DETAILED PROCEDURE FOR COMPLIANCE MECHANISM UNDER CCTS

- To meet India's enhanced NDC targets, the Government has initiated a framework for the Indian Carbon Market (ICM) to create demand and mobilise emission reduction through public and private entities.
- The Carbon Credit Trading Scheme (CCTS) 2023, notified on 28 June 2023 under the Energy Conservation Act, 2001, establishes a national carbon market to reduce or avoid GHG emissions by pricing emission reductions via carbon credit trading.
- The Energy Conservation Act, 2001, empowers the Government to frame the CCTS and issue Carbon Credit Certificates (CCC), while the Environment (Protection) Act, 1986, allows it to set emission standards for obligated entities.
- Clause 12 of CCTS provides for a detailed operational framework covering:

(i) Criteria for issuing CCCs

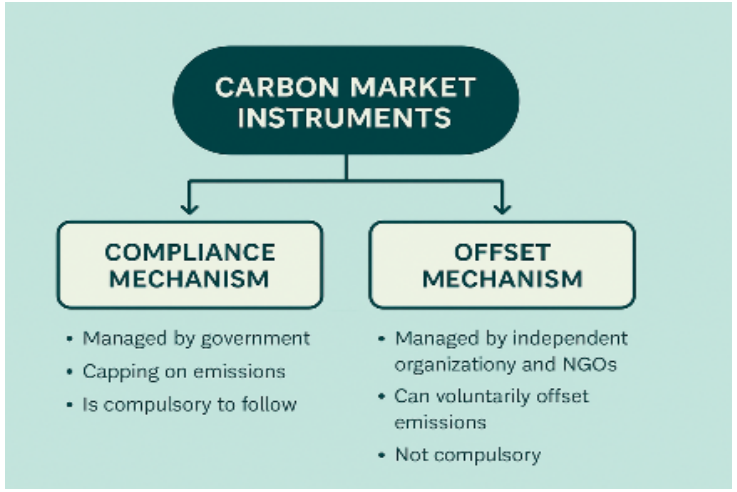
(ii) Validity of CCCs

(iii) Floor and forbearance price

(iv) Submission requirements and timelines

(v) Monitoring, reporting, and verification

(vi) Other related and incidental matters.



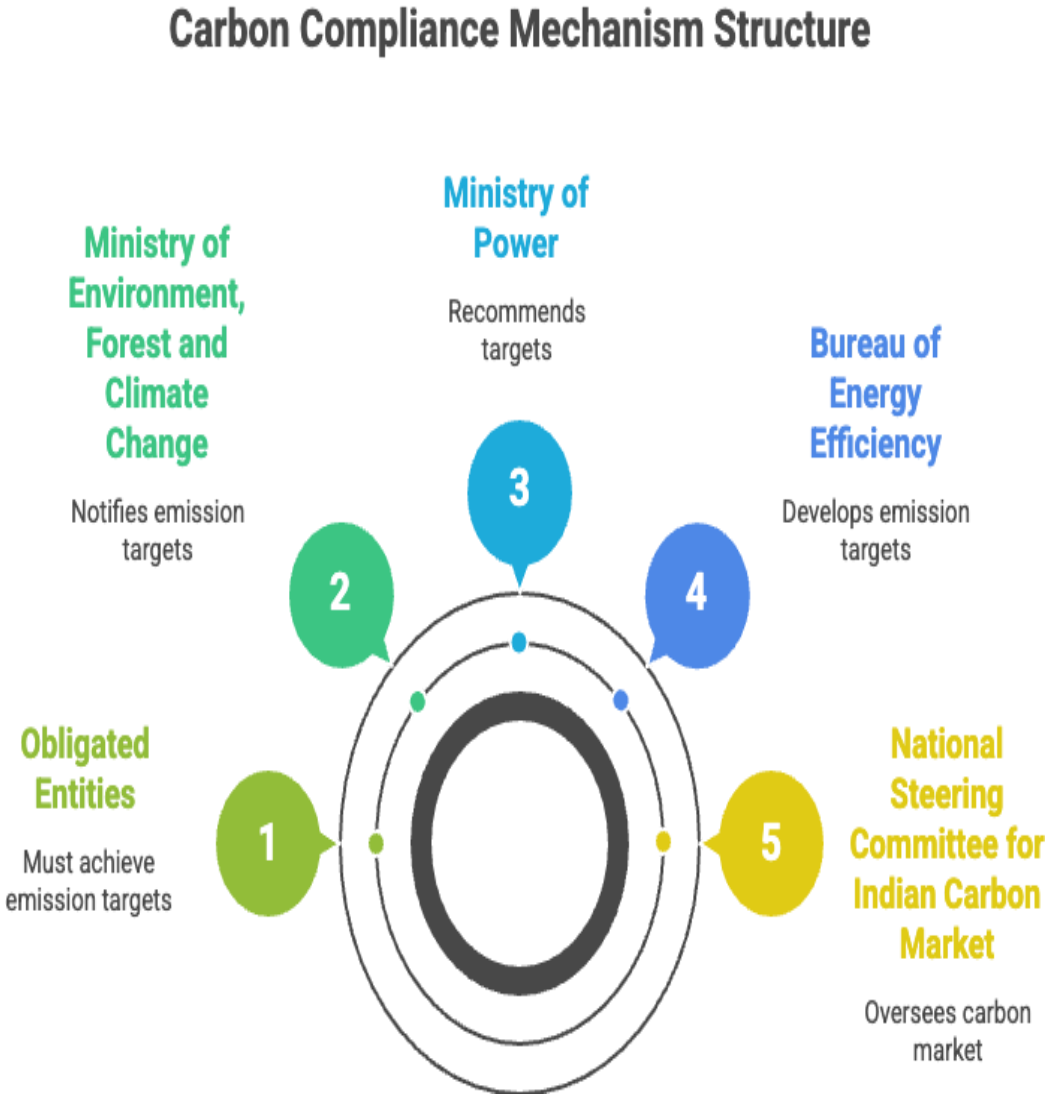
Compliance Mechanism

- Under CCTS, registered entities notified under the mechanism are termed "obligated entities."
- MoEFCC, based on MoP's recommendations, will notify GHG emission intensity targets (in tCO_2e per unit output) for each year of a trajectory period.
- Each obligated entity receives an annual target before the trajectory period begins; targets are revised after each period.
- Entities achieving lower GHG intensity than the target earn Carbon Credit Certificates (CCCs), calculated as:

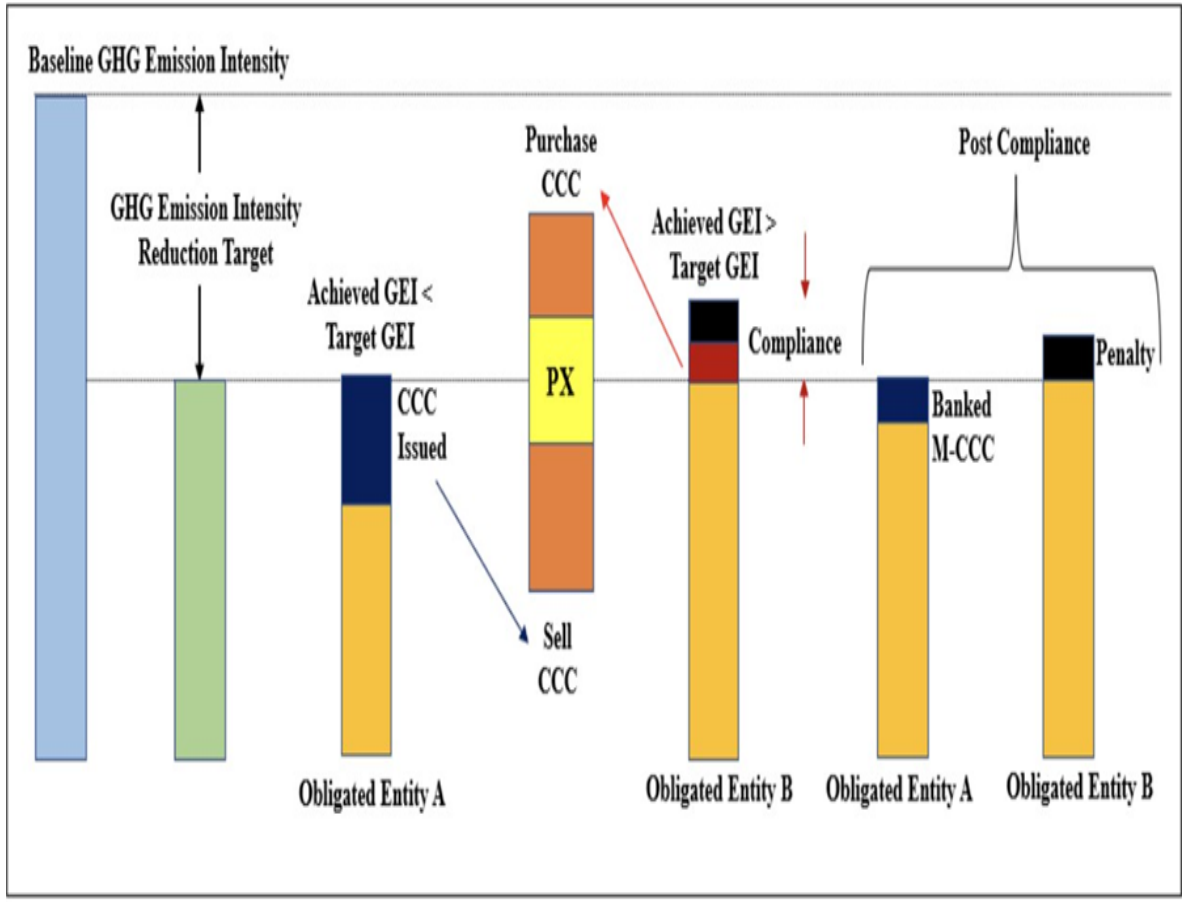
  (Target – Achieved GHG Intensity) × *Production Units.*
- Entities exceeding targets must surrender CCCs equal to:

  (Actual – Target GHG Intensity) × *Production Units.*

  If insufficient CCCs are available, they must purchase additional certificates.



- Obligated entities may use banked or purchased CCCs to meet their GHG intensity targets each compliance year.
- Example: Entity A earns CCCs for performing below target, while Entity B must buy CCCs to meet its target.
- Entity A can sell its earned CCCs, whereas Entity B must surrender and purchase CCCs via the trading exchange to stay compliant.



GHG Emission Intensity Trajectory and Targets

Inclusion of Obligated Entities under the Compliance Mechanism

- The Central Government, based on NSC-ICM recommendations, will determine and notify obligated entities under the CCTS compliance mechanism.
- Sectors will be specified under Section 14(e) of the Energy Conservation Act, covering energy-intensive industries or other designated consumers listed in the Schedule.

Greenhouse Gases (GHG) Coverage

- The CCTS compliance mechanism covers CO_2 and perfluorocarbon (PFCs) emitted from obligated entities' operations.
- Emissions will be expressed in CO_2 equivalent (CO_2e) using Global Warming Potential (GWP) values from the latest IPCC report
- Additional GHGs may be included in the future.

Establishment of GHG Emission Intensity Trajectory

- The Bureau, with the Technical Committee, will set sector GHG intensity trajectories to align with India's NDC targets.
- The trajectory up to 2030 will be periodically reviewed and updated by the Bureau of Energy Efficiency.

❖ Trajectories will be based on:

(i) GHG reduction needed for NDC goals
(ii) Technology availability and cost
(iii) Potential for energy efficiency, fuel switching, non-fossil energy use, and decarbonisation.

❖ Entity-specific targets will depend on:

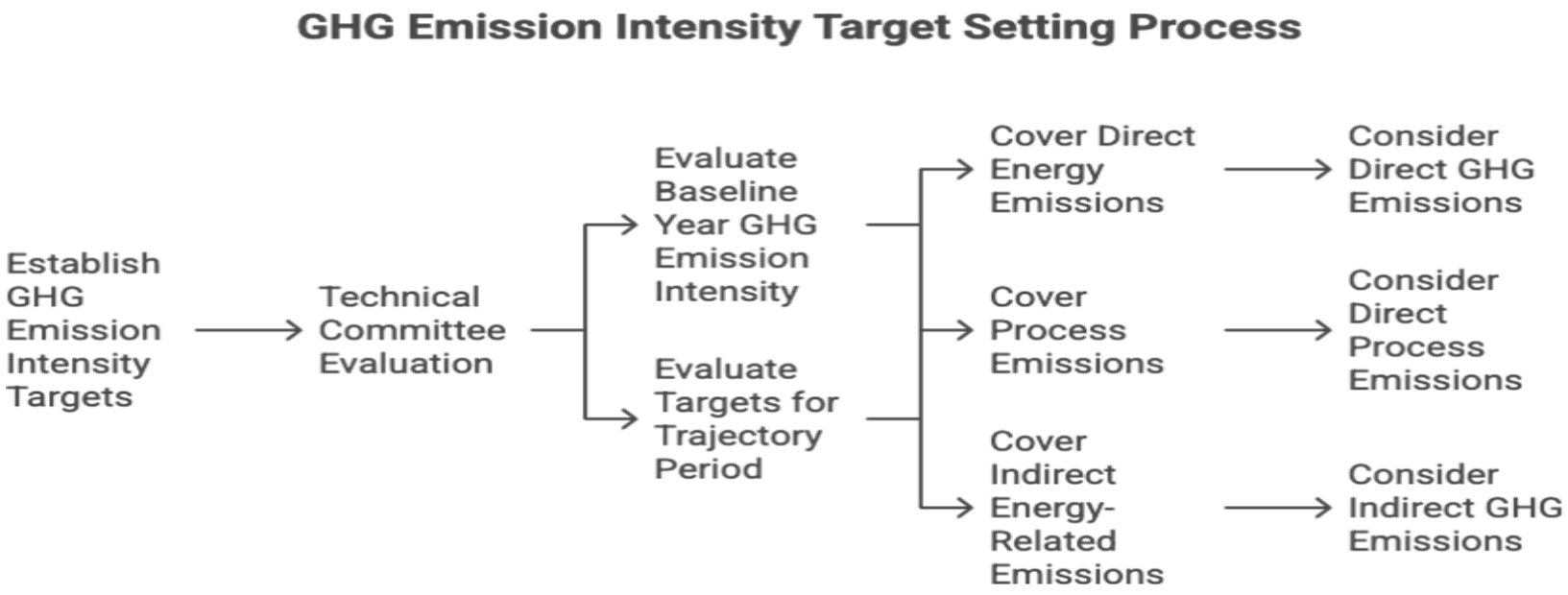
(i) Sub-sector trajectories

(ii) Each entity's GHG intensity compared to the lowest intensity within its sub-sector.

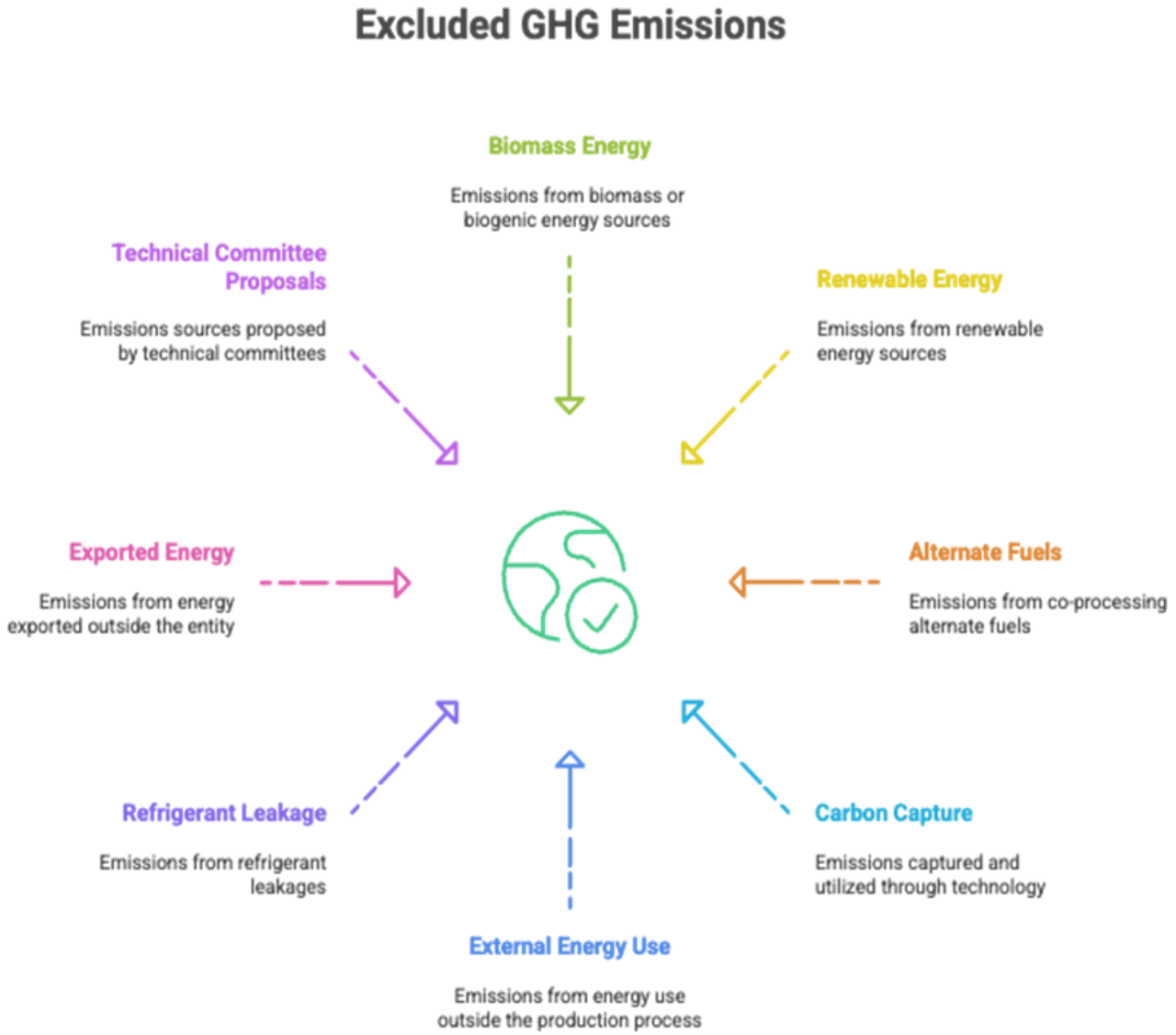
- Targets will be notified for each trajectory period (e.g., 3 years), with annual targets for every compliance year.

Establishment of GHG Emission Intensity Targets

The Technical Committee, approved by NSC-ICM, will assess each obligated entity's baseline-year GHG intensity and set trajectory targets, covering



- For production calculation, if multiple products exist, the main or equivalent product (as per EC Rules 2012) will be used. Entities must inform BEE if the main product ceases production.
- Baseline GHG intensity will be computed from verified data submitted by the entity and verified by an accredited carbon verification agency.
- The Technical Committee prepares a report recommending emission intensity targets for each entity and submits it to the Bureau.

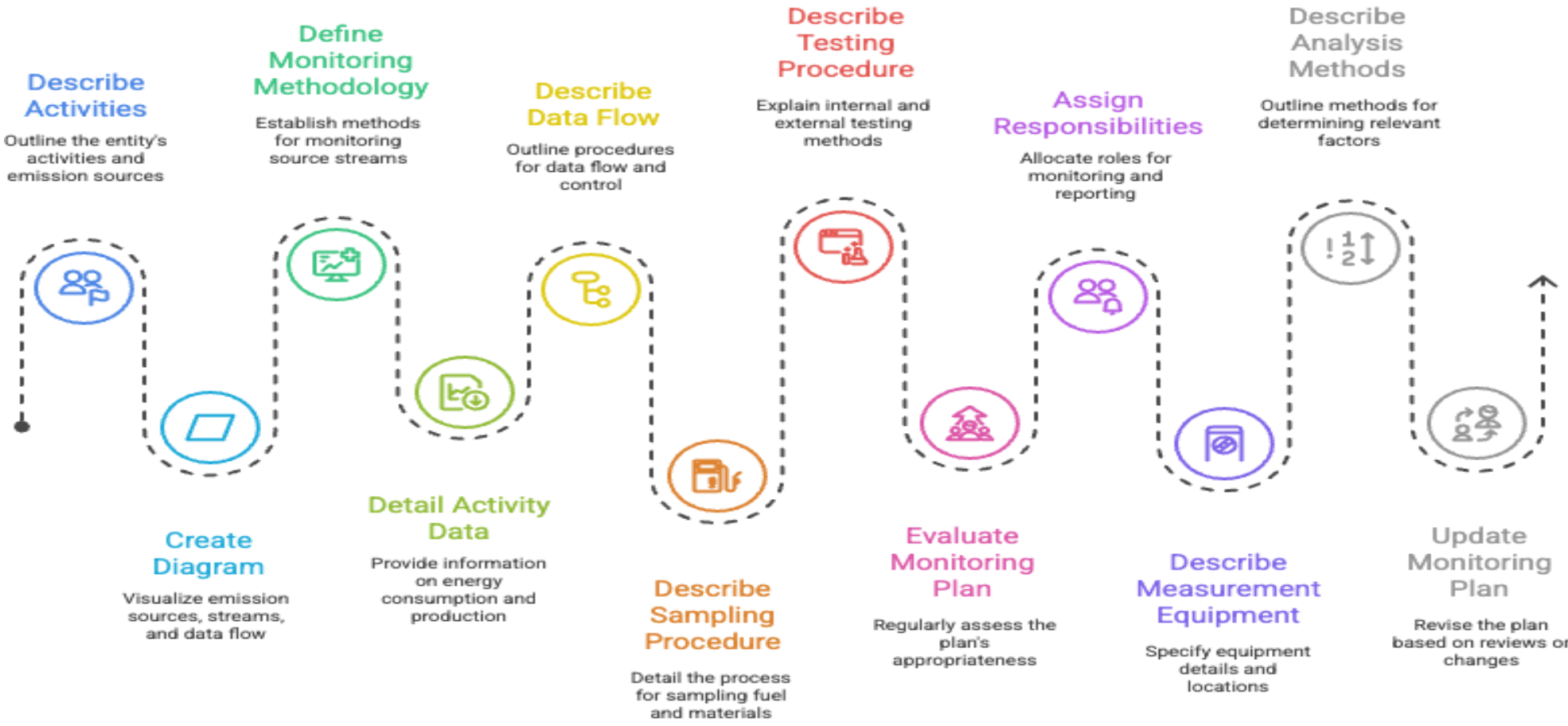


Monitoring and Reporting Process

- GHG emission intensity shall be calculated using direct and indirect emissions within the Gate-to-Gate boundary
- Once fixed, the same boundary applies for the trajectory period; any change (e.g., capacity expansion, merger) requires BEE approval.
- Each entity must develop, submit, and annually update a monitoring plan (within 3 months of the first trajectory period), to be reviewed and approved by BEE.
- GHG emissions (direct & indirect) shall be calculated in **tCO_2e** using standard or mass-balance methods:

- ✔ Monitor all energy, process, and indirect emissions.
- ✔ Use NCV-based emission factor (tCO_2e/T or $gCO_2e/kCal$).
- ✔ Apply mass balance method (fuel carbon × 3.664).
- ✔ Exclude biomass/biogenic fuels from total GHG (report separately).
- ✔ Apply oxidation factor (default = 1 if not available).
- ✔ Use **CEA grid factors** for purchased electricity (fixed for compliance period).
- ✔ Use supplier-specific factors for PPAs (default = 1.19 tCO_2/MWh if not available).

- ✔ Use fuel-based factors for imported/exported heat.
- ✔ Process emissions as per sector-specific **MRV guidelines**.
- ✔ BEE to publish MRV guidelines (approved by NSC-ICM).
- ✔ Calculate GHG intensity = Total emissions / Product output (tCO_2e/t).



GHG Emission Calculation Process

Identify Emission Sources

Determine direct and indirect emission sources

Collect Activity Data

Gather data on fuel consumption and materials

Apply Emission Factors

Use standard or supplier-specific factors

Calculate Direct Emissions

Compute emissions from combustion and processes

Calculate Indirect Emissions

Compute emissions from electricity and heat

Adjust for Oxidation

Apply oxidation factors to combustion emissions

Exclude Biogenic Emissions

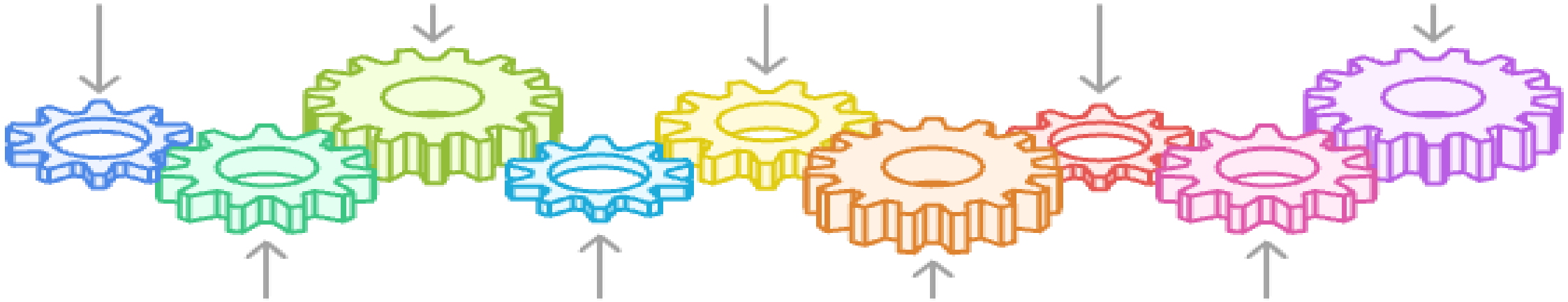
Remove emissions from biomass and biogenic fuels

Calculate Total Emissions

Sum direct and indirect emissions

Determine Emission Intensity

Divide total emissions by output



Monitoring of Activity Data

S. No.	Aspect	Details
1	Methods of Monitoring	(a) Continual measurement at the source causing emissions. (b) Aggregated quantities of delivered or consumed materials, considering stock changes, at regular intervals (daily, weekly, monthly).
2	Calculation for Point (1)(b)	Activity Data = (Quantity received during the year) - (Quantity moved out) + (Stock at start) - (Stock at end)
3	Units of Quantity	• Mass: tonne (t) • Volume: kilolitre (kL) or cubic metre (m^3)
4	Estimation When Direct Measurement Not Feasible	(a) Use data from previous years correlated with production or output. (b) Use documented procedures and audited financial statements, ensuring supporting records are maintained for verification.

Measurement Of Energy Content

Step	Action / Decision	Outcome / Next Step
1	Identify the Fuel Type	Solid, Liquid, Gaseous (Generated On-Site), or Natural Gas (Supplied)
2	Check for Fuel-Specific Requirements	Go to the relevant calculation path.
Path A	**Solid Fuels**	
3	Analyze Solid Fuel to determine NCV.	IS 1350 (Part 2): 2022 or equivalent national/international standard.
4	Keep Lab Analysis Records	Use the determined NCV for emission calculation.
Path B	**Gaseous fuels**	
5	Analyze Gaseous Fuel (generated at site) to determine NCV.	Relevant Indian Standard OR ASTM D3488/D1946/1945 or equivalent national/ international standard.
6	Keep Lab Analysis Records	Use the determined NCV for emission calculation.
Path C	**Liquid Fuel & Natural Gas**	
7	Obtain NCV Value from Supplier	Must be supported by relevant test certificates from a NABL-accredited fuel testing laboratory.
8	Verify Certificate	Use the supplier-provided NCV for emission calculation.

Path D: Non- Non-Availability of NCV			
Step	**Action / Decision**	**Outcome/ Next step**	
		Conversion Factor	**Resulting NCV**
9	Check if NCV is Unavailable (Only Gross Calorific Value (GCV) is known).	Applies to all fuel types if NCV cannot be determined through Paths A, B, or C.	Use the conversion factor to estimate NCV from GCV.
10	Apply IPCC Standard Conversion Factor	Solid & Liquid Fuels: 95% (NCV = GCV *0.95)	Gaseous Fuels: 90% (NCV = GCV *0.90)

Emission factors for GHG emission calculation

Type I Emission Factors (Default Values)

- **Primary Sources** for Type I EF include:

✔ Latest **IPCC guidelines** for emission factors.

✔ National inventory submissions such as the **Biennial Update Report** or **National Communication** by the Government of India submitted to the UNFCCC.

✔ Publications by statutory or central government organisations, or reputed international bodies.

- **Selection Criteria**:

✔ Emission factors should be selected based on the **type of fuel** used.

✔ The principle of **conservativeness** must be followed, meaning the emission factor chosen should not underestimate emissions.

- **Use Case**:

✔ Applied when site-specific data (Type II) is not available.

✔ Also relevant when site-specific data is **technically infeasible** or involves **unreasonable cost**.

Type II Emission Factors (Site-Specific Values)

✔ Preferred for emission calculations from **solid fuels, gaseous fuels, and process emissions**.

✔ Used when feasible, based on technical and financial considerations.

 Calculation Method:

✔ Requires **laboratory analysis** of fuel or raw materials.

✔ For solid and gaseous fuels, factors are calculated using:

✧ **Site-specific Net Calorific Value (NCV)** of the fuel.

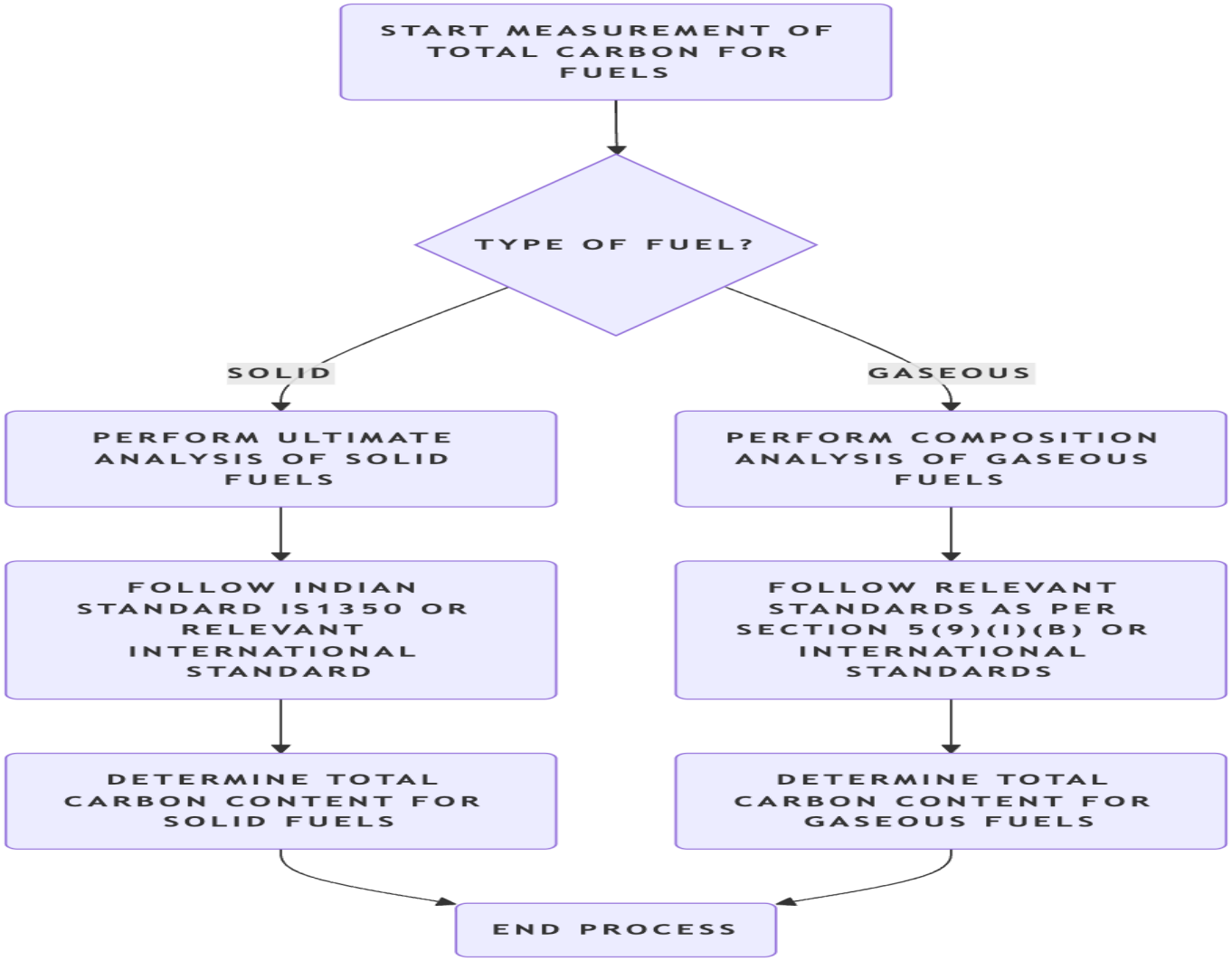
✧ **Total Carbon (TC) percentage** in the fuel.

✔ Fuel composition analysis for gaseous fuels also forms the basis for calculation.

For Liquid and Gaseous Fuels

Contributing **less than 10%** of the overall emissions from all source streams within the Gate-to-Gate boundary:
Emissions may be estimated by using the **actual NCV of the fuels** combined with **Type I emission factors.**

Measurement of Total Carbon (TC) (%) for Solid Fuels and Gaseous Fuels



Sampling Plan

Procedure for Written Sampling Plan

Obligated entities must maintain a documented sampling plan detailing:

- Procedures for sample preparation.
- Locations where samples will be collected.
- Frequency and quantity of sample collection.
- Methods for storage and transport of samples.

Standards Compliance

- ✔ The sampling plan and procedures must be aligned with the relevant Indian Standard or ISO Standard to ensure consistency and reliability.
- ✔ Samples collected must be representative of the relevant batch or delivery period and must avoid bias to ensure accuracy in emission calculations.
- ✔ The sampling plan and procedures must be accessible to accredited carbon verification agencies for auditing and verification purposes.

Frequency of Sample Collection and Analysis

Material Type	Minimum Frequency Based on Quantity	Minimum Frequency Based on Time Interval	Notes
Solid Fuels (coal, lignite, coke, petroleum coke)	Every 20,000 tonnes	At least once every month	Whichever is higher must be followed
Carbonates (limestone, dolomite)	Every 50,000 tonnes	At least once every month	Whichever is higher must be followed
Materials for conversion factor estimation (raw material, intermediate or final product)	Every 50,000 tonnes	At least once every quarter	Whichever is higher must be followed

GHG Emission Report

- The obligated entity, within four months of the completion of the compliance year, shall submit the GHG emissions report and GHG Emissions pro forma, duly verified by the accredited carbon verification agency, to the Bureau of Energy Efficiency and State Designated Agency for compliance purposes.

Comprehensive details for all emission sources and source streams, including:

- ✔ **Total Emissions:** Expressed in tonnes of CO_2 equivalent (tCO_2e).
- ✔ **Non-CO_2 Greenhouse Gases:** Emissions of other GHGs are also expressed in tonnes.
- ✔ **Calculation Method:** Description of methods used for emissions calculation
- ✔ **Emission Factors:** Type and source of emission factors applied per emission source.
- ✔ **Activity Data Details:**
  - For fuels: Amount consumed (in tonnes or normal cubic meters - Nm^3) and net calorific value (kCal/kg or kCal/Nm^3) reported separately.
  - For other source streams: Quantities reported in tonnes or Nm^3.
- ✔ **Emission, Oxidation, and Conversion Factors:** Expressed as dimensionless fractions used in calculations.
- ✔ **Mass Balance Methodology:** Details on mass flow and carbon content for each source stream entering and leaving the entity, with comparison against calculated GHG emissions values.

The annual GHG emissions report submitted by the obligated entity shall include

Section	Details
Registration Number	Unique identifier issued to the obligated entity
Plant Head and Energy Manager Info	Name, address, and contact details of key responsible personnel
Reporting Year Details	Explicit indication of the year for which emissions data is presented
Monitoring Plan	Details of the current monitoring plan, including reference to the latest submitted plan, version number, and effective date
Operational Changes	Disclosure of any changes in operations during the reporting period
Production Process Details	Raw material consumption and detailed breakdown of production processes and sub-processes
Sampling Plan and Procedures	Documentation of the sampling strategy and methods used for emissions data collection.
Data Control	Measures to ensure data integrity, accuracy, and reliability throughout the reporting process.
Memo Items	Reporting of biomass quantities combusted or used in processes, expressed in terajoules (TJ), tonnes (t), or cubic meters (Nm^3), as applicable.
GHG Reduction Measures	A list of all emission reduction initiatives implemented during the reporting year.

Verification and Assessment of Performance

- *Key Requirements for Obligated Entities*

Every obligated entity must submit a **performance assessment document within four months** after the end of the compliance year.

The submission must include:

- **Form 'A'** : Performance assessment covering the relevant compliance year.
- **Form 'B'** : Certificate of verification by an accredited carbon verification agency.

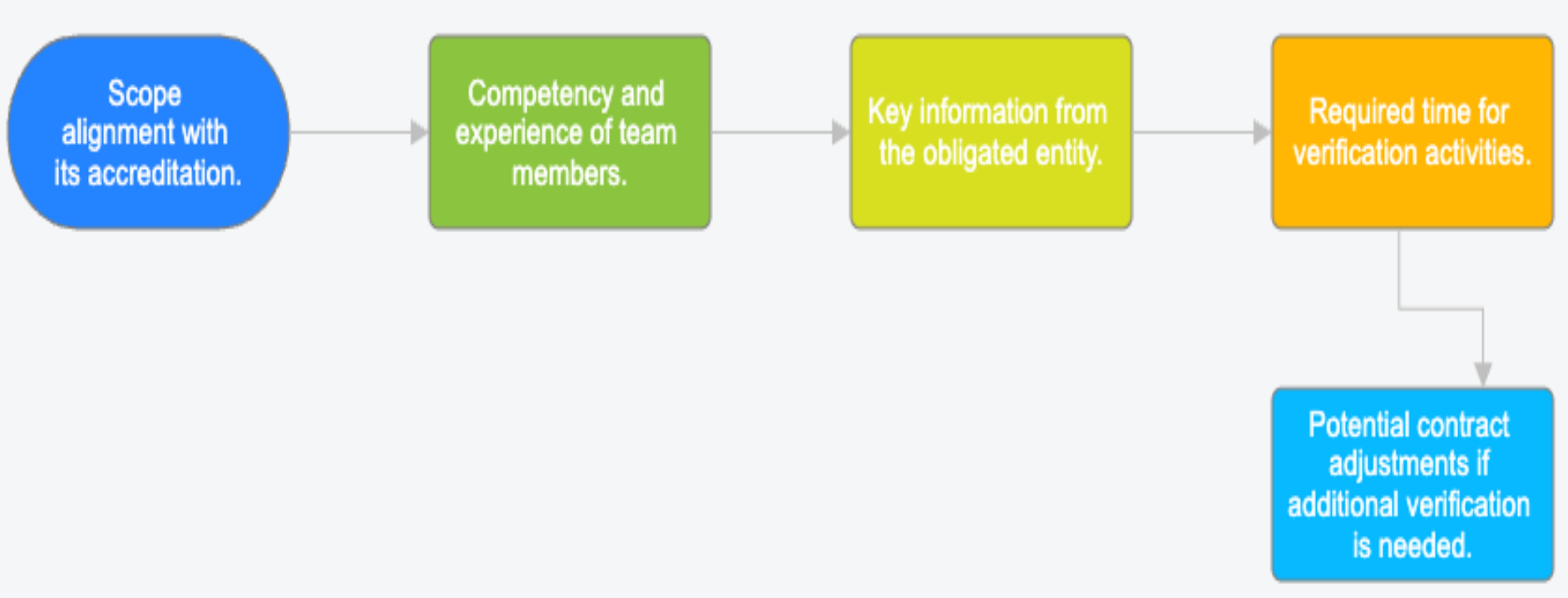
Supporting documents:

- Copy of unique registration number.
- Proof of timely submission of annual energy consumption and GHG emissions (E2 form).
- GHG emissions and intensity data for baseline and compliance years, verified by the accredited agency.
- Carbon Credit Certificates surrender details, calculations, and data correctness.

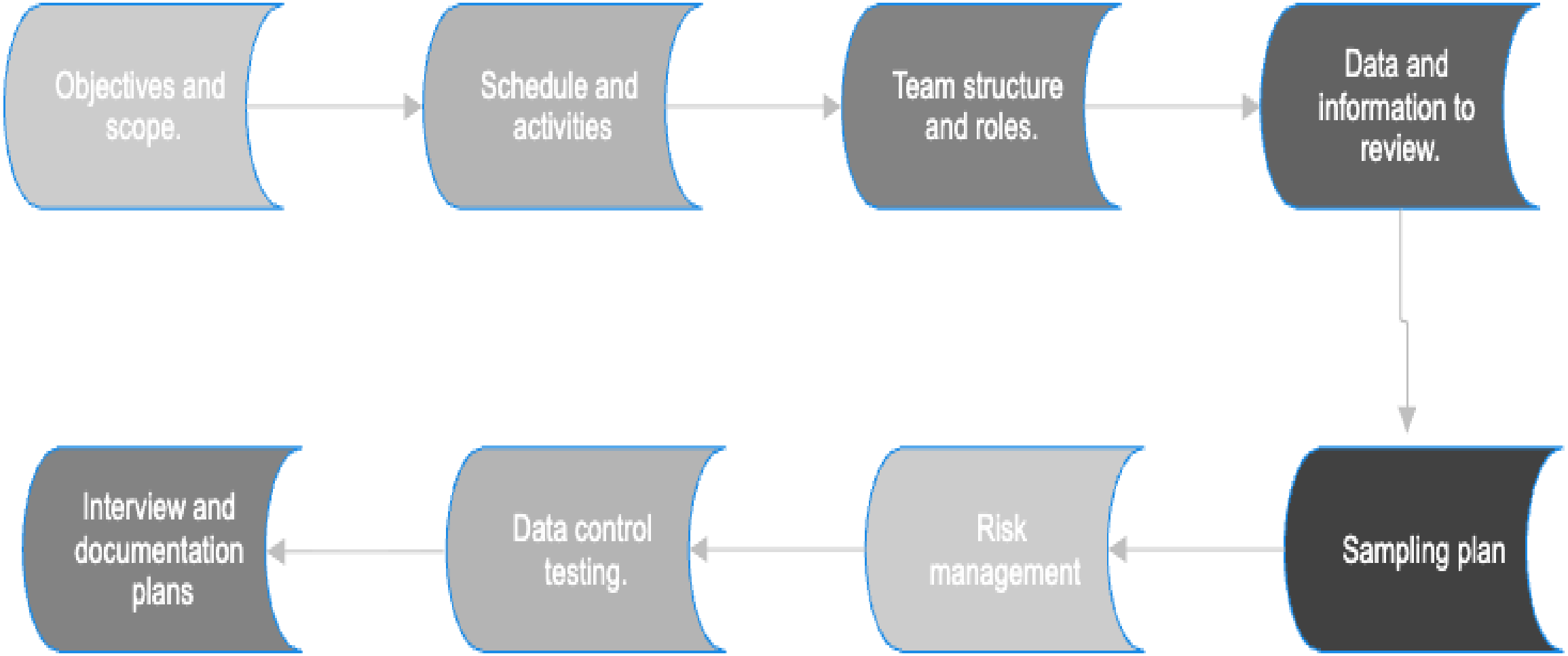
- Details of GHG emission reduction measures, including:
  - ✔ Brief description of mitigation measures.
  - ✔ Investment details.
  - ✔ Photographic evidence (if feasible).
  - ✔ Percentage reduction achieved.
- Verified GHG emissions report.
- Details of the appointed energy manager: name, appointment date, duties, and initiatives for GHG reduction

Accredited Carbon Verification Agency (ACVA)

- The obligated entity must appoint an **accredited agency** recognised **by the Bureau of Energy Efficiency**.
- The ACVA must provide verification **with a reasonable level of assurance**.
- Before starting verification, the ACVA shall review:



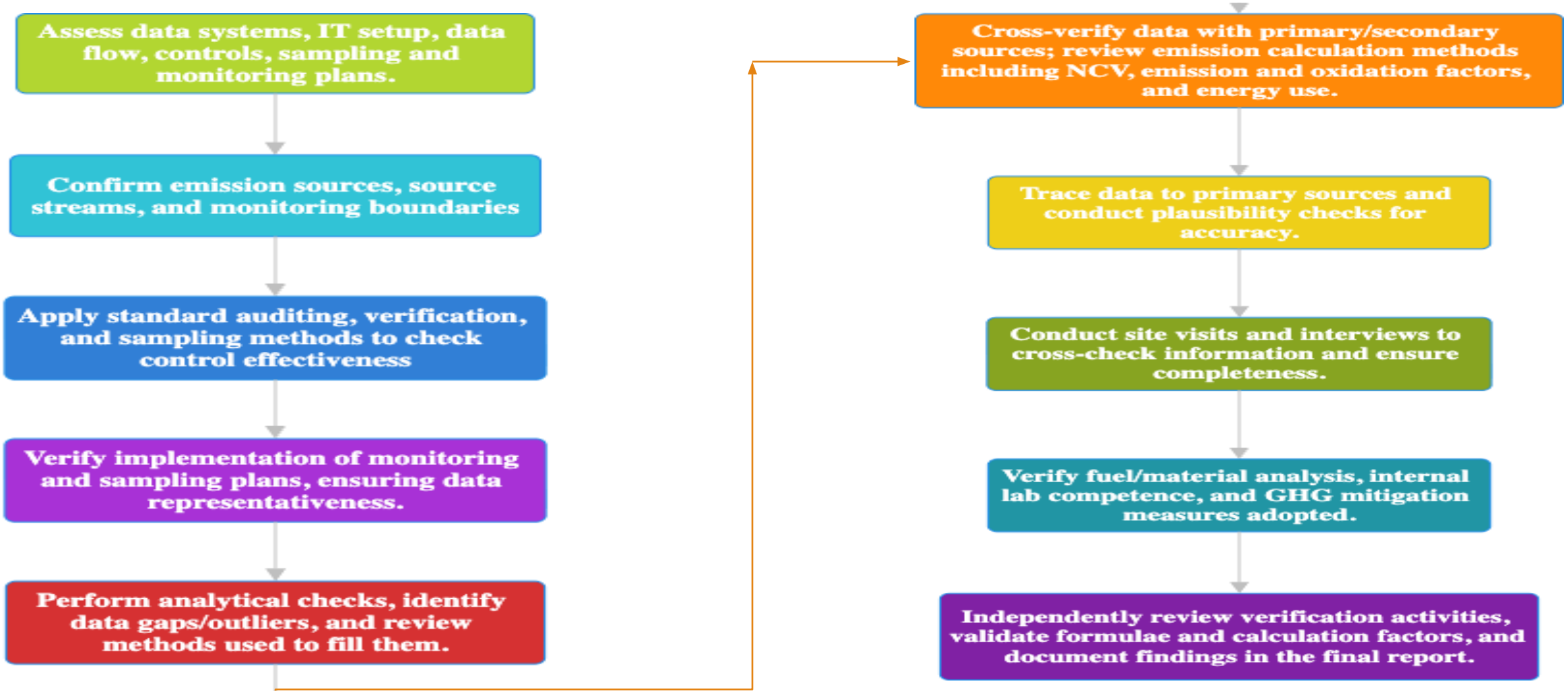
- The ACVA prepares a detailed verification plan comprising:



Verification Process:

- ✧ Conducts a **strategic analysis** assessing:
- ✔ Nature, scale, and complexity of the verification.
- ✔ Materiality threshold.
- ✔ Risk analysis for effective planning.
- ✧ Appoints a qualified verification team according to accreditation criteria.
- ✧ Communicates team details to the obligated entity before starting.
- ✧ Conducts at least **one site visit** to the obligated entity for verification activities.

Procedure for Assessment of GHG Report



- The accredited carbon verification agency shall **independently evaluate** the obligated entity's actions for compliance with procedures, GHG emission intensity targets, and entitlement or surrender of Carbon Credit Certificates, ensuring alignment with the scheme's requirements.
- A **materiality threshold of 2%** of the total reported emissions for the reporting period shall be applied during verification.
- Any **variations, discrepancies, or non-compliance** identified shall be documented, clarified with supporting evidence from the entity, and assessed for their **material impact** on GHG emissions.

- After completing verification, the agency shall **finalise findings** by:

✔ Reviewing final and revised data, documenting reasons for any changes.

✔ Reviewing implementation and compliance of the monitoring plan.

✔ Ensuring the verification process provides **reasonable assurance** and is properly documented.

- The agency shall conduct an **independent technical review** of the verification activity:

✔ The **lead verifier** submits all documents and reports for review before issuance.

✔ The **independent reviewer**, not part of the original team, ensures the process follows procedures and meets quality standards.

✔ The review confirms that verification was **satisfactory and sufficient** to support issuance of the verification report.

- After completing the verification process, the **accredited carbon verification agency** shall prepare a detailed **verification report** summarizing its findings and conclusions.

The Verification report shall include

- A **summary of the verification process**, key observations, and the verifier's professional opinion, supported by relevant documentation.
- Details of **verification activities and assessments**, including evaluation of compliance with GHG emission intensity targets and any change in emission intensity compared to the baseline year.
- A record of **interactions and clarifications** between the agency and the obligated entity, along with any resulting updates to the verifier's assessment.

*Upon issuance of a **positive verification opinion**:*

- The **obligated entity** shall submit a **Performance Assessment Document (Form A)**, along with the filled pro forma and GHG emission report, to the **Bureau of Energy Efficiency (BEE)** and the **State Designated Agency (SDA)**.
- The **verification agency** shall submit a **Certificate of Verification (Form B)**, duly signed and dated, along with the complete verification report, to the BEE and SDA.

The verification report shall clearly state whether:

- The GHG emission report is satisfactory and eligible for a **positive verification opinion**, or
- It contains **material misstatements or non-conformities** preventing such an opinion.

- If the obligated entity fails to provide sufficient data or evidence, or if material errors limit the scope of verification, the agency may issue a **limited opinion**, which the entity must address within **15 days** of report submission.

  A **positive opinion** shall be issued only when the GHG emission report is free from material misstatements.
- The obligated entity must resolve any **outstanding issues or non-conformities** identified by the verifier before the final report is issued.
- Once a **positive verification opinion** is recorded, the **Bureau of Energy Efficiency** will consider the entity to have met its **GHG emission intensity target**, and the corresponding **entitlements or obligations to surrender Carbon Credit Certificates** shall be determined.
- The final **entitlement or surrender of carbon credits** will be calculated based on the formula prescribed by the **Ministry of Environment, Forest and Climate Change (MoEFCC)** in the official GHG emission intensity target notification.

Steps to Check the Verification Process

Step	Description	Timeline
Initiation	Bureau initiates check verification on own or upon complaint.	Within 1 year of GHG report submission or 6 months of carbon credit certificate issuance, whichever is later
Notice Issuance	Notice sent to obligated entity and verification agency requesting comments.	Immediately after initiation
Comments Submission	Obligate entity and agency respond with confirmation or acceptance of errors + explanations.	Within 10 working days from notice
Bureau Decision	Bureau decides on independent review and informs all parties.	Within 10 working days after comments
Appointment of Independent Agency	If review proceeds, appoint a different verification agency; complainant submits affidavit.	Immediately after decision
Check Verification Execution	Independent verification agency conducts document review, onsite inspection, and data analysis.	Not specified (dependent on case)
Submission of Revised Reports	If errors accepted, obligated entity submits revised reports addressing non-conformities.	Within 10 days from notice of check verification

- **The check verification assesses:**

❖ Compliance with the defined procedures for issuing carbon credit certificates.

❖ Adherence of monitoring and reporting processes to procedural requirements.

❖ Accuracy of data, ensuring *errors or omissions do not exceed a 2% materiality threshold* affecting GHG emission norms.

- The appointed accredited carbon verification agency will perform:

❖ **Document reviews and onsite assessments** to verify compliance with GHG emission intensity targets.

❖ Examination of:

1. **Quantitative data:** Reported in 'Form A'.
2. **Qualitative information:** Internal management controls, calculation methodologies, data transfer procedures, reports, and internal audits.

❖ Review of previous verification reports.

❖ Evaluation of any additional relevant documents or information.

❖ Verification of the monitoring and reporting processes.

Outcomes Based on Verification Opinions

Verification Opinion	Implication
Positive Opinion	- Confirms that the entity has met all requirements for compliance with GHG emission norms. - Validates the legitimacy of issuing or surrendering carbon credit certificates.
Negative Opinion	- Details the impact on GHG emission standards compliance. - Affects issuance or acquisition of carbon credit certificates. - Quantifies the agency's liability for issuing the report. - Calculates any unfair advantage gained by the obligated entity due to the report.

Submission and Review Process

- The agency must submit the **check verification report** using **'Form C'** to the **Bureau of Energy Efficiency (BEE)**.

  (Form C is the **Accredited Energy Auditor's (AEA) verification report** that an auditor submits to the BEE and the relevant State Designated Agency (SDA))

- The **BEE** will take necessary decisions based on the submitted verification opinion and report.

Issuance and Surrender of Carbon Credit Certificates

- After verifying the accuracy of the **verification report** (and any check-verification if requested), the **Bureau of Energy Efficiency (BEE)** shall submit the report to the **NSC-ICM** within **two months** of receiving **Form A** from the obligated entity. The submission is made for the issuance of carbon credit certificates under **Section 14AA of the Act**, specifying:
  - The **number of certificates to be issued**, calculated as:
    (GEI Target – GEI Achieved) × Unit of Equivalent Output for the compliance year.
  - A **certification of compliance** by the accredited verification agency confirming the entity's eligibility for issuance.
- The **NSC-ICM** shall review and recommend issuance of carbon credit certificates to the BEE within **two weeks** of receiving the report.
- The **BEE** shall issue the certificates to the obligated entity on the **ICM registry** within **two weeks** of receiving NSC-ICM's recommendation.

- For entities required to **surrender certificates** to meet GHG emission intensity targets, the report shall specify:
- The **number of certificates to be surrendered**, calculated as:

  (GEI Achieved – GEI Target) × Unit of Equivalent Output for the compliance year.
- Certification that the entity has met all surrender requirements, verified by the accredited agency.
- The **BEE** shall **debit** the obligated entity's registry account with the equivalent number of carbon credit certificates for compliance purposes.

Trading of Carbon Credit Certificates

- All obligated and non-obligated entities must register on the **ICM Registry** by submitting required details and paying the prescribed fees as per **CERC's terms and conditions** for CCC trading.
- Upon successful registration, the ICM Registry shall issue a **Certificate of Registration** to the concerned entity.
- Both obligated and non-obligated entities shall trade **Carbon Credit Certificates (CCC)** only on **power exchanges** approved by CERC, following the defined trading procedures under the ICM.

Compliance with GHG Emission Intensity Targets

- Each obligated entity shall prepare a **five-year GHG reduction plan** detailing measures, costs, savings, and implementation strategies to meet emission intensity targets.
- **Submission Timeline:**
  - The initial plan must be submitted within **one year** of the first compliance year.
  - Annual updates and planned activities for each compliance year must be submitted within **3 months** of its commencement.
- The plan shall outline identified reduction measures, estimated costs and savings, implementation schedule, and the next 5 years' projections.
- Entities must submit a **Compliance Assessment Document (Form D)** within **1 month** after the last trading session of each compliance year.

Banking of Carbon Credit Certificates

- **Carry-Forward Option:** Unused Carbon Credit Certificates (CCC) from a compliance year may be banked for use in subsequent years.
- **Usage:** Banked CCCs can be sold in the Indian Carbon Market or used for future compliance by the same entity.

Obligations of the Obligated Entities

- **Monitoring:** Develop and implement a monitoring plan to track GHG emissions and intensity accurately.
- **Reporting:** Comply with all monitoring and reporting requirements prescribed under the scheme.
- **Verification:** Undergo third-party verification by accredited agencies after each compliance year and submit a verified GHG emission report.
- **Target Compliance:** Implement GHG reduction measures to achieve emission intensity targets.
- **Certificate Surrender**: If targets are not met, surrender equivalent CCCs to ensure compliance.
- **Continuous Improvement:** Adopt best practices and implement long-term measures to reduce GHG emissions.
- **Data Submission:** Provide complete and accurate data, documents, and records to the Bureau or verification agencies as required.