

Detailed Procedure for Compliance Mechanism under the Indian Carbon Market, 2023 [draft]

Bureau of Energy Efficiency (BEE) notified draft Detailed Procedure for Compliance Mechanism under the Indian Carbon Market (ICM) on 9th November, 2023. The key highlights of the document are mentioned below: -

- **Objective:** The purpose and vision for the development of ICM is to accelerate decarbonization and meet Nationally Determined Contributions (NDCs) targets.
- **Legal framework:**
 - ICM was established under the Energy Conservation Act, of 2001, and the Environment (Protection) Act, of 1986.
 - The Energy Conservation Act, 2001 empowers the Union Government to specify the Carbon Credit Trading Scheme (CCTS) and emission standards for obligated sectors. The Government of India notified CCTS on June 28, 2023.
- **Compliance mechanism:**

Obligated Entity Definition	Registered entities under the Compliance Mechanism are called 'Obligated Entities'. Here, 'Obligated Entities' are the Designated Consumers by the Central Government.
GHG Emission Intensity Targets	<ul style="list-style-type: none"> • MoEFCC notifies GHG emission intensity targets (tCO₂e per unit of equivalent product) • Annual targets assigned for a three-year trajectory period, subject to revision
Compliance Cycle	<ul style="list-style-type: none"> • Annual Targets - Obligated entities comply with annual targets in each compliance cycle • Revision - Targets are revised at the end of the trajectory period
Issuance of Carbon Credit Certificates (CCC)	<ul style="list-style-type: none"> • Exceeding Targets - Obligated entities receive CCC • Calculation - Based on the difference between achieved and targeted emission intensity for the production quantity
Purchase of CCC	<ul style="list-style-type: none"> • Failing to Achieve Targets - Obligated entities can purchase CCC • Calculation - Based on the difference between achieved and targeted emission intensity for the production quantity

- **GHG emission intensity targets:**

Targets Trajectory	<ul style="list-style-type: none"> • Targets will be considered based on energy consumption intensity, investment requirements, industry capacity and technology availability. • Trajectory developed for each sector • Average rate of reduction across all obligated entities in the sector
Calculation of GHG Emissions	<ul style="list-style-type: none"> • GHG emissions converted to CO₂ equivalent (CO₂e) based on Global Warming Potential (GWP) • Direct and indirect GHG emissions from the obligated entity's establishment • Exclusions specified for certain sources
Excluded Emission Sources	<ul style="list-style-type: none"> • Biomass or biogenic source emissions • Renewable energy sources • Emissions captured or utilized through carbon capture technology • Other excluded sources as per technical committee and NSICM recommendations
Production Calculation	<ul style="list-style-type: none"> • GHG emission intensity calculated based on the main product or equivalent product • Notification requirement in case of production cessation

- **Emission intensity verification:**
 - The intensity of GHG emissions will be calculated from verified data for the baseline year.
 - Emission factors that will be used are described in two types i.e., Type I (default) for the first trajectory period and Type II (actual) for subsequent periods.
- **GHG emission monitoring plan:**
 - Obligated Entity responsible to develop and implement a monitoring plan in collaboration with Accredited Carbon Verification Agency.
 - **Components of the plan**
 - Description of monitored activities, emission sources, and source streams
 - Diagram highlighting metering and sampling points
 - Reference data for traceable and verifiable activity data
 - Procedure for data flow and control activities
 - Sampling procedure for fuel and materials
 - Internal and external testing procedures for fuel and materials
 - Submit the plan to the Bureau within 3 months from the start of a compliance cycle
- **GHG emission calculation methodology:**
Obligated entity shall convert direct and indirect GHG emissions into tCO₂e using standard calculation methodologies as given below:

General guiding principles	<ul style="list-style-type: none"> • Direct energy, non-energy, and indirect energy-related GHG emissions from its boundary • Multiplication of activity data (fuel consumption) by emission factor and oxidation factor
Oxidation factor adjustment	<ul style="list-style-type: none"> • Conversion factors for fuel combustion adjusted with monitored oxidation factor • Default oxidation factor of 1 applied in case of non-availability
Mass balance methodology	<ul style="list-style-type: none"> • Multiply activity data (fuel or material) by carbon content and conversion factor (3.664 t CO₂/t C)
Biogenic emissions	<ul style="list-style-type: none"> • Separate reporting without inclusion in overall emissions
Purchased electricity emissions	<ul style="list-style-type: none"> • Indirect emissions from purchased electricity calculated using CEA's average grid emission factors • Supplier-specific grid emission factors allowed with verified documentation
Non-energy process emissions	<ul style="list-style-type: none"> • Non-energy-related process emissions calculated per formula published or endorsed by the Bureau
Total GHG Emissions Target will be based on Specific GHG Emissions Calculation	
Specific GHG emissions are calculated by dividing total emissions by product output	

- The draft document outlines steps to be followed for monitoring, verification, and check-verification.

- **Issuance of Carbon Credit Certificate (CCC):**

Bureau Verification Report	<ul style="list-style-type: none"> • Bureau submits correct verification report to NSCICM. • Submitted within two months from the last date of Form 'A' submission.
Calculation of Carbon Credits	<ul style="list-style-type: none"> • Formula: Number of certificates = (Notified GHG emission - Achieved GHG emission) × Production.
Certification and Entitlement	<ul style="list-style-type: none"> • Certification that all requirements for issuance are met. • Entitlement certified by accredited carbon verification agency in the verification report.
NSCICM Recommendation	<ul style="list-style-type: none"> • NSCICM recommends Bureau to issue carbon credit certificates within two weeks of receiving the report.
Central Government Approval	<ul style="list-style-type: none"> • Subsequent approval from Central Government required.
Issuance of Carbon Credits	<ul style="list-style-type: none"> • Bureau issues carbon credit certificates to obligated entity within two weeks of Central Government approval.

- **Trading of Carbon Credit Certificates (CCC):**

Obligated Entity Registration	Register on ICM Registry within 4 weeks of CCC issuance.
Registration Process	Submit relevant details and defined fees as per CERC procedure.
Non-Obligated Entity Registration	Non-obligated entities register on ICM Registry for voluntary CCC purchase.
Certificate of Registration	Issued by ICM Registry upon successful registration.
Power Exchange Registration	Obligated and Non-Obligated Entities can register and trade CCC on designated Power Exchanges.
Mandatory Registration	Certificate of Registration mandatory for entities to register with Power Exchanges.
CCC Trading Process	CCC traded on Power Exchanges as per CERC-defined procedure.

- **Banking of Carbon Credit Certificates:**

Banking Process	Completed at the end of each compliance cycle.
Utilization of Banked CCC	Can be sold in the market or used for future compliance.
Origin of Banked CCC	Issued to the Obligated Entity in the previous compliance cycle.
Market Transactions	Banked CCC sold in the Indian Carbon Market.
Usage Limitation	Purchased CCC can only be used for compliance in subsequent cycles.

The documents can be accessed [here](#).

CER Opinions

1. **Issuing Carbon Credits: Incremental Reduction Vs Total Emission Reduction:** The proposed framework provides for issuance of carbon credit for emission reduction beyond the stipulated target. Let us call it Incremental Emission Reduction. **We suggest that carbon credits be issued towards all the emission reduction, wherein that achieved would be surrendered to the nodal agency, the rest (incremental) would be available for trade in the Indian Carbon Market.** This would contribute to liquidity in the carbon market, wherein a designated consumer can sell carbon credits, say in one of the earlier months, and buy it from the market subsequently towards its compliance. **This would have twin advantage – (i) enhancing market liquidity for carbon credits, and (ii) allowing early monetization of emission reduction earlier in a financial year thus improving their cashflow within a year rather than waiting for carbon credits to be traded next year onwards.** This would improve attractiveness of participation in the emission reduction program.
2. **Market-based rather than a compliance-based framework:** The current compliance mechanism proposes an annual target. Consider converting these annual targets into normative quarterly targets for effective monitoring. This would also provide early signals for potential shortage and allow for taking measures to address that shortage within the year (at least for shortages discovered till the third quarter). Further, this would also help enhance liquidity in carbon market. However, overall compliance will still be evaluated based on an annual basis.

This would also enhance participation in the carbon market throughout the year rather than postponing the same to the later months. As mentioned in the comment #1, this would also enhance market liquidity and, provide early cash flow to the obligated entities having complied beyond target.

Since the target trajectory spans three years, obligated entities may be encouraged to achieve targets earlier through suitable investment means, if there are early cash flows associated with the reduction. This flexibility would enable the entity to make investment decisions for emission reduction interventions for the second and third years, contributing to a more strategic and forward-looking approach. This approach can encourage industries to actively participate in emissions reduction activities, fostering a more sustainable and market-driven approach. **The shift towards a market-based approach with carbon trading acting as a business activity instead of limiting to compliance mechanism can enhance the ICM.**

3. **Banking and Rollover of CCC:** To enhance flexibility for obligated entities, it is recommended to allow for limited banking of carbon credits (beyond that required for compliance) and roll-over of the non-complied emission quantum. This will enable entities to carry forward unmet obligations to subsequent periods, providing a more adaptable approach to compliance. Similar suggestions were provided in the context of Renewable Energy Certificate (REC) mechanism, leading to extended validity of the RECs in subsequent amendment to the regulations.

Further Reading:

- Anoop Singh, *A market for renewable energy credits in the Indian power sector, Renewable and Sustainable Energy Reviews, 13(3), April (2009).*
- Anoop Singh, *Economics, Regulation, and Implementation Strategy for Renewable Energy Certificates, in India Infrastructure Report OUP (2010).*
- Singh, Anoop. (2022). Regulatory Insights - CER Newsletter - Volume 05 Issue 02. https://cer.iitk.ac.in/newsletters/regulatory_insights/Volume05_Issue02.pdf

Banking can be implemented by extending the validity of the carbon credits over to the period of compliance (3-years), say up to 10% of the credits beyond the compliance limit, and limited

rollover in case of shortfall, say up to 5% of the target. **Limiting banking and rollover within a compliance period would provide useful flexibility while also ensuring that compliance target for the said period is retained overall.**

4. **Revision of targets:** The existing compliance mechanism's mention of target revision at the end of the trajectory period may be reconsidered. It is advisable to revise targets earlier, preferably at least one year in advance, providing scope for advance planning for the next target year before the trajectory period concludes.
5. **Penalty for non-compliance:** The Energy Conservation Act, 2001 does not currently outline penalties for non-compliance related to the ICM. It is suggested that the penalty for non-compliance be pre-determined by MoEFCC. This determination could be based on a per-ton assessment of excess emissions and a lump-sum amount after reaching the threshold emission level. Additionally, repeated non-compliance by an obligated entity should incur an additional lump-sum amount penalty.
The current compliance mechanism lacks mention of the forbearance prices for newly issued carbon credit certificates (CCCs). Consider setting the penalty at a level that can function as the forbearance price.
6. **Approach to target setting:** When setting targets for emission intensity, it's worth considering multiple approaches such as Data Envelopment Analysis (DEA) other benchmarking methods. This allows for a more comprehensive evaluation and selection of the most suitable approach based on the characteristics and goals of the entities involved. An application of DEA based approach is explained below.
7. **DEA-based target:** Consider adopting an alternative target-setting method based on Data Envelopment Analysis (DEA). This approach accounts for variations in vintage, scale, output mix, input mix, and technical and operational differences across industrial plants. DEA provides a comprehensive framework to set targets that reflect the unique characteristics of each plant, promoting a more nuanced and tailored approach to performance evaluation.

Further reading:

- *Anoop Singh and Bharat Sharma, DEA Based Approach to Set Energy Efficiency Target Under Pat Framework: A Case of Indian Cement Industry (February 2, 2018). Central European Review of Economics and Management, ISSN 2543-9472; eISSN 2544-0365, Vol. 2, No. 1, 103-132, March 2018, Available at SSRN: <https://ssrn.com/abstract=3440444> or <http://dx.doi.org/10.2139/ssrn.3440444>*

For Example: The current compliance framework relies on the intensity of energy consumed as a criterion. However, it is recommended to shift to a system based on relative intensity for target setting. Entities with higher intensity should be assigned higher targets, taking into account the relative intensity difference between different entities during the target-setting process. The draft clause 3.1.(1) "The Central Government in consultation with the Bureau, having regard to the intensity or quantity of energy consumed..." may be rephrased as "The Central Government in consultation with the Bureau, having regard to the **relative intensity** or quantity of energy consumed..."(Emphasis added).

8. **Benchmarking:** The regulatory approach in setting emission intensity target benchmarks¹ for identified obligated entities should convey crucial signals to both the entities and stakeholders like investors and lenders, encouraging a reduction in emission intensity through innovative and efficient

¹ Singh, Anoop. (2021). Regulatory Insights - CER Newsletter - Volume 03 Issue 04. https://cer.iitk.ac.in/newsletters/regulatory_insights/Volume03_Issue04.pdf

operational practices. Introducing a progressive efficiency factor (X) across various components of energy consumption and manufacturing activities can serve this purpose. Initiatives by BEE to establish lower base benchmarks, considering criteria such as energy consumption intensity, investment requirements, industry capacity, and technology availability, are essential. Regularly revisiting existing benchmarks is necessary to prevent potential inflation of targets in subsequent years.

9. **NDC and GHG emission intensity target:** The draft clause 3.4.(1) "The GHG emission intensity reduction trajectory will be developed for the considered sectors based on the: (i) India's nationally determined contribution commitments..." is misaligned with the current compliance mechanism. **The NDC target considers emission intensity in relation to GDP, while the compliance mechanism calculates intensity based on the physical quantity manufactured. It is crucial to ensure the translation of physical quantity and GDP onto the same scale within the compliance mechanism before determining the trajectory.**
10. **Three-year historical data for baseline year:** The utilization of a single year data to set a benchmark may result in an unreliable baseline due to uncertainties associated with production, sales, and energy mix fluctuations. **Using a three-year dataset would be more reliable than relying on a single year.** The draft clause 3.4.(5) "The GHG emissions intensity shall be calculated for the baseline year **from the verified data for that year** and submitted by the obligated entity (emphasis added)" may be rephrased as "The GHG emissions intensity shall be calculated for the baseline year from the verified data for **average of three historical years** and submitted by the obligated entity"(Emphasis added).
11. **Resale of banked CCC:** The mechanism allows for banking of purchased carbon credits, not their sale. This restriction on the resale of purchased CCC reduces liquidity in the CCC market and also hampers flexibility of the obligated entities. This also places accounting challenge wherein each credit would have to be monitored and accounted for based on its origin and history of trade. Allowing the resale of excess CCC ensures that obligated entities, who may have surplus certificates due to improved performance, can trade them effectively.
12. **Streamlined classification of obligated entities:** When collecting verified data w.r.t Annexure V, section A, it is advisable to use the names of sectors and sub-sectors along with their Harmonized System Nomenclature (HSN) and National Industrial Classification (NIC) codes. This approach streamlines the data, making it organized and suitable for academic purposes. This would also allow this to be linked to respective sectors while calculating emission reduction at sectoral and sub-sector level.
13. **Inclusion of inventory and sales data:** In Annexure V, section B, the current production details for verified data solely focus on the total production of various products in tonnes. However, **it's imperative to address scenarios where entities purchase finished products, impacting emission intensity, such as the purchase of clinker by cement industries.** To ensure a comprehensive understanding, **a clear definition of the production boundary is essential**. The verified data should extend beyond production details to incorporate inventory and sales-related data for an accurate estimation of emission intensity.
14. **Electricity consumption boundary:** For the verified data collection of energy consumption details (Annexure V, Section B), additional clarification is needed. It is crucial to clearly **define the energy consumption boundary**. Specifically, **electricity purchased from the market or through open access should be based on the electricity received at the boundary of the obligated entity**. Likewise, electricity generated should be confined within the boundary of the obligated entities for

accurate and transparent reporting. A detailed illustration is shown in Figure 1 below. Furthermore, it is suggested to include the collection of energy storage-related data as part of the verified data. This addition is deemed relevant due to **greater deployment of energy storage technologies in future**.

15. **Classification of fuel consumption:** The fuel consumption data to be collected as verified data should undergo further classification. Specifically, **solid fuel consumption data should be separated into fossil and biomass categories**. It is recommended to subtract the biomass fuel used as solid fuel from the total fuel consumption. Furthermore, it is advised to account for the export of solid fuels and liquid fuels by subtracting these quantities. The data related to **fuel trading and fuel stock** is of utmost importance. Additionally, for both solid and liquid fuel, providing details such as the **grade and caloric value of the fuel used** is essential. This refined data classification will not only enhance accuracy but also prove valuable for subsequent target-setting and research purposes.
16. **Thermal energy consumption:** In the context of Annexure V, where data related to total thermal consumption is collected, it's important to acknowledge scenarios of certain large entities in industrial areas where an industrial plant may export steam to other nearby plants.
17. **Pre-defined normalization criterion:** The draft document mentions the normalization of verified data in Annexure V, Section B, Sub-Section 5.1, 5.3, 5.5.1, 5.5.2, and 5.6. However, **it fails to elucidate the necessity and methodology for normalization, resulting in uncertainty in target setting and allowing for subjective interpretation**. For the verified data collected according to Annexure V, where energy and emission-related data is required both with normalization and without normalization, it's essential to **establish pre-defined criteria for normalization in the compliance mechanism**. The normalization formula should be defined before target setting, providing a clear basis for the process. This pre-defined approach ensures transparency and prevents potential adjustments by obligated entities, promoting accuracy and consistency in energy and emission data.

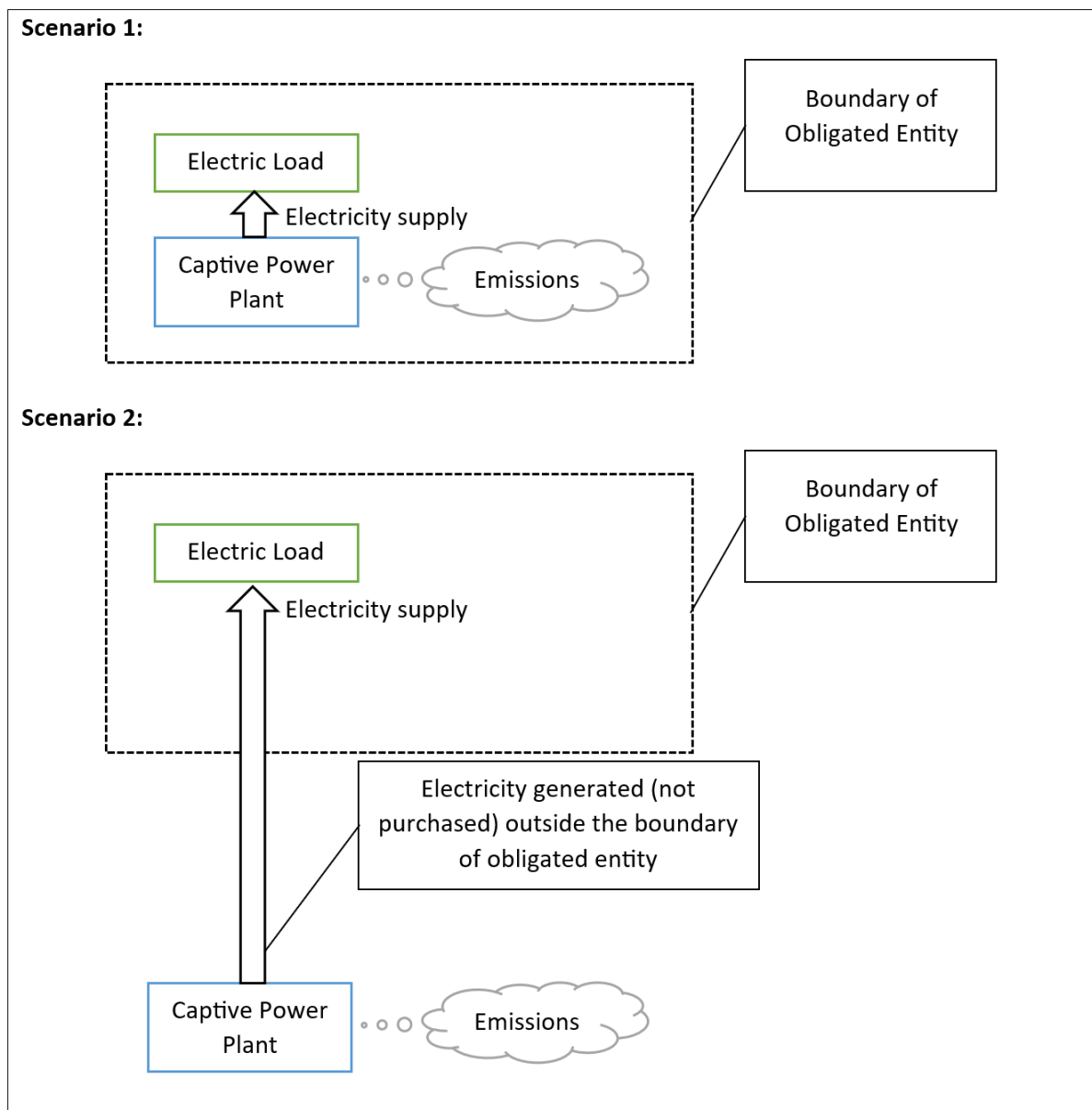


Figure 1: Electricity generated outside the boundary of obligated entity

18. **Solar-rooftop accounting in net energy input:** In the energy input details for distribution companies as designated consumers (Annexure V, Section B, Sub-section 5.4), it is recommended that **the net energy input takes into account solar-rooftop contributions**. The calculation of net energy input should involve subtracting the distributed solar PV based electricity that consumers export through net metering. To ensure accuracy, data from both net metering and gross metering should be considered and made available by distribution companies in the verified data proforma.
19. **Unmetered consumption towards energy accounting :** In the energy input details for distribution companies as designated consumers (Annexure V, Section B, Sub-section 5.4), where the total energy billed is considered, it's crucial to address the absence of billed data for agriculture consumers. As they continue to be charged based on hours of usage², it is recommended to **use the State Electricity Regulatory Commission's approved number of hours**. This approach, through

² Anoop Singh (2006), Power Sector Reform in India: Current Issues and Prospects, Energy Policy, 34(16), 2006

still inaccurate, ensures that the compliance calculations are coherent with those approved by the SERCs and avoids further overestimation of the energy billed for agriculture consumers.

20. **Defining types of areas for accurate interpretation:** In the verified data for commercial buildings as designated consumers (Annexure V, Section B, Sub-section 5.6), where information on total built-up area and gross floor area is collected, it is crucial to provide clear definitions for these data fields. Definitions often vary and can be interpreted differently by stakeholders, and a standardized definition is essential for accurate reporting.
21. **Volumetric measure for air-conditioning:** Moreover, for air-conditioned area data, the current collection in square meters should be reconsidered. Instead, it is recommended **to use volumetric measures such as tons or BTU rating, especially for large hotels with multi-floored lobbies. This adjustment ensures a more accurate representation of the energy load required for cooling larger spaces.**
22. **Other energy footprints of buildings:** In the verified data for commercial buildings, specifically hotels, as designated consumers (Annexure V, Section B, Sub-section 5.6), it appears that electricity consumption data is currently collected only for the building area. It is essential **to broaden the scope of data collection to include other activities that contribute significantly to electricity consumption, such as water treatment, water heating and refrigeration.** This adjustment ensures a more comprehensive understanding of the overall electricity consumption within the designated commercial buildings.
23. **Clarification with specific energy consumption:** The calculation of specific energy consumption by dividing energy consumption with a thousand square meters **lacks clarity regarding which specific area among data-points (5.6(a) (i) to (vii)) is being used for the division.** It is recommended to clearly define the relevant area to ensure consistency and accuracy in calculating specific energy consumption.
24. **Zone-wise target methodology:** Given the varying energy requirements for hotels located in different geographical areas, where some require cooling and others heating, it is advisable to reevaluate the approach for calculating emission intensity and defining targets. Considering a **zone-wise methodology for target-setting could be a more effective approach, accounting for regional variations in energy needs.** This ensures a more tailored and equitable framework for hotels across different geographical zones.
25. **ESCCerts conversion and trading:** The current compliance mechanism overlooks the trading of existing ESCerts under the PAT Scheme. It is recommended to **introduce a provision specifying a cut-off date for the mandatory conversion of existing ESCerts.** Additionally, ensure that newly issued ESCerts in the upcoming cycle are obligatory for trading on the ICM. A cut-off date for ESCerts compliance will provide opportunity to obligated entity to plan ahead with investment decision.