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Ministry of Power

भारत 2023 INDIA

Ministry of Environment, Forest and Climate Change

Detailed Procedure for Compliance Mechanism under CCTS

Bureau of Energy Efficiency

Contents

1. Introduction

(1) India has been at the forefront of climate action to meet the global climate goals through its ambitious Nationally Determined Contributions (NDC). To facilitate the achievement of India's enhanced NDC targets, the Government has initiated the development of the unified carbon market mechanism **'Indian Carbon Market' (ICM)** which will mobilize new mitigation opportunities through demand for emission reduction credits by private and public entities.

(2) ICM is envisioned to accelerate decarbonisation and mobilize finance and technology towards achieving India's NDCs. 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.

(3) The challenge of meeting future NDC goals makes it imperative that market measures are promoted to facilitate gradual decarbonisation of the economy. The proposed carbon market mechanism will enable active participation of the private sector in decarbonisation efforts, in all potential sectors. 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 and incentivising carbon emission reduction in India.

(4) ICM is established under the purview of the Energy Conservation Act, 2001, and the Environment (Protection) Act, 1986. The Energy Conservation Act, 2001 empowers the Government of India to specify the Carbon Credit Trading Scheme (CCTS), where any entity, including the designated consumers, registered for carbon credit trading scheme will be the "registered entity". The act empowers the Central Government to issue the "Carbon Credit Certificates" to the registered entities under different mechanisms. While the Environment (Protection) Act, 1986 empowers the Government of India to specify standards for emission or discharge of pollutant for the obligated sectors.

(5) The Central Government has notified the Carbon Credit Trading Scheme, 2023 vide S.O. 2825(E) dated 28th June 2023 under the powers conferred by clause (w) of section 14 of the Energy Conservation Act, 2001 (52 of 2001) which defines the Indian carbon market where a national framework is established with an objective to reduce or remove or avoid the greenhouse gases emissions from the Indian economy by pricing the greenhouse gases emission reduction through trading of the carbon credit certificates.

2. Compliance Mechanism

(1) The Carbon Credit Trading Scheme envisages the Compliance Mechanism, whereby the registered entities which are notified under the compliance mechanism are called as 'Obligated Entity'.

(2) The Ministry of Environment, Forest and Climate Change (MoEFCC) shall notify the GHG Emission intensity targets in terms of tons of carbon dioxide equivalent (tCO_2e) per unit of equivalent product for each cycle of defined trajectory for the considered obligated entities.

(3) The obligated will be notified an annual target for a three-year trajectory period and on completion of trajectory period, the targets shall be revised.

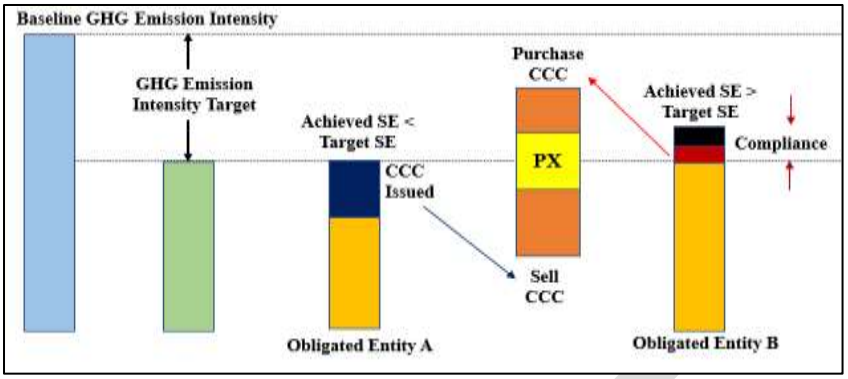
(4) The Obligated Entity notified in any trajectory period shall comply for each annual year (compliance cycle) with the GHG emission intensity targets assigned to it.

(5) The obligated entity who exceeds the targeted GHG emission intensity in any compliance cycle are entitled for issuance of the Carbon Credit Certificates based on the difference in the achieved GHG emission intensity and targeted GHG emission intensity for the production quantity in the relevant compliance cycle.

(6) The obligated entity who fails to achieve the targeted GHG emission intensity in any compliance cycle are entitled to purchase the Carbon Credit Certificates based on the difference in the achieved GHG emission intensity and targeted GHG emission intensity for the production in the relevant compliance cycle.

(7) The obligated entities can purchase the CCC to meet the GHG emission intensity targets in each compliance cycle.

(8) The illustration given below shows that the Obligated Entity 'A' are issued CCC on achieving the GHG emission intensity greater than the target GHG emission intensity while the Obligated Entity 'B' is entitled to purchase the CCC to meet their GHG emission intensity targets from Indian Carbon Market.



(9) The Obligated Entity 'A' can sell their CCC, and the Obligated Entity 'B' can purchase the CCC over the trading exchange.

3. GHG Emission Intensity Trajectory and Targets

3.1. Obligated Entities

(1) The Central Government in consultation with the Bureau, having regard to the intensity or quantity of energy consumed and the amount of investment required for switching over to energy efficient equipment and capacity of industry to invest in it and availability of technology and equipment required, specifies some user or class or users of energy as Designated Consumers in S.O. 394(E) dated 12th March 2007 and subsequent amendments.

(2) The Central Government shall decide the Designated Consumers that can be notified under the compliance mechanism of the Carbon Credit Trading Scheme.

3.2. Greenhouse Gases (GHG)

(1) Greenhouse gas (GHG) emissions shall be converted to CO_2 equivalent (CO_2e) basis the Global Warming Potential (GWP) for the Greenhouse Gases (GHGs) as specified in India's Biennial Update Report (BUR 3) under UNFCCC. This conversion allows for standardized and consistent measurement of different GHGs based on their warming potential relative to carbon dioxide. The GWP values for different gases are provided in Annexure I.

3.3. GHG Emission Intensity Trajectory and Targets

(1) The GHG emission intensity reduction trajectory will be developed for the considered sectors based on the:

(i) India's nationally determined contribution commitments.

(ii) Potential for fuel switch, use of non-fossil fuel energy/feedstock and decarbonisation in the sector.

(iii)available technology and associated cost of their implementation.

(2) The GHG emission intensity reduction target shall be specific for every obligated entity for any sector and shall be determined based on:

(i) The GHG emission intensity reduction trajectory developed for that sector.

(ii) Average rate of reduction in GHG emission intensity across all the obligated entities for that sector determined based on the historical data.

(3) The trajectory period will be of three years and the targets will be given on annual basis that has to be complied by the Obligated Entity which is defined as compliance cycle.

3.4. Establishment of GHG Emission Intensity Targets

(1) To establish the GHG emission intensity targets, the technical committee set up by the Bureau shall calculate the GHG emission intensity in the baseline year and the targets of GHG emissions intensity for the trajectory period for each compliance cycle covering the direct energy, process (non- energy) and indirect energy related emissions from the boundary of the obligated entity's establishment against the product manufactured during the year on a gate-to-gate basis where:

(i) Direct GHG emissions are emissions from sources that are owned or controlled by the obligated entity and includes emissions from combustion of any type of fuel (fossil) burnt in stationary (fixed) equipment, such as boilers, gas turbines, kiln, or furnaces to generate heat, mechanical work, and steam.

(ii) Direct process emissions from industrial processes means emissions other than combustion emissions occurring because of chemical reactions between substance or their transformation.

(iii) Indirect GHG emissions means GHG emissions that are a consequence of the activities of the obligated entity but occurred at sources outside the obligated entity establishment and shall include – indirect emissions from electricity purchased from grid, and emissions from electricity and heat imported outside plant boundary.

Note: GHG emission intensity targets within 2024-27 for the obligated entities shall be calculated only on the basis of emission related to sources as (i) and (iii) highlighted above, subsequently targets will be calculated based on (i), (ii) and (iii)

(2) The GHG emissions from the obligated entity's establishment shall be calculated by considering following:

(i) Identifying all possible emission sources and source stream resulting in emissions within the establishment.

(ii) the emission sources shall cover energy and process (non-energy) related GHG emissions sources.

(iii) consider all forms of GHG emission sources from energy use that is solid fuel, liquid fuel, gaseous fuel, purchased electricity, purchased heat or any other form of energy imported into plant for consumption as energy for production of output.

(iv) consider all form of process related GHG emissions wherever applicable resulting from chemical reaction between substances or transformation.

(v) estimate the total GHG emissions by adding GHG emissions from different sources and converting into a single GHG emissions unit, namely, ton of carbon dioxide equivalent using the formulas as specified in the Annexure II.

(3) For estimating the GHG emissions from the obligated entity's plant following shall not be included:

(i) GHG emissions from biomass or biogenic source of energy.

(ii) energy from renewable energy sources.

(iii) GHG emissions if captured or utilised by the plant through carbon capture, storage and utilisation technology.

(iv) emissions resulting from energy consumed in colony attached to the plant, temporary or major construction work and for outside transportation.

(v) emissions from refrigerant leakages in office building and processes.

(vi) Emissions from alternate fuel and raw material (sourced from waste),

(vii) Emissions resulting from production of energy which is exported out of plant's boundary.

(viii) If any obligated entity does not have disaggregated figures for energy consumed (to estimate emissions), the overall energy should be accounted for emissions, the obligated entity shall give adequate reason if it's not feasible to have disaggregated figures and shall implement necessary actions to monitor it.

(ix) Any other emissions sources stream as proposed by technical committed and recommended by the National Steering Committee for Indian Carbon Market.

(4) In calculating the production for the purpose of deriving the GHG emission intensity, where more than one product is produced, the main product or an equivalent product worked out from the product mix per standard practice prevalent in the obligated entity's sector shall be considered.

Provided that where the production of main product is stopped, the obligated entity shall inform the necessary details in that regard to the Bureau.

(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.

(6) The default emission factors (Type I) depending on type of fuel and materials will be applied for the first trajectory period. For the subsequent trajectory period, the emissions shall be based on actual emission factors (Type II) for fuel and material. However, the emission factor shall be consistently applied for baseline and assessment year.

(7) The technical committee shall prepare a report containing obligated entity's emission intensity targets and submit its recommendation to the Bureau.

(8) The Bureau shall examine the report submitted by technical committee and finalize its report containing its recommendation regarding the GHG emissions intensity targets for each

obligated entity and submit to Sub Working Group under NSCICM and NSCICM shall further recommend it to the central government for notification.

(9) The Ministry of Power, after duly considering the recommendations of Bureau and National Steering Committee for Indian carbon market, shall recommend the greenhouse gases emission intensity targets to the Ministry of Environment, Forest and Climate Change for notification under the Environment Protection Act, 1986

(10) The MoEFCC after considering the said recommendation shall:

(i) notify the annual GHG Emission intensity target for each obligated entity for the trajectory period.

(ii) Penalise the obligated entity for not complying with the GHG emissions intensity target in any compliance cycle under the trajectory period.

4. Monitoring and Reporting Process

(1) The obligated entity in consultation with Accredited Carbon Verification Agency, shall put in place transparent, independent and credible monitoring and reporting arrangements (monitoring plan) for GHG emissions and production for compliance with GHG emissions intensity targets.

(2) The obligated entity shall monitor greenhouse gas emissions based on the monitoring plan and shall submit the plant to the Bureau within 3 months from the commencement of a compliance cycle, taking into account the nature and functioning of the entity.

(3) The obligated entity shall develop and submit a GHG emission monitoring plan to Bureau, and it shall consist of a detailed, complete and transparent documentation of monitoring methodology for each emission sources. The monitoring plan shall contain at least the following:

(i) Description of activities carried out at entity's plant to be monitored, a list of emission sources and sources stream to be monitored.

(ii) A simple diagram highlighting the emission sources, source stream, metering points, sampling points and metering equipment.

(iii) Information on traceable and verifiable reference of activity data such as energy consumption and other conversion factors.

(iv) A description of the written procedure for data flow and control activities.

(v) A description of the sampling procedure for fuel and other materials as required.

(vi) A description of the internal and external testing procedure for fuel and other materials as required.

(4) The obligated entity shall convert sources of direct and indirect GHG emissions and estimate GHG emission from these sources by converting into single unit i.e., tonnes of carbon dioxide equivalent (tCO_2e) using the standard emission calculation methodology and/or mass balance methodology. The following general guiding principle shall be used in this regard:

(i) The obligated entity shall report both direct energy, non-energy and indirect energy related GHG emissions from its boundary.

(ii) The obligated entity shall calculate the emissions using the standard methodology where the activity data representing the quantity of fuel consumed for a particular emission source.

(iii) Under the standard methodology, the obligated entity shall calculate combustion emissions from emissions source by multiplying the activity data related to the amount of fuel consumed, expressed as tons of oil equivalent based on net calorific value (NCV), by the corresponding emission factor, expressed as tonnes of carbon dioxide equivalent per ton of oil equivalent (t CO_2/TOE) or as grams of carbon dioxide equivalent per kilo calorie (g CO_2e/kCal) consistent with the use of NCV, and the corresponding oxidation factor.

(iv) Under the mass balance methodology wherever applicable, the obligated entity shall calculate the quantity of carbon dioxide emissions (CO_2) corresponding to the emission source by the mass balance by multiplying the activity data related to the amount of fuel or material entering or leaving the boundaries of the mass balance, with the fuel's or material's carbon content multiplied by 3.664 t CO2/t C.

(v) For the biomass and biogenic fuel source, the emission shall be considered as biogenic emissions and not included in overall emissions but shall be reported as biogenic emissions separately.

(vi) The conversion factors for fuel combustion shall be further adjusted with the oxidation factor as monitored and measured by the obligated entity and in case of non-availability of oxidation factor, the default oxidation factor of 1 shall be applied.

(vii) For the estimation of indirect emissions from purchased electricity, the emissions shall be calculated by considering the latest average grid emission factors from CO_2 baseline database for Indian Power Sector - published by the Central Electricity Authority. In case of dedicated power purchase agreement for purchased electricity, the supplier specific grid emission factors can be used if the obligated entity is able to provide the emission factor with supporting documentation verified by an independent agency.

(viii) For the estimation of non-energy related process emissions (if applicable to the obligated entity) shall be calculated as per the formula published or endorsed by Bureau.

(ix) Once the total GHG emissions from the obligated entity is estimated, the specific GHG emissions shall be calculated by dividing the total GHG emissions by the product output from the obligated entity.

(5) Monitoring of Activity Data

(i) The obligated entity shall monitor the activity data of a source stream in one of the following direct ways:

(a) on the basis of continual measurement at the emission source.

(b) on the basis of quantities aggregated at regular intervals - daily/ weekly/ monthly considering relevant stock changes.

(ii) The activity data shall be calculated as quantity of fuel or material in stock at the beginning period, plus fuel or material purchased in the reporting period minus the fuel or material consumed and closing quantity of fuel or material in the compliance cycle.

(iii) The quantity of fuel or material shall be represented in mass as tonne or volume as kilolitre (kL) or cubic meter (m^3).

(iv) Where it is not feasible to determine quantities in stock by direct measurement due to technical or unreasonable cost associated challenges, the obligated entity may estimate those quantities on the basis of one of the following:

(a) data from previous years correlated with output for the compliance cycle.

(b) documented procedures and respective data in audited financial statements for the compliance cycle.

(6) Measurement of energy content

(i) The obligated entity shall estimate the net calorific and gross calorific value of the fuel and for emission calculation purpose the net calorific value shall be calculated.

(ii) The net calorific value can be calculated using the formula specified in the Annexure III.

(iii) The obligated entity shall undertake the fuel analysis to determine the NCV of the fuel and shall keep the lab analysis records for estimation of NCV.

(iv) For the first trajectory period, in case of non-availability of the net calorific value, the standard conversion factor of 5% for solid fuel and liquid fuel and 10% for gaseous fuel shall be used for converting gross calorific value to net calorific value.

(v) For liquid and gaseous fuel the NCV values provided by the supplier can also be used for calculation purposes.

(7) Emission Factors for GHG Emission Calculation

(i) The obligated entity shall determine calculation factors either as default values (Type I) or values based on analysis of fuel or material or process (Type II).

(ii) The obligated entities shall strive to use the Type II emission factor if the contribution of emission source/source stream is more than ten percent of overall emissions.

(iii) For Type I - standard factors and stoichiometric factors are the default emission factors published by IPCC or Central Government as annexed at Annexure IV.

(iv) For Selection of Type I emission factor, the factors should be selected based on the type of fuel used and shall be based on principle of conservativeness.

(v) The selection of Type I emission factor and any discrepancy on selection of emission factors further shall be finalized by the Bureau based on the recommendations from the technical committees.

(vi) For determining Type II emission factors for the solid fuel, the emissions factors shall be estimated using the formula in Annexure and using the actual Net Calorific Value (NCV) of fuels and Total Carbon (%) in the fuel estimated based on ultimate analysis of the fuel.

(vii) For the liquid and gaseous fuel, the emissions shall be estimated using the formula specified in annexure III and using the actual Net Calorific Value (NCV) of fuels and type I emission factors.

(8) Sampling

(i) For the emission calculation derived on the basis of fuel and material quality, the obligated entity shall have a sampling plan in the form of a written procedure, which contains the information on the procedure on the preparation of samples, including locations for sample collection, frequencies of collection, quantity, storage and transport of samples. The sampling procedure shall be based on relevant Indian Standard/ISO Standard

(ii) The obligated entity shall make necessary arrangements for taking "as fired basis" samples for solid from auto-sampler installed at solid fuel feeding points for the purpose of fuel sampling.

(iii) The obligated entity shall ensure that coal samples are picked up from the auto-sampler at least once in a month or at every 20,000 tonnes and for raw material at least once in a month or at every 50,000 tonnes and get such samples tested at the their internal lab and external National Accreditation Board for Testing and Calibration Laboratories (NABL)accredited lab for material, energy analysis and proximate/utlimate analysis of coal.

(iv) The obligated entity shall also implement a sampling procedure for material and fuel analysis for emission estimation as required.

(9) Internal Laboratory Analysis

(i) The obligated entity shall undertake the sample analysis for demonstration of conversion factors at the internal lab at the obligated entity premises and also at the National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited laboratory for Net Calorific Value (NCV) and ultimate/proximate analysis of coal and material.

(10) External Laboratory Analysis

(i) The obligated entity shall also facilitate the testing of samples for coal and material (wherever applicable) at NABL accredited laboratory and compare the internal lab and external lab results. The external lab analysis shall be conducted once every quarter.
(ii) The means of the result of duplicate determinations carried out in each of two laboratories on representative portions taken from the same sample at the last stage of sample preparation, should and the deviation between the values should be less 71.7 kcal/kg for coal as per ISO 1928: 1995 (E) and ±2% for material.
(iii) If the difference is greater than above thresholds, the difference will be added to the analysed parameter of the test result obtained in obligated entity's Lab for that particular quarter.
(iv) The obligated entity shall have a documented procedure of the sample analysis at the internal lab and external lab.
(v) The testing of samples at the external lab coal and material shall be at least once every month.

(11) Treatment of Exported Power to Grid or Colony (outside entity's boundary)

(i) The electricity exported by the obligated entity through means of captive power plant, cogeneration plant or waste heat shall be adjusted for emissions and subtracted from the overall emissions of the entity.
(ii) The emission factor for the exported power shall be calculated basis the Weighted Average Net Heat Rate of the power generation and fuel used.
(iii) In case of non-availability of the above data, the exported power shall be adjusted using the Grid average emission as published by Central Electricity Authority.

(12) Renewable Electricity

(i) The obligated entity if using renewable energy at their premises through onsite generation, and offsite procurement through open access or through dedicated power purchase agreement or by Green Tariff shall be considered as energy input with zero emissions.
(ii) The obligated entity if claiming such benefits shall by means of necessary documentation such as contracts and agreement shall demonstrate that the energy procured is renewable energy and emission reduction is not double account by the entity and renewable energy generator.
(iii) The purchase of Renewable Energy Certificates is not considered as a claim towards renewable energy under the mechanism.

(13) Carbon Capture Utilisation and Storage

(i) The obligated entity shall subtract the emissions from their overall direct GHG emissions that is not emitted from the entity's operation and emissions are captured, transferred or utilized further by the Carbon Capture Utlisaiton and Storage process or is used to produce precipitated calcium carbonate in which captured CO2 is chemically bonded.

(ii) The obligated entity shall ensure and demonstrate the permeance of captured CO2 for claiming the reduction.

(iii) The obligated entity shall monitor and quantify such captured or transferred emissions and must be incorporated into the monitoring plan.

(14) Preparation and maintenance of quarterly and yearly data reports by the obligated entity covering at least the following:

(i) On the performance of the plant and production processes.

(ii) On the internal fuel audits of plants and production processes for the purpose of identification of various opportunities and measures to reduce GHG emissions and improve performance.

(iii) Production achieved, energy consumed, GHG emissions, and specific GHG emissions, measures adopted for GHG reduction/mitigation and quantity of GHG emissions reduced.

(iv) Form 1 – Annual Energy Consumption and GHG Emissions (as per Annexure V)

(15) All the activities undertaken by the obligated entity under this procedure shall be scrutinised by the accredited carbon verifier for the purpose of preparation of verification report and verify compliance with respect to GHG emissions norms as notified by the MoEFCC.

5. Verification and Assessment of Performance

(1) Every obligated entity, within three months of the conclusion of the compliance cycle shall submit the performance assessment document in Form 'A' (as per Annexure VI) covering the performance for the relevant cycle specifying the compliance with GHG emission intensity targets, duly verified together with certificate of verification in Form 'B' (as per Annexure VII) given by the accredited carbon verification agency and accompanied by the following documents, namely:-

(i) copy of unique number of registration given to the obligated entity.

(ii) proof of timely submission of Form 1 – Annual Energy Consumption and GHG Emissions

(iii) details of GHG emission reduction measures implemented to comply with the GHG emission intensity targets in the compliance cycle enclosing therewith, a brief about the GHG mitigation measures, details of investment made, photographs in support of measures implemented, if feasible, and percentage reduction in GHG emissions achieved.

(iv) details of GHG emissions and GHG emission intensity in the baseline year, achievement made in the current compliance cycle as per assessment of the accredited carbon verification agency on the achievement of GHG emission intensity targets, entitlement, or requirement of – Carbon Credit Certificates along with the details of calculation and correctness of duly certified by the accredited carbon verification agency.

(v) name and particulars of the energy manager, his date of appointment, details of duties performed including initiatives undertaken for reduction of GHG emission intensity.

(2) To conduct the verification process, the obligated entity shall appoint the accredited carbon verification agency. The appointed accredited carbon verification agency shall undertake strategic analysis to develop verification plan which shall at least contain:

(i) Verification objectives and scope.
(ii) Verification activities and schedule.
(iii) Team structure with roles and responsibilities.
(iv) Data and information to be reviewed and verified.
(v) Data sampling plan.
(vi) Risk management plan.
(vii) Plan for interviews/discussion and documentation of verification records.

(3) The accredited carbon verification agency shall appoint team for conducting the verification process as per the team requirements defined under the 'Accreditation eligibility criteria and Procedure for Accredited Carbon Verification Agency', the agency shall further define roles and responsibilities of each team member in verification and shall communicate same to the obligated entity before initiating the verification process.

(4) The verifier shall at least conduct one site visit to the obligated entity establishment during the verification process to carry out the activities required for verification as well as to gather

sufficient information and evidence enabling it to conclude whether the obligated entity emission and performance is free from errors or misrepresentations.

(5) The accredited carbon verification agency, in order to assess the correctness of the information provided by the obligated entity regarding the compliance with GHG Emission intensity targets shall –

(i) assess the data and information systems, IT systems, data flow activities, control activities, control systems and procedures for control activities.

(ii) verify the emission source and source stream coverage.

(iii) apply standard auditing and verification techniques.

(iv) sampling techniques in relation to data sampling and checking the control activities

(v) verify the data against the primary and secondary data sources and can conduct additional verification checks to determine the reliability of the data sources.

(vi) verify the emission calculation methodology for each of the emission sources of the obligated entity including estimation and analysis of net calorific value, GHG emission factor, oxidation factor, energy consumption and other relevant information.

(vii) document review, involving- review of data and its source, and information to verify the correctness, credibility and interpretation of presented information.

(viii) follow up action, involving- site visits, interviews with personnel responsible in the obligated entity' establishment; cross-check of information provided by interviewed personnel to ensure that no relevant information has been omitted or, over or under valued.

(ix) verify the fuel and material analysis process to determine the emission factor.

(x) verify the GHG emission measures implemented by the obligated entity.

(xi) integrate all aspects of verification, and certification functions.

(xii) make independent technical review of the opinion and decision of the verification team.

(xiii) review of the application of formulae and calculations, and reporting of the findings in the verification report.

(xiv) also take into consideration, a situation where a particular activity may or may not form part of the activities related to the compliance with the GHG emission norms.

(6) The accredited carbon verification agency shall verify the approach and information for its appropriateness to calculate the uncertainty levels.

(7) The accredited carbon verification agency shall independently evaluate each activity undertaken by the obligated entity for compliance with the GHG emission intensity targets and entitlement or requirement of – Carbon Credit Certificates, to ensure that they meet with the requirements of the compliance mechanism under this scheme.

(8) The accredited carbon verification agency shall report the results of his assessment in a verification report and the said report shall contain:

(i) the summary of the verification process, results of assessment and his opinion along with the supporting documents.

(ii) the details of verification activities carried out in order to arrive at the conclusion and opinion, including the details captured during the verification process and conclusion relating to compliance with GHG Emission norms, increase or decrease in specific GHG emission with reference to the specific GHG emission in the baseline year.

(iii) the record of interaction, if any, between the accredited carbon verification agency and the obligated entity as well as any change made in his assessment because of the clarifications, if any, given by the obligated entity.

(9) If the accredited carbon verification agency identifies any variations, discrepancy, inconsistency, missing information, misrepresentation, data gaps or non-compliance with the rules, the agency' shall document such information and obtain explanations from the obligated entities supported by additional relevant evidence or explanation

(10) If the accredited carbon verification agency records a positive opinion in his verification report, the Bureau shall consider that all the requirements with regard to the compliance with GHG emission intensity target, entitlement about issue or liability to purchase - Carbon Credit Certificate have been fulfilled.

6. Check-Verification Process

(1) The Bureau may on it own, or on receipt of a complaint regarding any error or inconsistency or misrepresentation, within six months from the date of submission of compliance report or within three months from the date of issue of carbon credits certificate, whichever is later, shall initiate action for independent review of compliance report in accordance with the provision of sub-rule (2).

(2) The Bureau shall initiate the action in accordance with the following procedure namely,

(i) A notice shall be issued to the obligated entity as well as to Accredited Carbon Verification Agency who has submitted the verification report to provide comments in reply to the said notice within ten working days from the date of receipt of aforesaid notice.

(ii) The comments furnished by the obligated entity and Accredited Carbon Verifiers shall clearly state that

(a) They stand by the compliance report and verification report submitted by them and submit a confirmation report giving point wise replies with necessary documents in response to the said notice.

(b) They accept the errors or inconsistencies, or misrepresentation pointed out in the aforesaid notice and shall give detailed explanation in respect to each point in the notice and work out the impacts of such errors or inconsistencies or misrepresentation.

(iii) Within ten working days from the date of the receipt of the comments referred to in clause (ii), Bureau shall after taking into consideration the said comments may decide to undertake or not to undertake the independent review and the Bureau shall record the reasons in writing for its decision and shall inform decision in writing to the obligated entity, his accredited carbon verifier and complainant.

(iv) Where the Bureau decides to undertake review,

(a) It shall appoint an accredited carbon verifier, who has not performed the verification functions with respect to the concerned obligated entity, to conduct the independent review

(b) On a complaint, the independent review shall be carried out at the cost of complainant.

(3) The independent review process shall involve assessment to ensure that

(i) The activities relating to the compliance with GHG emission norms have been performed and the issue of carbon credit certificate are in accordance with the process defined in this procedure.

(ii) The monitoring and reporting process are in accordance with the process defined in this procedure.

(iii) The details of the data and activities are evaluated, and conclusions then made that errors, omissions or misrepresentation or aggregation thereof in the said data do not affect the GHG emission norms achieved by the activities and issue or purchase of carbon credit certificates.

(4) The said accredited carbon verification agency shall assess and verify the activities performed by the obligated entity for compliance with GHG emission norms are in accordance with the process defined in this procedure, and the assessment and independent review shall involve-

(i) A review of the documents as well as the on-site assessment to verify that the activities performed to comply with the GHG emission norms are in accordance with the process defined in this procedure and in case the aforesaid accredited carbon verification agency decides that it was not possible or appropriate to make a site visit, then reasons shall be recorded in writing in this regard.

(ii) A review of both quantitative and qualitative information on the GHG emission norms, the quantitative information comprising of the reported data in 'Form A' and the qualitative information comprising of information on internal management controls, calculation procedures, procedures for transfer of data, reports, and review of internal field audit of calculations or data transfer.

(iii) A review of previous verification reports.

(iv) A review of any other information and documents relevant to or having a bearing on the activities performed under the process defined in this procedure.

(v) A review of monitoring and reporting process.

(5) The obligated entity shall furnish full and complete data, provide necessary document and other support required by the accredited carbon verification agency for the purpose of performing the function of independent review under the process defined in this procedure.

(6) The accredited carbon verification agency undertaking the independent review function shall report the results of his assessment independent review report and it shall contain:

(i) The summary of independent review process, results of their assessment and his opinion along with the supporting documents.

(ii) The details of independent review carried out in order to arrive at the conclusion and opinion including the details captured during the verification process and conclusion relating to compliance with GHG emission norms.

(7) If the accredited carbon verifier records in their independent review report, a positive opinion, it shall be concluded that all the requirements with regard to the compliance with GHG emission norms and the issue or purchase of carbon credit certificates have been met.

(8) If the accredited carbon verification agency records in their independent review report, a negative opinion, the effect of such opinion on GHG emission norms, issue, or purchase of carbon credit certificates, the liability of the accredited carbon verification agency in giving the verification report and amount of the unfair advantage by the obligated entity as a result of such verification report shall be calculated by the accredited carbon verification agency conducting the independent review.

(9) The accredited carbon verification agency in charge of independent review shall submit their review report with due certification in 'Form C' (as per annexure VIII) to the Bureau.

(10) Where the independent review has been initiated on the basis of a complaint received by the Bureau, the cost of independent review shall be borne by the obligated Entity in case it was found during the independent review that the obligated entity has submitted false and incorrect information in Form A.

7. Issuance of Carbon Credit Certificate

(1) The Bureau on satisfying itself about the correctness of verification report, and check-verification report, wherever sought by it, shall submit the report to the NSCICM, based on the claim raised by the obligated entity in Form 'A', within two months from the last date of

submission of said Form 'A', for issuance of carbon credit certificates under section 14AA of the Act and the report shall specify.-

a. the exact number of carbon credit certificates to be issued to the designated consumer and the entitlement to purchase the carbon credit certificates after determining by the following formula:

b. number of carbon credit certificates = (specific GHG emission notified for the respective compliance cycle – specific GHG emission as achieved in the respective compliance cycle) × production in that compliance cycle.

c. the certification that all the requirements for issue of carbon credit certificates have been complied with, by the obligated entity and his entitlement has been certified in the verification report by the accredited carbon verification agency.

(2) The NSCICM shall recommend to Bureau to issue carbon credit certificates within the 2 weeks from the date of receiving the report.

(3) The Bureau shall take subsequent approval of the Central Government and issue the carbon credit certificates of required value to the concerned obligated entity with in two weeks from the date of receipt of such approval from the Central Government.

8. Trading of Carbon Credit Certificates

(1) After the issuance of Carbon Credit Certificates, the Obligated Entities shall register themselves on the ICM Registry with the objective to get the equivalent CCC credited into the respective Obligated Entity registry account.

(2) Each Obligated Entity shall register with the ICM Registry within 4 weeks from the issuance of CCC by submitting the relevant details and defined fees as per the procedure defined by the Central Electricity Regulatory Commission (CERC) under the Terms and Conditions for trading of CCC under the ICM.

(3) The non-obligated entities who want to purchase the CCC on voluntary basis shall also register themselves on the ICM Registry by submitting the relevant details and defined fees as per the procedure defined by the Central Electricity Regulatory Commission (CERC) under the Terms and Conditions for trading of CCC under the ICM.

(4) On the successful registration with the ICM Registry, the Certificate of Registration shall be issued by the ICM Registry to the concerned Obligated and Non-Obligated Entity.

(5) The Obligated and Non-Obligated Entity can register and trade the CCC on the Power Exchanges registered by Commission for the purpose of the CCC trade under the ICM.

(6) The Certificate of Registration shall be mandatory for the entities to register with the Power Exchanges.

(7) The CCC shall be traded over the power exchanges as per the procedure defined by the Central Electricity Regulatory Commission (CERC) under the Terms and Conditions for trading of CCC under the ICM.

9. Banking of Carbon Credit Certificates

(1) On completion of the compliance cycle, the balance CCC of that compliance cycle can be banked for the purpose of utilizing them in the next compliance cycles.

(2) The banked CCC that were issued to the Obligated Entity can be sold in the Indian Carbon Market or can be used for the purpose of achieving compliance in the next compliance cycles.

(3) The banked CCC that were purchased from the Indian Carbon Market can be used only for the purpose of achieving compliance in the compliance cycles.

10. Compliance with GHG Emission Norms

(1) The obligated entity for the purpose of achieving the compliance with the GHG emission norms in any compliance cycle of the trajectory period, shall prepare the long-term action plan to reduce or remove or avoid the greenhouse gases emissions in the format as annexed as Annexure V.

(2) The obligated entity shall submit the long-term action plan within three months from the commencement of first compliance cycle along with the planned annual activities for the current compliance cycle.

(3) The obligated entity shall submit the annual planned activities for the subsequent compliance cycles within three months from the commencement of relevant compliance cycle and revised long-term action plan, in case of any revision.

(4) The obligated entity shall act in accordance with the submitted long-term action plan and after the verification and trading process, furnish the status of compliance in the form of 'Compliance Assessment Document' in FORM D (as per Annexure IX) within 2 weeks from the date of last trading session of the relevant compliance cycle in the format as annexed as Annexure VI.

(5) The obligated entity shall comply and furnish the status of compliance after the verification and trading process within 9 months from the completion of the compliance cycle –

a. by implementation of the submitted action plan or

b. where the actions implemented in terms of clause (a) are found inadequate for achieving compliance with the specific GHG emission norms, the obligated entity shall meet the shortfall by purchasing Carbon Credits Certificates from the Indian Carbon Market.

11. Obligations of the Obligated Entities

(1) Every Obligated Entity shall get the work of verification done through accredited carbon verification agencies for the assessment of their performance for compliance with the specific GHG emission norms.

(2) Every Obligated Entity shall take all measures including implementation of long-term action plan and good practices prevalent or in use in the concerned sector so as to achieve the reduction in the GHG emissions in their establishment.

(3) Every Obligated Entity shall furnish the full and complete data, provide necessary documents in the form as required by the Bureau or the accredited carbon verification agencies for the purpose of this scheme.

Annexure I: Global Warming Potential for Greenhouse Gases

If other greenhouses are applicable for an obligated entity, the GHG equivalence calculation shall be undertaken basis of the Global Warming Potential (GWP) of GHGs for 100 years, IPCC AR2 (IPCC, 1995), and as referred in India Biennial Update Reports to UNFCCC.

Gas	GWP (100 Years)
Carbon Dioxide (CO_2)	1
Methane (CH_4)	21
Nitrous Oxide (N_2O)	310
CF_4	6500
C_2F_6	9200
C_6F_{10}	7000
C_6F_{14}	7400

Annexure II: Conversion Formula

A. Total GHG Emissions

$$Total\ GHG\ Emissions = Direct\ Emissions\ (energy) + Direct\ Emissions\ Process\ + Indirect\ Emissions\ from\ Purchased\ Electricity\ \&\ Heat - adjusted\ emissions\ from\ (exported\ power, CCUS)..$$ (Equation I)

B. Total GHG Emissions Intensity

$$GHG\ Emission\ Intensity\ (t\ CO2/t) = \frac{Total\ GHG\ Emisisons\ \ (t\ CO2)}{Total\ Equivalent\ Output\ (t\ or\ MWh)}\ (Equation\ II)$$

C. Absolute Emissions Estimation (Standard Calculation methodology)

In this methodology the emissions are calculated by using activity data i.e., the amount of fuel and raw material consumed by the entity and using the relevant emission and conversion factors. The conversion factors include oxidation factor for combustion emissions and conversion factor for process emissions:

D. Combustion emissions (Direct)

$$GHG_{Direct} = Activity\ Data\ X\ Emisison\ Factor * Oxidation\ Factor$$ (Equation III)

where,

GHG_{Direct} ..... Direct GHG Emissions [t CO_2]

AD ..... Activity data [TOE or kCal or kg or tonne of material]

EF ..... Emission factor [t CO_2/TOE or t CO_2/t or t CO_2/Nm^3 or g CO2/kCal]

OF ..... Oxidation factor [dimensionless]

Activity data of fuels (including fuels used as raw material input) shall be expressed as net calorific value.

$$AD = FQ * NCV$$ (Equation IV)

Where:

AD……. Activity data

FQ ..... Fuel quantity [tonne or toe or kCal or Nm3]

NCV .... Net Calorific Value [kCal/kg or kCal/Nm3]

Oxidation Factor shall be calculated as per following formula

$$Oxidation\ Factor = 1 - \frac{Carbon_{Fuel}}{Carbon_{ash\ \&\ gas}}$$ (Equation V)

Where:

Carbon Fuel……Total Carbon Content in Fuel on Weight basis

Carbon Ash & Gas…. Carbon contained in ash and flue gas dust

E. Purchased Electricity (Indirect)

$$GHG_{Indirect} = AD * EF$$ (Equation VI)

where,

$GHG_{Indirect}$ ..... *Emissions [t CO_2]*

AD ..... Activity data [MWh]

EF ..... Emission factor [t CO_2/MWh]

F. Purchased Heat (Indirect)

$$GHG_{Indirect} = AD * EF$$ (Equation VII)

where,

$GHG_{Indirect}$..... *Emissions [t CO_2]*

AD ..... Activity data [TOE]

EF ..... Emission factor [t CO_2/TOE]

G. Process emissions

The process emissions are estimated as

$$GHGprocess = AD * EF * CF$$ (Equation VIII)

Where:

GHG Process..... Emissions [t CO_2]

AD ..... Activity data [t or Nm3]

EF ..... Emission factor [t CO_2/t or t CO_2/Nm3]

CF ..... Conversion factor [dimensionless]

Activity data can be an input material in a particular process or the output of the process The process emissions covers both organic and inorganic carbon emissions from the process. The sector specific methodology to estimate process emissions is mentioned below.

The following sources of process emissions shall atleast be covered by the obligated entity while reporting emissions:

- Calcination of limestone and other carbonates in the raw material
- Raw materials used for waste gas scrubbing
- Emissions from reactions of raw materials (other than combustion)
- Emissions from consumption of electrodes

G.1. Cement Sector – Process emissions

Process emissions from raw meal (i.e., a mixture of clay and limestone which is a raw material for clinker production) shall be monitored based on carbonate content of process input/output or amount of clinker produced.

G1.1. Output Based Method (based on amount of clinker produced)

Under this method, CaO and MgO shall be taken into account and emissions. The emissions shall be estimate using the following formula

$$GHGclinker = fraction\ CaO\ x\ \frac{44.01}{56.08} + fraction\ of\ Mgo\ x\ \frac{44.01}{40.34}$$ (Equation IX)

Where,

$GHG_{Clinker}$.....Emission from Clinkerisation (t CO2/t)

Fraction of CaO in Clinker

Fraction of MgO in Clinker

G1.2. Emissions related to CKD (if applicable)

The emission factor for clinker shall be further adjusted for bypass dust leaving the system, and shall be calculated using following equation

$$GHG_{CKD} = \frac{\frac{GHG_{Clinker}}{1+GHG_{Clinker}} x\ CR}{1-\frac{GHG_{Clinker}}{1+GHG_{Clinker}}}$$ (Equation X)

Where,

$GHG_{Clinker}$ is emission factor derived from Equation IX (t CO2/T)

CR is calcination rate (

$GHG_{CKD\ is}$ GHG emission factor for Calcined Kiln Dust (t CO2/t)

G.1.3. Emissions related to Bypass Dust (if applicable)

Emission factor for Bypass dust leaving the system shall be calculated basis the quantify of Bypass dust and clinker emission factor

$$GHG_{Bypassdust=GHG_{Clinker}}$$ (Equation XI)

Where,

GHGBypass Dust ---emission factor for bypass dust (t CO2/t)

G.1.4. *Emissions from Organic Carbon in Raw Material*

The obligated entity should also include emission from organic carbon in raw material and following is the formula:

$$GHG_{OC} = \frac{\%\ Organic\ Carbon\ in\ Raw\ Meal\ x\ Raw\ Meal\ to\ Clinker\ Factor}{100}\ x\ \frac{44}{12}$$ (Equation XII)

Where,

GHG_{Oc}…GHG emission factor for Organic Carbon (t CO2/t Clinker)

G.1.5. Total Direct Emissions from Process (Cement)

$$\text{Total Process Emissions (t CO2)} = \text{GHG}_{\text{Clinker}} \text{ x Clinker Prodution (t)} + \text{GHG}_{\text{Clinker}} \text{ x Bypass Dust (t)} + \text{GHG}_{\text{CKD}} \text{ x CKD (t)} + \text{GHG}_{\text{OC}} \text{x Clinker Production (t)}\ldots$$ (Equation XIII)

G.2. Process emissions from production or processing of primary aluminium

For the aluminium sector, the following sources of CO_2 emissions shall be considered atleast by the obligated entity:

- electrode production
- reduction of Al_2O_3 during electrolysis which is related to electrode consumption
- use of soda ash or other carbonates for waste gas scrubbing
- PFC (Perfluorocarbons) emissions as a result of anode effects including fugitive emissions.

G.2.1 Determination of CO_2 emissions (refer mass balance approach)

The CO_2 emissions shall be estimated by using mass balance approach. The mass balance methodology shall consider all carbon in inputs, stocks, products and other exports from the mixing, forming, baking and recycling of electrodes as well as from electrode consumption in electrolysis.

G.2.2. Determination of PFC emissions

The emissions of CF_4 and C_2F_6 emitted through Slope Method

Slope Method

The obligated entity shall use the following equations for determining PFC emissions:

$$CF_4\ emissions\ (t) = AEM\ xSEF_{CF4}\ x\ Production\ molten\ aluminium\ (t)\ /1000$$

(equation XIV)

Where,

AEM ….Anode effect minutes / cell-day;

SEF_{CF4} …..Slope emission factor [(kg CF_4 / t Al produced) / (anode effect minutes / cell-day)].

Where different cell-types are used, different SEF may be applied as follows;

Technology	Emission factor (SEF_{CF4})
Centre Worked Prebake (CWPB)	0.143
Side Worked Prebake (SWPB)	0.233
Vertical Stud Søderberg (VSS)	0.092
Legacy Point Feed Pre Bake	0.122
Modern Point Feed Pre Bake	0.104

$$C_2F_6\ emissions\ (t)\ = CF_4 emissions\ \times\ Wt.Fraction\ (C_2F_6)$$ (Equation XV)

Where:

C_2F_6 …emissions in t

F_{C2F6}….. Weight fraction of C_2F_6 (t C_2F_6/ t CF_4).

Where different cell-types are used, different FC_2F_6 may be applied as follows;

Technology	Emission factor for C_2F_6
Centre Worked Prebake (CWPB)	0.121
Side Worked Prebake (SWPB)	0.280
Vertical Stud Søderberg (VSS)	0.053
Legacy Point Feed Pre Bake	0.097
Modern Point Feed Pre Bake	0.057

The total PFC emissions from aluminum production shall be measures by using following formula.

$PFC\ emissions\ (t\ CO2e)\ =\ CF4\ emissions\ (t)\ \times\ GWPCF4\ +\ C2F6\ emissions\ (t)\ \times\ GWPC2F6$ (Equation XVI)

G.3. Mass Balance Approach

$GHG\ Emissions\ =(Material_{in}\ x\ Carbon\ Content_{in}-Material_{out}\ xCarbon\ Content_{Out})\ x\ 44/12$ .. (Equation XVI)

Annexure III: Conversion Formula for Conversion NCV

A. Measuring GCV

The Gross Calorific value for coal shall be measured using following formula (in case of NCV is not available)

$$GCV = 81\ x\ (\%C) + 342.5\ x\ \left(\%H - \frac{\%O}{8}\right) + 22.5\ x\ (\%S)\ldots \text{(Equation XVII)}$$

Where,

GCV …Gross Calorific Value (kCal/kg)

C ….. % of Carbon by weight

H….% of Hydrogen by weight

O….% of Oxygen by weight

S…% of Sulphur by weight

B. Measuring NCV

The Net Calorific value for coal shall be measured using following formula (in case of NCV is not available)

$NCV = GCV - 5.87\ x\ (9\ x\ \%H + \%M)$ (Equation XVIII)

Where,

NCV ….Net Calorific Value (kCal/kg)

GCV …Gross Calorific Value (kCal/kg)

H….% of Hydrogen by weight

M….% of Moisture by weight

C. Measuring Total Carbon

If the ultimate analysis has not been carried out for getting TC% result, the Total Carbon can be calculated by using following formulae:

$\%Total\ Carbon = 0.97x\ \%C + 0.7(\%VM + 0.1\ x\ \%A) - \%M(0.6 - 0.01\ x\ \%M)$.. Equation (XIX)

Where

C…. % of fixed carbon

A….% of ash

VM….% of volatile matter

M….% of moisture

D. Measuring Emission Factor from Total Carbon Content

The emission factor (Type II) for the calculation of emission basis the total carbon content for fuel shall be calculated using the following formulae:

$$GHG\ emssion\ factor\ \left(\frac{gCO2}{kCal}\right) = \frac{\%\ Total\ Carbon\ Content}{Net\ Calorific\ Value\left(\frac{kCal}{kg}\right) x\ 100}\ x\ \frac{44}{12}\ x\ 100.$$ (Equation XX)

Annexure IV: GHG Emission Factors

The obligated entity are required to calculate the emissions using the Type I or Type II emissions factors and when referring to Type I factors, it should be referred from IPCC Guidelines and as per following table:

Reference Value for Emission Factors				
Sr. No	Fuel	Carbon Dioxide (CO2)	Methane (CH4)	Nitrous Oxide (N2O)
		t CO2/TJ	kg CH4/TJ	kg N2O/TJ
1	Crude Oil	73.30	3.00	0.60
2	Orimulsion	77.00	3.00	0.60
3	Natural Gas Liquids	64.20	3.00	0.60
4	Motor Gasoline	69.30	3.00	0.60
5	Aviation Gasoline	70.00	3.00	0.60
6	Jet Gasoline	70.00	3.00	0.60
7	Jet Kerosene	71.50	3.00	0.60
8	Other Kerosene	71.90	3.00	0.60
9	Shale Oil	73.30	3.00	0.60
10	Gas/Diesel Oil	74.10	3.00	0.60
11	Residual Fuel Oil	77.40	3.00	0.60
12	Liquefied Petroleum Gas	63.10	3.00	0.60
13	Ethane	61.60	3.00	0.60
14	Naptha	73.30	3.00	0.60
15	Bitumen	80.70	3.00	0.60
16	Lubricants	73.30	3.00	0.60
17	Petroleum Coke	97.50	3.00	0.60
18	Refinery Feedstock	73.30	3.00	0.60
19	Refinery Gas	57.60	3.00	0.60
20	Paraffin Waxes	73.30	3.00	0.60
21	White Spirit and SBP	73.30	3.00	0.60
22	Other Petroleum Products	73.30	3.00	0.60
23	Anthracite	98.30	1.00	1.50
24	Coking Coal	94.60	1.00	1.50
25	Other Bituminous Coal	96.10	1.00	1.50
26	Sub Bituminous Coal	101.00	1.00	1.50
27	Lignite	107.00	1.00	1.50
28	Oil Shale and Tar Sands	107.00	1.00	1.50
29	Brown Coal Briquettes	97.50	1.00	1.50
30	Patent Fuel	97.50	1.00	1.50
31	Coke Oven Coke and Lignite Coke	107.00	1.00	1.50
32	Gas Coke	107.00	1.00	0.10
33	Coal Tar	80.70	1.00	1.50

34	Gas Works Gas	44.40	1.00	0.10
35	Coke Oven Gas	44.40	1.00	0.10
36	Blast Furnace Gas	260.00	1.00	0.10
37	Oxygen Steel Furnace Gas	182.00	1.00	0.10
38	Natural Gas	56.10	1.00	0.10
39	Municipal Waste (Non Biomass Fraction)	91.70	30.00	4.00
40	Industrial Waste	143.00	30.00	4.00
41	Waste Oils	73.30	30.00	4.00
42	Peat	106.00	1.00	1.50
43	Wood/Wood Waste	112.00	30.00	4.00
44	Sulphite Lyes (Black Liquor)	95.30	3.00	2.00
45	Other Primary Solid Biomass	100.00	30.00	4.00
46	Charcoal	112.00	200.00	4.00
47	Biogasoline	70.80	3.00	0.60
48	Biodiesel	70.80	3.00	0.60
49	Other Liquid Biofuels	79.60	3.00	0.60
50	Landfill Gas	54.60	1.00	0.10
51	Sludge Gas	54.60	1.00	0.10
52	Other Biogas	54.60	1.00	0.10
53	Municipal Waste (Biomass fraction)	100.00	30.00	4.00

Sr.No	Material	Value	Unit
1	CaCO3	0.44	t CO2/t material
2	MgCO3	0.522	t CO2/t material
3	Na2CO3	0.415	t CO2/t material
4	BaCO3	0.223	t CO2/t material
5	Li2CO3	0.596	t CO2/t material
6	K2CO3	0.318	t CO2/t material
7	SrCO3	0.298	t CO2/t material
8	NaHCO3	0.524	t CO2/t material
9	FeCO3	0.38	t CO2/t material
10	Urea	0.7328	t CO2/t material

Annexure V- Form I – Annual Energy and GHG Emissions submission Form

Form 1				
Annual Energy Consumption and GHG Emissions				
Section-A (General Information Details)				
Sr No.	**General Details**	**Description**		
1	Name of the Unit			
2	(i) Year of Establishment			
	(ii) Registration No (As provided by BEE)			
3	Sector and Sub-Sector in which the Designated Consumer falls	Sector		Sub-Sector
4. (i)	Complete address of DCs Unit location **(including Chief Executive's name & designation)** with mobile, telephone, fax nos. & e-mail.			
(ii)	Registered Office address with telephone, fax nos. & e-mail			
(iii)	Energy Manager's Name, designation, Registration No., Address, Mobile, Telephone, Fax nos. & e-mail			
Section - B (Production and Energy Consumption Details)				
5.1	**Aluminium, Cement, Chlor Alkali, Iron & Steel, Fertilizer, Pulp & Paper, Textile, and Petro-Chemical sectors notified as Designated Consumers**			
(a)	**Production details**			
	Name of Products	**Unit**	**Previous Year**	**Current Year**
		(1)	**(2)**	**(3)**
(i)	Product 1	Tonne		
(ii)	Product 2	Tonne		
(iii)	Product 3	Tonne		
(iv)	Product (Please add extra rows in case of additional products)	Tonne		
(v)	Total Equivalent Product	Tonne		
(b)	**Energy Consumption and GHG Emissions Details**			
(i)	Total Electricity Purchased from Grid/Other Source	Million kWh		
(ii)	Total Electricity Generated	Million kWh		
(iii)	Total Electricity Exported	Million kWh		
(iv)	Total Electrical Energy Consumption	Million kWh		
(v)	Total Solid Fuel Consumption	Million kcal		

(vi)	Total Liquid Fuel Consumption	Million kcal		
(vii)	Total Gaseous Fuel Consumption	Million kcal		
(viii)	Total Thermal Energy Consumption	Million kcal		
(ix)	Total Energy Consumption (Thermal + Electrical)	TOE		
(x)	Total Normalized Energy Consumption (Thermal + Electrical)	TOE		
(xi)	Direct GHG Emissions (Energy related)	t CO_2eq		
(xii)	Indirect GHG Emissions (Energy related)	t CO_2eq		
(xiii)	Direct GHG Emissions (Process related)	t CO_2eq		
(xiv)	Total Direct & Indirect Emissions	t CO_2eq		
(c)	**Specific Energy Consumption Details**			
(i)	Specific Energy Consumption(Without Normalization)	TOE/Tonne		
(ii)	Specific Energy Consumption (Normalized)	TOE/Tonne		
(iii)	Specific GHG Emissions	t CO_2eq/Tonne		
5.2	**Thermal Power Stations (Coal/Oil/Gas/others) notified as Designated Consumer**			
(i)	Total Capacity	MW		
(ii)	Unit Configuration	No. of units with their capacity		
(iii)	Annual Gross Generation	Million kWh		
(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		
(x)	Direct GHG Emissions (Energy related)	t CO_2eq		
(xi)	Indirect GHG Emissions (Energy related)	t CO_2eq		
(xii)	Direct GHG Emissions (Process related)	t CO_2eq		
(xiii)	Total Direct & Indirect Emissions	t CO_2eq		
(xiv)	Specific GHG Emissions (on Net Generation)	t CO_2eq/MWh		
5.3	**Petroleum Refinery notified as Designated Consumer**			
(a)	**Crude Oil Processed Details**			
(i)	Throughput (Total Crude Oil Processed)	Thousand Barrels (Mbbls)		
(ii)	NRGF (Without Normalization)			
(iii)	NRGF(Normalized)			

(b)	**Energy Consumption and GHG Emissions Details**			
(i)	Total Electricity Purchased from Grid/Other Source	Million kWh		
(ii)	Total Electricity Generated	Million kWh		
(iii)	Total Electricity Exported	Million kWh		
(iv)	Total Electricity Consumed in the Plant	Million kWh		
(v)	Total Electrical Energy Consumption	SRFT		
(vi)	Total Solid Fuel Consumption	SRFT		
(vii)	Total Liquid Fuel Consumption	SRFT		
(viii)	Total Gaseous Fuel Consumption	SRFT		
(ix)	Total Thermal Energy Consumption	SRFT		
(x)	Total Steam Exported/Consumed for Non-refinery opeartions	SRFT		
(xi)	Total Energy Consumption (Thermal + Electrical)	MMBTU		
(xii)	Total Normalized Energy Consumption (Thermal + Electrical)	MMBTU		
(xiii)	Direct GHG Emissions (Energy related)	t CO_2eq		
(xiv)	Indirect GHG Emissions (Energy related)	t CO_2eq		
(xv)	Direct GHG Emissions (Process and fugitive related)	t CO_2eq		
(xvi)	Total Direct & Indirect Emissions	t CO_2eq		
(c)	**Specific Energy Consumption Details**			
(i)	Specific Energy Consumption(Without Normalization)	MMBTU/Mbbls/NRGF (MBN)		
(ii)	Specific Energy Consumption (Normalized)	MMBTU/Mbbls/NRGF (MBN)		
(iii)	Specific GHG Emissions	t CO_2eq/ Mbbls/NRGGF (MBN)		
5.4	**Electricity Distribution Companies notified as Designated Consumer**			
(a)	**Energy Input Details**			
(i)	Input energy purchase	Million kWh		
(ii)	Net input energy (at DISCOM Periphery after adjusting the transmission losses and energy traded)	Million kWh		
(iii)	Total Energy billed (is the Net energy billed, adjusted for energy traded))	Million kWh		
(b)	Transmission and Distribution (T&D) loss Details	Million kWh		
		%		
5.5	**Railways units notified as Designated Consumer**			

5.5.1	**Zonal Units Notified as Designated Consumers**			
(a)	**Gross Tonne Kilometrage**			
(i)	Gross Tonne Kilometrage (For Diesel-Passenger)	GTKm		
(ii)	Gross Tonne Kilometrage (For Diesel-Goods)	GTKm		
(iii)	Gross Tonne Kilometrage (For Electrical-Passenger)	GTKm		
(iv)	Gross Tonne Kilometrage (For Electrical-Goods)	GTKm		
(b)	**Energy Consumption Details**			
(i)	Diesel Consumption for Gross Tonne Kilometrage (for Passenger)	KL		
(ii)	Diesel Consumption for Gross Tonne Kilometrage (for Goods)	KL		
(iii)	Electricity Consumption for Gross Tonne Kilometrage (for Passenger)	Million kWh		
(iv)	Electricity Consumption for Gross Tonne Kilometrage (for Goods)	Million kWh		
(c)	**Specific Energy Consumption Details**			
(i)	Specific Energy Consumption of Diesel for Passenger (Without Normalization)	L/1000GTKm		
(ii)	Specific Energy Consumption of Diesel for Goods (Without Normalization)	L/1000GTKm		
(iii)	Specific Energy Consumption of Electrical for Passenger(Without Normalization)	kWh/1000GTKm		
(iv)	Specific Energy Consumption of Electrical for Goods (Without Normalization)	kWh/1000GTKm		
(v)	Specific Energy Consumption of Diesel for Passenger (With Normalization)	L/1000GTKm		
(vi)	Specific Energy Consumption of Diesel for Goods (With Normalization)	L/1000GTKm		
(vii)	Specific Energy Consumption of Electrical for Passenger(With Normalization)	kWh/1000GTKm		
(viii)	Specific Energy Consumption of Electrical for Goods (With Normalization)	kWh/1000GTKm		
5.5.2	**Railway Production Units Notified as Designated Consumer**			
(a)	**Production Details**			
(i)	Total Major Production	No of units		
(ii)	Total Minor Production	No of units		
(iii)	Total Other Product-1	No of units		
(iv)	Total Other Product-2	No of units		

(v)	Total Other Product-3	No of units		
(vi)	Product (Please add extra rows in case of additional products)	No of units		
(vii)	Total Equivalent Product	No of Equated Units		
(b)	**Energy Consumption Details**			
(i)	Total Electricity Purchased from Grid/Other Source	Million kWh		
(ii)	Total Electricity Generated	Million kWh		
(iii)	Total Electricity Exported	Million kWh		
(iv)	Total Electrical Energy Consumption	Million kWh		
(v)	Total Solid Fuel Consumption	Million kcal		
(vi)	Total Liquid Fuel Consumption	Million kcal		
(vii)	Total Gaseous Fuel Consumption	Million kcal		
(viii)	Total Thermal Energy Consumption	Million kcal		
(ix)	Total Energy Consumption (Thermal + Electrical)	TOE		
(x)	Total Normalized Energy Consumption (Thermal + Electrical)	TOE		
(c)	**Specific Energy Consumption Details**			
(i)	Specific Energy Consumption(Without Normalization)	Kgoe/ Eq. Unit		
(ii)	Specific Energy Consumption (Normalized)	Kgoe/ Eq. Unit		
5.6	**Commercial Building or establishments - Hotels notified as Designated Consumer**			
(a)	**Building Area**			
(i)	Total Built up area	m2		
(ii)	Air-conditioned area	m2		
(iii)	Non-Airconditioned area	m2		
(iv)	Gross Floor area	m2		
(v)	Public area	m2		
(vi)	Service area	m2		
(vii)	Covered Parking Area	m2		
(b)	**Energy Consumption Details**			
(i)	Total Electricity Purchased from Grid/Other Source	KWh		
(ii)	Total Electricity Generated	KWh		
(iii)	Total Electrical Energy Consumption	KWh		
(iv)	Total Solid Fuel Consumption	Million kcal		
(v)	Total Liquid Fuel Consumption	Million kcal		
(vi)	Total Gaseous Fuel Consumption	Million kcal		
(vii)	Total Thermal Energy Consumption	Million kcal		
(viii)	Total Normalized Energy Consumption (Thermal + Electrical)	TOE		

(ix)	Direct GHG Emissions (Energy related)	t CO_2eq		
(x)	Indirect GHG Emissions (Energy related)	t CO_2eq		
(xi)	Total Direct & Indirect Emissions	t CO_2eq		
(c)	**Specific Energy Consumption Details**			
(i)	Specific Energy Consumption (Without Normalization)	TOE/1000 m2/year		
(ii)	Specific Energy Consumption (Normalized)	TOE/1000 m2/year		
(iii)	Specific GHG Emissions	t CO2/1000 m2/year		

	Section - C (Sector-wise as well as sub-sector wise pro-forma details)		
6	**Name of the Sector (illustrative)**	**Sub-Sector**	**Pro-forma in which the details to be furnished**
(i)	Aluminium	Refinery/Smelter	Sa_1
		Cold Rolling Sheet	Sa_2
(ii)	Cement	Cement	Sb
(iii)	Chlor-Alkali	Chlor-Alkali	Sc
(iv)	Fertilizer	Fertilizer	Sd
(v)	Iron and Steel	Integrated Steel	Se_1
		Sponge Iron	Se_2
(vi)	Pulp and Paper	Pulp and Paper	Sf
(vii)	Textile	Composite	Sg_1
		Fiber	Sg_2
		Spinning	Sg_3
		Processing	Sg_4
(viii)	Thermal Power Plant	Thermal Power Plant (Coal/Oil/Gas)	Sh
(ix)	Petroleum Refinery	Petroleum Refinery	Si
(xii)	Commercial Building	Hotels	Sl

I/we undertake that the information supplied in the Form 1 and Sector Specific Pro-forma is accurate to the best of my knowledge and the data furnished in Form 1 has been adhered to the data given in the concerned Sector Specific Pro-forma.

Signature

( )

Name of the Energy Manager

Registration number

Annexure VI- Form A –Performance Assessment Document

Form – A
PERFORMANCE ASSESSMENT DOCUMENT

(To be filled by Obliged Entity)

1.	Name of obligated entity			Auto	
2.	Registration number			Auto	
3.	Sector			Auto	
4.	Sub-sector			Auto	
5.	Accredited Carbon Verification Agency			Auto	
6.	Annual Carbon Emission Accounting Form – Form I Previous Year			Submitted/Not submitted	
7.	Achieved Specific GHG Emissions (SGE) [tCO_2e per unit of equivalent product]				
8.	Production (baseline) [ton or Million kWh]				
9.	Number of Carbon Credit Certificates				Issued/ Purchased (Drop Down)
10.	Carbon Emission Reduction measures implemented in the current compliance cycle				
11.	Measure	Year of Implementation	GHG Emission (before)	GHG Emission (after)	Investment
(i)					
(ii)					

Undertaking

I/We undertake that the information supplied in this Performance Assessment Document is accurate to the best of my knowledge and if any of the information supplied is found to be incorrect and such information result into loss to the Central Government or any of the authority under them or any other person affected, I/we undertake to indemnify such loss.

I /We agree to extend necessary assistance in case of any enquiry to be made in the matter.

Signature
Name
Designation
For and behalf of
Name of the Firm/Company/Organization
SEAL of the Firm /Company/Organization

Annexure VII- Form B –Certificate of Verification

Form B
CERTIFICATE OF VERIFICATION

We _____the accredited carbon verification agency, have undertaken a thorough independent evaluation of the activities undertaken by M/s. _____, a obligated entity for compliance with the greenhouse gases emission norms specified under the Government of India, Ministry of Environment Forest and Climate Change notification number_____, dated the _____for the compliance cycle ____ and consequent entitlement or requirement of carbon credit certificates and certify that-

(a) the verification of the data collection in relation to greenhouse gases emitted and specific greenhouse gases emission per unit of equivalent product in the compliance cycle in Annual Carbon Emission Accounting Form (Form 1), has been carried out diligently and truthfully;

(b) the verification of the identified carbon emission reduction measures and the progress of their implementation given in the Form A has been carried out diligently and truthfully;

(c) the verification of the compliance with greenhouse gases emission norms during the compliance cycle has been carried out diligently and truthfully;

(d) the verification of the total amount of greenhouse gases emissions reduced in the compliance cycle and request made by the obligated entity, the entitlement of _____ (Nos) carbon credit certificate (s) required to be issued or purchased by that obligated entity have been carried out diligently and truthfully;

(e) all reasonable professional skill, care, and diligence have been taken in verifying the various verification activities, findings and conclusions, documents, reports, preparing the documents including the performance assessment document in Form ‘A’ and verification report and the contents thereof are a true representation of the facts.

Signature:
Authorized Signatory on behalf of accredited carbon verification agency
Designation:

Annexure VIII- Form C –Certificate of Check Verification

Form C
Certificate of Check – Verification

We _____the accredited carbon verification agency, have undertaken a thorough independent evaluation of the activities undertaken by M/s. _____, a obligated entity for compliance with the greenhouse gases emission norms specified under the Government of India, Ministry of Environment Forest and Climate Change notification number_____, dated the _____for the compliance cycle ____ and consequent entitlement or requirement of carbon credit certificates, mentioned in the Performance Assessment Document in Form 'A' and compliance of greenhouse gas emission norms document in Form 'D' and certify that-

(a) the check-verification of the data collection in relation to greenhouse gases emitted and specific greenhouse gases emission per unit of equivalent product in the compliance cycle in Annual Carbon Emission Accounting Form (Form 1), has been carried out diligently and truthfully;

(b) the check-verification of the identified carbon emission reduction measures and the progress of their implementation given in the Form A has been carried out diligently and truthfully;

(c) the check-verification of the compliance with greenhouse gases emission norms during the compliance cycle has been carried out diligently and truthfully;

(d) the check-verification of the total amount of greenhouse gases emissions reduced in the compliance cycle and request made by] the obligated entity, the entitlement of _____ (Nos) carbon credit certificate (s) required to be issued or purchased by that obligated entity have been carried out diligently and truthfully;

(e) all reasonable professional skill, care, and diligence have been taken in check-verifying the various verification activities, findings and conclusions, documents, reports, preparing the documents including the performance assessment document in Form 'A' and verification report submitted by the accredited energy auditor appointed by the obligated entity …… for verification and the contents thereof are a true representation of the facts.

Signature:
Authorized Signatory on behalf of accredited carbon verification agency for check-verification
Designation:

Annexure IX- Form D –Compliance of Greenhouse Gas Emissions Norms – Document

Form D

COMPLIANCE OF GREENHOUSE GASES EMMISSION NORMS DOCUMENT
(To be filled in by obligated entity)

1.	Name of obligated entity	Auto	
2.	Registration number	Auto	
3.	Sector	Auto	
4.	Sub-sector	Auto	
5.	Accredited Carbon Verification Agency	Auto	
6.	Performance Assessment Document – Form A	Submitted/Not submitted	
7.	Number of Carbon Credit Certificates	Issued/ Purchased	
8.	Carbon Credit Certificates submission for compliance	No. of Certificates	
(i)	Compliance Cycle II		Max. CCC Available
	…..	…	….
(ii)	Compliance Cycle I		Max. CCC Available