gas (GHG) emissions trading scheme, the European Union Emissions Trading System (EU-ETS), was launched. The concept remained largely limited to the developed countries, but it did build an understanding of the potential of carbon markets to finance climate actions. Currently, according to the World Bank's latest State and Trends of Carbon Pricing report¹, there are 32 ETSs operational globally and global carbon pricing revenue touched US\$ 84 billion in 2021. This indicates a growing opportunity, which India too should leverage for supporting the achievement of its climate goals, through direct financing of climate initiatives, as well as potential international collaboration and financing opportunities under Article 6 of the PA.

While India does not have an explicit carbon market, it has instruments that closely resemble carbon markets, in the form of Perform, Achieve, and Trade (PAT) and Renewable Energy Certificates (REC). These are two major market-based approaches in play in India to regulate energy consumption and transition to cleaner energy, facilitated by the Ministry of Power (MoP). India also has vast experience in the international carbon trading platform, the Clean Development Mechanism (CDM), which has been implemented by the MoEFCC. Going forward, India will build on these experiences to develop its domestic carbon market.

2.1. Clean Development Mechanism

The CDM was the largest global carbon market instrument, created by the Kyoto Protocol. It was designed to enable developing countries to access finance, technology, and capacity building for their sustainable development, while at the same time allowing developed countries (EU, and to a limited extent Japan and Korea) to cost-effectively meet their emission reduction obligations by investing in mitigation actions in developing countries, and/or purchasing carbon credits from the CDM (Certified Emission Reductions, or CERs). Under the CDM, CERs are generated through standardized mitigation project-specific methodologies, with each CER being equivalent to the mitigation of one tonne of CO₂e.

The CDM was implemented in India through the National CDM Authority (NCDMA) under MoEFCC, and India emerged as one of the largest actors in the CDM, with the second-largest number of CERs generated. Out of a total of 7,847 projects registered by the CDM Executive Board, 1,686 projects are from India, and around 12.6% (255 million) of CERs issued are to Indian projects. Indian CERs were generated from projects in the areas of renewable energy, energy efficiency, industrial gases, fuel switching, municipal solid waste, and forestry, about 85-90% of which were projects developed by the private sector. CDM especially supported the early deployment of large-scale renewable energy technologies, such as solar, wind, small hydro, and biomass.

¹ World Bank 2022. State and Trends of Carbon Pricing. Available for download at <https://www.worldbank.org/en/news/press-release/2022/05/24/global-carbon-pricing-generates-record-84-billion-in-revenue>

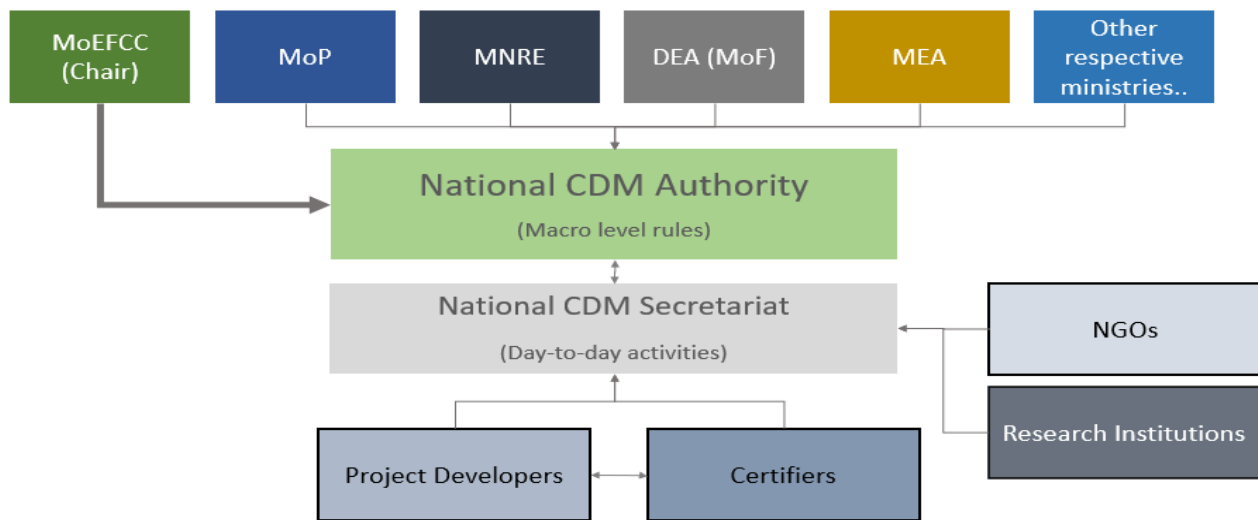


Figure 1 Overview of the NCDMA structure

The CDM market crashed in 2012, when the EU, through a unilateral decision, decided to give preference to CERs from Least Developed Countries (LDC) for the 2013-2020 period. This resulted in the demand for a majority of the CERs falling, and there were no corresponding domestic markets in developing countries, so the prices fell from the highs of US\$ 20 per CER to less than US\$ 0.5 per CER. However, in the period 2008-2012, it was evident that carbon credits could provide a great incentive for the private sector to undertake climate change mitigation measures. Trading of carbon credits in the international carbon market has started to increase since 2020, driven by voluntary buying by corporates, and the prices of voluntary credits have increased to US\$ 6 - US\$12 per credit in Q1 2022.

The Indian experience with the CDM highlights the existing capabilities of Indian industry and other entities for developing and implementing carbon mitigation projects. It also points to the opportunity provided by a stable and strong national-level carbon market, to encourage and support India's increasingly ambitious domestic climate actions from a range of sectors and industries. India can further benefit in the future once Indian entities are also enabled to export carbon credits in the international carbon market created under Article 6 of the PA. The export of carbon credit can bring in necessary private sector interest and finance for emerging technologies and nature-based solutions.

2.2. Perform Achieve and Trade (PAT) Scheme

The PAT mechanism focused primarily on reducing the energy intensity of large energy-using entities through accelerated adoption of energy-efficient and low-carbon technologies. The crux of the scheme is that selected designated consumers (DCs) are given mandatory energy intensity targets over a specified period based on their relative energy intensity performance in their sector. If the DC consumes less energy per unit of production than the set target, it is awarded Energy Saving Certificates (ESCerts) equal to the saving vis-à-vis the target for the actual production, which can be traded on a dedicated exchange. If the DC consumes greater energy than the target, it is directed to purchase ESCerts on the exchange to cover the

shortfall. The ESCerts, equivalent to 1 tonne of oil equivalent (toe) of energy savings, are given based on quantified energy savings verified by an accredited energy auditor (AEA). The ESCerts are awarded after a DC surpasses its target and can then be sold to another DC that has failed to achieve its target.

Under the PAT Scheme, the designated consumers are given the targets on Specific Energy Consumption (SEC) (toe/t equivalent product) and are adjusted to account for factors such as product mix, capacity utilization, change in fuel quality, import/export of power and other factors. The DCs have to achieve these targets in three years (PAT cycle) and based on the status of achievement of the targets, the DCs can sell the excess ESCerts (issued to them) or are obligated to buy the ESCerts from the market.

The following is an example of target setting approach under the PAT scheme for the Pulp and Paper Sector. The graph highlights the baseline and targets specific energy consumption for different designated consumers. The targets given to the DCs vary from 8.51% for the inefficient plants, while 3.04% given for the energy-efficient plant. Thus, depending on the level of energy efficiency, sub-sector classification, and other aspects, the targets are given to the designated consumers, relatively lower targets are assigned for energy efficient plants, while higher targets are given to energy inefficient plants. Under this approach, the overall sector will converge towards the best efficiency levels.

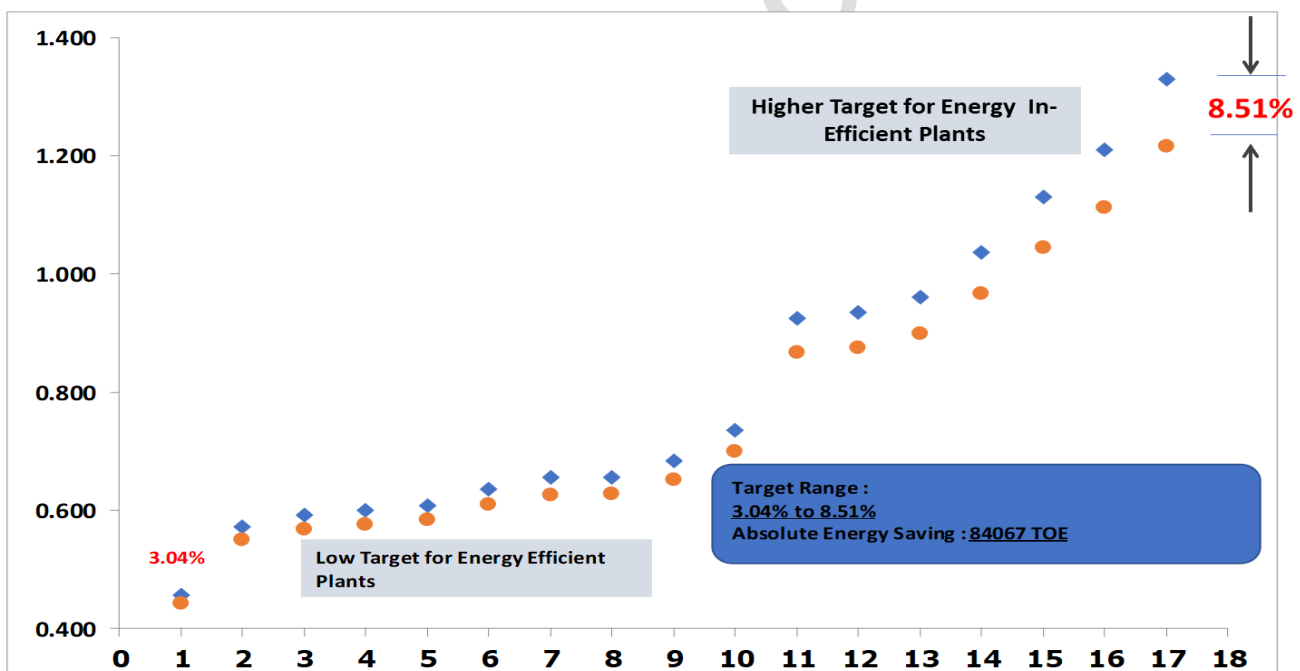


Figure 2 Target Setting Approach – PAT Scheme

A similar target-setting approach is adopted for all the designated sectors and considering various factors such as sub-sector classification, benchmarks, and other aspects the targets are given to the designated consumers.

A total of seven cycles of PAT have been launched till April 2022, covering 1,104 DCs from 13 industrial and service sectors, representing around 50% of the country's energy consumption. In addition to the coverage and impact, the PAT scheme was able to establish a strong and robust – monitoring, reporting, and verification system for assessing the energy consumption

and performance of the designated consumers. In addition to that, the scheme was able to establish the ecosystem for facilitating the assessment of baseline and verification of performance through Accredited Energy Auditors (AEA). The AEAs have developed the required capacity, knowledge, and expertise to meet various requirements under the PAT scheme.

The PAT scheme was largely successful and met most of its targets in the completed cycles. However, the PAT scheme suffered from an oversupply of ESCerts in the market perhaps driven by lenient goals set in its earlier cycles, the absence of market makers or financial traders which provide liquidity and manage oversupply and deficit market situations, and no provision of carry-over of unused ESCerts to subsequent PAT cycles. Due to excess supply and no take up in the market, the cost of ESCerts reduced in subsequent trading (Refer Figure 3). Other issues in PAT include limiting the participation of the identified DCs and precluding voluntary participation of other buyers. Trading of ESCerts was periodic, largely occurring at the end of each cycle which had long intervals in between them, and there was a lack of fungibility between the ESCerts of PAT with the emission reduction in tCO_{2e} which is required for the international compliance or voluntary markets. There are currently 44 lakhs ESCerts that are unsold in the market. Despite these weaknesses, the PAT mechanism did result in actual GHG mitigation, which was revealed in the country's GHG inventory, and thereby PAT contributed to the accomplishment of India's climate goals. The following graph highlights the price trends for ESCerts in different trading cycles:

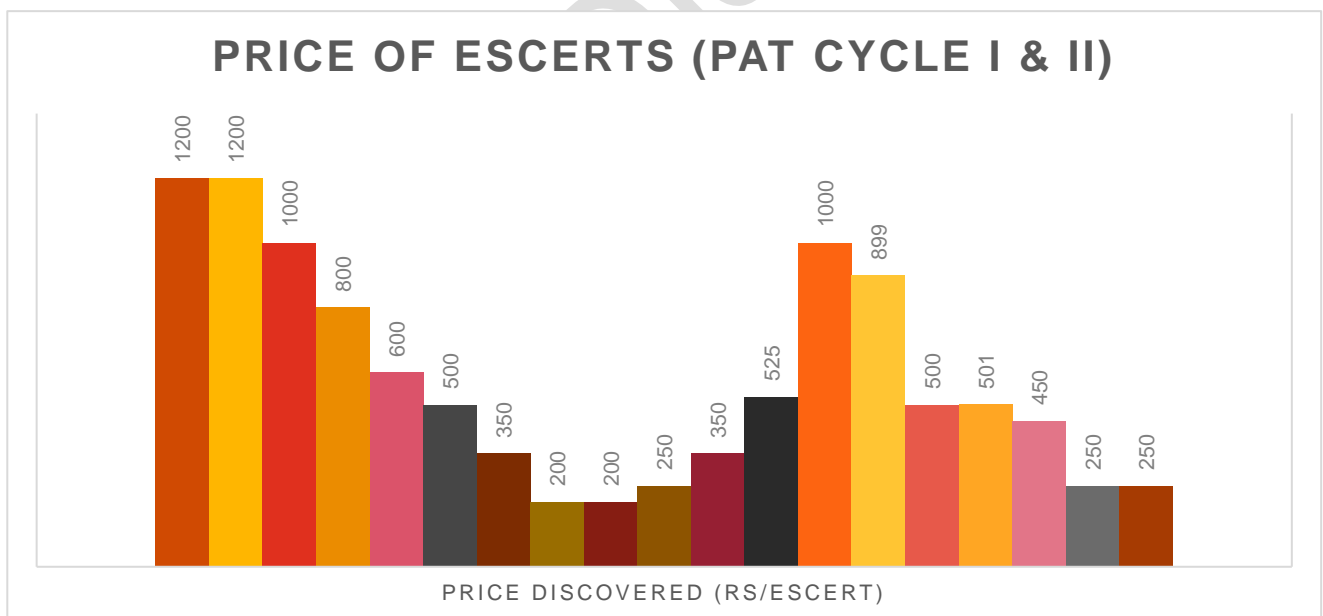


Figure 3 Prices of ESCerts – Cycle I and II (Trading Periods)

2.3. Renewable Energy Certificate (REC) Scheme

The REC mechanism was designed to support the regime of Renewable Energy Purchase Obligations (RPOs) by obligated entities to cover possible shortfalls in their compliances. Obligated entities included electricity distribution companies (DISCOMs) and large captive generation plants, which are using fossil fuels to generate power. RPOs were defined for solar

and non-solar generation separately and varied from state to state, depending on the RE potential in the state. The obligated entities had the option to buy RECs from renewable energy generators, from any state, in case they fell short of their RPO target. Thus, the REC scheme aimed at large-scale deployment of RE in an efficient manner, while facilitating the inter-state exchange of RECs, and thus providing an additional financing mechanism for driving investments in RE.

The REC scheme also suffered from oversupply, as the DISCOMs did not purchase enough RECs despite being obligated, due to their being financially distressed.² Further, the RECs were perceived as an additional cost without any additional benefits for the DISCOMs. Other problems with the REC scheme related to a modest level of purchase obligations, which further needed frequent resets due to falling costs of RE generation, absence of traders and financiers to smoothen the market and provide liquidity, significant barriers to generation of RECs (generators were not granted RECs if they supplied to DISCOMs or took benefit of transmission charge waivers), and barriers to free transfers of RECs. The following figure highlights the average price of Solar and Non-Solar REC since 2011:

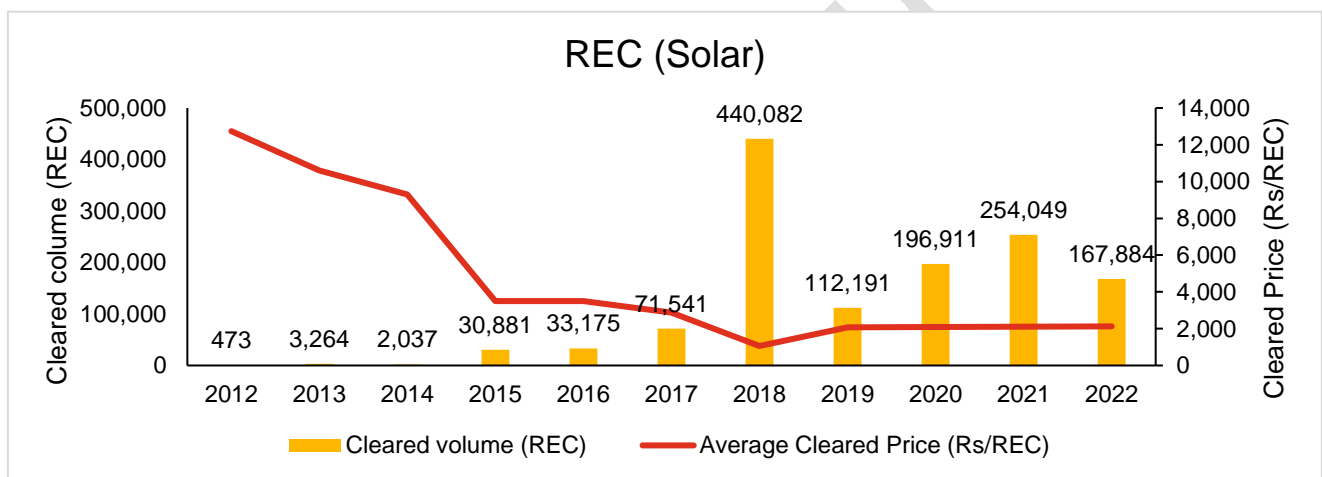


Figure 4 Price Trends for REC (Solar)

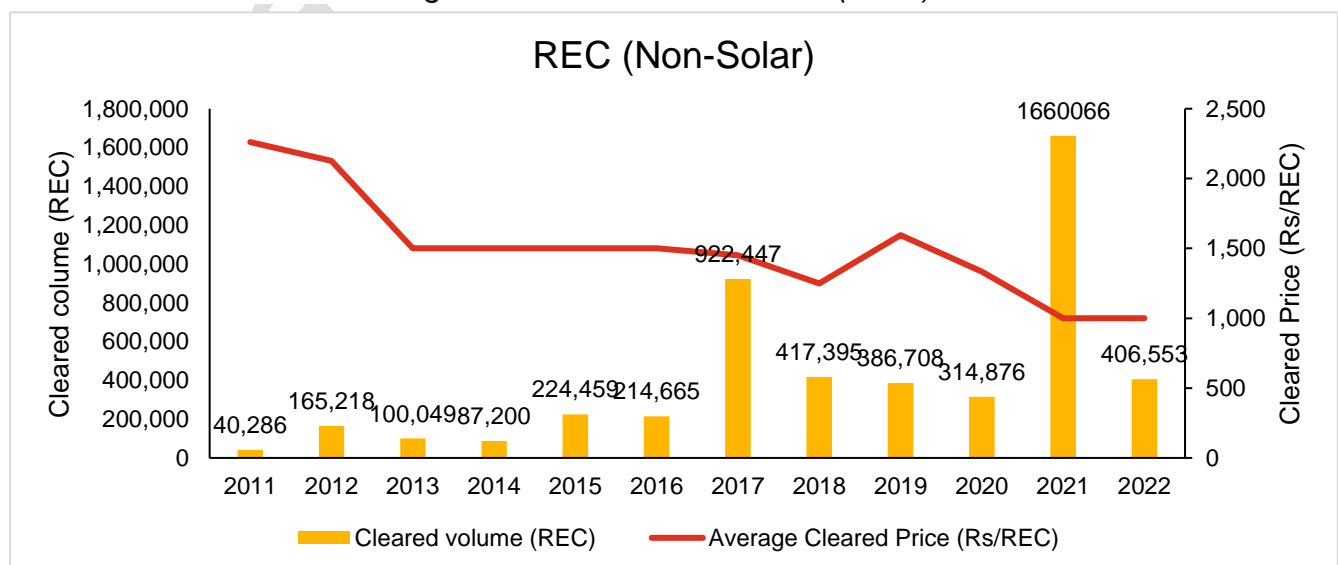


Figure 5 Price trends for REC (Non-Solar)

² According to REC registry data of July 2022, about 5.6 Mn RECs are unsold, and trading normally takes place at floor prices.

2.4. Learning from Experience

Key learnings from the experience of these market mechanisms, to be carefully considered before developing the ICM, are the following:

- a) The market needs to have a robust MRV system and processes to monitor performance and compliances, ensure environmental integrity, and remove apprehensions of any form of double counting of the carbon credit units generated and traded.
- b) To improve liquidity and mitigate problems of oversupply, measures for strengthening demand, primarily through setting suitably stringent targets and properly enforcing these, besides enabling trading at any time through shorter compliance cycles, and carry-over of credits across compliance cycles, levy of effective penalties and permitting third-party buyers and sellers, should be considered.
- c) Experiences, capabilities, and learnings from other similar markets, including stock markets or commodity markets, should be brought in, especially to check and control market-distorting operations by operators, and to set rules accordingly. The aim would be to ensure a competitive market for carbon credits, in which the price mechanism would bring supply in balance with demand.
- d) To ensure a competitive market, it is better to have a single commodity rather than fragmented markets with varieties of credits overlapping with each other. Further, to ensure comparability with international carbon market mechanisms, including voluntary markets, the commodity should be in terms of carbon dioxide equivalent.
- e) The Administrative Authority needs to actively track demand and supply and develop approaches to keep them in balance over time so that the market remains healthy. This would require the administrator to set appropriate emission targets, and bring in additional sectors when needed, to release sufficient demand.
- f) For a successful ETS system, there should be a well-defined registry. The registry should have a transparent system and a well-versed web portal for easy accessibility of users.

3. International Carbon Markets Landscape

Internationally it has been confirmed that carbon markets play a key role in reducing global GHG emissions cost-effectively. In addition to the proposed mechanisms under Article 6 of the Paris Agreement, the number of national, sub-national, and regional emissions trading systems around the world is increasing. Besides the EU emissions trading system (EU-ETS), national or sub-national systems are already operating or under development in Canada, China, Japan, New Zealand, South Korea, and Switzerland.

3.1. Carbon Markets in the Paris Agreement

The Paris Agreement provides a robust and ambitious basis for the use of the international carbon market and reinforces international rights, transparency, and the accountability of Parties.

Article 6.2: Cooperative Approaches

- It discusses the technicalities of Internationally transferred mitigation outcomes (ITMOs)/ international carbon credit trading (a carbon dioxide equivalent metric)
- Each ITMO transfer, when authorized will impact NDC through corresponding adjustments (to avoid double counting)
- Countries can either engage this mechanism through cooperative approaches as pure sellers, pure buyers, or through a mixed strategy which may include both, the purchase and sale of ITMOs, to support NDC achievement
- ITMOs include all carbon market transfers including CORSIA and VCM credits when authorized by host country
- These approaches will increase cooperation between countries to achieve NDC and Net Zero targets
- Example: A country can buy ITMOs (tCO₂) from India, and India will need to reduce the equivalent tCO₂ from their NDC

Article 6.4: New UNFCCC Mechanism (Successor of CDM)

- These are new institutional structures and methodologies are being built for the UNFCCC mechanism (will replace the CDM)
- New mechanisms to have stringent rules for additionality and baselines below BAU, aligned with long term goals
- Existing CDM registered projects will be able to transition to the new Article 6.4 mechanism provided they have an active crediting period.
- Current CDM methodology will be applied to them until the end of their crediting period or 2025, then they will need to apply an approved methodology under the new Article 6.4 Mechanism
- CERs from projects registered post-2013 can now be used for NDCs
- CERs post-December 2020 are provisional in nature and cannot be traded

Article 6 of the Paris Agreement

- Establishes a framework for common robust accounting rules, allowing for bilateral or multilateral agreements for trading units (under Article 6.2) for compliance with Parties' NDCs or other international mitigation purposes (such as under the International Civil Aviation Organization, or ICAO agreements).

- b. Allows Parties to use international trading of emission allowances (under Article 6.4) to help achieve emissions reduction targets under their respective NDCs or for other international mitigation purposes (such as under ICAO agreements).
- c. Allows for non-market approaches (under Article 6.8) through work programmes to help Parties achieve their respective NDC targets.

The UNFCCC secretariat is in the process of setting up the requisite infrastructure and institutional framework to facilitate the functioning of the international carbon market under Article 6.4. The processes for reporting, recording, and tracking are still under negotiations at UNFCCC fora and potentially will be finalized post-COP 27.

3.2. Overview of Regional Carbon Markets

Examples of ETS' with multi-level institutional structure³:

3.2.1. EU-ETS

EU-ETS			
Design Features of EUs National Carbon Market			
Emission Cap	1571 MtCO ₂ (2022)	Gases	CO ₂ , equivalent amount of other powerful gases (N ₂ O), PFCs etc.
Sectors	Initially large sources including power, heat and steam generation, oil refineries, iron and steel, pulp and paper, buildings materials (cement etc.). Gradually added in other sectors aviation, aluminum, chemical production		
Threshold	Emissions >20,000 tCO ₂ per year	No. of entities	11,000 power stations and manufacturing plants (2022)
Trading Period	One year	Compliance Period	Annual
Allocation method	Free allocation	MRV Frequency	Annual
Banking	Allowed within each phase	Avg. Price	Trade of allowances: \$90 (2021)*
Usage of Carbon Credits by Regulated Entities			
Quantitative limit: No restrictions on usage of domestic carbon credits			
Type of projects and geography: Domestic offsets in all economic sectors (GHG reduction or absorption activities), except for emissions reductions at the entities covered by the ETS			
<small>*Source: tradingeconomics.com/commodity/carbon on July 4, 2022.</small>			
Design Features of China's National Carbon Market			
Emission Cap	~4,500 tCO ₂ (2019 and 2020 each)	Gases	Only CO ₂
Sectors	Power sector (including combined heat & power & captive power plants in other sectors)		
Threshold	Emissions >26,000 tCO ₂ in any year over the period of 2013-19	No. of entities	2,162 companies (2020 and 2021)
Trading Period	Not defined yet	Compliance Period	Annual
Allocation method	Free allocation	MRV frequency	Annual
Banking	Not defined yet	Avg. Price	Trade of allowances: \$7.23 (2021)
Usage of Carbon Credits by Regulated Entities			
Quantitative limit: Obligated entities can use carbon credits for up to 5% of their verified emissions from China Certified Emissions Reductions (CCERs) projects registered under the China GHG Voluntary Emission Reduction Program			
Type of projects and geography: CDM projects in the areas of carbon sinks, renewable energy, methane utilization and others, developed within China.			

European Union Emission Trading System – generally known as EU-ETS is a central pillar of EU's initiatives on mitigating GHG emissions and combating climate change. The system

³ High Level Blueprint of the Carbon Market Governance Mechanism, Intelicap, 2022

currently covers around ~45% of the EU's GHG emissions from the power, industry, and aviation sector. Introduced in 2005, it is currently the oldest and second largest ETS in force, over time it has evolved and undergone various forms and is in the fourth phase.

The EU ETS directive was adopted in 2003 and came into force in 2005 to help Europe meet its Kyoto Protocol targets. Thus, it became the first and largest facility-level cap and trade program for greenhouse gas mitigation in the world. Under the EU ETS, a practical learning approach is adopted where at end of each phase key achievements and drawbacks are studied subsequent reforms are undertaken to further strengthen it. The EU ETS scheme has completed three phases - Phase I: 2005-2007; Phase II: 2008-2012, Phase III: 2013-2020 and is currently in its fourth phase (Phase IV: 2021-2030). It covers 45% of the EU's GHG emissions and aims to reduce GHG emissions by 21% below 1990 levels by 2020 and 43% below 1990 levels by 2030. Since its inception, EU ETS has generated about Euro 70 billion (USD 80 billion) in revenues. Under EU ETS there's a provision where 50% of the Generated revenue from auctioning of allowances should be used for Climate and Energy related purposes.

One of the important infrastructure elements of ETS is a registry and for EU ETS - The EU Registry and the European Union Transaction Log (EUTL) track the ownership of general and aviation allowances by recording the amounts owned in the accounts and the transactions between accounts. These systems also register the emissions of stationary (power and heat, and industry) installations and aircraft operators, and compliance with obligations stemming from these emissions. Both systems are operated and maintained by the Commission, whereas the national registry administrators in the participating countries remain the point of contact for account holders and representatives (companies and individuals). While the EU Registry holds the accounts and registers compliance information, the EUTL automatically checks, records, and authorizes all transactions between accounts, ensuring that all transfers comply with the EU ETS rules.

One of the noteworthy features of the EU ETS scheme is the Monitoring, Reporting, and Verification (MRV) system, aimed toward robust, transparent, and consistent monitoring, reporting and verification of emissions. All emitters develop and submit a monitoring plan detailing their emissions, which are subsequently approved based on predefined criteria. Annually, emitters submit an emissions report. On verification, operators are required to surrender the equivalent number of allowances by 30 April of the current year. Capped firms also report emissions annually and have them independently verified, failing which they lose the right to sell allowances in the carbon market. In case a regulated entity fails to surrender enough units, it pays a penalty, and the penalized companies also have their names shared in public and may also face additional national fines.

The EU ETS has proven to be an effective tool in driving down costs for reducing GHG emissions and entities covered under EU ETS were able to reduce the emissions by 35% during the period of 2005-2019. In addition to the emission reduction, under the EU ETS, two funds – Innovation Fund (target EUR 20 billion between 2020-30) and Modernization Fund (target EUR 25 Billion between 2020-30) are introduced to support projects accelerating decarbonization in member states.

The EU-ETS is a regional ETS, and its day-to-day implementation is carried out by the European Commission (EC) and competent national authorities of different EU member states. EC is responsible for managing the registry and for examining and approving free allocation to member countries, while the competent authorities of respective member states are responsible for implementing the ETS within their countries. For example, in Germany, the German Emissions Trading Authority (DEHSt) is the competent national authority and functions under the legal and technical oversight of the Federal Ministry of Environment (BMU). The DEHSt is responsible for the administration of German accounts in the EU's trading registry, auction of certificates, allocation of certificates, examination of emissions reports, and sanctioning. The DEHSt further delegates some of its functions to the state-level authorities, known as Lander authorities (Germany has 16 federal states or Landers). These state-level authorities are responsible for issuing emissions allowances and for approval and inspection of monitoring plans.

EU ETS: Benchmarks are the measures used to determine how free allowances are distributed to entities under the EU ETS. The benchmark is based on the CO₂ emissions intensity of the top 10% of the most carbon-efficient installations in every sector. Further, the benchmarks are product benchmarks wherein a 'one product one benchmark' concept is followed. Based on the benchmark, all installations within that sector then receive free allowances up to the benchmark level, and only need to purchase European Union Allowances (EUAs) to cover their CO₂ emissions above the benchmark.

3.2.2. China National ETS

China			
Design Features of China's National Carbon Market			
Emission Cap	~4,500 tCO ₂ (2019 and 2020 each)	Gases	Only CO ₂
Sectors	Power sector (including combined heat & power & captive power plants in other sectors)		
Threshold	Emissions >26,000 tCO ₂ in any year over the period of 2013-19	No. of entities	2,162 companies (2020 and 2021)
Trading Period	Not defined yet	Compliance Period	Annual
Allocation method	Free allocation	MRV frequency	Annual
Banking	Not defined yet	Avg. Price	Trade of allowances: \$7.23 (2021)
Usage of Carbon Credits by Regulated Entities			
Quantitative limit: Obligated entities can use carbon credits for up to 5% of their verified emissions from China Certified Emissions Reductions (CCERs) projects registered under the China GHG Voluntary Emission Reduction Program			
Type of projects and geography: CDM projects in the areas of carbon sinks, renewable energy, methane utilization and others , developed within China.			

Building on the experience of eight pilots, the Government of China politically announced the introduction of National ETS in 2017. A step-by-step development roadmap was then outlined in a work plan, which was endorsed by the country's highest administrative body, the State Council. Post this, the China ETS was launched in 2021 bringing the world's largest ETS into

operation. The objective of the China national ETS is to contribute to the effective control and gradual reduction of carbon emissions in China and the achievement of green and low-carbon development. The ETS regulates more than 2,200 companies from the power sector (including combined heat and power, as well as captive power plants of other sectors), which emit more than 26,000 tCO₂ per year. The Chinese national ETS is estimated to cover more than four billion tCO₂, accounting for ~40% of national carbon emissions. The ETS's scope is to be further expanded in the future. Currently, it is an intensity based ETS with the cap being adjusted ex-post based on actual production levels. Key pillars of the development of the national ETS include reporting and verification of historical emissions data from eight emission-intensive sectors; development of the national registry, trading system, and national enterprise GHG reporting system; set-up of the legislative and regulatory framework; and capacity building.

The China ETS trading started in the month of July with 4.1 million t CO₂ volume being traded and discovered price was USD 7/ t CO₂ which was above pilot ETS prices in the range of USD 4-4.5 / t CO₂ but still less than EU ETS price of USD 59/ t CO₂. More sectors such as cement, iron & steel, petrochemicals, and chemicals are expected to be included in the next phase of China's national ETS.

China follows a multi-tiered approach to the implementation of the national ETS. It is administered by the Ministry of Environment and Ecology (MEE) and its representative offices at a sub-national level. The MEE provides policy and technical oversight such as formulating national policies and technical specifications for carbon emissions trading and related activities, determining emission reduction caps and allocation of emission allowances, supervising emission reporting and verification, and coordinating with other administrators of the ETS. At the provincial level, the ecological and environmental authorities of the MEE are responsible for determining the list of obligated entities, allocating emission allowances as per the national plan, and undertaking supervision and management of local authorities. Further, the local ecological and environmental authorities may be directed by their provincial supervisors to discharge some of these implementation functions.

The ETS scheme in China will gradually expand from just the power sector to cover key emission-intensive industries such as petrochemicals, chemicals, steel, and aviation. Although a unified carbon market was launched throughout the country with the electric power industry as a pilot in 2017, a regulatory framework and legal supervisory system are absent at a national level. The regulations are based on the Interim Measures for the Administration of Carbon Emission Trading, promulgated by the National Development and Reform Commission in 2014⁴.

The ETS covers coal- and gas-fired power plants and it allocates allowances (also known as permits), based on the plant's generation output, with a different benchmark for each fuel and technology. The ETS is set to expand to seven other sectors and will be the world's largest by far covering one-seventh of global CO₂ emissions from fossil-fuel combustion.⁵

⁴ <https://www.ieta.org/resources/2016%20Case%20Studies/China%20case%20study.pdf>

⁵ <https://www.iea.org/reports/chinas-emissions-trading-scheme>

China ETS

Under the current regulations, free allowances are allocated, and a benchmarking-based approach is used for allocation.

The benchmark for conventional coal-fired plants above 300 MW has been set at 0.877 t CO₂/MWh, meaning they will receive 0.877 t CO₂/MWh allowances for every megawatt hour of electricity generated. However, for coal fired plants that are operating at less than 85% of their capacity, the benchmark is 1.00 t CO₂/MWh or higher.

The benchmark for conventional plants with capacities lower than 300 MW has been set at 0.979 t CO₂/MWh, while for non-conventional coal plants it is 1.146 t CO₂/MWh. Gas-fired plants have been given a benchmark of 0.392 t CO₂/MWh and these facilities will not have any compliance obligations under the ETS in the beginning but will be issued allowances that they can sell in the market if they exceed their benchmark. (Source: Latham & Watkins LLP)

3.2.3. Korea ETS

The Republic of Korea launched its cap-and-trade program on 1st January 2015. This program was East Asia's first nationwide mandatory cap-and-trade programme and the world's second-largest when it was launched. The Korea-ETS covers around 685 of the country's largest emitters which accounted for ~73.5% of national GHG emissions⁶. K-ETS covers direct emissions of six GHGs, as well as indirect emissions from electricity consumption. With the country's NDC commitment of achieving a 37% reduction in its absolute emissions by 2030 (compared to business-as-usual scenario), the carbon market has capped emissions at 610 million t CO₂e during the period 2021-25.

The K-ETS covers six sectors – heat & power, industry, buildings, transportation, waste, and the public sector. The construction and transport sector has also been brought into the ETS scope which resulted in a total of 69 subsectors. The thresholds for inclusion of entities in Korea ETS at a company level – if annual emissions are greater than 125,000 T CO₂ and for a facility having annual emissions greater than 25,000 t CO₂ are included.

In phase III of Korea ETS, the share of auctioning of allowance increases from 3% to 10% in 2021 in 41 sub-sectors, for the remaining 28 subsectors 100% free allocation as determined by carbon leakage index and share of benchmarking increased from 50% to 60% in 12 sectors. In addition to the above, the share of offsets in phase 3 also reduced from 10% to 5%.

Since the beginning of the program, Korea ETS generated a revenue of USD 407.3 million. The government has put forward possible options for the use of the revenues and options include support for mitigation equipment, low-carbon innovation, and technology development of ETS-covered entities. Specific rules on the use of revenues are yet to be decided.

⁶ICAP - <https://icapcarbonaction.com/en/ets/korea-emissions-trading-scheme>

In addition to the Korea ETS – the Government of Korea has also introduced the Korea Offset scheme - The Carbon Offset Scheme is the key policy of the Korean Emissions Trading Scheme through which companies, local governments, and institutes can voluntarily register their GHG reduction projects to the Carbon Offset Scheme to use the Korean Offset Credits (KOC) to achieve the project targets or create economic profits through carbon markets. In Korea, the government allows existing domestic and international CDM credits to be canceled and converted to Korea Offset Credits (KOCs) under the Korea Offsetting Program (KOP). These KOCs can be used for voluntary carbon offsetting or be converted into Korea Credit Units (KCU) for use by regulated entities.

Korea ETS

The initial and default method of free allocation under the K-ETS is grandfathering, with Benchmark based allocation gradually expanding to different sectors. In Phase 1 (2015–17), the benchmarking-based allocation was applied for cement, oil refineries and domestic aviation sectors. In phase 2 (2018–20) benchmarking-based allocation was extended to power, district heating and wastewater treatment and in phase 3, the benchmarking-based allocation was extended to steel, petrochemicals, paper and building sector. For Phases 1 to 3, the benchmark value is based on the weighted-average emissions intensity of all facilities in the sector.

The following is the summary for the three ETS:

Table 1: International ETS Summary

ETS	Start of Operation	Level	Type of GHG	% National emissions	Sectoral Coverage	Number of Entities	Type of Allocation
China National ETS	2021	National	CO ₂	40%	Thermal Power Plant	2,225	Free allocation based on benchmarking. It is also mentioned that the auction of allowances can be implemented in future
EU-ETS	2005	Regional	CO ₂ , N ₂ O, PFCs	39%	Industry, Power, and Aviation	9,997	Auctioning and Free allowances based on product benchmarks and carbon leakage were also addressed.
Korea ETS	2015	National	CO ₂ , CH ₄ , N ₂ O, SF ₆ , HFCs, PFCs	74%	Buildings, Domestic Aviation, Industry, Power, and Waste	685	Free Allocation based on benchmarking and auctioning

The following graph highlights the allowances prices under the three ETS scheme i.e., EU-ETS (Figure 6), Korea ETS (Figure 7), and China ETS (Figure 8):

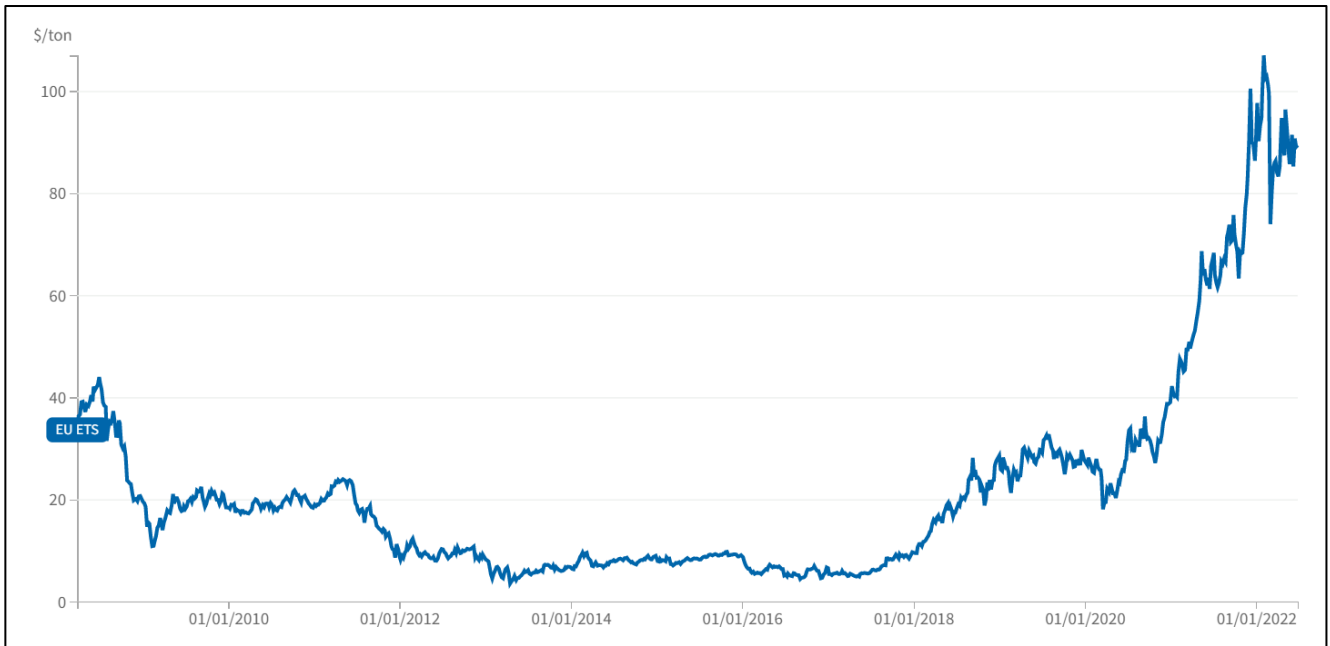


Figure 6 Allowance Prices – EU ETS,

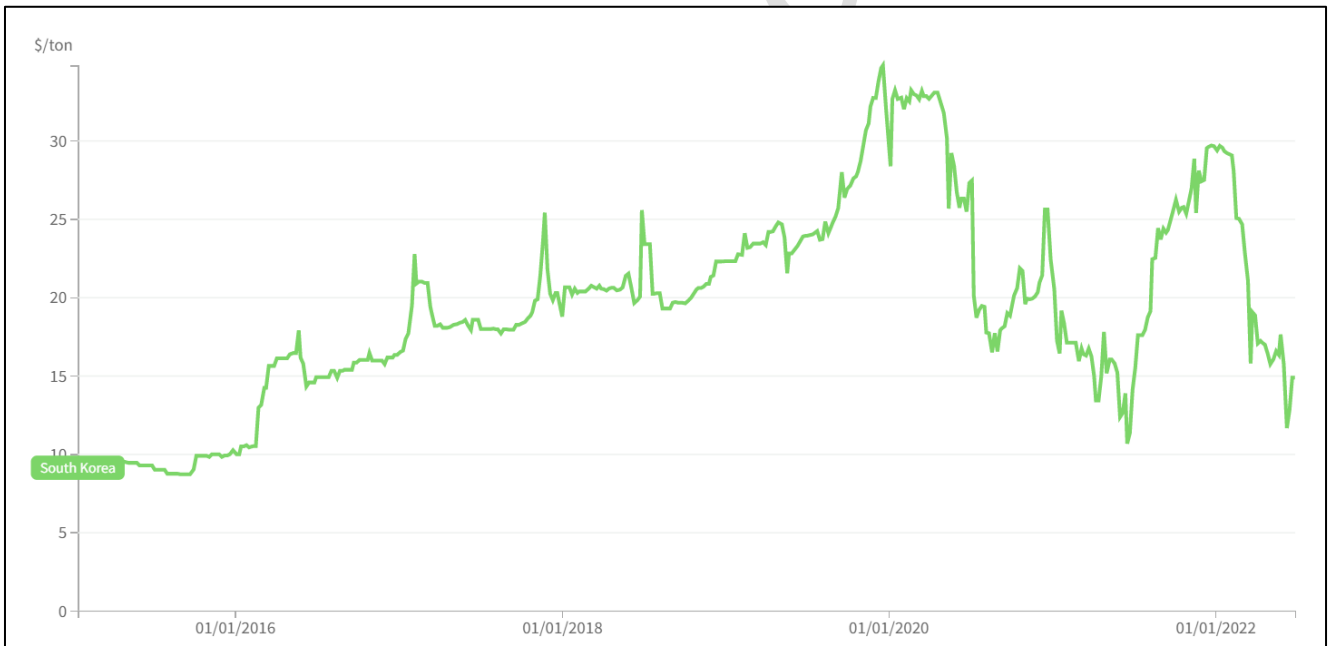


Figure 7 Allowance Prices - Korea-ETS

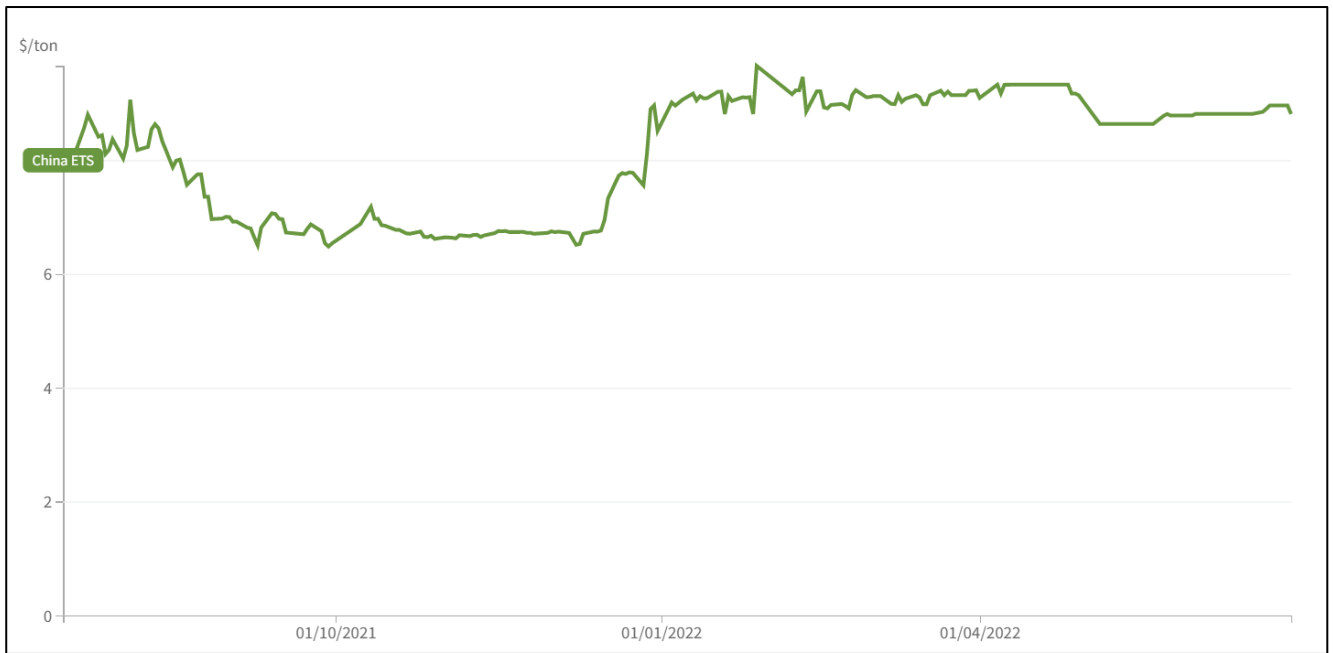


Figure 8 Allowance Prices - China ETS

Draft for Discussion

4. The rationale for a Carbon Market Mechanism

4.1. National Context

A well-designed, competitive carbon market mechanism can enable the reduction of GHG emissions for a specified target at the least cost, both at the level of each regulated entity, as well as the overall sector and drive faster adoption of clean technologies. While India has market mechanisms in place, they are yet to realize their full potential and thus, is unable to provide the required support for decarbonisation of the Indian energy sector and industries. To create an efficient and effective domestic carbon market mechanism in India and reach a viable scale of operations, it is necessary to set up a single carbon market mechanism, integrating the existing PAT and REC markets into it.

A major challenge faced by India's market mechanisms, PAT and REC, is that their measurement, through the metric unit of their certificates, is not stated in terms of carbon dioxide equivalent, and is instead in terms of tonnes of oil equivalent or MWh, respectively. This aspect of the above two mechanisms imposes a serious limitation on their growth potential and the efficacy of their ability to be a price discovery mechanism for carbon, as it constrains the generators and buyers of these certificates and fragments the scale of the domestic energy market, without allowing for cross-linkages. This, along with the issues of low targets and weak enforcement (in the case of the REC), has also resulted in an over-supply of PAT and REC certificates.

India in its NDCs document has also indicated the use of market instruments as follows:

"Policies to promote actions that address climate concerns also include fiscal instruments like coal cess, cuts in subsidies, increase in taxes on petrol and diesel, market mechanisms including Perform Achieve and Trade (PAT), Renewable Energy Certificates (REC) and a regulatory regime of Renewable Purchase Obligation (RPO). (...) At the same time, India is not relying solely on budgetary resources and is experimenting with a careful mix of market mechanisms together with fiscal instruments and regulatory interventions to mobilize finance for climate change".

To address this, a unified domestic carbon market mechanism is proposed. This unified domestic carbon market mechanism will subsume the existing PAT and REC mechanisms, with the certificates generated under it expressed in terms of tonnes of carbon dioxide equivalent (tCO₂e). A single market at the national level, as opposed to having multiple sectoral market instruments, would reduce transaction costs, improve liquidity, enhance a common understanding and targeted capacity development, and streamline the accounting and verification procedures. This carbon market mechanism will set targets for the mandated participants, as per existing and emerging policy objectives, and their achievement will count towards India's NDCs.

A major problem of the REC market was weak enforceability on DISCOMs, which were financially stressed and had limited incentives to minimize costs. To address these

shortcomings, it is suggested that in respect of the power sector, in place of the DISCOMs the regulated entities under the unified carbon market mechanism may be power generators, who would be assigned CO₂e intensity targets, as any other regulated entities in other sectors.

It should be noted that since the targets under the national carbon market will be policy mandated, these carbon credits supplied may not always cover the requirement of “additionality” under the Article 6 mechanisms. Any carbon credits for international trading under Article 6 would first, need to be above the domestically mandated targets, and second, issued by the SB of the CMA under Article 6.4, or generated under a bilateral or plurilateral commercial agreement with other Party(ies) and subject to international review as provided under Article 6.2. The domestic MRV and issue processes cannot substitute for these international processes. Carbon credits for international trading under the Article 6 mechanisms will thus have to undergo NDAIAPA full scrutiny and endorsement, distinct from the ICM processes.

Further, under the guidelines of the Paris Agreement, India will need to periodically submit updated NDCs. Thus, India’s climate targets would become increasingly ambitious, and the emission reduction requirements will increase. The challenge of meeting future NDC goals makes it imperative that market measures are promoted to facilitate gradual decarbonisation of the economy. A robust carbon market mechanism will also enable active participation of the private sector in decarbonisation efforts, in all potential sectors.

Finally, in international trade negotiations, countries and regional blocs have started asking for the carbon intensity of products being traded. While these are not settled issues and are still in nascent stages, it indicates the growing need to account for the carbon intensity of industrial products and the impact it could have on India’s exports. A carbon market mechanism could be a means of initiating this accounting and as a means of supporting Indian industries to decarbonise by gradually transitioning to lower carbon technologies.

4.2. Alignment with Paris Agreement (NDC, Article 6)

To meet its host Party responsibilities, India has set up a Designated National Authority, *The Nationally Designated Authority for the Implementation of Article 6 of the Paris Agreement (NDAIAPA)*, to govern and facilitate the participation of Indian project proponents in the international carbon markets. The NDAIAPA will approve and authorize projects for use towards India’s NDC or international transfer as ITMOs.

Potentially, Indian entities may generate carbon credits *above* their targets under the ICM and may be eligible for transfer internationally under Article 6.2 or 6.4 of the Paris Agreement. Under Article 6.4, the monitoring, reporting, and verification (MRV) processes as well as the issue of these credits will be set up under the SB of the CMA (for A6.4 carbon credits). The Indian registries for the ICM and Article 6, will need to ensure no double counting in such cases.

Under Article 6.2, India may sign agreements with other Party (or Parties) identifying sectors, GHG mitigation activities, and the terms of cooperation in terms of finance, technology, sharing of credits, and price of credits transferred to the partner Party (or Parties) for each cooperative agreement. The credits transferred internationally under such agreements will be subject to accounting methods and review by processes specified under the Article 6 rules. India’s or the

participating entities' shares of these credits generated may then be traded internationally as ITMOs or employed for compliance with the country's relevant NDC. ITMOs transferred out of India will be debited, or added back to the domestic entity's targets, or debited to its carbon credit stock (further elaboration in section 5.3).

4.3. Contribution to Sustainable Development

The carbon markets, both compliances-based and project-based baseline & crediting mechanisms, deliver on several sustainable development goals (SDGs) apart from providing much-needed climate action under Goal 13 of the SDGs. The Indian Carbon Market will span sectors including energy, manufacturing, chemicals, waste management, afforestation, agriculture, community development, etc. Given this wide canvas, the Indian Carbon Market will have significant positive impacts on India's SDG goals provided the environmental integrity and interests of communities are considered. Some of the goals related to carbon markets and related impacts are as below:

Table 2: Indian Carbon Market Positive Impact on SDGs

SDG Goals	Impacts
Goal 1 - No poverty, Goal 8 – Decent work and economic growth and Goal 10 – Reduced inequalities	Carbon markets have the potential to ensure financial savings, increased employment opportunities, increased access to sustainable livelihoods, etc among communities.
Goal 3 – Good health and well being	Through improvements in local ecosystems and biodiversity as well as positive impacts on earnings of local community members, carbon markets can bring about positive impacts on public health and general wellbeing
Goal 5 – Gender equality	Firstly, climate change negatively impacts women disproportionately. Through climate action, women stand to benefit. Further, through the implementation of a gender equality framework in carbon projects, women can be an equal partners in the projects.
Goal 6 – Clean water and sanitation	Some of the projects in the sectors of biodiversity, agriculture, and afforestation have the potential to positively impact ecosystems and contribute to providing clean water and sanitation to local communities.
Goal 7 – Affordable and clean energy and	One of the biggest barriers to the spread and acceptance of newer clean energy technologies is the high initial cost. Carbon markets provide such projects with valuable climate finance that help them meet the viability gap and support the spread of new and groundbreaking clean energy technologies.
Goal 13 – Climate action	Carbon markets, where implemented, have been successful in reducing CO ₂ emissions in the most cost-efficient manner.
Goal 14 – Life below water	Carbon market projects in coastal ecosystems such as mangroves, tidal marshes, and seagrass meadows can lead to the restoration of such ecosystems as well as the conservation of important fisheries and endangered marine species. In addition, such projects can sequester large amounts of CO ₂ from the atmosphere.
Goal 15 – Life on Land	Carbon market projects can lead to sustainable management of all types of forests, reduce deforestation, restore degraded land and forests, and generally improve the health of ecosystems.

5. Scope of the Carbon Market

The Indian Carbon Market (ICM) is envisioned to serve as a vibrant carbon financing platform to mobilize finance and technology towards decarbonisation of the economy, helping achieve India's 2030 NDC target – specifically the emission intensity target, future NDCs expressed in CO₂e terms, and the 2070 Net Zero target. The creation of a unified ICM can help to create eligible carbon credits, increase the liquidity of credit trading, and thus lay the foundations for a good price discovery mechanism for carbon in India.

India has a vast potential of generating carbon mitigation outcomes. Based on the experience with CDM, which was strictly a voluntary mechanism, an assessment of 500 registered projects implemented from 2013 to 2020 shows that India was able to generate nearly 90 million CERs (i.e. reduce 90 million tCO₂e).⁷ Further, as per the assessments of PAT, in its first two cycles, the mechanism enabled the reduction of nearly 100 million tCO₂e.⁸ Thus, a unified domestic carbon market under the ICM, which would be mandated targets for all participating entities, will have the potential of generating a sizeable amount of carbon emission reduction. However, a thorough assessment to understand this potential, including sectoral potentials needs to be conducted.

Additionally, with the Paris Agreement, there are corresponding adjustments that are required for any international transfer of mitigation outcomes (ITMOs). The ICM will take into consideration with due approval of NDAIAPA for international transfers. This is important as overselling of mitigation outcomes internationally may impact the NDC targets due to corresponding adjustments.

While determining the scope of the ICM, we need to choose obligated sectors carefully, so that:

- India's NDCs for GHG emission intensity of GDP are met comfortably
- Costs imposed on the domestic markets are acceptable
- The scope for international trade of credits is open and utilized well.
- There is approval for international transfers from NDAIAPA

5.1. Indian Carbon Market – Phase-wise approach

It is proposed that under the Indian Carbon Market – there will be two mechanisms – carbon credit trading mechanism for the obligated sectors i.e., the extended PAT scheme based on carbon emissions targets instead of energy targets, and a project-based offset scheme for non-obligated and non-energy sectors.

As India already has a market-based mechanism in the form of PAT and REC, the obligated sectors covered under the PAT and REC schemes would continue to remain obligatory under the ICM as well. The ICM would also allow participation from other sectors (currently not covered under PAT and REC) for the trading of offsets.

⁷ GIZ; MoEFCC (2020).

⁸ BEE.

Based on global good practices and the domestic context (See Section 3.2 and 5.3), a phased and iterative approach will be taken for implementing the ICM and following figure highlights the overall phase wise approach:

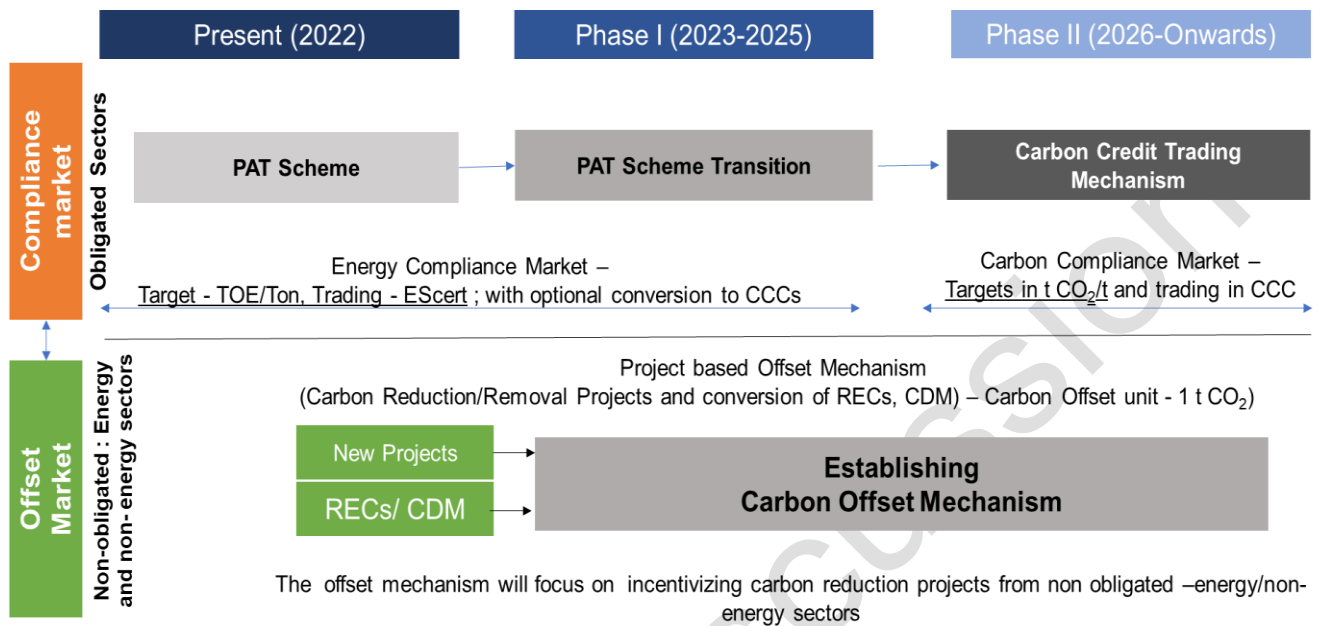


Figure 9: Phase wise approach for the Development of Indian Carbon Market

For the development of the ICM, the following activities will be carried out

Phase I: Following will be the key aspects for Phase I

Compliance Market

Under the compliance market the current PAT Scheme would continue and the obligated entities would continue to operate under the current energy efficiency compliance market and the entities will have to meet their energy targets compliance in form of Energy Saving Certificates only. The RPO obligated entities will have to meet their RPO obligation through RECs only.

But the existing and excess ESCerts and RECs that are generated in this phase would be eligible to be converted to carbon credit certificates and will be allowed to be purchased by non-obligated entities for voluntary purposes. This will enable the trading of excess/unsold certificates under the offset scheme. Eligibility & additionality criteria and factors for conversion of ESCerts and RECs to equivalent carbon credit certificates will be developed and communicated to stakeholders.

The details of the key aspects relating to phase I for the compliance market are as below:

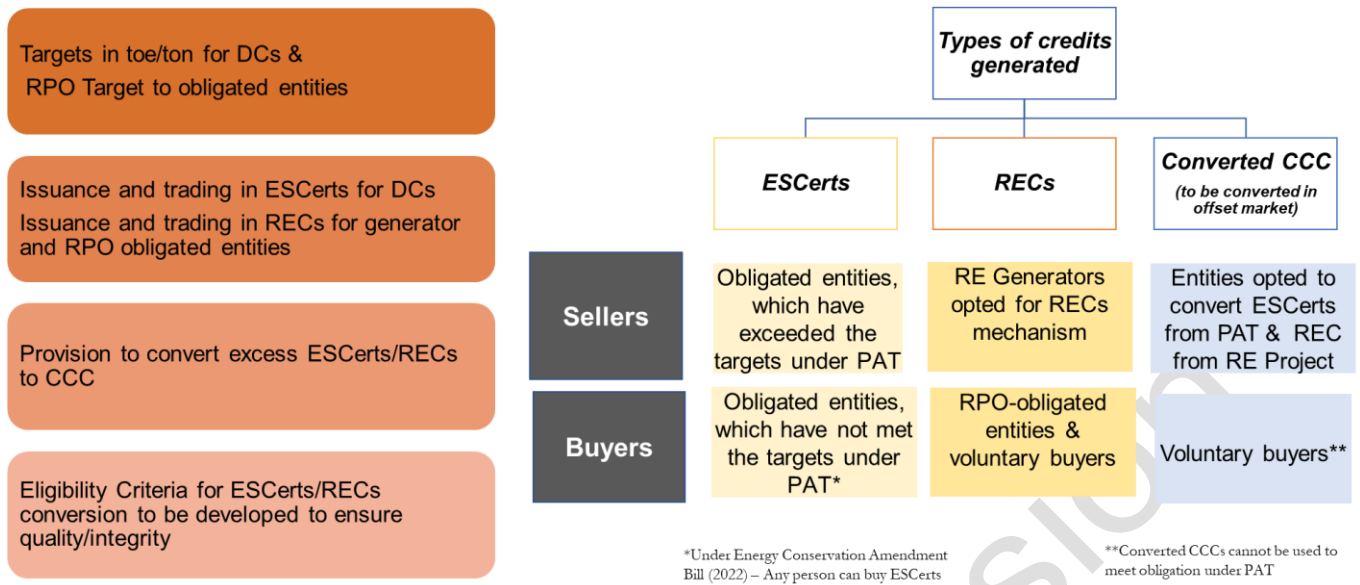


Figure 10: Key Aspects for Compliance Market in Phase I

Phase I – Offset Market

In parallel, the development of an offset scheme would start. The offset scheme would be applicable to non-obligated sectors and would be project based offset schemes. The registration of such projects will follow detailed methodology to demonstrate additionality and emission reduction, avoidance, or removals. Under the domestic offset scheme, the governing structure for developing and approving methodologies for estimation of carbon emissions reductions and removals from the offset scheme, and setting the required validation, registration, verification, and issuance processes will be undertaken (See Section 4.1). The additionality criteria for the offset projects will be determined based on the context of technological, financing needs, and priorities and will be aligned with international requirements under Article 6 of the Paris Agreement. In addition, criteria for sustainable development and environmental integrity for the offset projects will be developed based on the Sustainable Development Goals of the country. The following are the key aspects relating to phase I for the offset market:

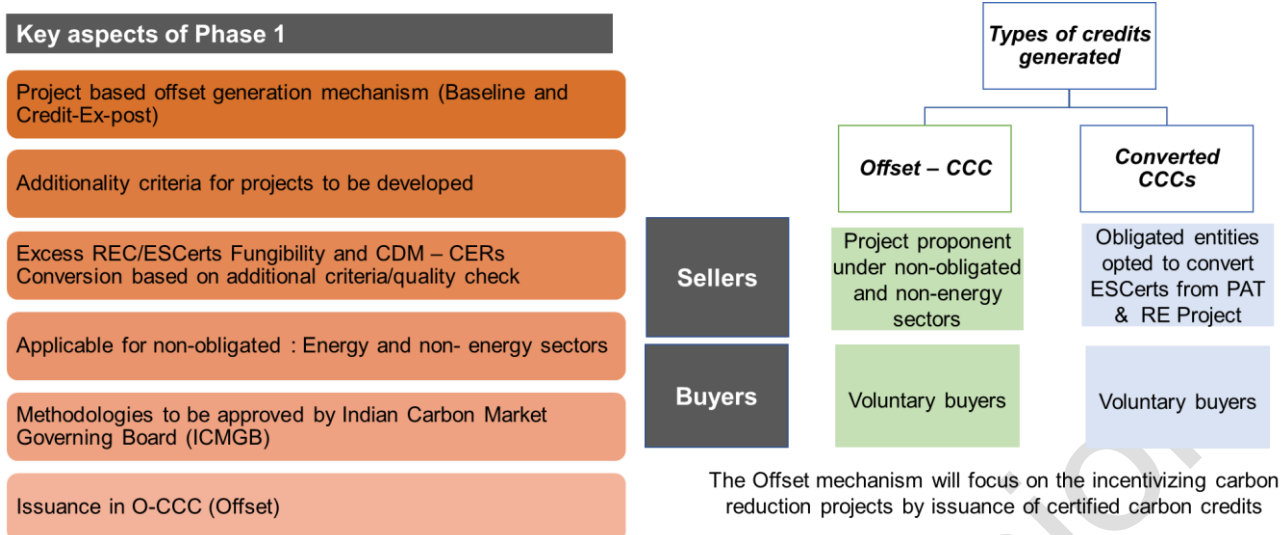


Figure 11: Key Aspects for Offset Market in Phase I

In parallel to the above activities, the Monitoring, Reporting, and Verification (MRV) guidelines for both compliance and offset market will be developed in consultation with the stakeholders. Also, the infrastructure development for operationalising for carbon market such as registry, trading platform would be underway in phase I. A comprehensive governance structure will be developed, and responsibilities will be allocated to all parties involved in the execution of ICM. Capacity building of all responsible parties will be carried out for upskilling and re-skilling in the subject matter. Extensive stakeholder consultation will be undertaken in Phase I to take key inputs and suggestion to ensure the success of Indian carbon market.

Thus, the outcome of phase I would initiate the development of comprehensive carbon market development in India by enabling fungibility of ESCerts and RECs with carbon credits certificates, initiation of domestic offset mechanism and development of infrastructure and capacity requirements to operationalise carbon market in India.

Phase II Compliance Market

Under the phase II, the current energy efficiency compliance market will transition to carbon compliance market, where the obligated entities will be provided the GHG intensity reduction targets. In the phase II of the compliance market the obligated entities will have to meet their obligation by trading the in-carbon credit certificates and the credits generated/traded in the compliance market will be tagged as mandatory carbon credit certificates (m-ccc). The obligated entities would be same as under the current PAT scheme and new sectors can be included under the compliance market. In the phase II, the obligated entities will have to monitor, report, and verify their GHG emissions and performance to demonstrate the compliance under the Carbon Credit Trading Scheme. The targets for emission intensity reduction shall be aligned with NDC trajectory for India.

The Obligated Entities will have the mandate to improve the GHG emissions per unit of output or equivalent measure of emission intensity. Entities that emit less than the target emission/unit of output will get credits whereas units emitting more than the target emission/unit of output will need to offset emissions by buying credits, from other obligated entities. Target emission

levels would be unique for each sector or entity and may be revised to keep it aligned with national targets for GHG reduction. The current PAT cycle for three years would be reformed to annual compliance cycle under the proposed carbon credit trading scheme. The RPO obligation would continue to be through RECs for the obligated entities. Under the phase II it is proposed that both energy and process emissions will be included in the in coverage of the GHG emissions from obligated entities. Following are the key aspects relating to Phase II of the compliance market:

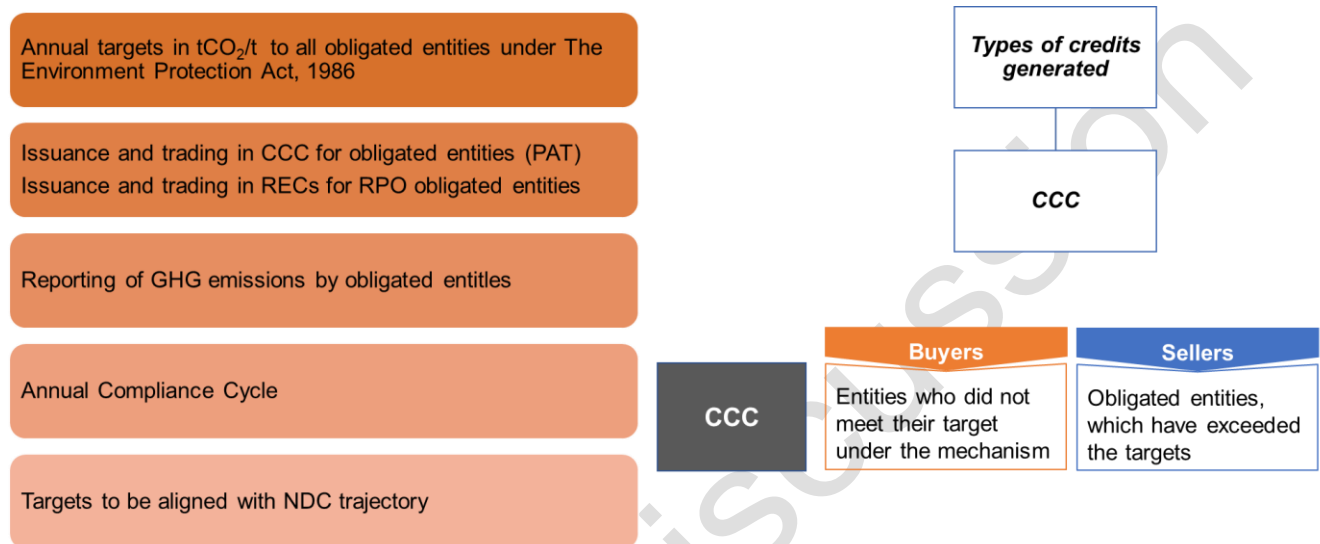


Figure 12: Key Aspects for Offset Market in Phase II

The outcome of Phase II will enable the complete transition of current energy efficiency compliance market under PAT scheme to Carbon emissions compliance market as Carbon Credit Trading Mechanism under the Indian Carbon Market.

In addition to the above activities, the ICM will also enable following

- The transition of projects registered, and carbon credits issued under other international voluntary mechanisms/markets into ICM
- Linkages with international mechanism emerging under Article 6.2 and Article 6.4
- Develop GHG reporting guidelines for the obligated and non-obligated sectors and entities

5.2. Proposed Obligated Sectors and Entities

Obligated Sectors: Obligated sectors are the sectors that are notified by the Ministry of Power under the PAT Scheme who are obligated to improve their energy efficiency and would be obligated to reduce GHGs intensity, in the phase II of the ICM. These sectors include:

1. Aluminium
2. Cement
3. Chlor Alkali
4. Commercial Buildings
5. Fertilizer
6. Iron and Steel
7. Petrochemicals
8. Petroleum Refineries

9. Pulp & Paper
10. Railways
11. Textiles
12. Thermal Power Plants

For some of the sectors where there is still energy efficiency potential, the sectors may continue in phase II (eg. Discoms) in the form of current PAT scheme and shall be given option to convert the EScerts into Carbon credit certificates (CCCs).

Within these sectors, obligated Entities are currently designated based on energy consumption and in future can be designated based on either absolute minimum emission levels. Essentially, the entities from these sectors would be the primary drivers of demand for the ICM credits.

In line with the country's climate goals and the vast emerging potential of clean technologies, the ICM would have the capability to promote a wider range of technological transitions for the decarbonisation of these mandated sectors, which will enable India to meet its NDC targets.

The scope of the ICM in terms of sectors covered and targets may be enhanced in the future in line with India's future NDCs.

5.3. Offset Scheme – Voluntary/Non-Energy Related Sectors

Offset Schemes – Under this scheme projects that meet the additionality requirements of the ICM will be eligible to generate carbon credits. Entities from the non-obligated sectors can buy these credits to meet their carbon neutrality goals and obligated sector entities may also be permitted to buy a certain percentage to meet their compliance under the extended PAT scheme.

There will be designated project proponents from the non-obligated sectors who can register their projects under this scheme upon fulfilment of the eligibility requirements prescribed by the Bureau of Energy Efficiency based on approval of the Indian Carbon Market Governing Board (ICMGB). The project proponent can also use the existing methodologies for CDM, Gold Standard, and other voluntary carbon markets for the demonstration of emission reduction and additionality to generate the carbon credits. It is also proposed that new methodologies shall be developed to enable new and emerging project idea that can result in substantial GHG reduction, avoidance or removal.

Thus, for the ICM the supply of credits could come from the following categories:

- Credits generated by Obligated Entities, in the Obligated Sectors under the extended PAT scheme
- Offsets generated through projects in sectors preferentially reserved for supply to ICM based on the Indian context of technology and financing priorities (e.g., Renewable Energy technologies such as solar, wind, hybrids, hydro, biomass, round-the-clock renewable energy, etc.)

- Offsets generated from sectors such as hydrogen, offshore wind, agriculture, afforestation/reforestation, conservation, community-based, and nature-based solutions that may be traded in the international market as well (in addition to ICM)

5.4. Gases covered

All of the six GHGs covered by the UNFCCC shall be included in the ICM (i.e., Carbon dioxide, Methane, Nitrous Oxide, Hydrofluorocarbons, Perfluorocarbons, and Sulphur hexafluoride). Since carbon dioxide is the gas with the largest contributions to GHG emissions (over 75% globally), as is the case in several international ETSs, carbon dioxide would be the primary GHG covered under the ICM.

Further, since the ICM is envisaged to have a single tradeable commodity expressed in terms of tonnes CO₂ equivalent, for all eligible activities and sectors overall emissions can be converted to carbon dioxide equivalent, using the respective global warming potentials (GWPs) notified by the UNFCCC⁹.

5.5. Emission Trading Metric

The ICM will have a single uniform metric as its fundamental trading unit – 1 tonne of CO₂ equivalent (tCO₂e) and shall be called Carbon Credit Certificates (CCC).

This is also in line with the Glasgow Decision on Art 6.2 – which defined ITMOs as 1 tCO₂. Emission reductions of different GHGs accruing from various activities and sectors should be converted to tCO₂e through the respective GWPs notified by the UNFCCC¹⁰.

The objective is that all types of carbon emissions from different sources and sectors are quantified and converted to the same unit of carbon dioxide emissions, i.e., tCO₂e, which would be certified as Carbon Credit Certificates (CCC).

However as under the ICM, there are different mechanisms – mandatory and voluntary (offset schemes), the CCCs would be tagged based on their generation

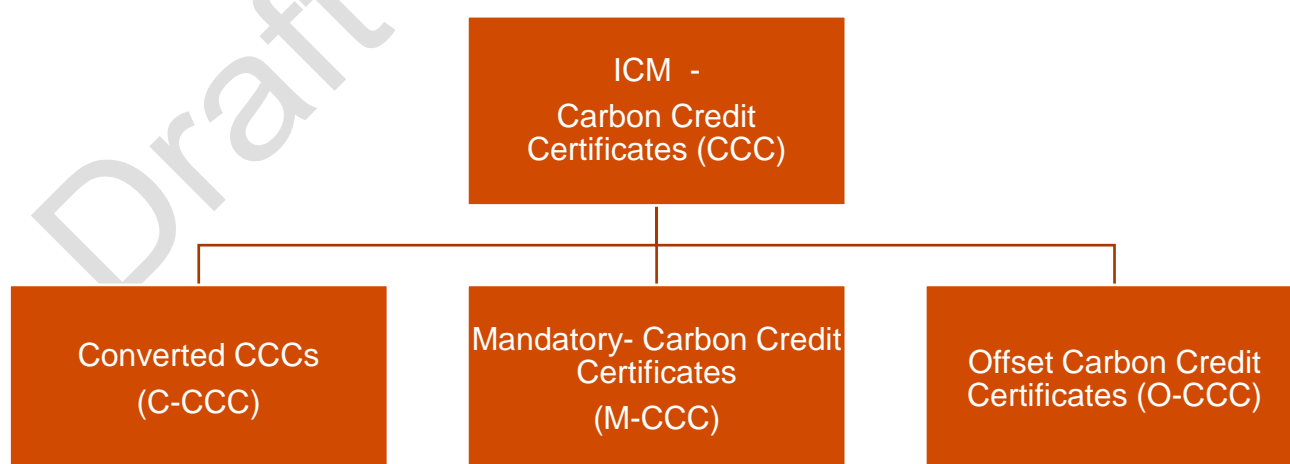


Figure 13: Carbon Credit Certificates – Terminology

⁹ For GWP – the factors referred in India Biennial Update Report (BUR) would be referred – GWP - CO₂ -1, CH₄ -21, N₂O -310. (https://unfccc.int/sites/default/files/resource/INDIA_%20BUR-3_20.02.2021_High.pdf)

The following table highlights the details of possible market participants for the credits that would be generated under ICM

Table 3: Carbon Credit Certificates – Terminology

Terminology	How will they be generated	Credit Generators	Credit Buyers
Converted CCC (will be generated in phase I)	The converted CCCs would be generated by converting existing Energy Saving Certificates, Renewable Energy Certificates, and CDM projects	The credit generators are entities/projects who are already holding these credits in the market	The buyers for these credits would be non-obligated sectors with carbon neutrality goals
Mandatory CCC (will be generated in phase II)	The Mandatory CCCs would be generated under the mandatory scheme (PAT) and based on performance	The credit generators would be obligated entities who have lower GHG emission intensity than the targeted emission intensity	The credits buyers would be obligated entities who have higher emissions than the benchmark
Offset CCC (Phase I & II)	The Offsets CCCs would be generated as part of the proposed offset scheme under the ICM (voluntary sectors/projects)	The credit generators would be the project proponent who will be developing the projects under the offset scheme	The credits buyers would be voluntary as well as obligated entities (they may be allowed to buy O-CCC to meet up to 10% of obligation). These credits could be sold to international market participants also if they meet the additionality criteria of the international market

5.6. Integrating Offset Carbon Credit Certificates

Offset Carbon Credits (O-CCCs) will be those arising from non-obligated sectors and entities under the Offset market. O-CCCs will expand the scope and reach of the ICM, bringing in non-energy sector entities as voluntary sellers (without mandated targets) to enhance India's climate actions and generate credits for international mechanisms.

The aim of bringing in O-CCC to the ICM is to encourage sustainable climate actions from across India's regions and sectors, covering a range of entities. Programmes generating offset credits could range from small-scale ones, developed and implemented by Farmer Producer Organisations (FPO), forestry enterprises, sustainable agriculture enterprises, or even individual entities; to those being developed at the level of Municipalities or States.

Since the concept of Offset CCC would be novel for most sectors, it would require developing methodologies and processes for verifying and issuing credits, and monitoring these programmes, based on international best practices and Indian experiences in voluntary carbon markets and other initiatives.

Clear communication and advocacy to relevant stakeholders will be critical for generating buy-in for offset CCC, both from generators of offset CCC as well as their potential buyers. This will also need to be complemented with a strong and structured stakeholder engagement process with a range of stakeholders, to build capacity through hand-holding and technical assistance. As a next step, there is a need to assess the potential of O-CCC under international mechanisms and measures on how best to onboard these onto the ICM.

5.7. Launch

For the introduction and roll-out of the carbon market mechanism, the high carbon-emitting, and energy-intensive industries, as identified under the (see Section 5.1), may be brought into the domain of the ICM. These industries have experienced a range of regulations over the last decade, including those being covered under PAT and REC for compliance needs, driving them to improve their energy efficiency and meet mandated targets. Through these, they have already developed a good understanding of the emerging climate regulations and have been building their capacities to address them. They are also likely to benefit from converting their existing unused stock of certificates from the PAT and REC mechanisms to Carbon Credit Certificates (CCC) under the ICM, as many of these sectors may also be imposed with GHG intensity-based cross-border regulations in the future.

5.8. Future Evolution of ICM

Considering that under the Pari Agreement, all Parties are required to periodically update and enhance the ambitions of the NDCs, India's NDC will not remain static, and India will continue to strengthen existing targets, and also develop new mitigation interventions. With this context, a dynamic ICM that will enable India to fulfill its future NDCs is necessary. While for now, the ICM is envisaged to cover the mandated energy and industry sectors, going forward, this may need to change. Further, in the long-term, the ICM may not be primarily a compliance market but may emphasize and incentivize voluntary participation from the private sector, the public sector, as well as international voluntary carbon market buyers, as distinct from the Article 6 carbon market.

6. Market Design Elements

6.1. Compliance Market (PAT Scheme)

6.1.1. Approach to Target-setting for Compliance Market

The current target-setting approach for PAT Scheme which is based on energy intensity would be transitioned to GHG intensity-based targets, instead of toe/t product, the targets would be given to the entities in terms of t CO₂/t product. The approach to derive the targets would be like the method followed in phase I, but instead of energy, GHG intensity trajectory highlighting contribution to achieving India's NDCs or GHG intensity-based benchmarking approach would be adopted.

Thus, targets would be defined in terms of intensity of emissions (tonne of CO₂/unit of output, or equivalent activity measure). Targets will be stringent and in line with NDC goals for GHG emission intensity of GDP. This is also required as per the Glasgow decision on Article 6.4 Para 27 "Baseline approaches and other methodological requirements if they are to engage with Art 6.4, should include an explanation of how those approaches and requirements are compatible with the host country's NDC, and its long-term low GHG emission development strategy". Also as currently under the PAT scheme – 7 cycles are in compliance, it is important to have a smooth transition to carbon compliance market, the following is plan for transition¹¹:

Table 4: PAT Cycle – Transition

Cycle	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Cycle – 4*	TOE/t & 3 years (109 DCs)											
Cycle – 5		TOE/t & 3 years (110 DCs)										
Cycle – 6			TOE/t & 3 years (135 DCs)									
Cycle – 7				TOE/t & 3 years (707 DCs)								
Cycle – 8					TOE/t & 3 years (109+110+ DCs)							
Cycle – 9						T CO ₂ /t and 1 Year (135+ DCs)						
Cycle – 10							T CO ₂ /t and 1 Year (707+ DCs)					
Cycle – 11								T CO ₂ /t and 1 Year (219+ DCs)				

For PAT Cycle 4-8 targets would be given in toe/t and will have a three-year cycle and for subsequent PAT Cycle 9-11 targets would be given in t CO₂/ t and will have an annual compliance cycle.

Under the proposed target-setting approach for the mandatory sector (in phase II), the NDC-based GHG intensity trajectory for each sector would be developed and the GHG intensity trajectory would be considered as to derive targets for the obligated entities for assessing the performance. The trajectory and targets would be defined and proposed for a specific period,

¹¹ Cycle VI has under been revised from 2018-19 -2020-21 to 2018-19 to 2021-22

example each of 3 years for the sectors/entities. The trajectory would be finalised for a period and would be having a reducing trend for the period (specific to the sector).

The sectoral trajectory would be reviewed before the start of the next compliance period and targets will be revised based on India’s subsequent NDC commitments and the sector’s contribution to the country’s overall emissions profile. The entities having GHG intensity performance better than the targets would be issued the carbon credits and entities having higher emissions than the targets would be obligated to buy the carbon credits. The sectoral target emission pathway would have downward trend and over the period will be aligned with the NDC trajectory.

As compared to the current PAT scheme, in the case of the ICM the verification of performance, issuance, and transaction of the carbon credits will take place annually based on the performance of the obligated entities against the target emission pathway.

Table 5: Target Setting Approach for Compliance Markets

Particulars	Current Approach	Proposed Approach under ICM for Mandatory Sector (Phase II)
Compliance Cycle	Three years (PAT Cycle)	Annually
Target Metric	TOE/t product	T CO ₂ /t
Issuance of Credits	Energy Saving Certificate (ESCert)	Carbon Credit Certificate (CCC)
Unit of Credits	1 toe	1 t CO ₂

Following is an example of how the mandatory scheme will work:

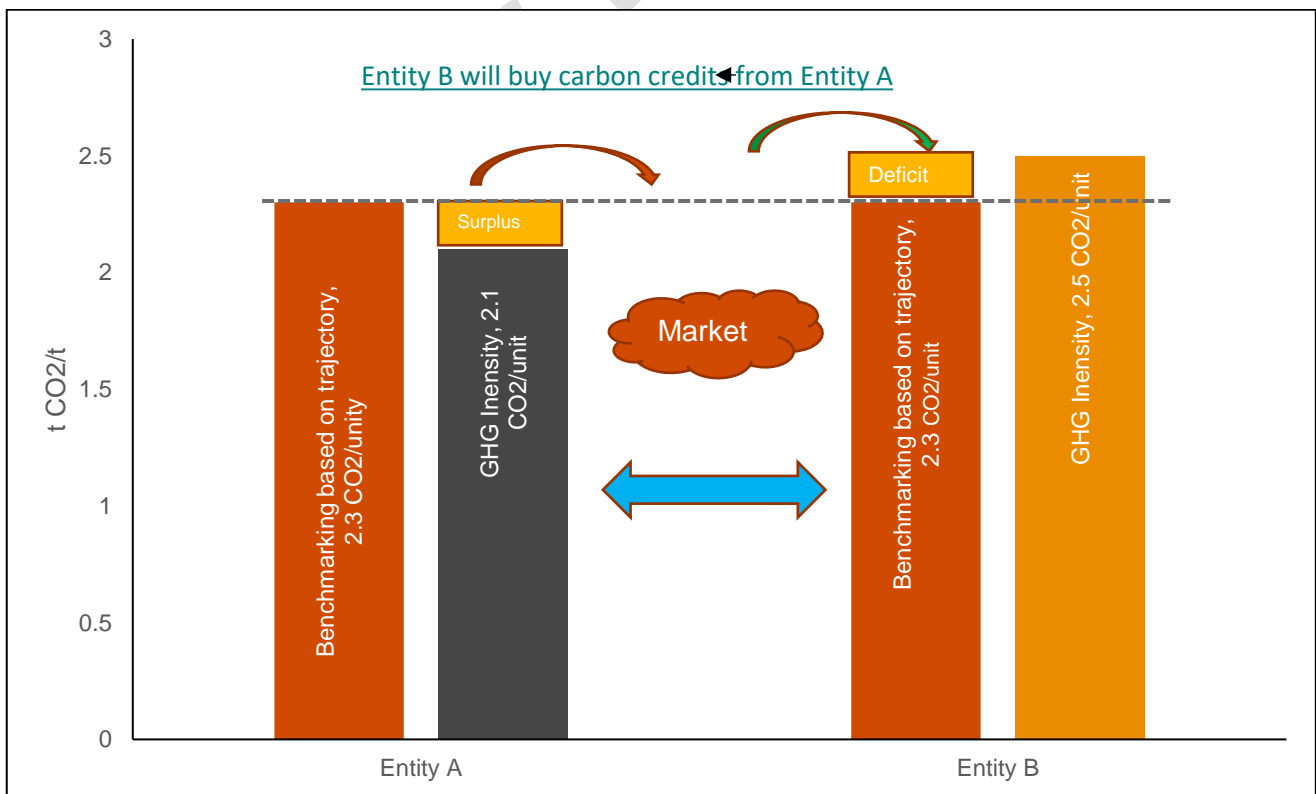


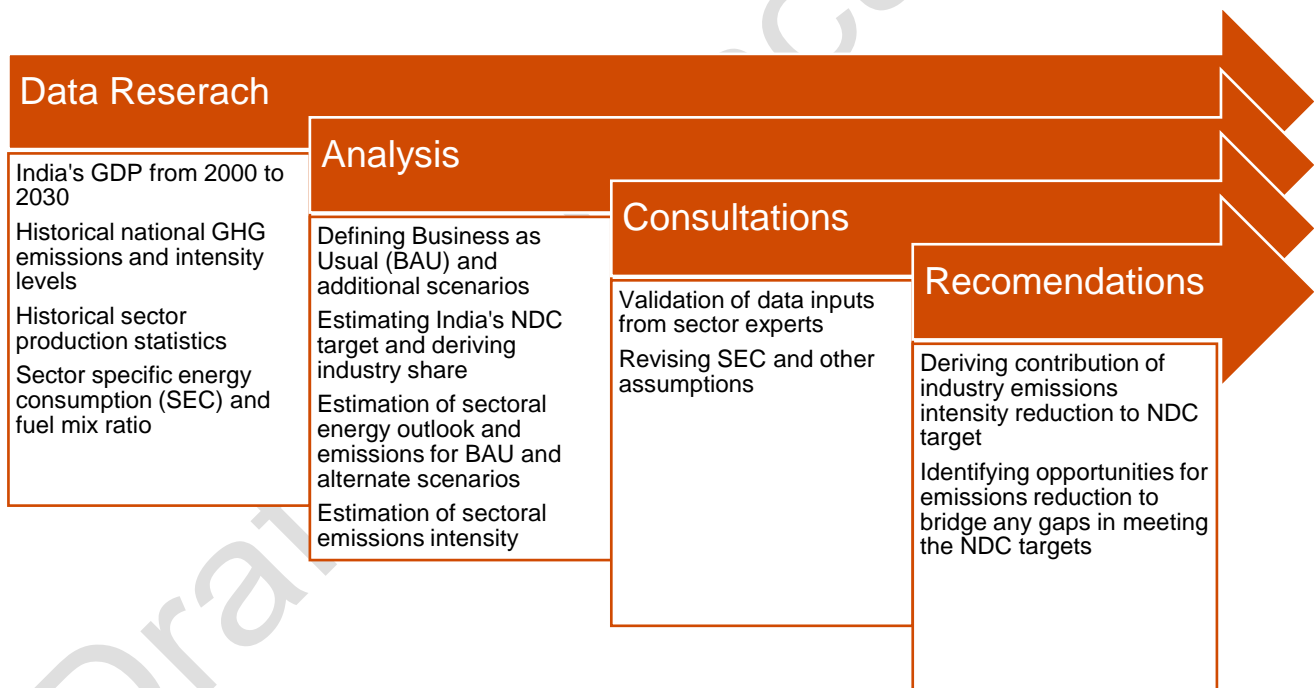
Figure 14: Emission Trading – Hypothetical case

In the above example, the emission target based on the NDC trajectory determined for the sector is 2.20 t CO₂/t, and entity A in the compliance year has an emissions intensity of 2.10 t CO₂/t. Therefore, as the entity has better GHG intensity performance than the target, the entity will be eligible to earn carbon credits based on the difference in emission intensity against the benchmark i.e., 0.1 t CO₂/t.

On the other hand, entity B has an emissions intensity of 2.5 t CO₂/t, which is a higher GHG intensity target of the sector. This obligates entity B to buy carbon credits based on the difference in emission intensity and the benchmark, i.e., 0.3 t CO₂/t.

It should be noted that besides energy-related emissions, GHG emissions also emanate from certain industrial processes, which are difficult to abate. For example, in the cement sector, the calcination of limestone results in substantial carbon emissions. These emissions too need to be identified and accounted for in the specific sectors, eventually, which is not currently addressed in the PAT scheme.

The Bureau of Energy Efficiency has undertaken a detailed study and has determined the possible GHG emissions intensity trajectories (aligned with NDC) for key economic sectors in India. The following approach was adopted for determining the trajectory for different sectors:



Some of the data used, assumptions made, and key findings of the study are provided in the subsequent sections.

Key Data and assumptions for Emission Trajectory

Production demand

Production demand is the primary parameter required to assess the sector's medium-term growth potential which will then be linked to the energy assumptions for deriving the outlook. The historical production data was sourced from sectoral reports, publications, statistics, and previous studies by BEE. To forecast the demand outlook for each sector, a regression model

was developed to establish the relationship between India's GDP growth and sectoral production. The correlation coefficient was applied as a multiplier to derive the long-term production demand between the period of 2020 to 2031.

Specific Energy Consumption (SEC)

Sectoral SEC is a key parameter that is essential for projecting the long-term energy demand and estimating the reduction potential as any technology/process improvement is measured through this indicator. For this study, the SEC values for each sector were sourced from reports available in the public domain and through interactions with sectoral experts from BEE.

Fuel Mix Ratio

The fuel mix is an important indicator that facilitates the evaluation of the quantum of energy and emissions based on the choice of fuel used in each sector. Over time, any fuel switching intervention would lead to a reduction in emission levels i.e., fuel switching from coal to natural gas, increasing penetration of renewable energy under electricity, and the addition of waste/biomass as an alternate option. In line with this, the fuel mix ratio for each sector was sourced from BEE's 'Impact of Energy Efficiency Measures' published in March 2021. Further, through discussions with sector experts from BEE, the fuel mix ratio for a few sectors was revised based on recent proforma data collected under PAT that captured fuels such as hydrogen, RDF/biomass, and renewable energy amongst others.

Limitation: The current model excludes the process emission estimates for cement sector (Calcination), Aluminium (PFC emissions from anode consumption), and lime kiln emissions (Steel, Pulp & Paper) and others.

The following are the GHG emissions trajectory for the key sectors:

Iron & Steel:

For the Iron & Steel sector, the major emissions are from coal and coke consumption in the steel-making process. In the year 2019-20, the average GHG emission intensity for the Iron & Steel sector is estimated to be 2.55 t CO₂/t and with a production of 109 million tonnes, the sector emission was estimated to be 260 million t CO₂. Analysis and research by BEE along with government and industry stakeholders indicate that there is a potential for implementation of various technologies in the sector which can result in GHG reduction in the sector. Implementation of technologies such as increase of pulverised coal injection share, waste heat recovery in coke oven & sinter, thin slab casting, installation of Top Pressure Recovery Turbine (TPRT)/Blast Furnace Recovery Turbine (BFRT), Carbon Capture & Utilisation (CCU) and others can lead to significant emissions reduction. In addition, to technology implementation in the current process, there are also upcoming low carbon steel making processes (which are currently in the development stage) such as HIsarna and 100% Hydrogen based DRI, both of which could lead to a significant reduction in GHG emissions as compared to the current process. The resource efficiency measures in the steel sector such as the use of scrap in secondary steel making can also result in GHG reduction as the recycling of scrap into steel has lower emissions than the conventional steel-making process.

Based on the possible measures and strategies, the steel sector emission intensity could reduce to 1.98 t CO₂/t by 2030 and with projected production of 255 million tonne steel, the

estimated emission from the sector will be 461 million t CO₂. This will result in an emission reduction of 144 million t CO₂ as compared to the Business-As-Usual (BAU). Refer to Annexure II for the emission trajectory highlights for the Iron & Steel sector. The following graph highlights the possible trajectory for the sector by 2030:

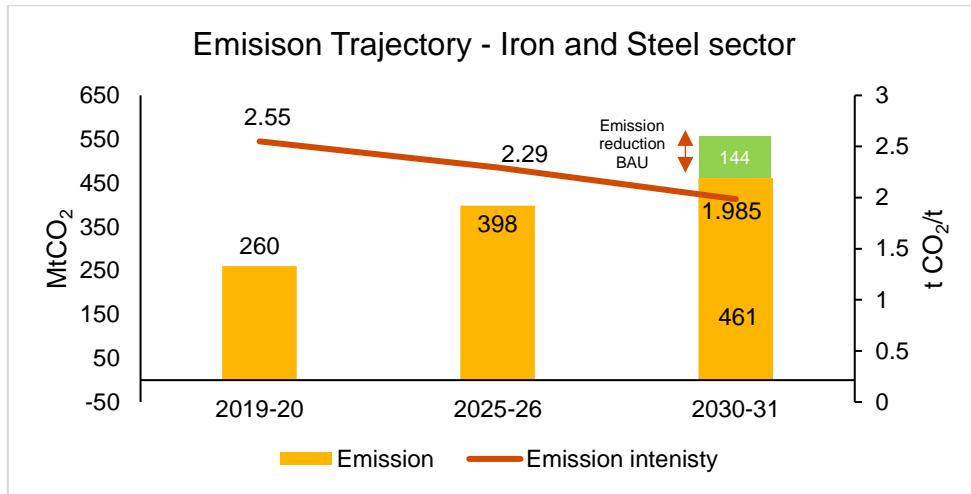


Figure 15: Emission Trajectory – Iron & Steel Sector

Cement Sector:

For the cement sector, the major energy-related emissions are from coal consumption in kilns, captive power plant, and electricity-related emissions for pyro and grinding operations. Also, the cement sector has process emission (525 kg CO₂/kg clinker) from the calcination process which is not currently included in the analysis.

In the year 2019-20, the average GHG emission intensity (energy-related for the cement sector) is estimated to be 0.29 t CO₂/t and with a production of 334 million tonnes, the sector emission is estimated to be 96.49 million t CO₂. Analysis and research by BEE along with government and industry stakeholders indicate that there is a potential for implementation of various technologies such as waste heat recovery, cooler hot air recirculation, increase alternate fuel usage, energy efficiency fans, and vortex classifiers in mills, blended cement. In addition, there are also new and emerging technologies, the implementation of which could lead to a significant reduction in GHG emissions. These technologies include carbon capture and utilisation, Lime Calcined Clay Cement, composite cement, etc.

Based on the possible measures and strategies, the cement sector emission intensity could reduce to 0.22 t CO₂/t by 2030 and with projected production of 562 million t cement, the estimated emission from the sector will be 121 million t CO₂ (Only energy related). This will result in an emission reduction of 32 million t CO₂ as compared to the Business-As-Usual (BAU). Refer to Annexure II for the emission trajectory highlights for the cement sector. The following graph highlights the possible trajectory for the sector by 2030:

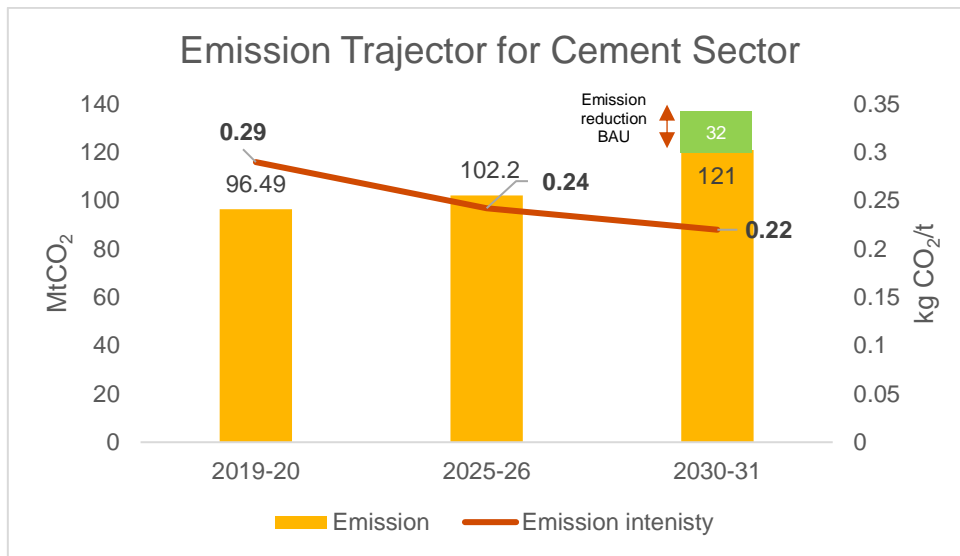


Figure 16 - Emission Trajectory – Cement Sector

Following is the trajectory for other key sectors – Pulp & Paper, Petroleum Refinery, Textile Chlor Alkali, Aluminium, and Petrochemicals under the PAT Scheme:

Pulp & Paper Sector

Based on possible measures and strategies, the pulp & paper sector emission intensity could reduce to 1.08 t CO₂/t by 2030 and with projected production of 34 million t paper, the estimated emission from the sector will be 34.1 million t CO₂ by 2030-31 (Only energy related). This will result in an emission reduction of 32 million t CO₂ as compared to the Business-As-Usual (BAU). Refer to Annexure II for the emission trajectory highlights for the pulp and paper sector. The following graph highlights the possible trajectory for the sector by 2030:

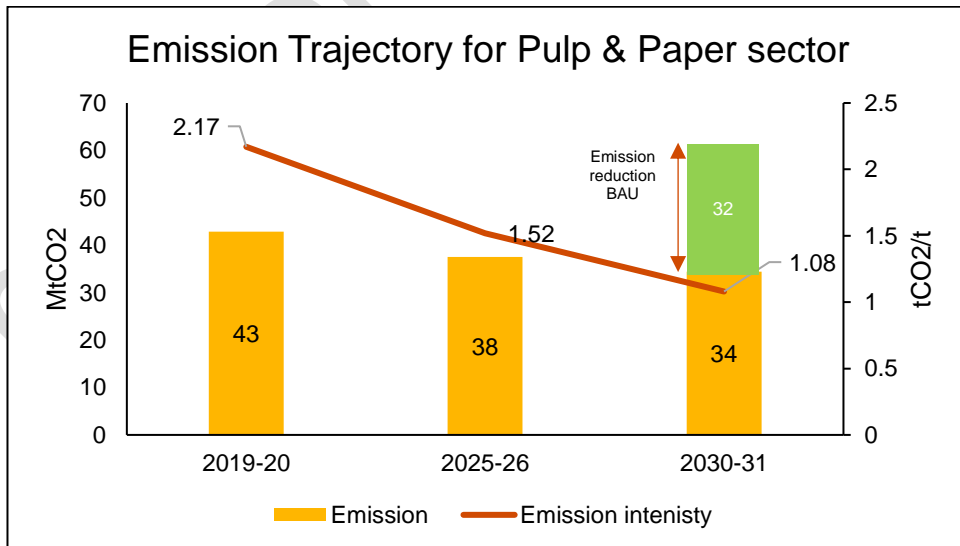


Figure 17: Emission Trajectory for Pulp & Paper Sector

Petroleum Refinery

Based on possible measures and strategies, the petroleum refinery sector emission intensity could reduce to 0.17 t CO₂/t by 2030 and with projected production of 276 million t, the estimated emission from the sector will be 62.68 million t CO₂. This will result in an emission

reduction of 24 million t CO₂ as compared to the Business-As-Usual (BAU). Refer to Annexure II for the emission trajectory highlights for the refinery sector. The following graph highlights the possible trajectory for the sector by 2030:

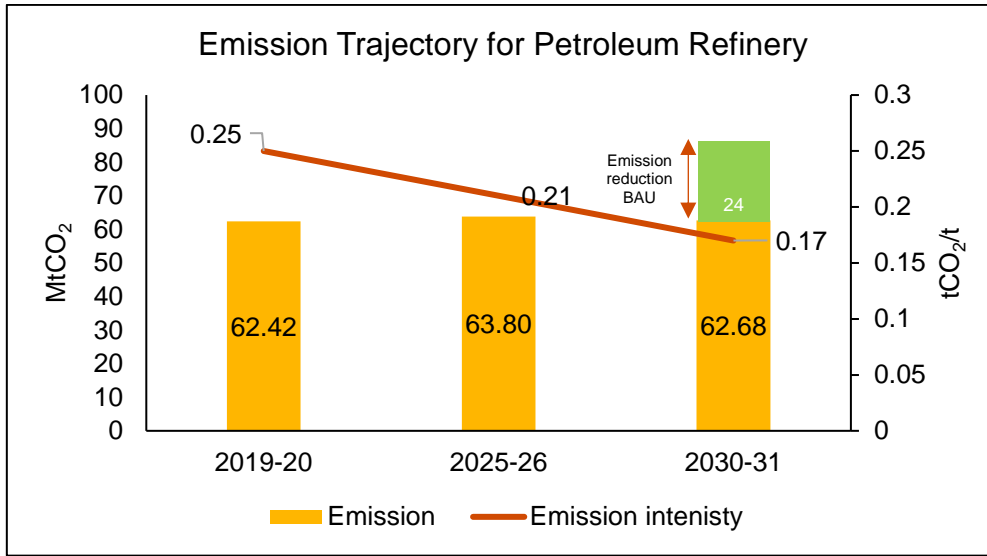


Figure 18:: Emission Trajectory for Petroleum Refinery

Textile Sector

Based on possible measures and strategies, the textile refinery sector emission intensity could reduce to 2.63 t CO₂/t by 2030 and with projected production of 9.1 million t, the estimated emission from the sector will be 30.87 million t CO₂. This will result in an emission reduction of 5 million t CO₂ as compared to the Business-As-Usual (BAU). Refer to Annexure II for the emission trajectory highlights for the Textile sector. The following graph highlights the possible trajectory for the sector by 2030:

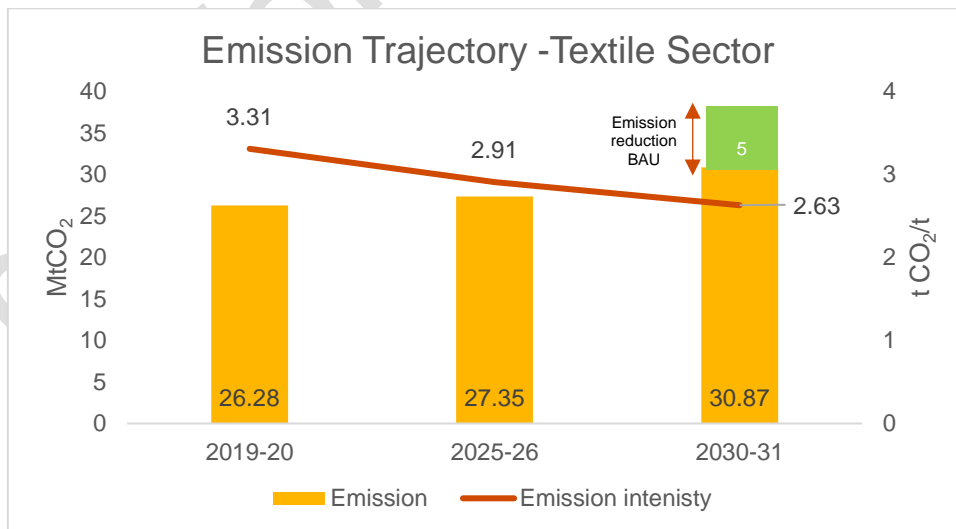


Figure 19: Emission Trajectory for Textile Sector

Chlor-Alkali Sector

Based on possible measures and strategies, the Chlor-Alkali sector emission intensity could reduce to 2.63 t CO₂/t by 2030 and with projected production of 11.8 million t, the estimated emission from the sector will be 30.87 million t CO₂. This will result in an emission reduction of

6.65 million t CO₂ as compared to the Business-As-Usual (BAU). Refer to Annexure II for the emission trajectory highlights for the Chlor-Alkali sector. The following graph highlights the possible trajectory for the sector by 2030:

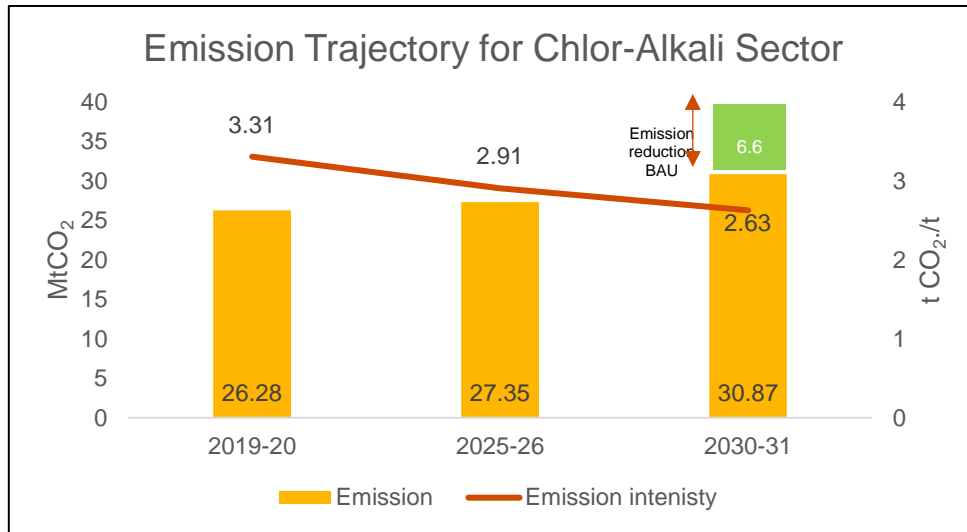


Figure 20: Emission Trajectory for Chlor-Alkali Sector

Aluminium Sector

Based on possible measures and strategies, the Aluminium sector emission intensity could reduce to 8.37 t CO₂/t by 2030 and with projected production of 8.05 million t, the estimated emission from the sector will be 67.46 million t CO₂. This will result in an emission reduction of 30 million t CO₂ as compared to the Business-As-Usual (BAU). Refer to Annexure II for the emission trajectory highlights for the Aluminium sector. The following graph highlights the possible trajectory for the sector by 2030:

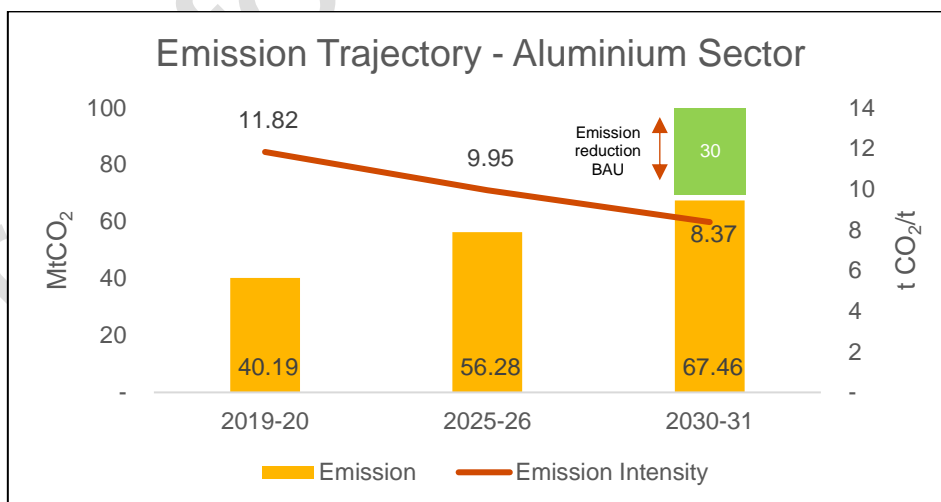


Figure 21: Emission Trajectory for Aluminium Sector

Petrochemical Sector

Based on the possible measures and strategies, the petrochemical sector emission intensity could reduce to 1.58 t CO₂/t by 2030 and with projected production of 58.2 million t, the estimated emission from the sector will be 91.9 million t CO₂. This will result in an emission

reduction of 21 million t CO₂ as compared to the Business-As-Usual (BAU). Refer to Annexure II for the emission trajectory highlights for the refinery sector. The following graph highlights the possible trajectory for the sector by 2030:

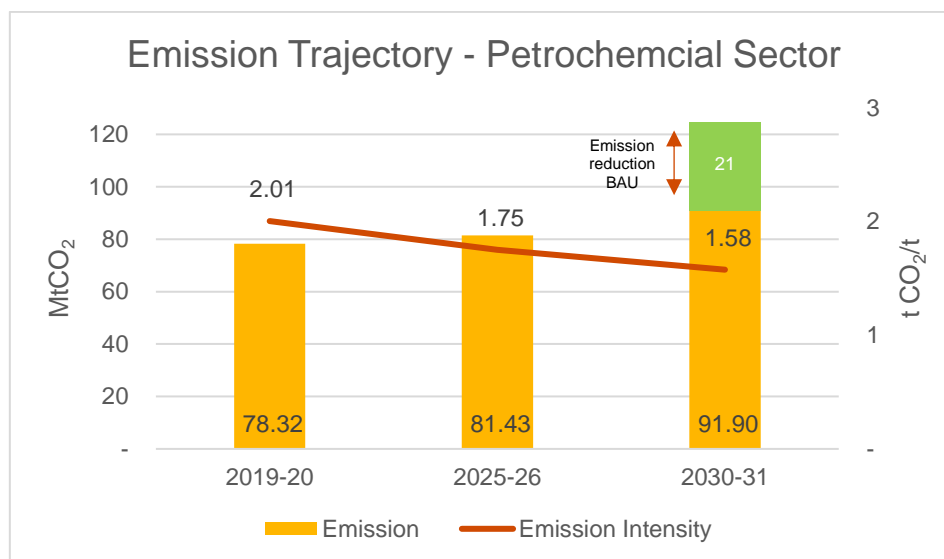


Figure 22: Emission Intensity Trajectory – Petrochemical Sector

Sectoral targets will be proposed for the mandatory sectors, the trajectory has also been developed for other obligated sectors and can be referred from Annexure II. For Offset projects, CDM projects, and other carbon reduction projects, baseline methodology to estimate emission reduction is to be followed and methodology acceptance will be based on approval by the ICM-Governing Board.

6.1.2. Conversion of Existing ESCerts and RECs

Existing unused stock of certificates from the PAT and REC mechanisms will be converted to Carbon Credit Certificates (CCC) under the ICM and will thus benefit existing participants. Conversion factors specific to each regulated entity may be used. They may be aligned with IPCC standards for inventorizing GHGs. Based on the volume of PAT and REC certificates available, setting a form of eligibility criteria for converting and registering unused certificates under the ICM may be considered. The following is the possible credit supply due to the conversion of ESCerts and RECs:

Table 6: Possible supply of ESCerts and RECs

Market	Trading Unit	Equivalent CO ₂ (approx.)	Possible Supply in Market
Perform Achieve and Trade Scheme	1 Energy Saving Certificate (1 toe)	1 toe ~ 3 t CO ₂	PAT Cycle I & PAT Cycle II – 45.94 lakhs unsold ESCerts (14.24 million t CO ₂)
Renewable Energy Certificate	1 Renewable energy certificate (1 MWh)	1 MWh ~ 0.79 t CO ₂	10 million t CO₂ based on a closing balance of 13 million REC (30 th September 2022)

Further, it may be notified that unused/unissued CDM CERs generated by Indian entities, and not transferred under Article 6 to international carbon markets may also be selectively used for ICM compliance.

Conversion of Energy Saving Certificates

At present in PAT rules, after satisfying the correctness of the verification report and check the verification report (wherever applicable), the Bureau of Energy Efficiency, recommends the issuance of Energy Saving Certificates to DCs based on the claim raised by Form A, as per following formula:

For thermal power plants

No. of energy saving certificates = (Heat rate notified for target year – Heat rate as achieved in the target year) X Production of electricity in the baseline year

For other sectors

No. of energy saving certificates = (Specific energy consumption notified for target year – Specific energy consumption as achieved in the target year) X Production in the baseline year

The value of one energy savings certificate is equal to one metric tonne of oil equivalent (1 toe) of energy consumed.

To make the unit of trading compatible for voluntary buyers/sellers and generate a real carbon market, it is proposed to make ESCerts fungible with Carbon Credit Certificate (CCC). The value of one CCC is equal to one metric tonne of CO₂ equivalent of emission reduction/sequestration. The fungibility of ESCerts and CCCs requires appropriate, conservative conversion factors.

There is a need to establish the DC-specific conversion factors as the carbon intensity of the designated consumers can vary depending on the type of fuel, fuel mix, and other factors. The analysis of the designated consumers under the PAT scheme indicates that there could be a large variation in the emission intensity within the same sectors also. Thus, the DC-specific emission factor would be used for conversion, and estimation of the conversion factor for a specific DC should be done using the following generic formula

Carbon Credit Certificates (CCC) (Nos) = Conversion factor of specific DC X ESCerts (Nos.)

Conversion factor of a specific DCs (tonne of CO₂ equivalent emission per mTOE) = Annual CO₂ emissions by DCs in target year X Conservativeness factor divided by [Gate to Gate Energy Consumption toe]

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)}

The emission factors would be specific to the designated consumers wherever available, otherwise, the average emission factors published by national and international organisations would be referred to for the emission estimation for GHG calculation. The current PAT Proforma has required information to estimate the GHG emissions from the designated consumers reasonably. Verification of emission factors for various fuels may be done during monitoring and verification studies using test reports (ultimate analysis for the carbon content of fuel). Refer to Annexure III for GHG emission factors for different fuels published by IPCC.

Conservativeness factor

Determined to account for the principles applied in international carbon markets, including the principles laid out in UNFCCC (2021a, b) for baseline and additionality determination; it may be differentiated by the type of DC. This approach estimates the conversion factor at a designated consumer level, so there will be a separate conversion factor for each DC.

To further clarify the conversion factor during and after a trading period, it would be pragmatic to convert ESCerts to CCC well before the actual trading, so that, DCs have visibility on available tradable units and may plan accordingly. This can be done through the communication of appropriate DC-specific conversion factors to the registry (POSOCO).

Applicability and potential way forward

- For DCs already holding ESCerts, may be issued with such instruments, calculated by multiplying existing ESCerts with DC-specific conversion factors. After issuance of equivalent CCC, ESCerts held earlier will be extinguished.
- For DCs that already provided compliance requirements for ESCerts, will be communicated compliance requirements in terms of CCC. In case the DC has already met part of the compliance requirement through the purchase or banking of ESCerts, balance compliance may be converted to CCC.
- In the future, the issuance to DCs may be done in form of such instruments only, by making appropriate changes in sector proforma and PAT forms.

Conversion of Renewable Energy Certificates

A possible approach to develop a linkage between REC and ICM is to create fungibility of REC (presently traded as MWh) with the proposed CCC. A potential conversion method is provided below.

Carbon Credit Certificates (tonne of CO₂ equivalent) = RECs X Grid emission factor (tonne CO₂ per MWh) X Conservativeness factor

The Grid emission factor published by Central Electricity Authority (CEA) would be referred to for converting the RECs into CCCs. The appropriate type of emission factor (average, operating margin, or build margin) would be referred for conversion. This method has the advantage of using existing information on grid emission factors declared by CEA periodically. However, to avoid double accounting (or issuance) as REC and CCC, the approach would require a stringent MRV to verify the parameters and maintain transparency (Singh et al. 2018).

6.1.3. Compliance Period for Obligated sectors

The ICM cycle, to meet set targets, will be an annual one. All emission Obligations will need to be fulfilled within a defined period (for example, 1-3 months) of a close of a financial year.

This is essential for ensuring liquidity in the market. By doing so, much of the CCCs may be expected to be traded in real-time. CCCs should have unlimited validity until used for compliance, enabling their carry-over across ICM cycles. This will address any potential oversupply and lead to a stable price across ICM cycles. Rules and guidelines for the trading of CCCs will need to be framed accordingly. Timeline for the typical cycle for mandatory and voluntary sectors is shown in the figure below

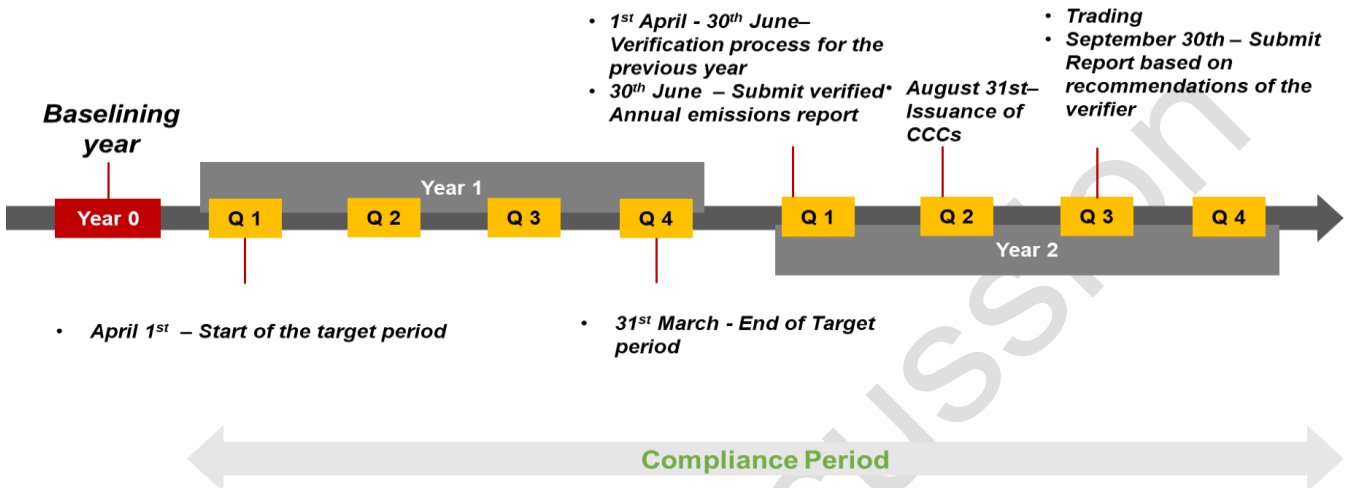


Figure 23: Annual Compliance Cycle – Under Proposed Carbon Credit Trading Scheme (Compliance)

6.1.4. MRV system for Compliance Market

MRV systems are used extensively in various carbon pricing mechanisms and trading schemes worldwide. In the carbon markets, MRV plays a crucial role because well-functioning trading mechanisms require trust in the market. Carbon market participants want to have the assurance that credit in one system must be comparable to credit in another system. Stringent MRV contributes to trust since MRV requires high accuracy and comparability of approaches. Furthermore, third-party verification according to common principles and standards ensures high-quality data. A robust MRV system is the backbone of every domestic and international carbon market.

Existing PAT MRV procedure

The PAT scheme lays out an elaborate mechanism for measurement, reporting, and verification, through various rules and regulations notified from time to time. The PAT MRV is summarized as follows:

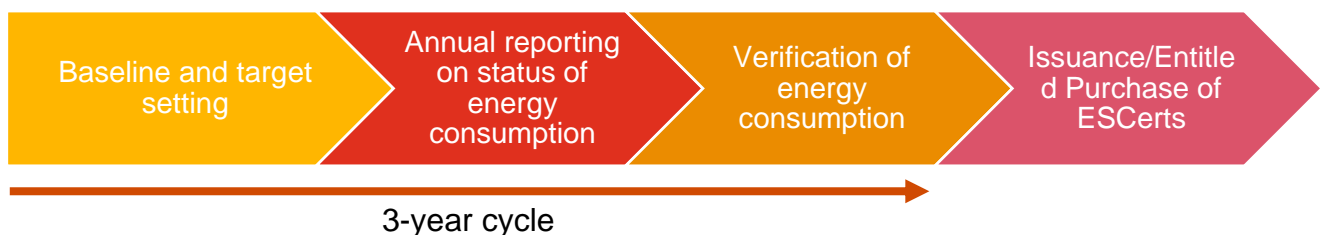


Figure 24: Existing PAT MRV Procedure

As part of the measurement verification and reporting (MRV) processes, Rule 11 of PAT rules 2012 provides detailed formulae to calculate the entitlement or requirement of Energy Savings Certificates at DCs. These calculations will be verified by the Accredited Energy Auditor conducting verification at DC's premises and submitted by the DC to SDA and BEE as part of the performance assessment document (Form A). Refer to Annexure III for the list of Accredited Energy Auditors empanelled under PAT Scheme.

Shifting to a process inclusive MRV system

The PAT MRV process currently is based on a system wherein the DCs submit their specific Pro-forma data which is later checked by the Empanelled Accredited Energy Auditor (EmAEA) and the required energy savings are determined and ESCerts are allotted based on the findings. The current process is focused on savings *after* the steps have been taken by the DCs and does not begin at the stage where DCs are in the decision-making process to identify technologies that would help them in achieving their desired energy savings. The MRV system would be upgraded to ensure the annual reporting of GHG emissions (along with energy) and would require updates across various submissions by the designated consumers. The following is the comparison of current MRV and MRV for the proposed GHG mechanism

Table 7: MRV System Comparison – Existing and Proposed Approach

Measurement and Reporting Process		
Particular	Existing Approach	Proposed Approach
Measurement/Monitoring	Reporting	The current MRV is aligned to energy consumption but will be strengthened to include verification of GHG emissions and performance.
Status of Energy Consumption by DC	<ul style="list-style-type: none"> Self-reporting by DC (Form 1, Rules 2007) with verification by AEA (Form 1, Rules 2008) Form-1 defines the manner for submission of report on the status of energy consumption by Designated Consumers 	<ul style="list-style-type: none"> The current annual reporting will be restructured so that along with energy consumption, DCs provide information on GHG emission performance Sample Reporting form (Form 1) can be referred from the annexure
Action Plan to achieve SEC target under PAT	<ul style="list-style-type: none"> Self-reporting by DC (data like Form 2) Form-2 has details of action taken on recommendations of accredited energy auditor for improving energy efficiency 	<ul style="list-style-type: none"> The DCs have to submit an action plan to achieve the GHG emission target. (energy efficiency, fuel switch measures quantification will also include GHG reduction)

Measurement and Reporting Process		
Particular	Existing Approach	Proposed Approach
Action Plan on recommendations of AEA	<ul style="list-style-type: none"> Reporting by DC along with verification by AEA (Form 2, Rules 2008 and Regulations 2010) 	The forms will be updated to include GHG mitigation measures.
Progress Report on the implementation of Recommendations	<ul style="list-style-type: none"> Reporting by DC along with verification by AEA (Form 3, Rules 2008 and Regulations 2010) Form-3 has details of energy efficiency improvement measures implemented, the investment made, savings in energy achieved and progress made in the implementation of other recommendations 	The forms will be updated to include GHG mitigation measures.
Assessment of SEC Performance Assessment against the target	<ul style="list-style-type: none"> Reporting by DC along with verification by AEA Performance Assessment Document (PAD – Form A) Form-A is the performance assessment document that is filled by the DCs with details like 3-year baseline data, Target year data, notified target SEC consumption, ESCerts issued, and revised target SEC for the cycle. 	<ul style="list-style-type: none"> The assessment of performance will be done annually against the benchmark developed by BEE. The process will be the same as earlier, but the forms (Form A) will be restructured to reflect GHG emission performance.
Status of Compliance	<ul style="list-style-type: none"> Self-reporting by DC (Form D, PAT Rules 2012) Form-D is the compliance form of energy consumption norms and standards 	<ul style="list-style-type: none"> The current approach will be followed but restructured to reflect compliance with GHG performance
Verification Process		
Verification of Performance by AEA	<ul style="list-style-type: none"> Reporting by AEA (Form B, PAT Rules 2012) Form-B is the certificate of verification that is provided by the Accredited Energy Auditor (AEA) after their evaluation. 	<ul style="list-style-type: none"> The AEAs will follow the current approach, but as the GHG verification will be a new exercise, the necessary training and capacity building would be provided to AEAs under the verification.

Measurement and Reporting Process		
Particular	Existing Approach	Proposed Approach
Check Verification by AEA	<ul style="list-style-type: none"> Reporting by AEA (Form C, PAT Rules 2012) Form-C is the check verification form provided by the AEA that lists verification for data collection, identified EE measures and progress of their implementation, compliance with energy consumption norms and standards and the total amount of energy saved year-wise after the baseline year and until target year. 	<ul style="list-style-type: none"> The AEA's will follow the current approach, but as the GHG verification will be a new exercise, the necessary training and capacity building would be provided to AEA's under the verification.

The MRV forms are notified under the Energy Conservation act, and necessary amendments would be required to update the Forms for the proposed scheme for obligated sectors.

6.1.5. Issuance of Credits under PAT

The current approach to the issuance of ESCerts is as follows and the current process would be updated to have the issuance of the CCCs.

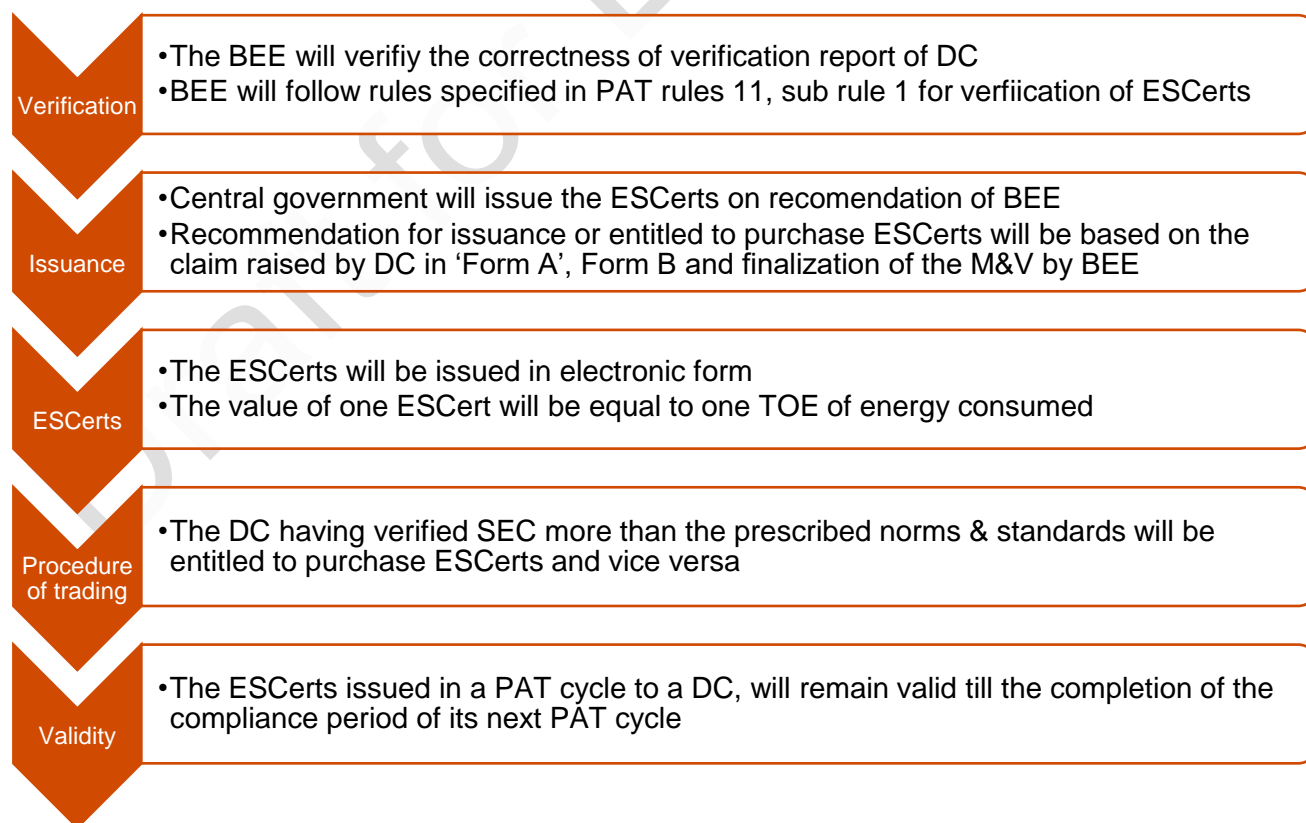


Figure 25: Issuance of ESCerts – Current approach

6.1.6. Current Accredited Energy Auditors Firms

BEE has developed a mechanism for empanelment and accreditation of energy auditor firms as Accredited Energy Auditors (AEA). The AEAs are required to undertake various activities such as verification of energy performance, performance assessment, and energy audits. The BEE has carried out extensive capacity and skill development for AEAs to undertake these activities. There are 85 AEA firms in India and the list can be referred from Annexure III. As part of the proposed scheme, it is proposed to undertake a capacity development and upskilling program for AEAs to undertake the required activities of GHG estimation, validation, verification, and reporting. The focus areas for the capacity development programs will be GHG accounting and reporting (based on international standards – GHG Protocol, ISO 14064-1:2019, ISO 14064-2:2019), GHG validation, and verification (based on ISO 14064-3 2019, 14065:2020).

6.2. Offset Market (Non-Obligated Sectors)

6.2.1. Methodologies for offset projects

As under the offset Market, the projects would be eligible to generate Offset Credits, the methodologies would be followed to establish the baseline and assess the carbon reduction. The Methodologies help in setting out the detailed procedures for quantifying the real and measurable greenhouse gas (GHG) benefits arising from the project. The methodology also guides to help project developers/proponents to determine project boundaries, set baselines, assess additionality and quantify the GHG emissions that were reduced or removed.

- Any methodology developed under the United Nations Clean Development Mechanism (<https://cdm.unfccc.int/methodologies/index.html>) can be used for projects and programs registered under ICM. Refer to Annexure IV for a list of methodologies under CDM.
- Any approved methodology in Voluntary Carbon market mechanisms can be used for projects and programs registering under ICM. The eligible voluntary market mechanisms are Verified Carbon Standard (VCS) /VERRA, Gold Standard, and Global Carbon Council.
- If no methodology fits the proposed project, project developers/proponents can choose to develop their methodology through the ICM methodology approval process.

The procedure for approval of methodologies is shown in Figure 26

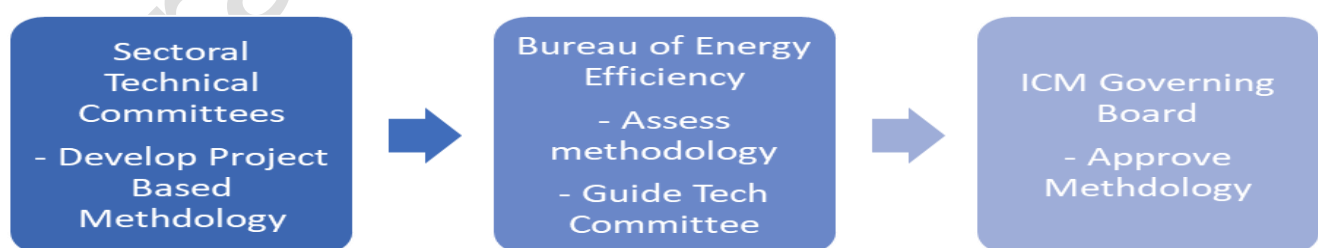


Figure 26: Proposed Approach for Approval of New Methodologies

6.2.2. Ensuring Environment Integrity

Emissions offset projects must not only result in the reduction or removal of emissions but also result in positive sustainable development impacts. Therefore, criteria must be set to assess

the nature of sustainable development impacts that a project will have on its surrounding communities and eco-systems. The criteria may be as follows:

- Does the project lead to the decrease of environmental pollutants other than GHG emissions? Does the project lead to environmental impacts such as acid rain, smog, water pollution, etc?
- Does the project lead to a reduction in forest degradation and deforestation? Does the project lead to improving agriculture productivity through restoration?
- Does the project lead to increased financial savings, reduced opportunity cost of time, and increased access to sustainable livelihoods of community members?
- Does the project lead to improved livelihood/vocational skills among community members?
- Does the project lead to reduced time savings for women? Does the project facilitate equal and equitable participation of women?
- Does the project lead to health ailments among community members?
- Does the project lead to a reduction of time spent by children at school? Does the project hinder the access of children to primary and secondary education?
- Does the project result in community members having greater access to a clean and reliable supply of energy?

6.2.3. Crediting Period

The crediting period for issuance of the carbon credits certificates for projects would be

- Five years, with a period renewable a maximum of twice
- Ten years with no renewal
- For activities involving removals, a crediting period of 15 years with a period renewable a maximum of twice

The crediting period would be subject to approval by the governing board.

6.2.4. MRV for Offset Scheme

Once projects are registered, the MRV process would begin right at the project design stage and would encompass the entire project lifecycle till CCCs are allotted post-verification.

The following process will be adopted for verification of the offset projects, which will be in line with the process followed by CDM, Gold Standard, and other carbon offset projects.

Validation and Verification for non-energy sectors:

- For non-energy sectors, designated operational entity (DOE) accredited by the CDM Executive Board (CDM EB) or Indian Carbon Market Government Board will be listed in order to validate and verify projects. (they can be called as Accredited Carbon Auditors)
- Refer Annexure for List of DOEs currently approved by CDM.

The verification process may start after:

- The project has achieved the ICM-certified project status.

- The project proponent/developer has contracted a listed Accredited Carbon Auditors (ACA)¹²
- The project proponent has developed the monitoring report for the intended period and submitted it to the ACA
- The project proponent notified the ICM administration Board for the commencement of verification.

Activities in the verification process by ACA:

- Publication of monitoring report for stakeholder comments.
- Onsite visit and assessment
- Review of project activity in line with ICM requirements.
- Review of the project in line with applied methodology.
- Review of the monitoring report.
- Review of supporting documents and evidence.
- Verification ends when the ACA has submitted a positive Verification Report to the ICM registry.

6.2.5. Project Cycle for Offset Scheme

The timeline for the typical project to generate carbon credits/offsets is as follows:



Figure 27: Project Cycle for Non-Energy Sector Projects

The timeline for the project cycle would be similar to that of voluntary carbon markets and methodology, crediting period, and issuance of credits would be approved by ICMGB.

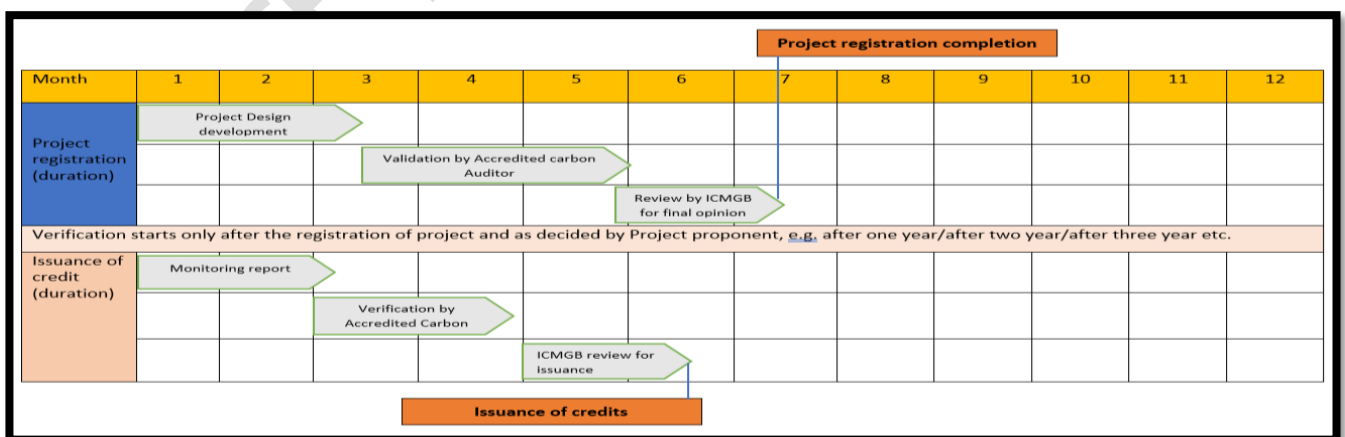


Figure 28: Typical Project Cycle (timeline) for Voluntary Projects (Non-Energy Sectors)

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6.2.6. Issuance of Credits

A Performance review for the issuance of Carbon Credit Certificates (CCC) is undertaken by the ICM registry board. The activities involved in the performance review process are listed below:

- **Completeness check:** Review of the document required for issuance of credits/certificates.
- **Information and reporting check:** Review of the documents submitted by ACA. This includes a review of the Monitoring report, a review of the verification report, review of all supporting evidence.
- The Performance Review period lasts for a minimum period of 6 weeks and is concluded when all Corrective Action Requests (CAR)/Clarifications (CLs) are successfully closed.
- During the Performance Review, new CARs/CLs/Forward Action Request (FAR) may be raised by the ICM registry board. If any new CARs or FARs are opened, these shall be addressed by either the Project proponent and/or the ACA.
- The verification conclusion will be sent to the ICM administration for issuance approval.

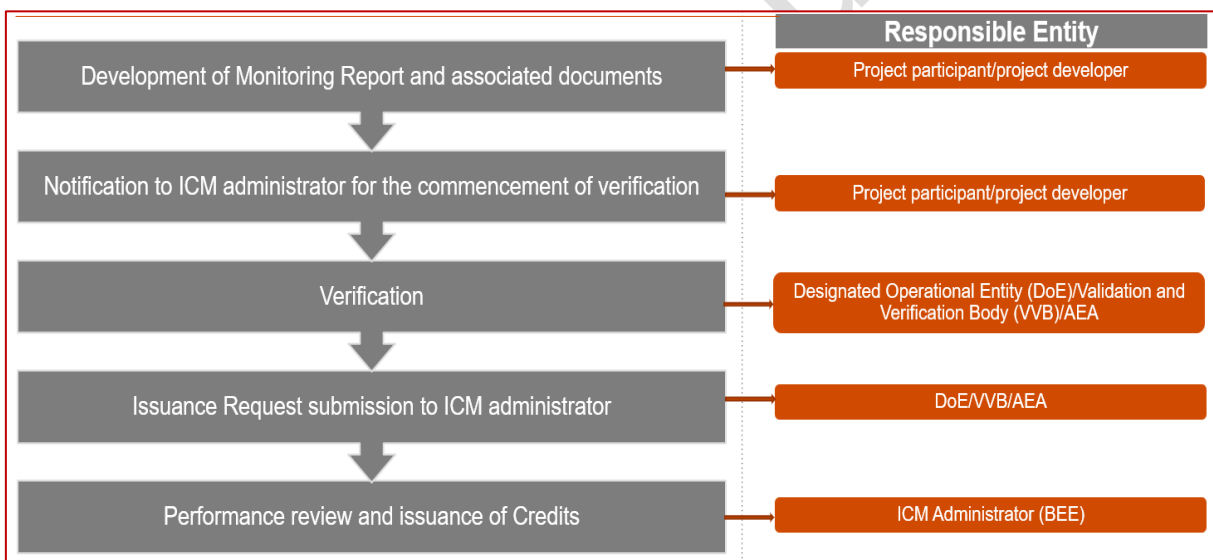


Figure 29: Issuance Request for Carbon Credits under offset scheme

The positive conclusion of the Performance Review period shall result in the issuance of CCC.

6.3. Principles for trading Project Credits outside India

The principles which India may consider for allowing credits to be purchased by buyers outside India should be based on India's ability to achieve its emission reduction targets and its climate finance considerations. Following are some of the principles that can be followed:

- **Government and non-government projects:** Any progress made in achieving NDC targets that are sourced through government funds (including PSUs) may be accounted as part of NDC and may not be allowed for international trading, however, private sector-funded initiatives such as agroforestry, social forestry or renewable and energy efficiency measures with communities can be considered as 'outside of NDC' and can be traded internationally. This will ensure that carbon credits generated through the

country's initiatives is accounted for in mitigation effort towards NDC and are not correspondingly adjusted for the international transfer of mitigation outcomes. For example, it is in India's interest to be able to account for emission reduction from national missions such as National Mission for Enhanced Energy Efficiency (NMEEE) towards India's NDC targets.

- II. **Allowance for new technologies:** Technologies, that are not BAU, such as offshore wind, renewable energy with battery storage green hydrogen, hydrogen fuel cells, clean transport solutions, carbon capture, and utilisation, nature-based solutions (in the area of agriculture, land use, and forestry) can be more advantageous under international transfers rather than bringing them under the domestic ICM. These projects can use credits generated against it for climate finance from outside India in the initial years. These credits will not be accounted against India's NDCs, requiring no host country approval. This way clean technologies can access climate finance.
- III. **SDG:** Projects with specific SDG benefits, that are critical for India's development and population can be allowed. Projects that are unable to demonstrate effective additionality will not be allowed to trade credits internationally.
- IV. **Sectors not included in NDC:** India will identify a list of sectors and sub-sectors that are not included in the NDC to get financial support for technologies that are not yet available in the country..

6.4. Engagement with Sectors

It is important to engage with Obligated Sectors and Entities, under the aegis of the Ministry of Power and relevant line Ministries, and understand their experience and challenges faced, while also building their understanding of the benefits and potential for clean transition available through the domestic carbon market. At this stage, it is also important to ensure that eligible state-owned enterprises, besides other leading industry actors, are engaged with and their buy-in for the ICM received. Beyond the mandated targets under the ICM, the regulated entities will be able to access the Article 6 international carbon market subject to the approval of the Apex Committee for the Implementation of the Paris Agreement (AIPA) (Refer Section 8 for more details on governing structure for ICM)

Since the experience of the non-energy sectors in creating robust carbon projects is limited, a focused and structured engagement process with stakeholders would be needed. This would require stakeholder discussions, sectoral research, and technical inputs. After the introduction phase of the ICM, these sectors can be better assessed, to understand their role and impact on the ICM. There's also a need to design structured capacity-building programs for obligated entities from across sectors, auditors/verifiers, and registry and platform operators for the ICM.

Incentivizing the participation of Indian industries in the carbon markets, especially as buyers, will be crucial for ensuring that returns on investments for clean technologies are viable, and will be helped if domestic carbon credits may be purchased voluntarily by non-Obligated Entities, and even Obligated Entities to meet their emission targets. There is already a surge in Indian companies voluntarily setting carbon reduction targets as well as net-zero targets, for themselves. For instance, as many as 93 Indian companies have committed to reducing greenhouse gas (GHG) emissions, according to the Science-based Target Initiative (till 23 August 2022). Understanding their requirements for offsets and enabling their participation as

buyers in the ICM would help address the legacy issue of over-supply of credits. Measures can also be put in place to encourage voluntary buyers, such as financial institutions and digital economy companies, to buy credits to offset their emissions.

6.5. Infrastructure

The trading platform, exchanges, and registries can be designed based on experience and learnings from the PAT, REC, and CDM infrastructure. In this regard, it is important to keep in mind the emerging international infrastructure requirements and formats, rather than re-inventing the wheel.

6.6. Use of Digital Processes

Digital processes will be used to register and process projects and issuance requests, monitor performance, track sectoral emissions, etc, supported by physical audits for verification, where necessary.

6.7. Penalty

A monetary penalty for non-fulfilment of emission targets may be prescribed by MoEFCC in terms of INR/tCO_{2e}, which may set the cap for the price of carbon credits in ICM. This may be reasonably fixed to incentivise the purchase of carbon credits by obligated entities.

6.8. Operational Expenses

A nominal fee may be charged on any credits issued and traded under ICM. This fee may be used to cover the operational expenses of the ICM.

6.9. Market Management Principles

A set of market management principles to reinforce 'liquidity', 'trading', and 'price management' will need to be developed to ensure the robustness and efficiency of the ICM.

The ICM Administrator and Regulator, with guidance from the NDAIAPA, would periodically update the list of obligated sectors, emission targets, and regulation of export of credits using international mechanisms (through host country approvals), to keep the market at healthy operating levels. The regulator would apply necessary controls in case of market-distorting actions by market participants. To balance the demand and supply necessary market stability mechanism shall also be developed.

Based on India's trajectory towards its NDC achievement, qualified investors, carbon funds, voluntary buyers, etc., may be allowed to participate in the ICM.

6.10. Expansion

After the early phase, the ICM may be expanded to additional sectors as obligated sectors. This would require a well-planned program for communication and advocacy, supported by regulatory measures, to raise awareness as well as generate demand for carbon and offset carbon credits

7. Legislative Backing for Regulating Indian Carbon Market (ICM)

As a first step towards establishing the ICM, it is important to understand the legislative backing available for operationalizing the ICM in India. Indian Carbon Market (ICM) will draw powers primarily from two Acts i.e. The Energy Conservation (EC) Act, 2001, and The Environment (Protection) Act, 1986.

7.1. The Environment (Protection) Act, 1986

- Section 2 (Definitions)
 1. **Clause (b): "environmental pollutant"** means any solid, liquid, or gaseous substance present in such concentration as may be, or tend to be, injurious to environment
- Section 3 (Power of Central Government to Take Measures to Protect and Improve Environment)
 2. **Clause (2)(iv):** laying down standards for emission or discharge of environmental pollutants from various sources whatsoever:

Provided that different standards for emission or discharge may be laid down under this clause from different sources having regard to the quality or composition of the emission or discharge of environmental pollutants from such sources

- Section 6 (Rules to Regulate Environmental Pollution)
 3. **Clause (2):** In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely: --

(b) the maximum allowable limits of concentration of various environmental pollutants (including noise) for different areas.

The introduction of the EPA states:

“An Act to provide for the protection and improvement of environment and for matters connected there with: WHEREAS the decisions were taken at the United Nations Conference on the Human Environment held at Stockholm in June, 1972, in which India participated, to take appropriate steps for the protection and improvement of human environment; AND WHEREAS it is considered necessary further to implement the decisions aforesaid in so far as they relate to the protection and improvement of environment and the prevention of hazards to human beings, other living creatures, plants and property.”

It is clear from the above that the genesis of the EPA lies in the decisions of the UN Conference on the Human Environment and regulating carbon emissions that present hazards to humans and other living creatures is within its scope.

The following excerpts from EPA are also relevant in this regard:

- EPA aims *“to provide for the protection and improvement of environment and for matters connected there with”*;

- *“...’ environment’ includes water, air and land and the inter- relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property.”*

Chapter 2 of the EPA defines a pollutant as *“any solid, liquid or gaseous substance present in such concentration as may be, or tend to be, injurious to environment”*. This formulation is broad enough to include GHG emissions.

The same chapter also authorizes the Central Government for *“planning and execution of a nation-wide programme for the prevention, control and abatement of environmental pollution”*.

- EPA also permits *“inspection of any premises, plant, equipment, machinery, manufacturing or other processes, materials or substances and giving, by order, of such directions to such authorities, officers or persons as it may consider necessary to take steps for the prevention, control and abatement of environmental pollution.”*
- EPA also provides for *“(xii) collection and dissemination of information in respect of matters relating to environmental pollution; (xiii) preparation of manuals, codes or guides relating to the prevention, control and abatement of environmental pollution.”*

These clauses enable the Central Government to inspect entities as well as impose obligations on them to reduce emissions. Entities with such obligations buying credits from other entities to meet these obligations are not precluded.

EPA further empowers the central government to set up appropriate authorities (chapter II):

“(3) The Central Government may, if it considers it necessary or expedient so to do for the purpose of this Act, by order, published in the Official Gazette, constitute an authority or authorities by such name or names as may be specified in the order for the purpose of exercising and performing such of the powers and functions (including the power to issue directions under section 5) of the Central Government under this Act and for taking measures with respect to such of the matters referred to in sub-section (2) as may be mentioned in the order and subject to the supervision and control of the Central Government and the provisions of such order, such authority or authorities may exercise the powers or perform the functions or take the measures so mentioned in the order as if such authority or authorities had been empowered by this Act to exercise those powers or perform those functions or take such measures”.

The EPA thus empowers the Central Government to establish the required institutional framework for the implementation and administration of the ICM.

The EPA also empowers the Central Government to provide for *“laying down standards for emission or discharge of environmental pollutants from various sources whatsoever...”* and also provides that *“different standards for emission or discharge may be laid down under this clause from different sources having regard to the quality or composition of the emission or discharge of environmental pollutants from such sources”* (Section 3).

Further, chapter 3 on Prevention, Control and Abatement of Environmental Pollution under the EPA, explicitly allows the Central Government to regulate excessive pollutants by stating that, *“No person carrying on any industry, operation or process shall discharge or emit or permit to*

be discharged or emitted any environmental pollutants in excess of such standards as may be prescribed.”

The Environment Protection Rules further provide that:

- Schedule I lists the standards for emission or discharge of environmental pollutants from the industries, processes or operations and their maximum allowable limits of concentration.
- Schedule IV lists standards for emission of smoke, vapour etc. from motor vehicles and maximum allowable limits of their emission.

Of particular note, is the EPA's role in regulating entities for the implementation of the Montreal Protocol (relating to a global environmental issue) through the Ozone Depleting Substances (Regulation and Control) Rules, 2000, which was enacted by the Central Government under the EPA. This sets a precedent for the ICM rules to be enacted under the EPA.

Going forward, to explicitly clarify, a list of GHGs covered under the UNFCCC can be included in the list of pollutants to be regulated under the EPA through a regulation/rule under the Act.

7.2. The Energy Conservation Act, 2001

Major provisions of the Energy Conservation Act, 2001, which will be used for the formulation of the Indian Carbon Market are hereunder:

- Section 2 (Definitions)
 1. **Clause (da): "carbon credit certificate"** means the certificate issued by the Central Government or any agency authorised by it under section 14AA.
 2. **Clause (db): "carbon credit trading scheme"** means the scheme notified by the Central Government under clause (y) of section 14 for reduction of carbon emissions.
 3. **Clause (qa): "registered entity"** means any entity, including designated consumers, registered for carbon credit trading scheme specified under clause (y) of section 14
- Section 14 (Power of Central Government)
 1. **Clause (w):** specify the carbon credit trading scheme
- Section 14AA (Issuance of Carbon Credit Certificate)
 1. **Clause (1):** The Central Government, or any agency authorised by it may issue a carbon credit certificate to the registered entity which complies with the requirements of the carbon credit trading scheme
 2. **Clause (2):** The registered entity shall be entitled to purchase the carbon credit certificate in accordance with the carbon credit trading scheme specified under clause (w) of section 14

8. Governance Structure of the Indian Carbon Market (ICM)

The ICM is envisaged as a cross-sectoral mechanism, with sufficient flexibility to control its scope and ambition, depending on the ground realities, which will emerge as we proceed with implementation measures to achieve India's increasingly ambitious NDCs.

The governance framework designed for the ICM should allow for ease of integration of the ICM with achieving India's NDCs and enabling international trade of credits where possible. It should be designed to institute a competitive market, having the characteristics and capacity to address carbon reduction needs, while ensuring that robust carbon credits, with verified environmental integrity, are generated through it. The institutional mechanisms for domestic carbon markets must synchronise with the national-level institutional framework being set up for the implementation of the Paris Agreement. In the interest of efficiency, efforts should be made to integrate the existing institutional framework for PAT and REC to the highest degree possible.

MoEFCC in its role as the National Designated Authority (NDA) and nodal Ministry responsible for oversight of India's climate goals, will establish a clear line relationship with the administration of the ICM, through a Governing Board, under the Apex Committee for the Implementation of the Paris Agreement (AIPA). This is necessary for managing NDC accounting and corresponding adjustments, and periodically reporting on NDC achievements to the UNFCCC.

Under the EPA, the MoEFCC will empower the Administrator and the Regulator for the ICM to set carbon reduction targets, oversee the monitoring, verification, and reporting of emission reductions claimed by participants, issue carbon credits, and enforce the targets, if necessary, through penalties notified for non-achievement.

8.1. Apex Committee for the Implementation of the Paris Agreement

An overview of the ICM from the AIPA is needed, as the ICM would have a direct bearing on the reputation and recognition of India's climate actions and also the achievement of its NDCs.

8.2. Steering Committee

An inter-ministerial committee will be set, to be co-chaired by the Secretaries of the Ministry of Power (MOP) and the MoEFCC, to meet regularly (once per quarter), and ensure the quality of credits generated and to promote synergies between international mechanisms and the ICM. The Committee will be responsible for ensuring that national emission trajectories, with quantitative projections, are developed for critical sectors, aimed at meeting India's NDCs and other climate goals. It will have an over-arching role to ensure close coordination and linkages between the two frameworks, the Designated National Authority (NDAIAPA) for Article 6 mechanisms, and the one for ICM administration.

8.3. ICM Governing Board

An inter-ministerial Board will be set for the governance of the ICM and direct oversight of its administrative and regulatory functioning. The board will be co-chaired by the Additional Secretary, MoEFCC, and Director General of the Bureau of Energy Efficiency (BEE). It will include suitable representatives from the key relevant Ministries – MOP, Ministry of New and Renewable Energy (MNRE), and the Ministry of Finance (MOF). It will also include a representative of the NDAIAPA. Technical experts with experience in market mechanisms may also be included, as well as representatives from the ICM administrators and regulators, i.e., BEE and CERC. The group will convene regularly, to be updated on the ICM and to provide technical oversight and review. The group will also interact with the NDAIAPA, with the latter sharing any developments on the Article 6 mechanisms, and other relevant issues emerging from the international market mechanisms.

8.4. ICM Administrator

Under the EPA, MoEFCC will empower BEE to act as the Administrator for the ICM to undertake its role while adhering to a set of over-arching principles set by the MoEFCC. The responsibilities of the ICM Administrator include:

- (1) Development and approval of methodologies, standards, and processes for registering carbon credit offset projects in various sectors
- (2) Recommend central government on the design of the Indian Carbon Market (ICM) rules and other related aspects
- (3) Issuance of digital carbon credits certificate (CCC), based on the due process, including MRV processes, supported by set data templates and reports
- (4) Transparently conducting the transfer of credits and ensuring that these are properly recorded in the carbon market registry
- (5) Recommend central government on rules and regulations to conduct baseline emission study across entities to take part in the carbon market
- (6) Recommend targets for DCs/others obligated under the proposed ICM to the central government.
- (7) Development of data submission formats
- (8) On-boarding of buyers, sellers, and potentially third-party traders on the exchange
- (9) Accreditation of third-party verifiers for conducting MRV of carbon reductions claimed
- (10) Ensuring that the trade happens with requisite discipline and unusual trades are quickly identified and dealt with. The ICM Administrator would be responsible for approving the rules for ICM and modifying these as needed.

The ICM Administrator will be supported by technical or sectoral committees, formed as required to facilitate the development of methodologies and standards, and processes for registration of carbon projects and issuances.

8.5. ICM Regulator

Under the EPA, MoEFCC will designate the Central Electricity Regulatory Commission (CERC) as a regulator of the ICM, while adhering to a set of over-arching principles set by the MoEFCC. In this role, CERC will be responsible for the:

- (1) Identifying entities to be regulated and setting targets for each before the commencement of each ICM cycle (year) based on the recommendations given by the ICM Administrator and the Governing Board
- (2) Monitoring the flow of CCCs, and tracking the achievements of entities in relation to their targets
- (3) Enforcement of targets, including by levy of penalties, etc.
- (4) Determination of fees related to ICM (annual fee, registration charges, transaction cost, and other applicable costs)
- (5) Define terms and conditions of recognition and issuance of CCCs
- (6) Eventually developing mechanism and establishment of market strategic/stability reserve (of CCCs to maintain a competitive price), to safeguard the interests of various stakeholders

8.6. Carbon Exchange Management

It would be useful to leverage the existing infrastructure established for PAT and REC, as they have sufficient capacity and understanding of the requirements for a carbon market. Thus, the trading and exchange platform could be managed by Indian Energy Exchange (IEX) or Power Exchange India Limited (PXIL). Both these entities have experience with PAT and REC and have also been building their capacities for carbon trading.

- (1) Implement Rules and Bye-Laws for Transaction of CCCs, issued by the commission
- (2) Develop/upgrade IT Platform compatible for online transaction
- (3) Permit transaction of CCCs only to the Eligible Entities (defined by commission).
- (4) Determine MCP and MCV based on double-sided closed Auction with Uniform Pricing principle
- (5) Send reports for Transaction confirmation, pay-in, and pay-out for Executed Transaction to relevant stakeholders
- (6) Issue Purchase Certificate to the Buyers
- (7) Display CCC demand-supply curves on the website

8.7. Registry

The Power System Operation Corporation Ltd. (POSOCO), which runs the registry for RECs and ESCerts, could continue to be responsible for the ICM registry. This may require the existing registry to be suitably modified and expanded to include the requirements for registering carbon credits and trading them, and ideally, also to align with the national registry being developed under the Paris Agreement's Article 6. The role will be to:

- (1) Comply with the directions issued by the Commission from time to time
- (2) Issue electronic Certificate of Registration to the eligible entities within the stipulated time
- (3) In case of rejection, intimate reasons for rejection within the stipulated time
- (4) Intimate registration of eligible entities to the BEE portal
- (5) Collect fees from eligible entities as may be prescribed in the Order to be issued by the Commission in compliance with CCC Transaction Regulations
- (6) Maintaining a secure database of CCCs and records of transactions of CCCs

- (7) Formulate protocol for sharing of information related to a transaction of CCCs in 'electronic form' with Power Exchange(s) and Administrator
- (8) After each trading session, the Registry shall update the dashboard of the concerned eligible entity

8.8. Verifiers

Suitable verifiers (or Designated Operating Entities - DOEs) from the existing cohort, as well as new ones developed and approved, would be empaneled for the ICM. They would undergo capacity-building activities, keeping in mind the requirements for a carbon market.

With these considerations in mind, the following expanded governance framework for the ICM is proposed in the following figure

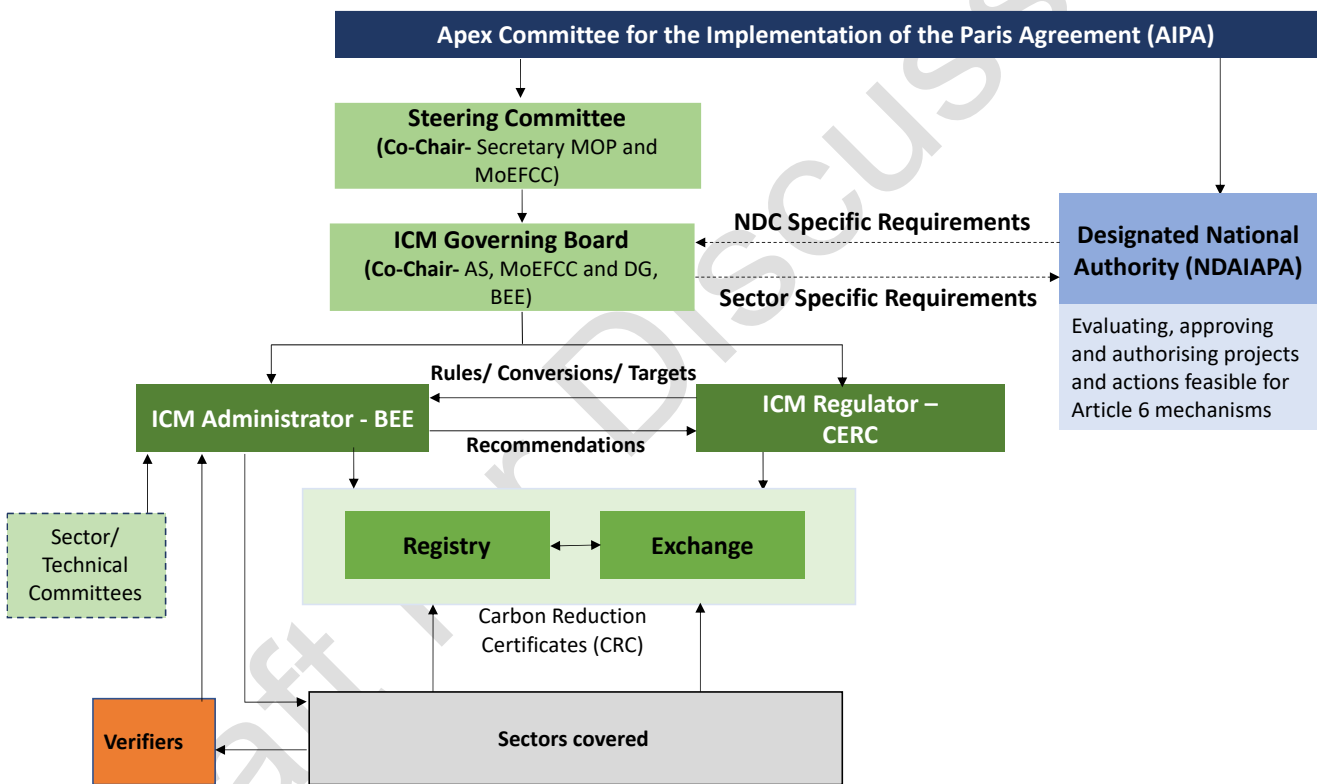


Figure 30 Governance Structure for the National Carbon Market

9. Demand Generation for ICM

For the carbon credits (or offset credits) traded through the ICM to be effective in attracting investments, a robust demand-supply ecosystem will be needed. Demand generation in the Indian carbon market will be critical in ensuring active participation and avoiding oversupply leading to unused credits.

Apart from the regulated entities, demand for carbon credits may also arise from entities voluntarily pledging to offset their emissions. Some other key mechanisms for driving demand are:

- PSUs are encouraged to buy credits only from ICM to meet their carbon neutrality targets.
- A policy document/guidance document may be issued that mandates corporates to purchase both offset credits and carbon credits certificates units towards meeting their carbon neutrality targets.
- Encouraging public pledges and commitments especially by high emitters in the country to signal the demand for CCCs. The government could initiate a voluntary charter or pledge for India to drive demand in the carbon market like the declaration on Climate Change signed by 24 key industry captains and MoEFCC at the virtual India CEO forum on Climate Change. This charter or pledge could be sector agnostic to include key market players across manufacturing industries, consumer goods, e-commerce, information and technology, financial services, telecommunication, pharmaceuticals, buildings, etc.
- Additionally, the mandate by SEBI that the top 1000 companies in India (by market capitalization) report their Environmental, Social, and Governance (ESG) indicators can also be leveraged to infuse demand for CCCs
- The Government could also encourage the procurement of products/services from carbon neutral Companies. This initiative can be promoted as part of Sustainable Public Procurement (SPP) where public sector organisations and institutions can provide preferential benefits to such organisations/products/services
- Carbon Offset projects in India registered under other voluntary schemes including CDM should be given the option to register under ICM to sell credits to Indian entities.
- As part of the Eco-mark scheme, the carbon-neutral certification for products and services can also be explored. This will have a pull effect on carbon markets and can result in demand for carbon-neutral products and services.
- To ensure demand from voluntary buyers, the quality and environmental integrity of carbon credits must be ensured. India's carbon market must therefore ensure a quality supply of carbon units through a robust MRV mechanism to attract demand from non-obligated entities.

10. Timeframe

Based on the imminent need for establishing an ICM in India, the following tentative timeframe for various key steps has been proposed. The aim is to have the critical decisions in place by the end of the year, with the pilot phase being ready for operationalization by January 1, 2023. For this, the constitution of a Joint Working group, to undertake the following activities is proposed.

	Activity	Joint Working Group		Months								
		MOEFCC	MOP-BEE	Jul '22	Aug '22	Sep '22	Oct '22	Nov '22	Dec '22	Jan. 23	Feb. 23	Mar. 23
1	Establish the structure and legal framework	L	S	C A								
2	Obligated sectors, entities, set targets	S	L		C							
3	Develop DNA – staffing, processes, technical standards, methodologies	L	S			C						
4	Assess/ Develop a pipeline for the supply of carbon credit certificate	L	L					C				
5	Establish international partnerships (for Article 6 mechanisms)	L	S				C					
6	Develop ICM platform, processes	S	L					C				
7	Enroll ICM participants, general awareness	L	L							C		

L Lead S Support

C: Completed
A: Approved

Annexures

Annexure I: Threshold Energy Consumption for Designated Consumers

Sectors	Minimum Annual Energy Consumption [Threshold] in Metric Tonne of Oil Equivalent (toe)	Reference Notifications
Aluminium	7,500	S.O. 394 (E) dated 12th March 2007
Chlor-Alkali	12,000	
Fertilizer	30,000	
Textile	3000	
Thermal Power Plant	30,000	
Cement	30,000	S.O. 2147(E) dated 17th June 2020
Cement Grinding Units	10,000	
Iron & Steel	20,000	S.O. 394 (E) dated 12th March 2007 amended vide
Paper & Pulp	20,000	S.O.968(E) dated 22nd February 2019
Petroleum Refinery	90,000	S.O. 394 (E) dated 12th March 2007 amended vide
Electricity Distribution Companies (DISCOMs)*	86,000	S.O. 3542 (E) dated 29th December 2015 (Annexure 4B)
Railways#		S.O. 394 (E) dated 12th March 2007 amended vide S.O. 3542 (E) dated 29th December 2015 (Annexure
(a) All Zonal Railways (Traction)	70,000	4B), amended vide S.O. 2022(E) dated 8th June, 2016, amendment vide S.O. 2147(E) dated 17th June
(b) Workshops	750	2020
Petrochemical (Gas Crackers and Naphtha Crackers)	1,00,000	S.O. 3600 (E) dated 15th November 2017 (Annexure 4D)
Hotels (under Commercial Buildings or Establishments)	500	S.O.1388 (E) dated 2nd May 2017 (Annexure 4C) amended vide S.O.968(E) dated 22nd February 2019
Airports (under Commercial Buildings or Establishments)	500	S.O. 2147(E) dated 17th June 2020

Annexure II – Emission Trajectory for key sectors (aligned with NDC)

Iron and Steel

Description	Unit	FY 2019-20	FY 2030-31
Production	MT	109.94	255
Total CO ₂ emissions	MtCO ₂	260	461.1
Specific Emissions	tCO ₂ /tonne.	2.55	1.99
Reduction in CO ₂ emissions (2030)	MtCO ₂		144

Cement

Description	Unit	FY 2019-20	FY 2030-31
Production	MT	334	562
Total CO ₂ emissions	MtCO ₂	96.49	121
Specific Emissions	tCO ₂ /tonne.	0.29	0.23
Reduction in CO ₂ emissions (2030)	MtCO ₂		31.9

Petroleum Refinery

Description	Unit	FY 2019-20	FY 2030-31
Production	MT	254.39	373
Total CO ₂ emissions	MtCO ₂	62.42	62.68
Specific Emissions	tCO ₂ /tonne.	0.25	0.18
Reduction in CO ₂ emissions (2030)	MtCO ₂		24.7

Petrochemical

Description	Unit	FY 2019-20	FY 2030-31
Production	MT	39.05	58.24
Total CO ₂ emissions	MtCO ₂	80.17	91.9
Specific Emissions	tCO ₂ /tonne.	2.05	1.68
Reduction in CO ₂ emissions (2030)	MtCO ₂		21.72

Pulp and Paper

Description	Unit	FY 2019-20	FY 2030-31
Production	MT	18.31	34.22
Total CO ₂ emissions	MtCO ₂	39.79	34.43
Specific Emissions	tCO ₂ /tonne.	2.17	1.23
Reduction in CO ₂ emissions (2030)	MtCO ₂		32.1

Textile

Description	Unit	FY 2019-20	FY 2030-31
Production	MT	6.15	9.14
Total CO ₂ emissions	MtCO ₂	21.69	27.21
Specific Emissions	tCO ₂ /tonne.	3.53	2.93
Reduction in CO ₂ emissions (2030)	MtCO ₂		5.03

Chlor-Alkali

Description	Unit	FY 2019-20	FY 2030-31
Production	MT	7.94	11.76
Total CO ₂ emissions	MtCO ₂	26.28	30.87
Specific Emissions	tCO ₂ /tonne.	3.31	2.75
Reduction in CO ₂ emissions (2030)	MtCO ₂		6.6

Aluminium

Description	Unit	FY 2019-20	FY 2030-31
Production	MT	3.4	8.7
Total CO ₂ emissions	MtCO ₂	42.72	73.56
Specific Emissions	tCO ₂ /tonne.	12.57	9.08
Reduction in CO ₂ emissions (2030)	MtCO ₂		30.33

Sugar

Description	Unit	FY 2019-20	FY 2030-31
Production	MT	29.43	45.23
Total CO ₂ emissions	MtCO ₂	8.11	8.53
Specific Emissions	tCO ₂ /tonne.	0.28	0.19
Reduction in CO ₂ emissions (2030)	MtCO ₂		4.07

Fertilizer

Description	Unit	FY 2019-20	FY 2030-31
Production	MT	24.93	30.46
Total CO ₂ emissions	MtCO ₂	43.63	52.41
Specific Emissions	tCO ₂ /tonne.	1.75	1.72
Reduction in CO ₂ emissions (2030)	MtCO ₂		0.91

Thermal Power Plant

Description	Unit	FY 2019-20	FY 2030-31
Production	BU	1058	1438
Total CO ₂ emissions	MtCO ₂	924.36	1229.3
Specific Emissions	tCO ₂ /BU	0.87	0.86
Reduction in CO ₂ emissions (2030)	MtCO ₂		14.38

Distribution Companies (DISCOMs)

Description	Unit	FY 2019-20	FY 2030-31
Losses	BU	282.17	451.24
Total CO ₂ emissions	MtCO ₂	242.26	287.49
Specific Emissions	tCO ₂ /BU	0.86	0.64
Reduction in CO ₂ emissions (2030)	MtCO ₂		99.93

Non-Ferrous

Description	Unit	FY 2019-20	FY 2030-31
Production	MT	2.02	2.02
Total CO ₂ emissions	MtCO ₂	3.47	2.85
Specific Emissions	tCO ₂ /tonne.	1.72	1.41
Reduction in CO ₂ emissions (2030)	MtCO ₂		0.62

Dairy

Description	Unit	FY 2019-20	Y 2030-31
Production	MT	192.42	339.85
Total CO ₂ emissions	MtCO ₂	9.74	13.56
Specific Emissions	tCO ₂ /tonne.	0.051	0.040
Reduction in CO ₂ emissions (2030)	MtCO ₂		3.64

Annexure III – GHG Emission factor for fuels¹³

Default emission factors for stationary combustion in the energy industries (kg of greenhouse gas per TOE on a Net Calorific Basis) -derived based on IPCC Default emissions factors using the conversion of 1 TJ = 23.884 TOE				
Fuel		CO ₂	CH ₄	N ₂ O
Crude Oil		3,068.92	0.13	0.03
Orimulsion		3,223.83	0.13	0.03
Natural Gas Liquids		2,687.92	0.13	0.03
Gasoline	Motor Gasoline	2,901.45	0.13	0.03
	Aviation Gasoline	2,930.76	0.13	0.03
	Jet Gasoline	2,930.76	0.13	0.03
Jet Kerosene		2,993.56	0.13	0.03
Other Kerosene		3,010.31	0.13	0.03
Shale Oil		3,068.92	0.13	0.03
Gas/Diesel Oil		3,102.42	0.13	0.03
Residual Fuel Oil		3,240.58	0.13	0.03
Liquefied Petroleum Gases		2,641.87	0.04	0.00
Ethane		2,579.07	0.04	0.00
Naphtha		3,068.92	0.13	0.03
Bitumen		3,378.75	0.13	0.03
Lubricants		3,068.92	0.13	0.03
Petroleum Coke		4,082.13	0.13	0.03
Refinery Feedstocks		3,068.92	0.13	0.03
Other Oil	Refinery Gas	2,411.60	0.04	0.00
	Paraffin Waxes	3,068.92	0.13	0.03
	White Spirit and SBP	3,068.92	0.13	0.03
	Other Petroleum Products	3,068.92	0.13	0.03
Anthracite		4,115.62	0.04	0.06
Coking Coal		3,960.71	0.04	0.06
Other Bituminous Coal		3,960.71	0.04	0.06
Sub-Bituminous Coal		4,023.51	0.04	0.06
Lignite		4,228.67	0.04	0.06
Oil Shale and Tar Sands		4,479.87	0.04	0.06
Brown Coal Briquettes		4,082.13	0.04	0.06
Patent Fuel		4,082.13	0.04	0.06
Coke	Coke Oven Coke and Lignite Coke	4,479.87	0.04	0.06
	Gas Coke	4,479.87	0.04	0.06
Coal Tar		3,378.75	0.04	0.06
Derived Gases	Gas Works Gas	1,858.94	0.04	0.06
	Coke Oven Gas	1,858.94	0.04	0.06
	Blast Furnace Gas	10,885.68	0.04	0.06
	Oxygen Steel Furnace Gas	7,619.97	0.04	0.06
Natural Gas		2,348.79	0.04	0.06

¹³Source: Stationary Combustion

https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf

Annexure III – Accredited Energy Auditors under PAT Scheme

There are a total of 85 Accredited Energy Audit firms empanelled under the BEE PAT scheme. Out of these firms, 11 firms are already de-impanelled or are in the process of same and 12 AEA firms are not actively applying for different PAT cycles. The maximum number of AEA firms empanelled are in the thermal power plant sector followed by the textile and iron and steel sector. The aluminium and railways have the least empanelled AEA's.

Around 28 active DOEs are working, 28 DOEs have withdrawn their registration from CDM and 6 others are inactive

The list of AEA firms is provided below:

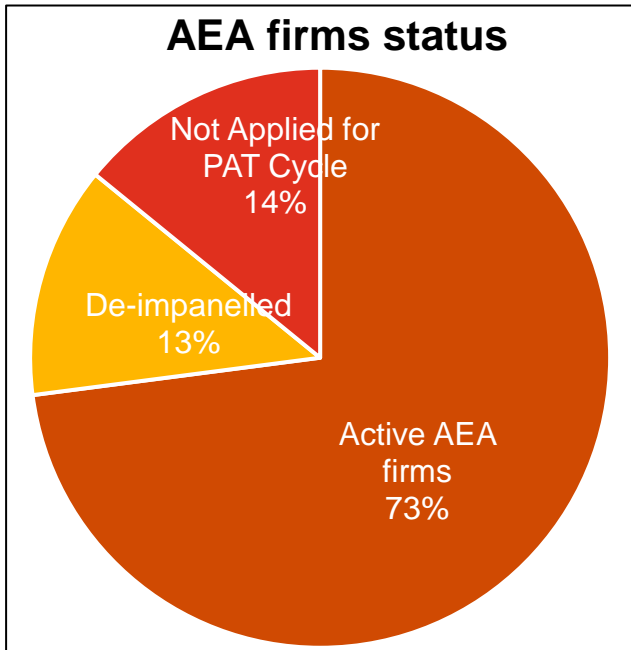


Figure 32 Status of AEA firms

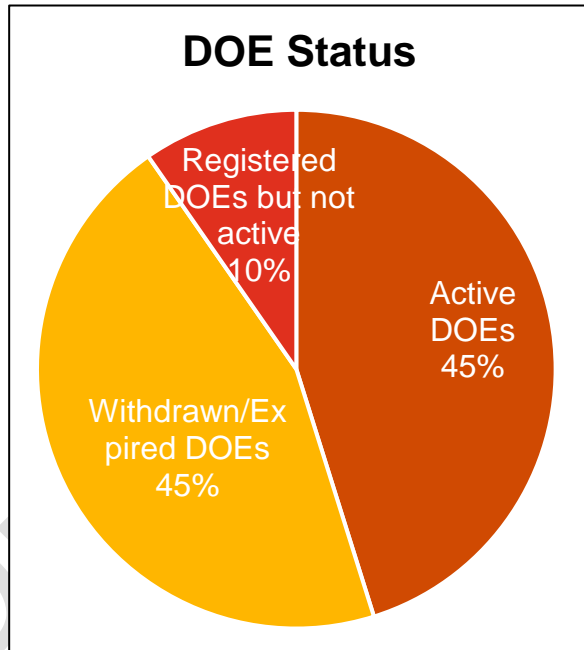


Figure 32 DOEs status

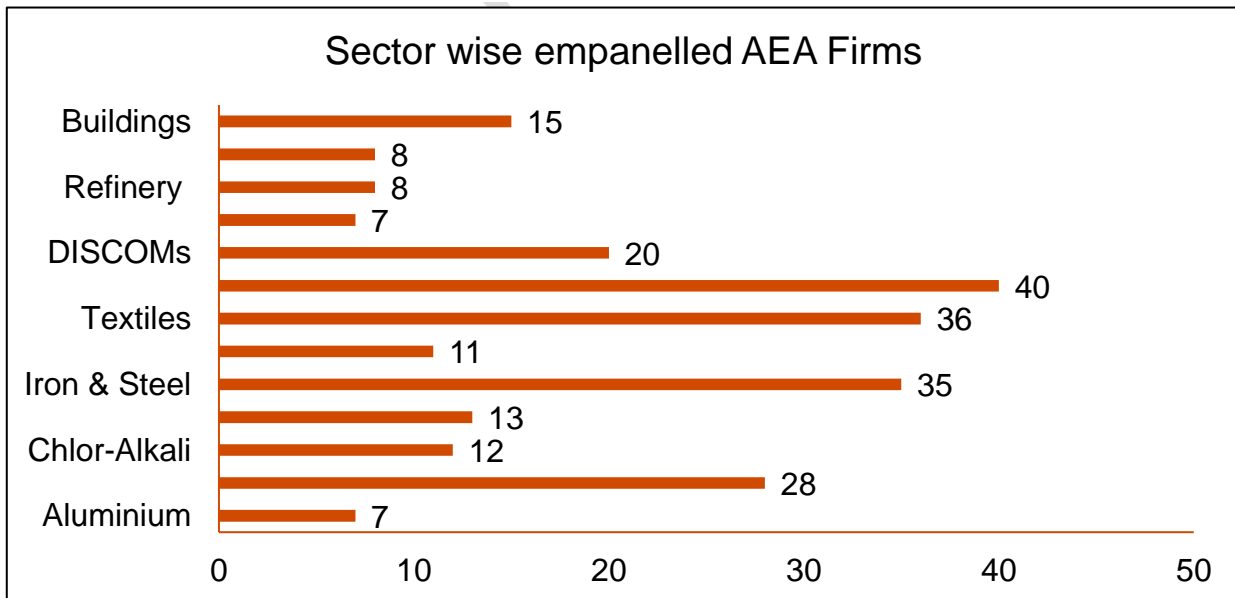


Figure 33 Sector wise AEA empanelled firms for PAT compliance

S. No.	Name of firm	Name of Lead Accredited Energy Auditor	Office Postal Address with Email Id & Contact Nos.
1	The Energy and Resources Institute (TERI)	Mr. G.R. Narsimha Rao, AEA-001	Southern Regional Centre 4th Main, 2nd cross, Domlur II Stage, Bangalore – 560071

S. No.	Name of firm	Name of Lead Accredited Energy Auditor	Office Postal Address with Email Id & Contact Nos.
			Tel. No. 24682100 / 2111 Mob. No. 09811392264 / 9448083750 Fax. No. 011 24682144 Email : grnrao@teri.res.in, girishs@teri.res.in
2	TUV SUD South Asia Pvt. Ltd.	Mr. Neeraj Dhingra, AEA-203	1st Floor, G -11, Sector - 11, Noida - 201301, Gautam Budh Nagar, Uttar Pradesh Tel. No. 01204073000 Mob. No. +91 9650080431 / 9711870401 Fax. No. +91 01204073005 Email: shailesh.shinde@tuv-sud.in, neeraj.dhingra@tuv-sud.in
3	Development Environenergy Services Ltd. (DESL)	Mr. Dipanjan Roy, AEA - 0242	819, 8th Floor, AntrikshBhawan, 22, Kasturba Gandhi Marg, New Delhi - 110001 Tel. No. 011 4079 1100 Mob. No. 09650052870 Fax. No. 011 4079 1101 Email: dipanjanroy@deslenergy.com
4	MITCON Consultancy and Engineering Services Ltd.	Mr. Jignesh Pravinbhai Patel AEA - 0104	807, 8th floor, mecantile house, Plot No.-15, K.G. Marg, Connaught Place, New Delhi-110001 Tel. No. 012066289401 Mo. No. - 9662946024 Email: amitabh.srivastava@mitconindia.com
5	Advance Metering Technology Limited (AMTL)		B-189, Noida Phase-2, Dist. Gautan Buddh Nagar, Noida-201305 Tel. No. 120-4531400/4531401 Fax. No. +91 120 4531402 Email: energy.audit@pkrgroup.in, support@pkrgroup.in,
6	Steag Energy Services (India) Pvt. Ltd.	Mr. Rakesh Kumar Mishra, AEA- 0060	A-29, Sector – 16, Noida – 201301 Uttar Pradesh, India Tel. No. +91 120 4625000 Mob. No. +91 9717298316 Fax. No. +91 120 4625100 Email : r.mishra@steag.in , jt.verghese@steag.in
7	TUV India Private Limited	Mr. Manojkumar Borekar, AEA-200	Survey No. 42, 3/1 & 3/2, Sus, Tal. Mulshi, Dist. Pune - 411 021 Tel. No. +91 2067900005 Mob. No. +91 9960316444 Email: energy@tuv-nord.com
8	Schneider Electric India Pvt. Ltd.	Mr. Upendra Pratap Singh, AEA-0005	9th Floor, DLF Building No. 10, Tower C, DLF Cyber City, Phase – II, Gurgaon – 122002, Haryana, India Tel. No. +91 124 3849589 Mob. No. 09910695696 Fax. No. +91 124 4222036 Email : upendrapratap.singh@schneider-electric.com , anil.chaudhary@schneider-electric.com
9	PricewaterhouseCoopers Private Limited	Mr. Manoj Kumar Bansal, AEA-0082	Building No. 10, 17th Floor, Tower – C, DLF Cyber City, Gurgaon – 122002, India Tel. No. +91 124 3306257 Mob. No. +919910154500 Email: manoj.bansal@in.pwc.com, amit2.kumar@in.pwc.com

S. No.	Name of firm	Name of Lead Accredited Energy Auditor	Office Postal Address with Email Id & Contact Nos.
10	SGS India Pvt. Ltd.		226, Udyog Vihar, Phase-I, Gurgaon – 122015 Haryana, India Phone: +91 124 6776464 Fax: +91 124 6776403 -04
11	Zenith Energy Services Pvt. Ltd.	Mr. R. Gopalakrishna, AEA-0123	10 – 5 – 6/B, My Home Plaza, Masabtank, Hyderabad - 500028 Tel. No. +91 4023376630 / 6631 Mob. No. 09849408485 No. +91 4023322517 rgk@zenithenergy.com , rgk515@hotmail.com , mohan@zenithenergy.com Fax. Email :
12	Confederation of Indian Industry (CII)	Mr. P. V. Kiran Ananth, AEA - 0069	Survey No. 64, Kothaguda Post, RR Dist., Hyderabad 500084 Tel. No. 040 44185101 / 111 Fax. No. 040 23112837 No. +91 9849909671 E-mail: kiran.ananth@cii.in; encon@cii.in Mob.
13	National Productivity Council (NPC)	Mr. B. P. Bhandary, AEA- 182,	5-6, Institutional Area, Utpdakta Bhawan, Lodi Road, New Delhi - 110003 Tel. No. 011-24607311 Mob. No. 09920920724 Email: prashant.s@npcindia.gov.in bp.bhandary@npcindia.gov.in
14	AMSET Energy Systems and Solutions Pvt. Ltd.	Mr. S. Ashok, AEA- 071	8A & B, PM Towers, 37, Greams Road, Chennai - 600006 Tel. No. 096552 41599 Mob. No. 09443720220 Email: ashok@energymeasuretosave.com, kannan@amsetenergy.in
15	Enfragy Solutions India Pvt. Ltd.	Mr. Rajiv Vikasin Shukla, AEA-0056	Awfis, Globsyn Crystal, 1st Floor, XI – 11 & 12, Block – EP, Sector – V, Salt Lake City, Kolkata – 700 091, West Bengal Telephone: +91 33 4604 8993 Mob. No. 9324213638 Email: rajiv.shukla@efragy.com, rajivshukla77@gmail.com
16	VSU Energy Services	Mr. V. K. Luhadiya, AEA-025	2/111, SFS, Agarwal Farm, Jaipur - 302020 Tel. No. 0141-2395779 Mob. No. 098296- 24819, 07742154345 Email: luhadiya_vinod@yahoo.co.in
17	EnergO Engineering Projects Pvt. Ltd.		A-57/4, Okhla Industrial Area, Phase – II, New Delhi - 110020 Tel. No. 011 30882030 Mob. No. 09811456950 No. 011 26385333 Email: bedi.hs@energOindia.com, energO@energOindia.com Fax.
18	Active Energy OPC Private Limited	Mr. Prabodh Kala, AEA-0122	C - 1010, Kailas Business Park, Vikhroli (W), Mumbai - 400079 Tel. No. 022 25272960 Mob. No. 09004346637, 9821592213 Fax. No. 022-25272960 Email: prabodh@activeenergy.in, prabodhkala@rediffmail.com
19	National Institute of Secondary Steel Technology	Mr. Sandeep Pal Singh, AEA-022	P. B. NO. 92, GT Road, Mandi Gobindgarh – 147301

S. No.	Name of firm	Name of Lead Accredited Energy Auditor	Office Postal Address with Email Id & Contact Nos.
			Distt. Fatehgarh Sahib (Punjab) Tel. No. 04023541306, 04024733473 Tel. No. 01765-500552 Mob. No. 9815829399 Email: spsinghweb@yahoo.co.uk, info@nisst.org, nisst@dataone.in
20	InsPIRE Network for Environment		IRIA House, C-5, Qutab Institutional Area, New Delhi - 110016 Tel. No. 011 49004800 Mob. No. 9811043119 Fax. No. 011 49004801 Email: shankar@inspirenetwork.org, kinsuk@inspirenetwork.org
21	Siri Exergy & Carbon Advisory Services (P) Ltd.	Mr. G.Subramanyam, AEA-019	93A, Janaki Enclave, Saroornagar, Hyderabad – 500035, Telangana Tel. No. 040 65128222 Mob. No. 09866324164 No. 040 24075323 Fax: subramanyam@siriexergy.com, siriexergy@gmail.com Email:
22	MCJ Energy Engineers Pvt. Ltd.	Mr. Moolchand Jain, AEA-30	244, Chouhan Estate, G. E. Road, Supela, Bhilai – 490023 (C.G.) Tel. No. 7882350477 Mob. No. 9752587060, 9893008136 Email: mcjain1948@gmail.com, mc_jain@yahoo.com
24	A-Z Energy Engineers Pvt. Ltd.	Dr. P.P. Mittal, AEA - 011	4860-62, Harbans Singh Street Plot No. 12, Kothi No. 24, Ward No. II, Darya Ganj, New Delhi – 110002 Tel. No. 0129 4046120, 011 23240541/42/43 Mob. No. 09811402040 No. 01123240544 Fax: Email: pp_mittal@yahoo.com
26	Padmashtdal Energy Services Pvt. Ltd.	Mr. Kamalesh Kumar Jha, AEA-007	320, Janaki Appt Sec 22 Dwarka, New Delhi - 110077 Tel. No. 011 28051185 Mob. No. 09810392563, 09811942412 Fax. No. 011 28051185 Email: kkjha65@gmail.com, pespl0412@gmail.com
27	SEE Tech Solutions Pvt. Ltd.	Mr. Milind Chittawar, AEA-015	11/5, MIDC Infotech Park, South Ambazari Road, Nagpur - 440022 Tel. No. 0712 2222177 Mob. No. 09422145534 / 09823553702 Fax. No. +91712225293 Email: milind.chittawar@seetechsolutions.in
28	NIN Energy India Private Limited	Mr. B. Senthil Kumar, AEA- 023	Jusa Complex New No. 47, Old No. 21/2 Ponnamman Koil Street Kottur, Chennai-600085 Tamil Nadu, India Tel. No. 04424455223 Mob. No. 09443112941, 9176012941 Fax. No. 044 24455220 Email: senthilkumar.b@NINenergy.com

S. No.	Name of firm	Name of Lead Accredited Energy Auditor	Office Postal Address with Email Id & Contact Nos.
29	Senenergy Consultants Pvt. Ltd.	Mr. Ravindra Datar, AEA-0161	03, Aastha II, B S Devshi Road, Govandi East, Mumbai 400088 Tel. No. 02225553297 / 02225588565 Mob. No. 09821271630 / 09920971630 Email: ravi@senenergy.co.in
30	Petroleum Conservation Research Association (PCRA)	Mr. Shankhjeet Kumar Sinha, AEA - 0028	10, Bhikaji Cama Place, New Delhi - 110066 Tel. No. 01126198846 Mob. No. +919810967124 Fax. No. 01126109668 Email: dirind@pcra.org, pcra@pcra.org, adind2@pcra.org, ddindustry@pcra.org
31	Kerala State Productivity Council	Mr. Shanavaz.K.M, AEA-099	House, P. B. No. 8, HMT Road, Kalamassery, Cochin – 683104, Kerala, India Tel. No. +91 4842555526, 2555367, 2532107 Mob. No. 9447816767 Fax. No. +91 484 2532107 Email : kmshanavaz@gmail.com , mail@kspconline.com
32	Devki Energy Consultancy Pvt. Ltd.	Mr. R. Paraman, AEA-003	405, Ivory Terrace, R. C. Dutt Road, Vadodara, Gujarat – 390007 Tel. No. 0265 2330636 Mob. No. 09825223844 No. 0265 2338868 Fax. Email: rparaman@devkienergy.com
33	Aditya Birla Management Corpn. Pvt. Ltd.	Mr. Deepak Gokhale, AEA-0109	Block No. SE – 2, 1st Floor, Plot No 1 & 1 – A/1 MIDC Taloja, Dist Raigad, Maharashtra Pin 410208 Tel. No. 022 67603000 Mob. No. 9702912499 Fax. No. 022 27403299 Email: deepak.gokhale@adityabirla.com, jagrat.mankad@adityabirla.com
34	Enkon Engineers	Mr. Surinder Kumar Kansal, AEA-0129	249, Housing Board Phase II, Baddi – 173205, Himachal Pradesh Tel. No. 0172 2586678 Mob. No. 09216942551, 9418142555 Email: skkansal1950@gmail.com, enkon.ers@gmail.com
35	Ottotractions	Mr. Suresh Babu B V, AEA-033	C-22, VT Nagar, Manikanteswaram P O, Thiruvananthapuram - 695013 Tel. No. 0471 2914388 Mob. No. 09447068747 No. 0471 2914388 Fax. Email: ottotractions@email.com, sureshbabubv@gmail.com
36	Federation of Indian Chambers of Commerce and Industry (FICCI)	Mr. M.N. Girish, AEA-013	Federation House, Tansen Marg, New Delhi - 110001 Tel. No. 01123359736, 23487382 Mob. No. 09810082612 No. 01123721504 Fax. Email: mn.girish@ficci.com, ma.patil@ficci.com
37	Pranat Engineers Pvt. Ltd.	Mr. Dalip Singh, AEA-0184	91, Kiran Vihar, Karkardooma, Delhi - 110092 Tel. No. 011 22372828 Mob. No. 9810160265, 7840047516

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39	Lloyd Insulations (I) Ltd.	Mr. Akhilesh Kumar Verma, AEA - 194	Punjstar Premises, 2 Kalkaji Industrial Area, Kalkaji, New Delhi - 19 Tel. No. 011 30882874, 77 Mob. No. 9654460120, 9313217709 Fax. No. 011 30882894, 895 Email:kk.mitra@lloydinsulation.com, lloyd@del2.vsnl.net.in, ankur.chauhan@lloydinsulation.com
40	Amtech Electronics (India) Ltd.		E – 6, Electronics Zone, GIDC, Sector – 25, Gandhinagar – 382028, Gujarat Tel. No. 07923289101 / 02 / 03 Mob. No. 8141884047 Email: energy@amtechelectronics.com, info@amtechelectronics.com
41	Katyani Energy Solution Pvt. Ltd.	Mr. R. K. Jain, AEA - 0043)	A-86, 3rd floor above, Arjun Nagar, Kotla Mubarakpur, New Delhi - 110003 Mob. No. 9868615189, 9717772068 Ph. No. 01140793249 Email: Katyanienergy@gmail.com, mukesh.kaju@gmail.com, rajesh492003@gmail.com
43	Enzen Global Solutions Pvt. Ltd.	Mr. I. Thanumoorthi, AEA-175	#90, Madiwala, Hosur Road, Bangalore-560068 Tel. No. +91 8067123002 Mob. No. 9880345888, 09663380445 Email: thanumoorthi.i@enzen.com satheesh.kumar@enzen.com
44	GSH Energy Services Private Limited		14, Thiru Vi Ka 3rd Street, (Off) Radhakrishnan Road, Myla pore Chennai- 600004 Mob. No. 09825069185, 7927473886, 7930222033 Tel. No. 914424989730 Email: prakash.vankani@gshgroup.com, vanks_krec@yahoo.co.in
45	BICON Consultants Private Limited	Mr. Ray Bimlendu Chaudhuri, AEA-0115	S - 41, Bangur complex, 5/7, B. S. T. Main Road, Kolkata - 700038 Mob. No. 9903037609 / 9830661115 Fax. No. 033 24002114 Email: bicon59a@gmail.com info@biconconsultants.com
46	Ganges Consultancy	Mr. Anoop Kumar Gupta, AEA-0125	273 – Y/1 Block kidwai Nagar Kanpur – 208011 U. P. Tel. No. +9105122636473 / 01887221504 Mob. No. +919464005209 / 08510810909 Email : gangesconsultancy@gmail.com , guptaanoopkumar@yahoo.co.in

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48	AEEE Consultants	Mr. Shashibhushan S. Agrawal, AEA-054	Kapil Building, Opposite Dr. Naik's X- ray clinic, New Bhagwat Plots, Akola (Maharashtra State) Pin: 444005 Tel. No. 07242411271 Mob. No. 09422161638 Email: shashi@aeec.com, sales@aeec.com
49	PGS Energy Services Private Limited	Mr. Pradeep Dhingra, AEA-191	408, I- SQUARE Corporate Park Near CIMS Hospital Science City Road Ahmedabad - 380060 Tel. No.0172-2555130/4605017 Mob. No. 09876105017 Email: pd@pgsenergyservices.com, info@pgsenergyservices.com
50	M/s UVK Susnomics Engineering Pvt Limited	Mr. Arul Mohan Swaminathan, AEA-050	6, Rajaji Nagar Main Road, Madipakkam, Chennai - 91 Mob: 9382382859 / 9840630106 Tel No: 044-22584172 Email: uvkro@uvka.net, uvkro@vsnl.net
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54	RM. Mayileru & Co.	Mr. R M. Mayileru, AEA- 0041	256, 3rd Street, Gandhipuram, Coimbatore-641012 Tel. No. 0422-2497455 Mob. No. 9345732419 No 0422-2494942 Email Id: mayileruandco@gmail.com
55	Power Tech Consultants	Mr. Bibhu Charan Swain, AEA-0121	K - 8-82, Kalinga Nagar, Ghatikia, Bhubaneswar - 751003, Odisha Tel. No. 0674-2386219 Mob. No. 9437155337, 8847836760, 9937698125

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57	Namdhari Eco Energies Pvt. Ltd.	Mr. Shri Bali Singh, AEA-0206	C 105 Galaxy Vega Techzone 4 Greater Noida 201306. Uttar Pradesh. Mob. No. 9711591550 Email Id: bali@ecoenergies.co.in
58	Electrical Research & Development Association	Mr. Bhavesh Vasiyani, AEA-0016	Erda Road, G. I. D. C., Makarpura Industrial Estate, Vadodara-390010 Tel. No. 0265-3043128-31 Ext.-262 Mob. No. 07574850913 Fax. No. 0265-2638382 Email Id: bhavesh.vasiyani@erda.org, mukesh.shah@erda.org
59	Excel Project Consultants Pvt. Ltd.	Mr. Prabir Chatteraj, AEA- 0090	P-160, Bangur Avenue, Block - B, Gr. Floor, Kolkata - 700055, West Bengal, India Ph. No. 033-25701025 / 033-23595793 Mob. No. 09432642426 Email Id: prabir.chatteraj@gmail.com psengupta@epcpl.co.in
60	A.R.S. Energy Auditors	Mr. Sachin S. Deshpande, AEA-0261,	A/1, A/101, Pramodini Palace Chs Ltd., near Air India colony, Virar (E) - 401305 Ph. No. 7350584488/ 9561036177 Mob. No. 7507184478 Email Id: surendra_bankar@rediffmail.com, sachin.ameya@gmail.com
61	URS Verification Private Limited	Mr. R Vaidyanathan, AEA - 178	F - 3, Sector - 6, Noida - 201301 Ph. No. 120451626465 Mob. No. 8826647353 Email Id: rvaidyanathan.delhi@urs-climate.com, ceo@ursindia.com
62	Eco Energime Engineers LLP	Mr. Govindaraj. A, AEA-0078	#708, Shop-2, B-Block, AECS Layout, Manipal County Road, Singasandra, Bangalore-560068, Karnataka Tel. No. 08025682040 Mob. No. 08050387500, 09449777000 Fax. No 08025682040 Email Id: agovind@eeellp.com, sebugovi@gmail.com, info@eeellp.com, ceo@eeellp.com
63	Mott Macdonald Private Limited	Mr. Prabhat Saraswat, AEA-0176	5/6th Floor, Logix Techno Park, Tower C, Plot 5, Sector 127, Noida-201301 Tel. No. 01203992335 Mo. No. - 9810526674 Email Id: prabhat.saraswat@mottmac.com
64	Atria Energy Services Private Limited,	Mr. M. Nagarajan, AEA-0199	#11, Commissariat Rd, Ashok Nagar, Bengaluru, Karnataka – 560025, India Mobile No. 9880575698, 7625086412, 8049411411

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			Email Id: nagarajan.m@atriapower.com, nagarajan.09@gmail.com
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66	PPS Energy Solutions Pvt. Ltd.	Mr. Ravi Deshmukh, AEA - 0243	B-403, Bharti Vihar, S. No.-78, Bharti Vidyapith Campus, Katraj, Pune 411043 Mob. No. 8308327696 Email: ravi@ppsenergy.in
67	East Coast Sustainable Private Limited	Mr. G Srinivasa Rao, AEA - 0251	6-80/1, Priya Gardens, PO Simhachalam, Visakhapatnam - 530028, Andhra Pradesh, India Mob. No. 97053 00059 Email: srinivasa.gandepalli@eastcoast.net.in
68	SGS Industrial C&S Pvt Ltd	Mr. Sanjeev Saxena, AEA - 0289	B-100, Sec-64, Noida-201307 Mob. No. 9818607624 Phone No. 1204547602 Email: energy@sgscontrols.com, audit@sgscontrols.com, instrumentation@sgscontrols.com
69	Bhagwat Technologies & Energy Conservation Pvt. Ltd	Mr. Lakshmi Narain, AEA - 0170	5, Millenium Business centre, 34, Corner Market Malviya Nagar, New Delhi - 110017 Phone No. 9811622699 Email: lakshminarain@yahoo.com, ak@btecon.com
70	The South India Textile Research Association (SITRA)	Mr. A. Sivaramakrishnan, AEA - 0169	13/37, Avinashi Road, Aerodrome P. O. Coimbatore - 641014 Mob. No. 9894512286 Email: engg@sitra.org.in, sivaramakrishnan.52@gmail.com
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72	M/s LEAP Infraasys Pvt. Ltd.,	Mr. Gangadhar G. Dalal, AEA - 0207	SCO No. 25, HUDA Market, Sector 21A, Faridabad-121001 Tel No. 0129-4039483 Mob. No. 9892071444, 9810764865 Email: ggdin2003@yahoo.com anil.jangid@leapinfraasys.com
73	M/s Earthood Services Pvt. Ltd.		424-A Tower B3 spaze I – Tech park, Sector 49, Sohna Gurgaon road, Gurgaon – 122018 (Haryana) Mob. No. 9970835204 / 9717819860 Email: makarand.shenwai@earthood.in info@earthood.in
74	M/s Operative Energy Solutions (I) Pvt. Ltd.	Mr. Ashu Sharma, AEA - 0101	C-938/9th Floor, Tower No. 10, River Heights, Raj Nagar Extention, Ghaziabad, Uttar Pradesh - 201003 Mob. No. 9868970770, 9868984904 Phone No. 1202875938 Email: ashu_sharma@rediffmail.com

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76	M/s Energo Construction Ltd.	Mr. H. S. Bedi, AEA-0113	51, Okhla Industrial Area Phase - III, New Delhi - 110020 Phone No. 011 68133200 Mob. No. 09810578904 Email. Id: bedi.hs@energoconstruction.com singh.dinesh@energoconstruction.com
77	M/s Operative Save Urja Solutions Pvt. Ltd.	Mr. Vishal Goyal, AEA- 0299	C-611, Sector - 1, Avantika, Rohini, New Delhi - 110085 Mob. No. 8447401115 Email. Id: saveurjasolutions@gmail.com info@saveurjasolutions.co.in
78	M/s Ensave Consultancy and Training Pvt. Ltd.	Dr. P. Dharmalingam, AEA - 0091	B-4, 2nd Cross 3rd Main Road, Nolambur TNHB Scheme Phase - I, Mogappair West, Chennai - 600037 Phone - 044-43551245 Mob. No. - 9444177914 Email Id - pdlingam@gmail.com ensaveconsultants@gmail.com
79	M/s Audittech Industrial Services Private Limited	Mr. Rakesh Khichariya, AEA - 0295	Shop no. 135, First Floor, Golden Trade Centre, New Rajendra Nagar, Raipur - 492001 Phone - 9827411444 Mob. No. 9827143100 8103651115 Email Id: rakeshkhichariya@gmail.com aashishbbl@gmail.com aispl.rpr@gmail.com
80	M/s Ingenius Energy Consultancy Private Limited	Mr. Ameet Jain, AEA - 0280	57/10, Near Nagar East, Street No. 9, Near Jain Mandir, Bhilai - 490020, Chhattisgarh Mob. No. 9827474040, 7000454505, 8319661725, 9981900123, 8319653798 Email - ameejain07@gmail.com
81	M/s Vodaluft Energy Technicks	Mr. S Arul Mohan, AEA - 0050	No. 73, Jasmine House, Tass Industrial Estate, Ambattur, Chennai - 600098 Phone: 044-26357925/7/8 Mob. No. 9840630106 Email: vodluftenergy@gmail.com sudhir.energy@vslprayag.com arulmohanswami@gmail.com
82	M/s Master Consultancy & Productivity Pvt. Ltd.	Mr. R. A. Sharma, AEA - 0024	7 & 8, Tirumala Commercial Complex, Paradise Circle, Opp: South Indian Bank, S.D. Road, Secunderabad - 500003 (T.S.) India Phone: 27810214, 27815288, 27818831 Mob. No. 9247422448 Email: masteriso7k@yahoo.co.uk rasmcppl@gmail.com
83	M/s Greenserve Energy Management Solutions	Mr. T. N. Agrawal, AEA - 0089	C/o Rahul Agrawal, Vijay Nagar, Near Saraswati Vidyapeeth school, Durg (C. G.)

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(ix)	Total Normalized Energy Consumption (Thermal+Electrical)	TOE		
(x)	Total Normalized Emission (Thermal+Electrical)	TCO ₂		
D	Specific Energy Consumption Details			
7. i	Specific Energy Consumption (Without Normalization)	TOE/tcs	0	0.0000
ii	Specific Energy Consumption (Normalized)	TOE/tcs	NA	0.00
iii	Specific GHG Emissions (Without Normalization)	TCO ₂ /tcs	0	0.0000
iv	Specific GHG Emissions (Normalized)	TCO ₂ /tcs	NA	0.00
E	Power Plants notified as Designated Consumer			
8. i.	Total Capacity	MW		
ii	Unit Configuration	No. of units with their capacity		
iii	Annual Gross Generation	MU		
iv	Annual Plant Load Factor (PLF)	%		
v	Station Gross Design Heat Rate	kcal/kWh		
vi	Station Gross Operative Heat Rate	kcal/kWh		
vii	Auxiliary Power Consumption	%		
viii	Operative Net Heat Rate	kcal/kWh		
ix	Operative Net Heat Rate (Normalized)	kcal/kWh		
F	Sector-Wise Details			
S.No	Name of the Sector	Sub-Sector	Pro-forma in which the details to be furnished	
a	Aluminium	Refinery/Smelter	Sa ₁	
		Cold Rolling Sheet	Sa ₂	
b	Cement	Cement	Sb	
c	Chlor-Alkali	Chlor-Alkali	Sc	
d	Fertilizer	Fertilizer	Sd	
e	Iron and Steel	Integrated Steel	Se ₁	
		Sponge Iron	Se ₂	
f	Pulp and Paper	Pulp and Paper	Sf	
g	Textile	Composite	Sg ₁	
		Fiber	Sg ₂	
		Spinning	Sg ₃	
		Processing	Sg ₄	
h	Thermal Power Plant	Thermal Power Plant	Sh	

Form-Se1 (Details of Energy Consumption)						
Item	Direct / Credit Emission Factor	Unit	Upstream Emission Factor	Unit	Reference	
Default values of Solid Fuel						
1	EAF Coal		t CO2 / Gcal	NA		
2	All other Coal		t CO2 / Gcal	NA		
3	Coke		t CO2 / Gcal		t CO2 / t coke	
Default values of Liquid Fuel						
4	Furnace Oil / LSHS / HSHS		t CO2 / Gcal	NA		
5	HSDO / Diesel / LDO		t CO2 / Gcal	NA		
6	Coal Chemicals		t CO2 / kl coal chemicals	NA		
Default values of Gaseous Fuel						
7	LNG / NG		t CO2 / Gcal	NA		
8	LPG / Propane		t CO2 / Gcal	NA		
9	Coke Oven Gas (Direct)		t CO2 / Gcal	NA		
10	Corex Gas (Direct)		t CO2 / Gcal	NA		
11	Blast Furnace Gas (Direct)		t CO2 / Gcal	NA		
12	LD Gas (Direct)		t CO2 / Gcal	NA		

S. No.	Section-wise parameters cover CO2 emission	Unit	Year-1	Year-2
1	SGE of Coke Oven Plant	t CO2 /tcs		
2	SGE of Purchased Coke	t CO2 /tcs		
3	SGE of Pellet Plant	t CO2 /tcs		
4	SGE of Purchased Pellet	t CO2 /tcs		
5	SGE of Sinter Plant	t CO2 /tcs		
6	SGE of Purchased Sinter	t CO2 /tcs		
7	SGE of Gas-based HBI/DRI Plant	t CO2 /tcs		
8	SGE of Purchased Gas-based HBI/DRI	t CO2 /tcs		
9	SGE of Coal-Based HBI/DRI Plant	t CO2 /tcs		
10	SGE of Purchased Coal-based HBI/DRI	t CO2 /tcs		
11	SGE of Light Structural Mill	t CO2 /tcs		
12	SGE of Plate Mill	t CO2 /tcs		
13	SGE of Hot Strip Mill	t CO2 /tcs		
14	SGE of Compact Strip Mill	t CO2 /tcs		
15	SGE of Cold Rolling Mill	t CO2 /tcs		
16	SGE of Corex Plant	t CO2 /tcs		
17	SGE of Blast Furnace Plant	t CO2 /tcs		
18	SGE of Purchased Iron (Pig /Granulated Pig /Skull)	t CO2 /tcs		
19	SGE of Calcining Plant	t CO2 /tcs		
20	SGE of Purchased Calcined Lime	t CO2 /tcs		
21	SGE of Purchased Calcined Dolomite	t CO2 /tcs		
22	SGE of Steel Melting & Casting Plant	t CO2 /tcs		

S. No.	Section-wise parameters cover CO2 emission	Unit	Year-1	Year-2
23	SGE component of Losses	t CO2 /tcs		
24	Specific Green House Gas Emission	t CO2 /tcs		

Form A (Performance Assessment Document)

1	Name of designated consumer		
2.	Registration number		
3.	Sector		
4.	Sub-sector		
5.	Accredited Energy Auditor		
a	Name of the Empanelled Accredited Energy Auditor Firm		
b	Registration number of Firm		
6.	List of documents submitted (Attach a copy self-attested by the Energy Manager and countersigned by Accredited Energy Auditor)		
a.	Baseline data	Submitted/Not submitted	Date of submission
b.	Form 1 of Rules, 2007 or Rules, 2008 () Specify the year in the bracket	Submitted/Not submitted	Date of submission
c.	Form 1 of Rules, 2007 or Rules, 2008 () Specify the year in the bracket	Submitted/Not submitted	Date of submission
d.	Form 1 of Rules, 2007 or Rules, 2008 () Specify the year in the bracket	Submitted/Not submitted	Date of submission
e.	Form 2 of Rules, 2008	Submitted/Not submitted	Date of submission
f.	Form 3 of Rules, 2008	Submitted/Not submitted	Date of submission
7.	Specific energy consumption		
a.	Specific energy consumption (baseline) as notified		toe/tonne or Net Heat Rate, kcal/kWh or Energy Performance Index, as specified for a particular sector
b.	Production (baseline) as notified		Tonne or Million kWh
c.	Target specific energy consumption (SEC) as Notified		toe/tonne or Net Heat Rate, kcal/kWh or Energy Performance

			Index, as specified for a particular sector
d	Difference between Baseline specific energy consumption (SEC) and Target specific energy consumption (SEC) as notified		toe/tonne or Net Heat Rate, kcal/kWh or Energy Performance Index, as specified for a particular sector (a-c)
e	Normalised specific energy consumption (Achieved in the target year)		toe/tonne or Net Heat Rate, kcal/kWh or Energy Performance Index, as specified for a particular sector
f	Energy savings certificates to be issued or deficit		Nos [(c-e)xb] or [(c-e)xb]/10

8. Energy Efficiency Project implemented during current cycle (Mention cycle period:)

S. No	Project	Year of Implementation	Annual Energy Savings in Lakh kWh	Annual Energy Saving in toe*	Annual Energy consumption (before) in toe	Annual Energy consumption (after) in toe	Energy cost (Rs per kWh or toe)	Investment (Rs crores)
a.								
b.								
c.								
d.								
e.								

*Please indicate the weighted average Gross Calorific Value (GCV) of coal considered for calculation of toe: kcal/kg.

Annexure V – Methodologies under CDM

In Clean Development Mechanism (CDM), the methodologies are categorized into four groups for all 15 sectoral scopes.

1. Approved large Scale methodologies
2. Approved small-scale methodologies
3. Approved large-scale Afforestation and reforestation methodologies
4. Approved small-scale afforestation and reforestation methodologies

The following table gives the sectoral-wise methodology availability in CDM. It is also possible that one methodology can apply to multiple sectoral scopes based on the type of project.

Sectoral scope no.	Sectoral scope	Type	Number of applicable methodologies
1	Energy industries (renewable-/ Non-renewable sources)	Renewable Energy	33
		Low carbon electricity	7
		Energy efficiency	21
		Fuel/feedstock switch	12
2	Energy Distribution	Renewable energy	5
		Energy efficiency	7
		Fuel/feedstock switch	3
3	Energy Demand	Renewable energy	2
		Energy efficiency	34
		Fuel/feedstock switch	5
4	Manufacturing Industry	-	39
5	Chemical Industry	-	23
6	Construction	-	1
7	Transportation	-	22
8	Mining/mineral production	-	7
9	Metal Production	-	9
10	Fugitive emissions from fuel (solid, oil, and gas)	-	11
11	Fugitive emissions from production and consumption	-	12

	of halocarbons and SF ₆		
12	Solvent Use	-	-
13	Waste handling and disposal	-	23
14	Afforestation and Reforestation	-	4
15	Agriculture	-	10

Draft for Discussion

Annexure VI – Designated Operational Entities under CDM

The list of active DOEs is provided below: (refer to Sectoral Scope serial number from annexure IV)

Ref. Number	Entity	Sectoral scopes for validation	Sectoral scopes for verification and certification
E-0001	Japan Quality Assurance Organisation (JQA)	1, 3-5, 10, 13, 14	1, 3-5, 10, 13, 14
E-0005	TÜV SÜD South Asia Private Limited (TÜV SÜD)	1, 3-5, 7, 10, 11, 13-15	1, 3-5, 7, 10, 11, 13-15
E-0006	Deloitte Tohmatu Sustainability, Co., Ltd. (DTSUS)	1-3, 5, 10, 12, 13, 15	1-3, 5, 10, 12, 13, 15
E-0009	Bureau Veritas India Pvt. Ltd. (BVI)	1-5, 7-10, 12-15	1-5, 7-10, 12-15
E-0011	Korea Energy Agency (KEA)	1, 3-5, 7, 9, 11-15	1, 3-5, 7, 9, 11-15
E-0016	ERM Certification and Verification Services Limited (ERM CVS)	1, 3-5, 8-10, 13	1, 3-5, 8-10, 13
E-0020	GHD Limited (GHD)	1, 4, 5, 8-10, 12, 13	1, 4, 5, 8-10, 12, 13
E-0021	AENOR INTERNACIONAL, S.A.U. (AENOR)	1-15	1-15
E-0022	TÜV NORD CERT GmbH (TÜV NORD)	1-16	1-16
E-0024	Colombian Institute for Technical Standards and Certification (ICONTEC)	1-3, 7, 13, 14	1-3, 7, 13, 14
E-0025	Korean Foundation for Quality (KFQ)	1-5, 9, 11, 13, 15	1-5, 9, 11, 13, 15
E-0032	LGAI Technological Center, S.A. (LGA Tech. Center S.A)	1, 3, 13	1, 3, 13
E-0034	China Environmental United Certification Center Co., Ltd. (CEC)	1-15	1-15
E-0037	RINA Services S.p.A. (RINA)	1-7, 9-11, 13-15	1-7, 9-11, 13-15
E-0039	Korean Standards Association (KSA)	1-5, 9, 10, 13-15	1-5, 9, 10, 13-15
E-0044	China Quality Certification Center (CQC)	1-15	1-15
E-0046	China Classification Society Certification Co., Ltd. (CCSC)	1-10, 13, 14	1-10, 13, 14
E-0047	CEPREI certification body (CEPREI)	1-5, 8-10, 13, 15	1-5, 8-10, 13, 15
E-0051	KBS Certification Services Pvt. Ltd (KBS)	1-5, 7-10, 12-15	1-5, 7-10, 12-15
E-0052	Carbon Check (India) Private Ltd. (Carbon Check)	1, 3-5, 9, 10, 13, 14	1, 3-5, 9, 10, 13, 14

Ref. Number	Entity	Sectoral scopes for validation	Sectoral scopes for verification and certification
E-0054	Re Carbon Gözetim Denetim ve Belgelendirme Limited Sirketi (Re Carbon)	1-3, 13, 15	1-3, 13, 15
E-0056	Korea Testing & Research Institute (KTR)	1, 3-5, 11, 13	1, 3-5, 11, 13
E-0061	Shenzhen CTI International Certification Co., Ltd (CTI)	1-15	1-15
E-0062	EPIC Sustainability Services Pvt. Ltd. (EPIC)	1-16	1-16
E-0065	China Testing & Certification International Group Co., Ltd. (CTC)	1-6, 9-11, 13-16	1-6, 9-11, 13-16
E-0066	Earthood Services Private Limited (Earthood)	1, 3-7, 9, 10, 13-15	1, 3-7, 9, 10, 13-15
E-0067	China Certification Center, Inc. (CCCI)	1-15	1-15
E-0069	4K Earth Science Private Limited (4KES)	1-3, 5, 6, 12-15	1-3, 5, 6, 12-15

Annexure VII –Gazette Notification for Constitution of Apex Committee for implementation of Paris Agreement (AIPA)

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पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 27 नवम्बर, 2020

का.आ. 4259(अ).—भारत जलवायु परिवर्तन संबंधी संयुक्त राष्ट्र ढांचा अभिसमय (यूएनएफसीसीसी) का एक पक्षकार देश है और इस अभिसमय का उद्देश्य वायुमंडल में ग्रीन हाउस गैस की सांद्रताओं का स्थिरीकरण इस स्तर तक हासिल करना है जिससे जलवायु प्रणाली में खतरनाक मानव-जनित हस्तक्षेप की रोकथाम हो पाए;

और, भारत ने जलवायु परिवर्तन संबंधी संयुक्त राष्ट्र ढांचा अभिसमय के अधीन क्योटो प्रोटोकॉल और क्योटो प्रोटोकॉल में किए गए दोहा संशोधन का अनुसमर्थन किया है और वर्ष 2003 में राष्ट्रीय सीडीएम प्राधिकरण (एनसीडीएमए) का गठन किया है;

और, भारत ने, विभिन्न राष्ट्रीय परिस्थितियों के आलोक में, साम्या एवं साझा सिद्धांतों किंतु भिन्न-भिन्न उत्तरदायित्वों और संबंधित क्षमताओं के अनुसार अभिसमय के कार्यान्वयन को बढ़ाने हेतु पेरिस समझौते का अनुसमर्थन किया है;

और, भारत ने वर्ष 2020 के पश्चात् की अवधि में पेरिस समझौते के कार्यान्वयन हेतु वर्ष 2015 में अपना राष्ट्रीय स्तर पर निर्धारित योगदान (एनडीसी) प्रस्तुत किया है; एनडीसी में आठ लक्ष्य निर्धारित किए गए हैं जिनमें तीन परिमाणात्मक लक्ष्य शामिल हैं अर्थात् वर्ष 2030 तक सकल घरेलू उत्पाद (जीडीपी) की उत्सर्जन तीव्रता को वर्ष 2005 के स्तर से 33 से 35 प्रतिशत तक कम करना; वर्ष 2030 तक नैर-जीवाश्म ईंधन आधारित ऊर्जा संसाधनों से लगभग 40 प्रतिशत समेकित विद्युत ऊर्जा की संस्थापित क्षमता हासिल करना; और वर्ष 2030 तक अतिरिक्त वन और वृक्षावरण के माध्यम से 2.5 से 3 बिलियन टन कार्बन डाइ-ऑक्साइड के समतुल्य अतिरिक्त कार्बन सिंक सृजित करना;

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(1)

और, पेरिस समझौते के बाजार, गैर-बाजार और स्वैच्छिक दृष्टिकोणों से संबंधित अनुच्छेद 6 के कार्यान्वयन हेतु क्योटो प्रोटोकॉल के अधीन गठित राष्ट्रीय सीडीएम प्राधिकरण (एनसीडीएमए) का अधिक्रमण करने के लिए एक अंतर-मंत्रालयी समिति का गठन आवश्यक है;

और, पेरिस समझौते में वर्ष 2020 के पश्चात् की अवधि के लिए नई पद्धतियों, प्रक्रियाओं और दिशा-निर्देशों (एमपीजी) के साथ 'संवर्धित पारदर्शिता ढांचा' की परिकल्पना की गई है, जो मौजूदा निगरानी, समीक्षा और सत्यापन (एमआरवी) प्रणाली को अधिक्रमित करेगा;

और, पेरिस समझौते के अधीन, वर्ष 2023 से पहली समीक्षा आरंभ करके प्रत्येक पांच वर्षों पर आवधिक रूप से इस समझौते के कार्यान्वयन का जायजा लेने और इस समझौते के प्रयोजन और इसके दीर्घ-कालिक लक्ष्यों को हासिल करने की दिशा में हुई सामूहिक प्रगति का आकलन करने हेतु 'वैश्विक समीक्षा' की प्रक्रिया स्थापित की गई है;

और केंद्रीय सरकार जलवायु परिवर्तन संबंधी मामलों पर सामूहिक कार्रवाई सुनिश्चित करने के प्रयोजन से पेरिस समझौते के कार्यान्वयन हेतु एक शीर्ष समिति गठित करना आवश्यक और समीचीन समझती है, जिससे देश के हितों की सुरक्षा हो और यह सुनिश्चित हो कि भारत पेरिस समझौते के अधीन अपने प्रस्तुत किए गए एनडीसी सहित जलवायु परिवर्तन संबंधी अपने दायित्वों को पूरा करने की दिशा में अग्रसर है।

अतः अब, केंद्रीय सरकार पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (3) के अधीन प्रदत्त शक्तियों का प्रयोग करते हुए, 'पेरिस समझौते के कार्यान्वयन हेतु शीर्ष समिति (एआईपीए)' गठित करती है, जिसका गठन निम्नलिखित है:-

- | | |
|--|-------------|
| 1. सचिव, पर्यावरण, वन और जलवायु परिवर्तन | अध्यक्ष; |
| 2. अपर सचिव, पर्यावरण, वन और जलवायु परिवर्तन | उपाध्यक्ष; |
| 3. अपर महानिदेशक (वन), पर्यावरण, वन और जलवायु परिवर्तन | सदस्य; |
| 4. संयुक्त सचिव, वित्त मंत्रालय | सदस्य; |
| 5. संयुक्त सचिव, कृषि और किसान कल्याण मंत्रालय | सदस्य; |
| 6. संयुक्त सचिव, विज्ञान और प्रौद्योगिकी मंत्रालय | सदस्य; |
| 7. संयुक्त सचिव, नवीन और नवीकरणीय ऊर्जा मंत्रालय | सदस्य; |
| 8. संयुक्त सचिव, जलशक्ति मंत्रालय | सदस्य; |
| 9. संयुक्त सचिव, विद्युत मंत्रालय | सदस्य; |
| 10. संयुक्त सचिव, पृथ्वी विज्ञान मंत्रालय | सदस्य; |
| 11. संयुक्त सचिव, स्वास्थ्य और परिवार कल्याण मंत्रालय | सदस्य; |
| 12. संयुक्त सचिव, आवासन और शहरी कार्य मंत्रालय | सदस्य; |
| 13. संयुक्त सचिव, ग्रामीण विकास मंत्रालय | सदस्य; |
| 14. संयुक्त सचिव, विदेश मंत्रालय | सदस्य; |
| 15. संयुक्त सचिव, वाणिज्य और उद्योग मंत्रालय | सदस्य; |
| 16. संयुक्त सचिव स्तर के अधिकारी, नीति आयोग | सदस्य; |
| 17. संयुक्त सचिव, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय | सदस्य सचिव; |
2. पेरिस समझौते के कार्यान्वयन हेतु शीर्ष समिति (एआईपीए) निम्नलिखित कार्यों का निष्पादन करेगी, अर्थात्:-
- उपर्युक्त अधिनियम की धारा 3 की उप-धारा (2) के खंड (i), खंड (ii) और खंड (iii) में निर्दिष्ट मामलों के संबंध में उपाय सुझाएगी और उसकी धारा 5 के अधीन निर्देश जारी करेगी;

- ii. एनडीसी के संबंध में यूएनएफसीसीसी को किए जाने वाले संप्रेषण और रिपोर्टिंग में समन्वय स्थापित करेगी;
 - iii. भारत के एनडीसी लक्ष्यों को प्राप्त करने लिए संबंधित मंत्रालयों की जिम्मेदारियों को निर्धारित करेगी तथा पेरिस समझौते की आवश्यकताओं को पूरा करने के लिए जलवायु परिवर्तन संबंधी लक्ष्यों की निगरानी, समीक्षा और पुनरावलोकन हेतु अद्यतन आवधिक सूचना प्राप्त करेगी;
 - iv. भारत के जलवायु परिवर्तन संबंधी कार्यक्रमों को उनके अंतर्राष्ट्रीय दायित्वों के अनुरूप बनाने के लिए, यदि आवश्यक हो, तो नीतियां और कार्यक्रम विकसित करेगी;
 - v. पेरिस समझौते के संबंधित पारदर्शिता कार्य-ढांचे के अधीन आवश्यकताओं के अनुसार, राष्ट्रीय सूची प्रबंधन प्रणाली (एनआईएमएस) के लिए निगरानी, रिपोर्टिंग और सत्यापन (एमआरवी) नवाचार विकसित करेगी;
 - vi. यूएनएफसीसीसी को राष्ट्रीय संप्रेषणों, द्विवार्षिक अद्यतन रिपोर्टों और द्विवार्षिक पारदर्शिता रिपोर्टों के संप्रेषण में समन्वय स्थापित करेगी;
 - vii. वर्ष 2020 के पश्चात् की अवधि में पेरिस समझौते के अनुच्छेद 6.2, अनुच्छेद 6.4 और अनुच्छेद 6.8 के अधीन भारत में कार्बन के बाजार को विनियमित करने के लिए राष्ट्रीय प्राधिकरण के रूप में कार्य करेगी;
 - viii. पेरिस समझौते के अनुच्छेद 6 के अधीन परियोजनाओं या कार्यक्रमों पर विचार करने के लिए दिशा-निर्देश तैयार करेगी;
 - ix. कार्बन का मूल्य-निर्धारण, बाजार तंत्र और इसी प्रकार की अन्य प्रक्रियाओं, जिनका जलवायु परिवर्तन और एनडीसी पर असर पड़ता है, के संबंध में दिशा-निर्देश जारी करेगी;
 - x. पेरिस समझौते के अधीन आवश्यकतानुसार अनुकूलन संप्रेषण प्रस्तुत करने में समन्वय स्थापित करेगी;
 - xi. बढ़ रही आवश्यकताओं की पहचान करेगी और लागत-प्रभावी तरीके से भारत के दायित्वों की उपलब्धियों को सुकर बनाने के लिए तंत्रों का प्रस्ताव करेगी;
 - xii. एनडीसी के लिए मार्ग-दर्शन प्रदान करेगी तथा घरेलू द्विपक्षीय और बहुपक्षीय कार्यक्रमों या परियोजनाओं हेतु उसके लेखांकन के लिए मार्ग-दर्शन प्रदान करेगी और सुनिश्चित करेगी कि ये मंत्रिमंडल के निर्णयों और अंतर्राष्ट्रीय जलवायु परिवर्तन वार्ताओं में भारत की स्थिति के अनुरूप हैं;
 - xiii. जलवायु परिवर्तन से निपटने के लिए निजी क्षेत्र के योगदानों पर ध्यान देगी तथा घरेलू प्राथमिकताओं के साथ उनके कार्यक्रमों को संरेखित करने में मदद के लिए मार्गदर्शन प्रदान करेगी;
 - xiv. स्वतंत्र अनुसंधान और विश्लेषणात्मक अध्ययनों को आरंभ करेगी और उनकी सिफारिश करेगी तथा उपर्युक्त मुद्दों के संबंध में क्षमता संवर्धन और प्रशिक्षण कार्यक्रमों की योजना बनाएगी;
 - xv. जलवायु परिवर्तन संबंधी प्रधानमंत्री काउंसिल (पीएमसीसीसी) से मार्गदर्शन प्राप्त करेगी और उन्हें सूचना प्रदान करेगी; तथा
 - xvi. यूएनएफसीसीसी और इसके पेरिस समझौते के अधीन आवश्यकतानुसार कोई अन्य मामला।
3. एआईपीए का सदस्य सचिव समिति के दिन-प्रतिदिन के कार्यक्रमों के लिए उत्तरदायी होगा, जिनमें कार्यक्रमों में समन्वय स्थापित करने हेतु उप-समूह गठित करना और विशेषज्ञों के माध्यम से या उपर्युक्त प्राधिकरण द्वारा विचारार्थ संगठनों से परामर्श करके जलवायु परिवर्तन संबंधी मुद्दों की विस्तृत जांच करना या किसी परामर्शदाता या विशेषज्ञ को ऐसे पारिश्रमिक पर, जो केंद्रीय सरकार द्वारा अनुमोदित किया जाए, संविदा के आधार पर नियोजित करना या भाड़े पर लेना शामिल है।
 4. पेरिस समझौते के कार्यान्वयन हेतु गठित शीर्ष समिति (एआईपीए) को:
 - (क) सरकार, वित्तीय संस्थानों, विश्वविद्यालयों, शैक्षिक संस्थानों, परामर्शदाता संगठनों, गैर-सरकारी संगठनों, सिविल सोसाइटी, विधिक वृत्ति, उद्योग और वाणिज्य क्षेत्र के अधिकारियों एवं विशेषज्ञों को, जैसा वह आवश्यक समझे, तकनीकी एवं पेशेवर जानकारी प्रदान करने हेतु आमंत्रित करने तथा आवश्यकता के आधार पर अन्य सदस्यों को सह-योजित करने;

- (ख) जलवायु परिवर्तन से संबंधित मामलों के लिए संबंधित प्राधिकरणों, संस्थानों, वैयक्तिक हितधारकों के साथ विचार-विमर्श करने;
- (ग) जलवायु परिवर्तन से संबंधित किसी पर्यावरणीय या संवहनीय विकास मुद्दे, जो केंद्रीय सरकार द्वारा उसे अंग्रेपित किया जाए, पर कार्रवाई करने; और
- (घ) जलवायु परिवर्तन से संबंधित मामलों पर केंद्रीय सरकार को संस्तुतियां प्रदान करने की शक्ति होगी।
5. पेरिस समझौते के कार्यान्वयन हेतु गठित शीर्ष समिति (एआईपीए) अपने कार्यकलाप के विषय में कम से कम छः माह में एक बार केंद्रीय सरकार को रिपोर्ट प्रस्तुत करेगी।

[फा. सं. सीसी-13008/55/2019-सीसी]

ऋचा शर्मा, संयुक्त सचिव (जलवायु परिवर्तन)

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
NOTIFICATION

New Delhi, the 27th November, 2020

S.O. 4259(E).—Whereas, India is a Party to the United Nations Framework Convention on Climate Change (UNFCCC) and the objective of the Convention is to achieve stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system;

And whereas, India has ratified the Kyoto Protocol and the Doha Amendment to the Kyoto Protocol under the United Nations Framework Convention on Climate Change and constituted the National CDM Authority (NCDMA) in 2003;

And whereas, India has ratified the Paris Agreement to enhance the implementation of the Convention in accordance with the principles of equity and common but differentiated responsibilities and respective capabilities, in the light of different national circumstances;

And whereas, India has submitted its Nationally Determined Contribution (NDC) in 2015 for implementation of the Paris Agreement in the post-2020 period; the NDC has eight goals including three quantitative goals viz. reduction in the emissions intensity of Gross Domestic Product (GDP) by 33 to 35 per cent by 2030 from 2005 level; achieving about 40 per cent cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030; and creating an additional carbon sink of 2.5 to 3 billion tonnes of carbon dioxide equivalent through additional forest and tree cover by 2030;

And whereas, implementation of Article 6 of the Paris Agreement dealing with market, non-market and voluntary approaches, necessitate an inter-ministerial committee to supersede the National CDM Authority (NCDMA) constituted under the Kyoto Protocol;

And whereas, Paris Agreement envisages an 'enhanced transparency framework' with new modalities, procedures and guidelines (MPG) for the post-2020 period which will supersede the existing Monitoring, Review and Verification (MRV) system;

And whereas, Paris Agreement establishes process of 'Global Stocktake' to periodically take stock of the implementation of this Agreement and assess the collective progress towards achieving the purpose of this Agreement and its long-term goals every five years with first in 2023;

And whereas, the Central Government considers it necessary and expedient to constitute an Apex Committee for Implementation of Paris Agreement (AIPA) for the purpose of ensuring a coordinated response on climate change matters that protects the country's interests and ensures that India is on track towards meeting its climate change obligations under the Paris Agreement including its submitted NDCs.

Now, therefore in exercise of the powers conferred under sub-section (3) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby constitutes the 'Apex Committee for Implementation of Paris Agreement (AIPA)' with the following composition:-

[भाग II—खण्ड 3(ii)]	भारत का राजपत्र : अध्याचारण	5
1.	Secretary, Ministry of Environment, Forest and Climate Change	Chairperson;
2.	Additional Secretary, Ministry of Environment, Forest and Climate Change	Vice-Chairperson;
3.	Additional Director General (Forest), Ministry of Environment, Forest and Climate Change	Member;
4.	Joint Secretary, Ministry of Finance	Member;
5.	Joint Secretary, Ministry of Agriculture and Farmers Welfare	Member;
6.	Joint Secretary, Ministry of Science and Technology	Member;
7.	Joint Secretary, Ministry of New and Renewable Energy	Member;
8.	Joint Secretary, Ministry of Jal Shakti	Member;
9.	Joint Secretary, Ministry of Power	Member;
10.	Joint Secretary, Ministry of Earth Sciences	Member;
11.	Joint Secretary, Ministry of Health and Family Welfare	Member;
12.	Joint Secretary, Ministry of Housing and Urban Affairs	Member;
13.	Joint Secretary, Ministry of Rural Development	Member;
14.	Joint Secretary, Ministry of External Affairs	Member;
15.	Joint Secretary, Ministry of Commerce and Industry	Member;
16.	Joint Secretary level Officer, NITI Aayog	Member;
17.	Joint Secretary, Ministry of Environment, Forest and Climate Change	Member Secretary.

2. The Apex Committee for Implementation of Paris Agreement (AIPA) shall exercise and perform the following functions, namely:-

- (i) take measures with respect to matters referred to in the clauses (i), (ii) and (iii) of sub-section (2) of section 3 of the aforesaid Act and may issue directions under section 5 thereof;
- (ii) coordinate communication and reporting of NDCs to UNFCCC;
- (iii) define responsibilities of concerned ministries for achieving India's NDC goals and receive periodic information updates to monitor, review and revisit climate goals to fulfill the requirements of the Paris Agreement;
- (iv) develop policies and programmes, if required, to make India's domestic climate actions compliant with its international obligations;
- (v) develop Monitoring, Reporting and Verification (MRV) protocol for National Inventory Management System (NIMS) as per the requirements under the enhanced Transparency Framework of Paris Agreement;
- (vi) coordinate communication of National Communications, Biennial Update Reports and Biennial Transparency Reports to UNFCCC;
- (vii) function as a National Authority to regulate carbon markets in India, under Article 6.2, Article 6.4 and Article 6.8 of the Paris Agreement in the post-2020 period;
- (viii) formulate guidelines for consideration of projects or activities under Article 6 of the Paris Agreement;

- (ix) issue guidelines on carbon pricing, market mechanism, and similar other instruments that have a bearing on climate change and NDCs;
 - (x) coordinate submission of Adaptation Communication as required under the Paris Agreement;
 - (xi) identify evolving requirements and propose mechanisms to facilitate achievement of India's obligations in a cost-effective manner;
 - (xii) provide guidance to NDCs and its accounting for domestic, bilateral and multilateral activities or projects and ensure that these are compliant with Cabinet decisions and India's position in international climate change negotiations;
 - (xiii) take note of the private sector's contributions for combating climate change and provide guidance to help align their actions with domestic priorities;
 - (xiv) commission and recommend independent research and analytical studies and plan capacity building and training activities on the above issues;
 - (xv) seek guidance from and provide inputs to the Prime Minister's Council on Climate Change (PMCCC); and
 - (xvi) any other matter, as required under UNFCCC and its Paris Agreement.
3. The Member-Secretary of AIPA shall be responsible for day-to-day activities of the Committee including constituting sub-group to coordinate activities and carry out detailed examination of climate change related issues through experts or by consulting organizations for consideration by the aforesaid Authority or to engage or hire any consultant or specialist on contract basis on such remuneration as may be approved by the Central Government.
4. The Apex Committee for Implementation of Paris Agreement (AIPA) shall have power:
- (a) to invite officials and experts from the Government, financial institutions, universities, academic institutions, consultancy organisations, non-Governmental organisations, civil society, legal profession, industry and commerce, as it may deem necessary for technical and professional inputs and may co-opt other members depending upon need;
 - (b) to interact with concerned authorities, institutions, individual stakeholders for matters relating to climate change;
 - (c) to take up any environmental or sustainable development issues pertaining to climate change as may be referred to it by the Central Government, and
 - (d) to provide recommendations to the Central Government on matters related to climate change.
5. The Apex Committee for Implementation of Paris Agreement (AIPA) shall furnish report about its activity at least once in six months to the Central Government.

[F. No. CC-13008/55/2019-CC]

RICHHA SHARMA, Jt. Secy. (Climate Change)



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