PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT

Title under UCR: 7.5 MW biomass based Power Project by SCPL, India

(Title under CDM: 7.5 MW biomass-based power project by Chambal Power Limited at Rangpur, Rajasthan, UNFCCC ID 0347)

Version 1.0
Date 21/03/2022

First CoU Issuance Period: 1 years, 00 months

Date: 01/01/2021 to 31/12/2021

Project Concept Note (PCN)
CARBON OFFSET UNIT (CoU) PROJECT

BASIC INFORMATION	
Title of the project activity	7.5 MW biomass based Power Project by SCPL, India (Title under CDM: 7.5 MW biomass-based power project by Chambal Power Limited at Rangpur, Rajasthan)
Scale of the project activity	Small Scale
Completion date of the PCN	21/03/2022
Project participants	Suryaa Chamball Power Limited (Representator)
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: AMS-I.D : "Grid connected renewable electricity generation", version 18 Standardized Methodology: Not Applicable.
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated amount of total GHG emission reductions	To be estimated during verification [An ex-ante estimate is 45,234 CoUs per year]

SECTION A. Description of project activity

A.1. Purpose and general description of Carbon offset Unit (CoU) project activity >>

The project activity is proposed under UCR with the title "7.5 MW biomass based Power Project by SCPL, India" is a biomass-based power project located in village Rangpur of Kota district in the state of Rajasthan (India). The project is an operational activity with continuous reduction of GHG, registered and verified under Clean Development Mechanism (CDM) of UNFCCC. The Project is currently being applied under "Universal Carbon Registry" (UCR) for the purpose of generating Carbon Offset Units for the operational period beyond CDM.

Purpose of the project activity:

The proposed project activity is promoted by Suryaa Chamball Power Limited (herein after called as Project Proponent or PP) and is a public limited company. The proposed project activity is installation and operation of one steam turbine generator having capacity of 7500 kW where steam is fed from biomass fired boiler in village Rangpur of Kota district in the state of Rajasthan in India.

The project activity utilises the renewable biomass for generation of electricity. The setting up of fossil fuel-based power project would have led to the GHG emission, which is a severe concern globally, while this project activity utilizes biomass (a renewable source), which is sufficiently available within 50 km diameter of selected location. Biomass being a renewable source and considering the established fact that there would be no net emissions of CO_2 (GHG) from such renewable energy projects, this 'project activity' will also lead to zero net onsite emissions in comparison to the emissions from the alternative fossil fuel-based power plants.

The project activity helps in reducing the ever-increasing demand and supply gap of electricity besides contributing towards economic growth and development of the area. The project activity apart from generating employment locally will provide economic value to the agricultural wastes and will provide stable and quality power to the local industry, farmers and households. The project will also create a business opportunity for local stakeholders such as bankers/consultants, equipment suppliers, equipment manufacturers, contractors, biomass suppliers, farmers, local community and the related. The following are some additional benefits of the project:

- Appropriate utilisation of surplus biomass
- Avoidance of burning of wasted agricultural residues
- Generation of environment friendly green power
- Reduction in Green House Gas (GHG) i.e., CO2 emissions

The project activity has already been commissioned on 31/03/2006.
The net generated electricity from the project activity is sold to transmission company of state electricity board i.e., Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPNL), which is a transmission company of the Rajasthan State Electricity Board (RSEB) under the Power Purchase Agreement (PPA) signed between the PP and the utility. In pre-project scenario, electricity delivered to the grid by the project activity would have otherwise been generated by the operation of fossil fuel-based grid-connected power plants and by the addition of new fossil fuel-based generation sources in the grid. As the nature of the biomass project, no fossil fuel is involved for power generation in the project activity apart from emergency fuel. The electricity produced by the project is directly contributing to climate change mitigation by reducing the anthropogenic emissions of greenhouse gases into the atmosphere by displacing an equivalent amount of power at grid.

Hence, project activity is displacing the estimated annual net electricity generation i.e., 50,260 MWh from the Indian grid system, which otherwise would have been generated by the operation of fossil fuel-based grid-connected power plants. The project activity doesn't involve any GHG emission sources. The estimated annual CO_2e emission reductions by the project activity are expected to be 45,234 tCO_2e, whereas actual emission reduction achieved during the first CoU period shall be submitted as a part of first monitoring and verification.

Since the project activity will generate electricity through biomass energy, a clean renewable energy source, it will not cause any negative impact on the environment and thereby contributes to climate change mitigation efforts.

Project's Contribution to Sustainable Development

Indian economy is highly dependent on "Coal" as fuel to generate energy and for production processes. Thermal power plants are the major consumers of coal in India and yet the basic electricity needs of a large section of population are not being met. This results in excessive demands for electricity and places immense stress on the environment.

Changing coal consumption patterns will require a multi-pronged strategy focusing on demand, reducing wastage of energy and the optimum use of renewable energy (RE) sources. This project is a greenfield activity where grid power is the baseline. The renewable power generation is gradually contributing to the share of clean & green power in the grid; however, grid emission factor is still on higher side which defines grid as distinct baseline.

The Government of India has stipulated following indicators for sustainable development in the interim approval guidelines for such projects which are contributing to GHG mitigations. The Ministry of Environment, Forests & Climate Change, has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. It has been envisaged that the project shall contribute to sustainable development using the following ways:

Social well-being: The project will facilitate communication development and access infrastructures in the area, which will help in civic development and enhance various livelihood options for the villagers, helping them improving their standard of living. Thus, project will improve the economical index around the project area.

Economic well-being: The project proponent agrees to provide employment to local people against the manpower requirement in the project activity to bonafide people of the state of Rajasthan, in respect of all the unskilled, skilled, semi-skilled staff and other non-executives as may be required for execution, operation and maintenance of the project. The project activity will contribute to reduction of power demand-supply gap in the region in an environment friendly manner, thus meeting the development needs of the country.

Technological well-being: The project activity leads to the promotion of 7.5 MW biomass-based power generation into the region and will promote practice for small scale industries to reduce the dependence on carbon intensive grid supply to meet the captive requirement of electrical energy and also increasing energy availability and improving quality of power under the service area. Hence, the technology used is safe and well-practised and leads to technological well-being.

Environmental well-being: The project activity, being a run-of-the-river hydro scheme, will have no requirement of reservoirs and will be having no impacts on the local environment and the community living in the vicinity. The electricity generated by the proposed project activity will be replacing the carbon intensive thermal energy (by equivalent amount) dominated power generation

from the respective grid system, thus will help in reducing GHG emission from the atmosphere.

With regards to ESG credentials:

At present specific ESG credentials have not been evaluated, however, the project essentially contributes to various indicators which can be considered under ESG credentials. Some of the examples are as follows:

Under Environment:

The following environmental benefits are derived from the project activity:

- Produces renewable electricity without any GHG emissions
- Appropriate utilisation of surplus biomass
- Avoidance of burning of wasted agricultural residues with little impact on the surrounding ecology
- No mining activity or cutting of forest or other impactful activities, hence no disturbance to the natural habitat.

The project activity is a renewable energy power project, which will use biomass generated from the agricultural fields in the locality as fuel for power generation and then export clean power to RRVPNL. This electricity generation will substitute the power generation by RSEB, dominated by conventional fossil fuel-based projects or make power available for additional demand. Also, the project by utilisation of renewable energy source will positively contribute towards reduction in finite natural resource like coal/gas/ oil thereby minimizing the depletion. The project will help to reduce the CO_2 emissions by reducing equivalent quantity of conventional fuel, which is a carbon emissive non-renewable resource.

For the project proponent, energy sale pattern is now based on renewable energy due to the project and it also contributes to GHG emission reduction and conservation of depleting energy sources associated with the project baseline. Hence, project contributes to ESG credentials.

Under Social:

The social well-being is assessed by contribution to improvement in living standards of the local community. The plant is located in a village and there is no significant development of industry in and around the project site. Project activity will help in alleviating poverty to some extent by generating both direct and indirect employment in the area for skilled and unskilled jobs for operation and maintenance of the power plant. The productive use of a renewable agro waste will bring in associated economic and social benefits.

The project activity uses energy efficient and environment friendly technology in the renewable energy sector which includes a modern boiler designed to operate with biomass like mustard and soya husk and other available agricultural wastes. The project activity contributed in a great way to environmental and social aspects and therefore sustainable development by capacity building of local people towards operation of modern technology power generation.

Under Economics:

Economic well-being refers to additional investment consistent with the needs of the local community. The project activity has invested significantly for project development and operation. This investment is quite significant in a rural area. These activities have contributed to the economic well-being of the local community. The project activity has also provided direct and indirect job opportunities to the local community during construction and shall provide permanent job

opportunities during operation. During operation of the project activity, many persons has been employed directly, apart from indirect employment, which would augur well for the economic well-being of the community

Further, increase in demand of biomass used by the project will further have a local effect on its price and will generate additional revenue for the biomass suppliers and farmers. Generation of electricity using the same (biomass) as fuel evidently contributed to the economic well - being by generating revenue and inflow of funds. Local and central government have also been financially benefited from the project as it will help in the rural upliftment of the farmers in the locality and is also consistent with the Government's rural development programme.

A.2 Do no harm or Impact test of the project activity>>

There was no harm identified from the project and hence no mitigations measures are applicable.

Rational: as per 'Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India)', final document on revised classification of Industrial Sectors under Red, Orange, Green and White Categories (07/03/2016), it has been declared that renewable energy project activity falls under the "White category". White Category projects/industries do not require any Environmental Clearance such as 'Consent to Operate' from PCB as such project does not lead to any negative environmental impacts. Additionally, as per Indian Regulation, Environmental and Social Impact Assessment is not required for renewable energy projects.

PP had proposed to implement a 7.5 MW non-conventional renewable energy source (i.e., biomass) based power plant at Rangpur village, Kota district. The project proposed to use biomass like mustard and soya husk / bagasse / residue / stalks, corncobs and other agricultural residues generated in the fields & located within a radius of 50 Km from the project site. The GHG emissions of the combustion process, mainly CO_2 are sequestered by mustard / bagasse / soya / corn crop plantation, representing a cyclic process. So, the project leads to zero net GHG on-site emissions. The stakeholders identified for the project are as under.

- Elected body of representatives administering the local area (village Panchayat)
- Rajasthan Rajya Vidyut Prasaran Nigam Ltd (RRVPNL)
- Rajasthan Renewable Energy Corporation Limited (RREC)
- Rajasthan State Pollution Control Board (RSPCB)
- Ministry of Environment & Forest (MoEF), Government of India
- Ministry of Non-conventional Energy Sources (MNES)
- Non-Governmental Organizations (NGOs)
- Consultants
- Equipment Suppliers
- Biomass suppliers and farmers
- Biomass collectors

Stakeholder list includes the government and non-government parties, which are involved in the project at various stages. PP has not only communicated with the relevant stakeholders under statutory obligations but also has engaged the other stakeholders in a proactive manner in expressing and accounting their opinions on the project. The feedback and inputs received from stakeholders confirm that no negative impact is foreseen by the stakeholders.

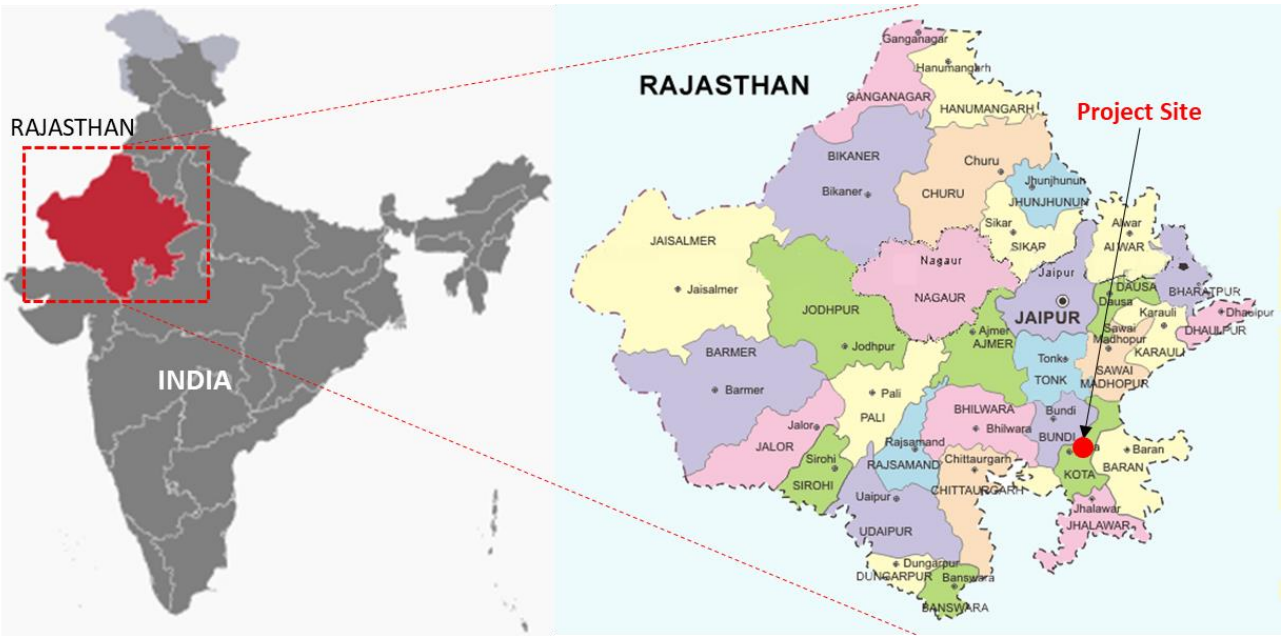
Additionally, there are social, environmental, economic and technological benefits which contribute to sustainable development. The key details have been discussed in the previous section.

A.3. Location of project activity >>

Country : India
State : Rajasthan
District : Kota
Village : Rangpur

This biomass based small-scale project activity is located in district Kota of Rajasthan and generates electricity from combustion of biomass which is exported to regional grid. The geographic co-ordinates of the project locations are 25º16'36" N (25.2766) and 75º56'22"E (75.9394).

The representative location map is included below:



(Courtesy: google map and images)

A.4. Technologies/measures >>

The project activity involves the installation of 7.5 MW fully condensing steam turbine and a steam generator of 35 tonnes per hour (TPH) capacity. The steam generator is designed to generate 35 tonnes per hour (TPH) steam at 67 kg/cm^2 pressure and at 450±5°C temperature at the super heater outlet considering feed water and temperature at economizer inlet as 170°C. The steam pressure and temperature at the inlet to the turbine shall be 64 kg/cm^2 pressure and 445 ± 5°C.

Project steam generator utilizes renewable biomass i.e., mustard husk and stalks, corn cobs, bagasse, and other available agricultural wastes as fuel. The project is likely to export surplus power to RRVPNL after meeting the in-house auxiliary demand (of about 700 kW). In this regard, the power purchase agreement (PPA) for a 20-year period has been signed with the RRVPNL, which is still valid, for the sale of entire power generated by the project. The power plant is designed to generate 7.5 MW gross power with net exportable power of 6.8 MW at 33 KV voltage through a step-up transformer.

All design calculations are based on the fuel composition referred to table below.

Fuels	%C	%H_2	%O_2	%N_2	%S	%M	%Ash	GCV (kcal/kg)
Bagasse	22.5	3	23	-	-	50	1.5	2270
Mustard husk	39.88	4.17	39.37	0.67	0.6	9.1	6.7	3620
Corn cobs	30.33	4.35	-	-	-	30.64	1.55	3480

Along with the 35 TPH boiler and the 7.5 MW Turbo-generator (TG), the other auxiliary units of the plant would include:

1. Fuel handling system with storage and processing arrangements
2. Ash handling system
3. Air pollution control device
4. Cooling water system and cooling tower
5. De-Mineralized (DM) water plant
6. Sire protection system
7. Air conditioning and ventilation
8. Complete electrical system for power plants and grid interconnection including power evacuation, instrumentation and control system, etc.

The power would be generated at the biomass-based power plant, then evacuated from the 11/33 kV, high voltage switch yard and will be exported to the RRVPNL grid system.

Steam Generator	**Make**
35 TPH, 67 kg/cm^2, 450 ±5^{o}C	WEG Indusrias S.A.
Turbine Details	**Make**
7.5 MW Fully Condensing	Triveni Engineering and Industries Ltd

In the absence of the project activity the equivalent amount of electricity would have otherwise been generated by the operation of fossil fuel-based grid-connected power plants and fed into Indian grid system, hence baseline scenario of the project activity is the grid-based electricity system, which is also the pre-project scenario as discussed in the previous section.

A.5. Parties and project participants >>

Party (Host)	Participants
India	**Suryaa Chamball Power Limited (Developer)** Address: 602, 'A' Wing, Prathmesh Tower Premises CHS Ltd., S.B. Marg, Lower Parel (W), Mumbai, Maharashtra - 400 013 India. Email: mumbai@suryachambalpowerltd.com

A.6. Baseline Emissions>>

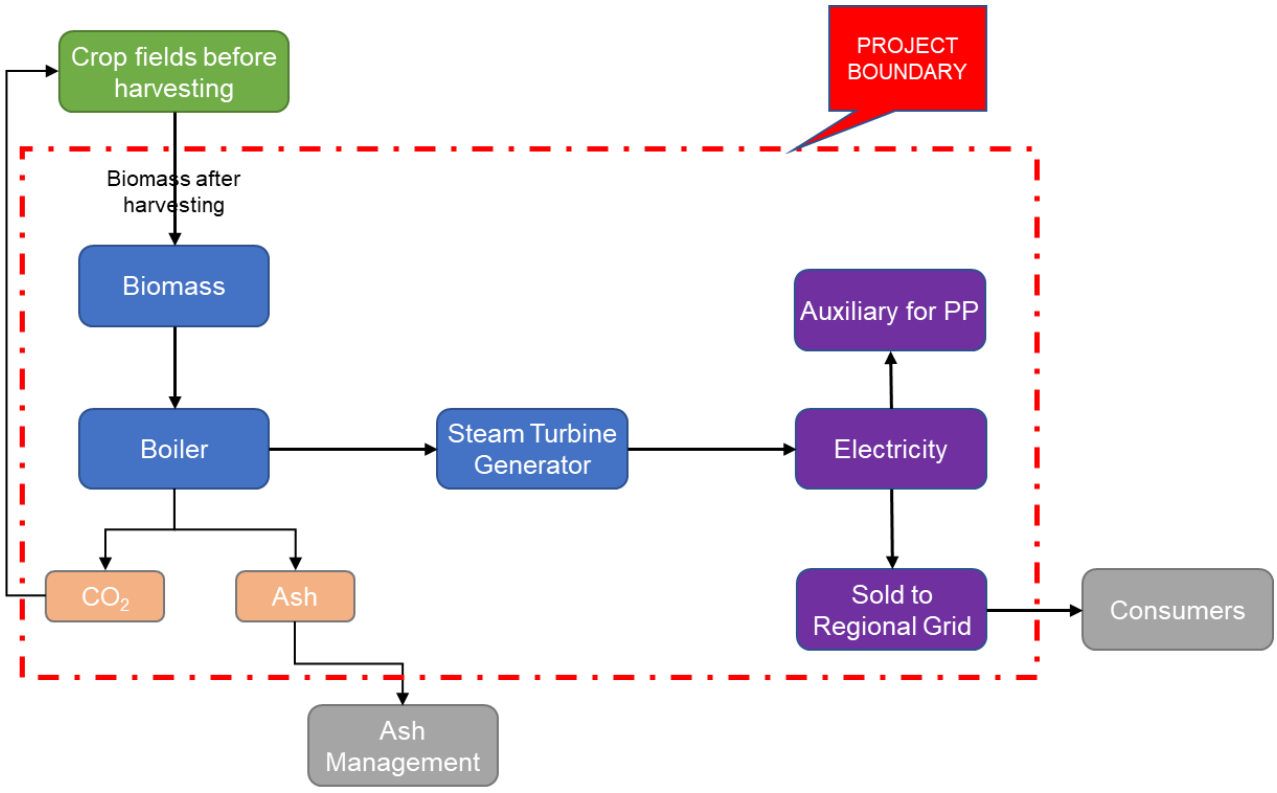
The baseline scenario identified at the PCN stage of the project activity is:

- Grid

In the absence of the project activity, the equivalent amount of electricity would have been generated by the operation of fossil fuel-based grid-connected power plants and fed into Indian grid system, which is carbon intensive due to use of fossil fuels. Hence, baseline scenario of the project activity is the grid-based electricity system, which is also the pre-project scenario.

Schematic diagram showing the baseline scenario:

Project Scenario:



Baseline Scenario:

As per the approved consolidated methodology AMS-I.D. Version 18, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

"The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid".

The project activity involves setting up of a new power plant which generates electricity from combustion of biomass which is a renewable source and to supply the produced power to the grid. In the absence of the project activity, the equivalent amount of power would have been supplied by the Indian grid, which is fed mainly by fossil fuel fired plants. Hence, the baseline for the project activity is the equivalent amount of power produced at the Indian grid.

A.7. Debundling>>

This project activity is not a debundled component of a larger project activity.

SECTION B. Application of methodologies and standardized baselines

B.1. References to methodologies and standardized baselines >>

SECTORAL SCOPE:
01, Energy industries (Renewable/Non-renewable sources)

TYPE:
I - Renewable Energy Projects

CATEGORY:
AMS. I.D. (Title: "Grid connected renewable electricity generation", version 18)

Note: PP had applied the version 18 of the methodology as the project is a CDM registered project under the CDM ID 0347 with the version 18 of the applied methodology. The project was registered at CDM on 8th May 2006 with first crediting period of 7 years (from 01st Mar 2006 to 28th Feb 2013). After completion of first, PP had renewed second crediting period of 7 years from 01st Mar 2013 to 29th Feb 2020 and 2nd renewal is completed the period 01st March 2020 to 28 Feb 2027. Hence, for UCR registration the latest version of methodology i.e., version 18 is being considered for emission reduction calculation which is also the current version applied under CDM.

B.2. Applicability of methodologies and standardized baselines >>

The project activity involves generation of grid connected electricity from the renewable biomass-based power generation project and is a Greenfield project activity. The project activity is having 7.5 MW installed capacity; therefore, falls in small scale project activity and eligible under small scale methodology AMS-I.D. The project status corresponding to the methodology AMS-I.D. Version 18 and applicability of methodology is discussed below:

Applicability Criterion	Project Case
1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: (a) Supplying electricity to a national or a regional grid; or (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The project comprises of renewable biomass-based electricity generation unit which will supply electricity to a regional grid on a contractual agreement signed with the state electricity board and thus satisfies the criteria. Hence, project activity satisfies this applicability criterion 1.a.
2. Illustration of respective situations under which each of the methodology (i.e. AMS-I.D: Grid connected renewable electricity generation", AMS-I.F: Renewable electricity generation for captive use and mini-grid" and AMS-I.A: Electricity generation by the user) applies is included in Table 2	According to the point 1 of the Table 2 in the methodology – "Project supplies electricity to a national/ regional grid" is applicable under AMS I.D. As the project activity supplies the electricity to RRVPNL which is a regional grid, the methodology AMS-I.D. is applicable

Applicability Criterion	Project Case
3. This methodology is applicable to project activities that: (a) Install a Greenfield plant; (b) Involve a capacity addition in (an) existing plant(s); (c) Involve a retrofit of (an) existing plant(s); (d) Involve a rehabilitation of (an) existing plant(s); or (e) Involve a replacement of (an) existing plant(s).	The Project activity involves the installation of new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity. Thus, Project activity is a Greenfield plant and satisfies this applicability condition (a).
4. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: (a) The project activity is implemented in existing reservoir, with no change in the volume of the reservoir; or (b) The project activity is implemented in existing reservoir, where the volume of the reservoir(s) is increased and the power density as per definitions given in the project emissions section, is greater than 4 W/m^2. (c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m2	The criterion is not applicable to the project activity as the proposed project is a biomass project.
5. If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The project activity involves the installation of a turbine generator with an installed capacity of 7.5 MW based on the renewable biomass and hence is within the 15 MW limit set by the methodology.
6. Combined heat and power (co-generation) systems are not eligible under this category	The project is not a combined heat and power plant and hence this criterion is not applicable.
7. In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	The project is a Greenfield project as there is no addition to the existing renewable power generation from the time of commissioning of the project activity and hence this criterion is not applicable.
8. In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement power plant/unit shall not exceed the limit of 15 MW.	The project is a Greenfield project as there is not any retrofit or replacement to the existing renewable power generation from the time of commissioning of the project activity and hence this criterion is not applicable.

Applicability Criterion	Project Case
9. In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as "AMS I. C.: Thermal energy production with or without electricity" shall be explored.	The project activity involves the installation of a turbine generator with an installed capacity of 7.5 MW based on the renewable biomass. Hence, this criterion is not applicable.
10. In case biomass is sourced from dedicated plantations, the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply.	Project activity is not based on the biomass sourced from the dedicated plantations. Hence, this criterion is not applicable.

B.3. Applicability of double counting emission reductions >>

There is no double accounting of emission reductions in the project activity due to the following reasons:

- Project is uniquely identifiable based on its location coordinates,
- Project has dedicated commissioning certificate and connection point,
- Project is associated with energy meters which are dedicated to the consumption point for project developer

B.4. Project boundary, sources and greenhouse gases (GHGs)>>

As per applicable methodology AMS-I.D. Version 18, "The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the project power plant is connected to."

Thus, the project boundary includes the biomass-based steam generator, steam turbine generators and the Indian grid system.

Source		Gas	Included?	Justification/Explanation
Baseline	Grid connected electricity generation	**CO_2**	**Yes**	**CO2 emissions from electricity generation in fossil fuel fired power plants**
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
		Other	No	No other GHG emissions were emitted from the project
Project	Greenfield Biomass Power Project Activity	CO_2	No	No CO_2 emissions are emitted from the project
		CH_4	No	Project activity does not emit CH_4
		N_2O	No	Project activity does not emit N_2O
		Other	No	No other emissions are emitted from the project

B.5. Establishment and description of baseline scenario >>

This section provides details of emission displacement rates/coefficients/factors established by the applicable methodology selected for the project.

As per para 19 of the approved consolidated methodology AMS-I.D. Version 18, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

"The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid".

The project activity involves setting up of a new biomass-based power plant to harness energy from combustion of biomass and generate renewable energy i.e., electricity which is used for sale to national grid through PPA arrangement. In the absence of the project activity, the equivalent amount of power would have been generated by the operation of grid-connected fossil fuel-based power plants and by the addition of new fossil fuel-based generation sources into the grid. The power produced at grid from the other conventional sources which are predominantly fossil fuel based. Hence, the baseline for the project activity is the equivalent amount of power produced at the Indian grid.

A "grid emission factor" refers to a CO_2 emission factor (tCO_2/MWh) which will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO_2/MWh for the 2014 - 2020 years as a conservative estimate for Indian projects not previously verified under any GHG program. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.

Net GHG Emission Reductions and Removals

Thus, $ER_y = BE_y – PE_y – LE_y$

Where:

ER_y = Emission reductions in year y (tCO_2/y)
BE_y = Baseline Emissions in year y (t CO_2/y)
PE_y = Project emissions in year y (tCO_2/y)
LE_y = Leakage emissions in year y (tCO_2/y)

Baseline Emissions

Baseline emissions include only CO_2 emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants.

The baseline emissions are to be calculated as follows:

$$BE_y = EG_{BL,y} \times EF_{grid,y}$$

Where:

BE_y	=	Baseline emissions in year y (t CO_2)
$EG_{BL,y}$	=	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of this project activity in year y (MWh)

$EF_{grid,y}$	=	UCR recommended emission factor of 0.9 tCO_2/MWh has been considered. (Reference: General Project Eligibility Criteria and Guidance, UCR Standard, page 4)

Project Emissions

As per paragraph 39 of AMS-I.D, version 18, for most renewable energy project activities emission is zero.

As per applied methodology only emission associated with the fossil fuel combustion, emission from use of alternate fuel during unavailability of biomass, would be accounted for the project emission on actuals. Therefore, following project emission type has been considered for the project activity:

Coal or lignite consumption:

The project activity will be using fossil fuel like coal and lignite as alternate fuel to meet the emergency requirements of the powerhouse; hence emissions due to usage of fossil fuel will be accounted as project emissions. As per the latest guidelines of Government of Rajasthan, 15% of conventional fossil fuel can be used in case of any emergency.

CO_2 emissions from fossil fuel combustion in the project activity are calculated based on the quantity of fuels combusted and the CO_2 emission factor of those fuels, as follows:

$PE_{FC,y} = \Sigma FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i}$

Where:

$PE_{FC,y}$ = Project Emission due to alternate fossil fuel consumed during monitoring period
$FC_{i,y}$ = Quantity of fuel type 'i' consumed in liters (lit) or tonnes (t)
$NCV_{i,y}$ = Net Calorific Value of type of fuel used
$EF_{CO2,i}$ = IPCC 2006 Emission factor for type of fuel used
i = fuel types combusted during the monitoring period

Hence, $PE_y = PE_{FC,y}$

Leakage

As per the para 23 of the tool "Leakage in biomass small-scale project activities" version 04, under "Competing uses for the biomass" category – "The project participant shall evaluate ex-ante if there is a surplus of the biomass in the region of the project activity, which is not utilised. If it is demonstrated (e.g., using published literature, official reports, surveys etc.) at the beginning of each crediting period that the quantity of available biomass in the region (e.g., 50 km radius), is at least 25% larger than the quantity of biomass that is utilised including the project activity, then this source of leakage can be neglected otherwise this leakage shall be estimated and deducted from the emission reductions".
In order to assess the availability of biomass in the project region, a biomass availability survey has been conducted by a credible third-party agent. Based on the biomass availability survey report it has been confirmed that there is sufficient biomass available in the region less than 50 km surrounding the site of the project activity. It confirms that there is no such leakage anticipated.

Hence, $LE_y = 0$

The actual emission reduction achieved during the first CoU period shall be submitted as a part of first monitoring and verification. However, for the purpose of an ex-ante estimation, following calculation has been submitted:

Estimated annual baseline emission reductions (BE_y)

= 50,260 MWh/year × 0.9 tCO_2/MWh

= 45,234 tCO_2/year (i.e., 45,234 CoUs/year)

B.6. Prior History>>

The project activity is a small-scale hydro project, following are the key details under the prior history of the project:

a) The project activity was applied under Clean Development Mechanism (CDM) of UNFCCC to consider generation or issuance of carbon credits under the project ID and title "Project: 0347 - Chambal Power Limited's (CPL) proposed 7.5 MW biomass based power project at Rangpur, Kota District, Rajasthan, India" and got registered on 05 May 2007 with first crediting period of 7 years i.e., from 01st Mar 2006 to 28th Feb 2013. During this crediting period PP has taken carbon credits for entire period. After completion of first, PP had renewed the project for both second & third crediting periods of 7 years each, viz. from 01st Mar 2013 to 29th Feb 2020 and 1st Mar 2020 to 28th Feb 2027. During the 2nd crediting period, PP has taken carbon credits for entire period. Currently, project is operational under 3rd crediting period under CDM and carbon credits are verified and issued till 31 Dec 2020.

b) The project was not applied under any other GHG mechanism apart from CDM; also, for the current period of COUs, the CDM verification has not been initiated. Hence project will not cause double accounting of carbon credits (i.e., CoUs).

B.7. Changes to start date of crediting period >>

There is no change in the start date of crediting period, the project is applied under UCR with its first crediting period starting from 01/01/2021. Any change in consideration of crediting for CoUs shall be informed and updated during the verification.

B.8. Permanent changes from PCN monitoring plan, applied methodology or applied standardized baseline >>

Not applicable.

B.9. Monitoring period number and duration>>

First Monitoring Period:
1 years, 00 months
01/01/2021 to 31/12/2021 (inclusive of both dates)

B.8. Monitoring plan>>

Data and Parameters available at validation (ex-ante values):

Data / Parameter	UCR recommended emission factor
Data unit	tCO_2 /MWh
Description	A "grid emission factor" refers to a CO_2 emission factor (tCO_2/MWh) which will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO_2/MWh for the 2014 - 2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.
Source of data	https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UCRStandardNov2021updatedVer2_301121081557551620.pdf
Value applied	0.9
Measurement methods and procedures	-
Monitoring frequency	Ex-ante fixed parameter
Purpose of Data	For the calculation of Emission Factor of the grid
Additional Comment	The combined margin emission factor as per CEA database (current version 16, Year 2021) results into higher emission factor. Hence for 2021 vintage UCR default emission factor remains conservative.

Data / Parameter	$NCV_{k,y}$
Data unit	GJ/mass or volume unit
Description	Net calorific value of biomass type k
Source of data	Laboratory record (Archived on paper)
Value applied	3,121.43 (an average value is given for representation)
Measurement methods and procedures	IPCC Default Value is considered. *OR* Monitoring equipment – Bomb Calorimeter Accuracy class- 0.1 Serial number- 3284 Calibration frequency- Annual Date of last calibration-06/08/2018 NCV = 2332 ✕ Temperature ✕ 30.32 / weight of the sample 2332 = water equivalent weight 30.32 = calorific value of Nicrom wire and calorific value of cotton thread. Water equivalent = H ✕ M ✕ (CV_t + CV_w) / T Where:

	H = Calorific value of Benzoic acid in cal/gm M = Mass of sample in gm CV_t = calorific value of thread (per cm = 2.1 cal) CV_w = calorific value of ignition wire (per cm = 2.331 cal) T = final rise in temperature
Purpose of Data	Calculation of baseline emission
Comments	The data will be archived electronically, and the archived data will be kept for 2 years beyond the Crediting Period

Data / Parameter	$NCV_{i,y}$
Data unit	MJ per unit volume or mass unit
Description	Net calorific value of fossil fuel type i
Source of data	The project proponent chooses default value option i.e., IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories and is fixed Ex-ante. This is in accordance to the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion", latest version applied.
Value applied	0.0433
Measurement methods and procedures	The net calorific value of diesel has been sourced from IPCC 2006 default value at the upper limit of the uncertainty at a 95% confidence interval and any future revision of the IPCC guidelines will be taken into account in determining the same.
Purpose of Data	Calculation of project emission
Comments	The data will be archived electronically, and the archived data will be kept for 2 years beyond the Crediting Period

Data / Parameter	$EF_{CO2,i}$
Data unit	tCO_2e/TJ
Description	CO2 emission factor of fossil fuel type i
Source of data	IPCC default value
Value applied	74.8
Measurement methods and procedures	The project proponent chooses default value option i.e., IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories and is fixed Ex-ante. This is in accordance to the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion", latest version applied.
Purpose of Data	Calculation of project emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data and Parameters to be monitored (ex-post monitoring values):

Note: For the purpose of baseline ER accounting only one ex-post parameter is relevant, i.e. Net Electricity supplied to the Grid by the project activity ($EG_{BL,y}$). However, in line with the registered CDM monitoring plan, few other monitoring parameters are also included. Hence, at the time of baseline emission reduction calculation only the $EG_{BL,y}$ will be used; whereas other parameters may be considered only for reporting purposes.

A. Main Monitoring Parameter for calculation:

Data / Parameter	$EG_{BL,y}$
Data unit	MWh / year
Description	Net electricity supplied to the grid by the project activity
Source of data	Monthly Joint Meter Readings (JMRs)
Measurement procedures (if any):	Monitoring equipment – Energy Meter Accuracy class - 0.2 Serial number - "RJB 89896" - Main Meter and "RJB 89897" - Check Meter Calibration frequency- Annual Date of last calibration – 02/07/2018 Measured readings of the energy meter installed at the SCPL plant switchyard outgoing feeder grid interconnection point. This will be recorded every month jointly by representative officials of SCPL and the state electricity board. This record will be archived and stored. For example, the difference between the measured quantities of gross electricity supplied to grid and auxiliary consumption will be considered as net export: $EG_{BJ,y} = EG_{Gross} – EG_{aux}$
Measurement Frequency:	Monthly
Value applied:	50,260 (Annualized average value has been considered here for an ex-ante estimation only, whereas this is an-ex post parameter hence actual value shall be applied during monitoring and verification)
QA/QC procedures applied:	Calibration of the Main meters will be carried out once in five (5) years as per National Standards (as per the provision of CEA, India) and faulty meters will be duly replaced immediately as per the provision of power purchase agreement. Cross Checking: The meter reading is cross checked with the sales receipts of electricity. The meters installed are owned by the state utility and the meter is tri-vector type of meter which can measure both export and import.
Purpose of data:	The Data/Parameter is required to calculate the baseline emission.
Any comment:	All the data will be archived till a period of two years from the end of the crediting period.

B. **Other Monitoring Parameters for reporting:**

Data / Parameter	EG_{Gross}
Data unit	MWh / year
Description	Quantity of gross electricity supplied to the grid in year y
Source of data	Logbook record (manually and Electronically archived)
Measurement procedures (if any):	Monitoring equipment – Energy Meter Accuracy class - 0.5 Serial number - 4223178 Calibration frequency - Annual Date of last calibration – 02/07/2018 Measured readings of the energy meter installed at the SCPL plant switchyard outgoing feeder grid interconnection point. This will be recorded every month by representative officials of SCPL. This record will be archived and stored.
Measurement Frequency:	Monthly (but Data will be monitored continuously)
Value applied:	55,845 (an annualized average value has been considered here for an ex-ante estimation purposes only, whereas this is an-ex post parameter hence actual value shall be applied during monitoring and verification)
QA/QC procedures applied:	Calibration of the Main meters will be carried out once in five (5) years as per National Standards (as per the provision of CEA, India) and faulty meters will be duly replaced immediately as per the provision of power purchase agreement. Cross Checking: The meter reading is cross checked with the sales receipts of electricity. The meters installed are owned by the state utility and the meter is tri-vector type of meter which can measure both export and import.
Purpose of data:	The Data/Parameter is required to calculate the baseline emission.
Any comment:	All the data will be archived till a period of two years from the end of the crediting period.

Data / Parameter	EG_{aux}
Data unit	MWh / year
Description	Quantity of electricity used for auxiliary consumption in year y
Source of data	Logbook record (manually and Electronically archived)
Measurement procedures (if any):	Monitoring equipment – Energy Meter Accuracy class - 1 Serial number - 10-05-UNI-6756 Calibration frequency - Annual Date of last calibration – 02/07/2018 Measured readings of the energy meter installed at the SCPL plant switchyard. This will be recorded every month by representative officials of SCPL. This record will be archived and stored.
Measurement Frequency:	Monthly (but Data will be monitored continuously)
Value applied:	10% of the gross electricity generated (an annualized average % has been considered here for an ex-ante estimation only, whereas this is an-ex post parameter hence actual value shall be applied during monitoring and verification)

QA/QC procedures applied:	Calibration of the Main meters will be carried out once in five (5) years as per National Standards (as per the provision of CEA, India) and faulty meters will be duly replaced immediately as per the provision of power purchase agreement. Cross Checking: The meter reading is cross checked with the sales receipts of electricity. The meters installed are owned by the state utility and the meter is tri-vector type of meter which can measure both export and import.
Purpose of data:	The Data/Parameter is required to calculate the baseline emission.
Any comment:	All the data will be archived till a period of two years from the end of the crediting period.

Data / Parameter	$M_{biomass,y}$
Data unit	tonnes/year
Description	Quantity of biomass consumed in year y
Source of data	Load cell available on belt conveyor (Archived on paper)
Measurement methods and procedures	Monitoring equipment – load cell available on belt conveyor Type - Electronic belt conveyor/ weigher Accuracy class - 5kg Calibration frequency - Once in 2 years All the biomass is weighed at the load cell available on belt conveyor installed at the factory. The load cell is used daily to measure the exact weight of biomass purchased. And the same reading is transferred to SCPL office for the regular data record
Frequency of monitoring/recording	Continuously and recorded monthly basis.
Value monitored	257,563 (a reference value has been considered for ex-ante presentation, actual value to be monitored)
Monitoring equipment	load cell available on belt conveyor
QA/QC procedures to be applied	Internal QA/QC procedure is available at the project site and same is being followed for data monitoring and archiving.
Purpose of the data	Calculation of baseline emissions.
Comments	The data would be archived up to two years after the end of crediting period.

Data / Parameter	$W_{biomass,y}$
Data unit	%
Description	Moisture content of the biomass (wet basis)
Source of data	Laboratory analysis results
Measurement methods and procedures	The biomass residue will be tested internal SCPL laboratory by moisture testing procedure which is as follows: W1 (weight of empty dish) = x gm W2 (weight of dish + sample) = y gm The y gm sample taken in hot air oven at 110±50C for 25 to 30 minutes

	then it is cooled in desicator for 10 mins. W3 (weight of W2 sample after 10 minutes cooling) = z gm Therefore, Moisture (%) = (W2 - W3 ✕ 100) / (W2 - W3)
Frequency of monitoring/recording	Sample basis
Value monitored	-
Monitoring equipment	Laboratory analysis
QA/QC procedures to be applied	The procedure is cross checked against bomb calorimeter at a regular interval to get calibrated by pre-determined standard test weight method.
Purpose of the data	Calculation of baseline emissions.
Comments	The data would be archived up to two years after the end of crediting period.

C. Parameter considered for project emissions:

Data / Parameter	$FC_{i,y}$
Data unit	Mass or volume unit/y
Description	Quantity of fossil fuel of type i consumed in year y
Source of data	Logbook maintained to record onsite
Measurement methods and procedures	Direct measurement at the point of consumption
Frequency of monitoring/recording	The data will be monitored continuously and aggregated monthly.
Value monitored	To be monitored as per actuals
Monitoring equipment	-
QA/QC procedures to be applied	Internal QA /QC procedure are available at the project site and same is being followed for data monitoring and archiving
Purpose of the data	Calculation of project emissions.
Comments	The data would be archived up to two years after the end of crediting period.