PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT

Title: 14 MW Rice Husk Power Project by M/s R. R. Energy Limited

Version 1.0
Date 24/12/2022
First CoU Issuance Period: 09 years, 0 months
Date: 01/01/2014 to 31/12/2022

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

BASIC INFORMATION	
Title of the project activity	14 MW Rice Husk Power Project by M/s R. R. Energy Limited
Scale of the project activity	Small Scale Project Activity
Completion date of the PCN	26/12/2022
Project participants	M/s R. R. Energy Limited
Host Party	India
Applied methodologies and standardized baselines	AMS-I.D.: Grid connected renewable electricity generation ---- Version 18.0
Sectoral scopes	SELECT SCOPE 01 Energy industries (Renewable/NonRenewable Sources)
Estimated amount of total GHG emission reductions	894,045.6 CoUs (79470.720 tCO_{2eq})

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SECTION A. Description of project activity

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

The project is located in Village- Garh Umariya, Tehsil- Pusour, District- Raigarh, State- Chhattisgarh, Country India.

The details of the registered project are as follows:

Purpose of the project activity:

The purpose of the project activity is to generate electricity using Biomass like rice husk for generation of power to achieve better energy efficiency, produce eco-friendly power; achieve sustainable development of the industry by reducing CO2 emission and other GHG emissions due to degeneration and uncontrolled atmospheric burning of biomass. In the proposed project activity biomass shall be combusted in the boiler for producing high pressure steam which will be fed into a turbine generator to generate 14 MW electricity. The fuel proposed is biomass like rice husk which is abunduntantaly available in Raigarh District and adjoining areas of Chhattisgarh and Orissa state where the project activity is situated. As the farmers in the state grow two crops of rice in a year as the state receives rains from both the monsoons; the rice husk availability is throughout the 12 months of the year. Other biomass which can be used are like wood chips; agricultural residues; bushes, de-oiled cakes of Sal seed and Dori seed and other de-oiled cakes which do not have any economically valuable use other than combustion.

Rice Husk quality procured for generation of electricity may not be consistent and hence it is proposed to use small percentage of fossil fuel like coal to ensure consistent generation of electricity. We estimate that maximum 10% fossil fuel is likely to be co-fired. *The Ministry of Non-conventional Energy sources (Power Group) has given the provision for using fossil fuel upto 25% along with primary fuel biomass.*

RREL generates electricity and supplies to or through CSEB grid which meets the demand of its consumers for electricity by producing and importing electricity from power stations generating electricity based on fossil fuel. Hence the project activity displaces the fuel fired power generating units. Hence achieves reduction in GHG emissions indirectly.

The main activity of RREL is be to produce electricity and sell it to or through Chhattisgarh state electricity board (CSEB) as CSEB is the only available state wide grid network and statutory agency to distribute power within Chhattisgarh state.

A power supply Agreement was signed with CSEB by RREL for supply of 13.23 MW
power to or through CSEB. The main carbon benefit to the project arises from the replacement /displacement of an equivalent amount of electricity which would have been generated in the absence of this project activity. The grid electricity has high carbon intensity as major part of power generated in grid is coal based.

The total emission reduction for the entire crediting period of 10 years have been calculated as 554720 Tonne CO2 –equivalent. The other benefits being reduction of GHG emissions considering global scenario, Sustainable development through better energy efficiency and also leads to improvement of local environment.

Economic Benefits to State

The sale agreement between RR ENERGY and CSEB shall provide for 100% generated power to be sold to or through CSEB at the rate of Rs.2.67 per unit (these rates have been raised from Rs.2.25/KWh at present and shall be applicable to the project). This is substantially lower than CSEB charges for their HT customers. Hence the economic benefit will be available to state.

The project activity investment is about 424.92 million rupees in green field project. This will lead to overall economic growth of state economy and also state will earn by way of z sales tax and other applicable levies.

Environmental Benefit

The Power generation in India / Chhattisgarh is mainly fossil fuel Coal based. The Project activity is Biomass based Power Plant and thus effectively saving environment of CO_2; NO_X; CH_4 emission. Reduces the fugitive-uncontrolled combustion of Rice Husk, at Sporadic location, which cause local environmental problem. The adoption of new advanced air-cooled technology for cooling and condensing of turbine exhaust steam will help to save water resources and reduce water wastage.

Reduction in T & D Losses of Power

CSEB State grid has almost 37%T & D losses. The Power generated by Project activity is much nearer to industrial belt of Chhattisgarh state where power demand is maximum. This will enable CSEB to cut down T&D losses by supplying power received from this project activity to nearby area consumers.

Reduction in Waste Water.

The Water consumption and Waste Water generation will be minimized by using the advanced Air-Cooled condenser system. The generated waste water will be used for in house activities like firefighting, road sprinkling for fugitive dust emission control, and green belt development etc.

Reduction in SPM level in the environment and additional Economic benefit.

ESP (Electrostatic Precipitator) provided shall arrest the ash which will be collected in Ash hoppers. This Ash will be given free of cost to cement plants & brick manufactures for further Economic benefit.

Use of Ash in Cement making will save the Natural limestone resources. Similarly, production of Ash bricks will help to reduce the fertile soil consumption,
used in clay brick making.

Technology up gradation
The project activity uses the latest technology in the equipment design construction and specifications.

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

There are social, environmental, economic and technological benefits which contribute to sustainable development.

Social benefits:

- The small farmers who grow paddy have made India self-sufficient in food. But due to rising price of input like of fertilizers; seeds etc. the farmers do not realize proper returns for their efforts. The project activity adds income to the farmers by providing added economic value to the produce of farmers by procuring rice husk from the rice mills, which they would have otherwise burnt or left in open to natural decay. This will definitely help the millers to pay better price to the farmers for their paddy crop. This will lead to overall development of society in economic health; education etc. At procurement price of rice husk @ Rs.1200/Tonne and procured quantity of rice husk of 89745 tonnes will make significant contribution to the income of farmers. The rice husk transportation to site will provide employment opportunities to a number of trucks and other similar vehicles will be making trips to project site throughout the year. This will increase the transport related income and employment. The transportation earning of biomass which involves about 8975 trips of 100-kilometer average distance is likely to generate income. At current consumption rates, CSEB projects Power deficiency between generating capacity and demand in supply of electricity from grid leading to import of power from central grid and others. mThe project shall enable the CSEB to satisfy more consumers leading to more employment for skilled and professional people in the state. The project activity shall provide direct employment to many temporary workers during project execution. After commissioning, it will provide employment to unskilled, skilled workers and to professionals.

Environmental benefits:

- The Power generation in India / Chhattisgarh is mainly fossil fuel Coal based. The Project activity is Biomass based Power Plant and thus effectively saving environment of CO_2; NO_X; CH_4 emission. Reduces the fugitive-uncontrolled combustion of Rice Husk, at Sporadic location, which cause local environmental problem. The adoption of new advanced air-cooled technology for cooling and condensing of turbine exhaust steam will help to save water resources and reduce water wastage.

Economic benefits:

<u>Saving of foreign exchange</u>

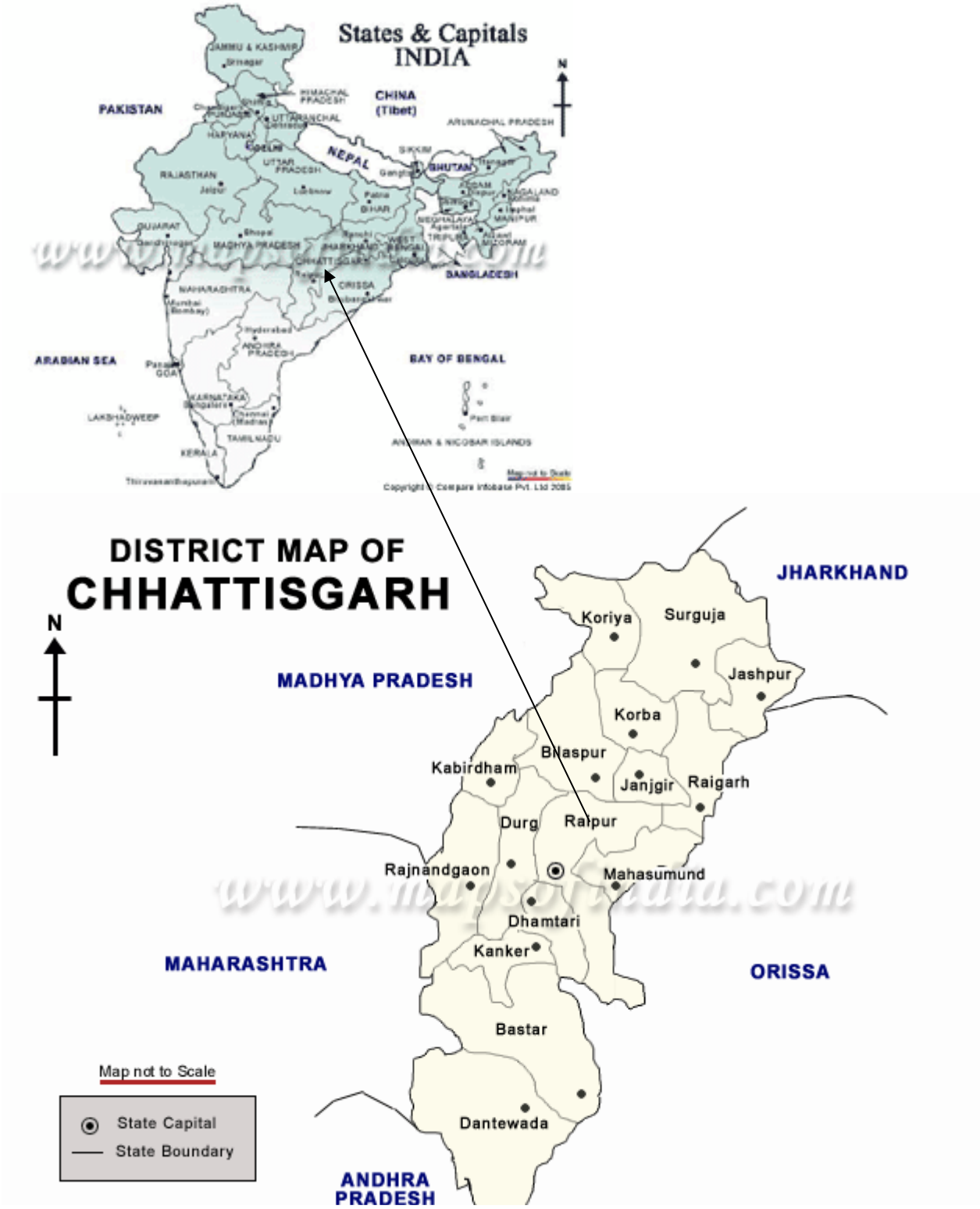
- The project activity does not involve any imports involving foreign exchange since
- most capital equipment is manufactured in India. This contributes to national
- policy of self-reliance.

<u>Indian industry growth</u>

- The project activity is green field project and hence investment of 424.92 million rupees involve capital equipment purchase of 361.30 million rupees from all India level and hence will lead to growth of capital equipment manufacturer adding employment opportunities to professionals and workers.

A.3. Location of project activity >>

Country: India
District: Raigarh
Village: Garh Umariya
Tehsil: Pusour
State: Chhatisgarh



A.4. Technologies/measures >>

The biomass is mainly rice husk. However, the boiler is designed to take other type of biomasses like crop residues and bushes.
The electricity generating system comprises of

1. Stroker fired furnace
2. Fluidised bed type boiler
3. Steam drum
4. Super heater
5. 15 MW STG electromagnetic induction type
6. Air Cooled condensers
7. De-mineralised water plant
8. Fuel handling system
9. Air dryer etc
10. Air preheater and Economiser

Specification	Value
Steam Turbine	1. 14 MW, 2. Steam Temperature: 490-495°C 3. Steam Pressure: 6.485/6.809 Mpa
Boiler	70 T/hr of Steam at 66 Kg/cm^2 pressure and 498±5°C temperature
Generator	15 MW, 3 Phase synchronous generator

The biomass is burnt in fluidized bed boiler where sand is used as inert bed to produce 62 T/hr of steam at 66 kg/cm^2 pressure and 495±5°C temperature. The boiler is controlled to supply the steam requirement of 62 T/hr to produce 14 MW of electricity as the capacity of steam turbine is 14 MW.

Rice Husk quality procured for generation of electricity may not be consistent and hence it is proposed to use small percentage of fossil fuel like coal to ensure consistent generation of electricity. We estimate that 10% fossil fuel is likely to be co-fired. The outlet box of the FBB leads to ESP to remove SPM from exhaust gases. The exhaust gas temperature is kept at 160°C or lower.
The steam from boiler at 66 kg/cm^2 pressure and 495±50C temperature is taken to high efficiency extraction cum condensing multi stage Steam Turbine (14 MW) and Generator (15 MW) operated to generate Electricity.

Ash collected from hoppers & ESP is conveyed to Ash Silo. The ash is given free to cement plants and brick manufacture as well as to the farmers, who also use it as Soil amelioration agent.
Other system used is circulating water, De-mineralized water plant, Instrument Air Compressor; air dryer.

Steam from FBB passes through steam turbine rotor and exhausted in water cooled condenser and water is cooled in air cooled heat exchanger. Only Demineralized water is used in FBB to avoid Scale

formation on boiler tubes. Make up DM water is de-aerated. Total Waste water is recycled and reused after treatment.

The 14 MW power is generated at 11 KV and is boosted to 33 KV to synchronize with the CSEB grid power. The entire 14MW power after using a part of for in-house consumption for equipment is sold to or through CSEB grid who will further distribute to their consumers. The technology is environmentally safe and abides all legal norms and standards for SPM, emissions. The project activity will be working 330 days in a year.

The project activity uses environmentally safe and sound technology by providing the following features during the project stage only.

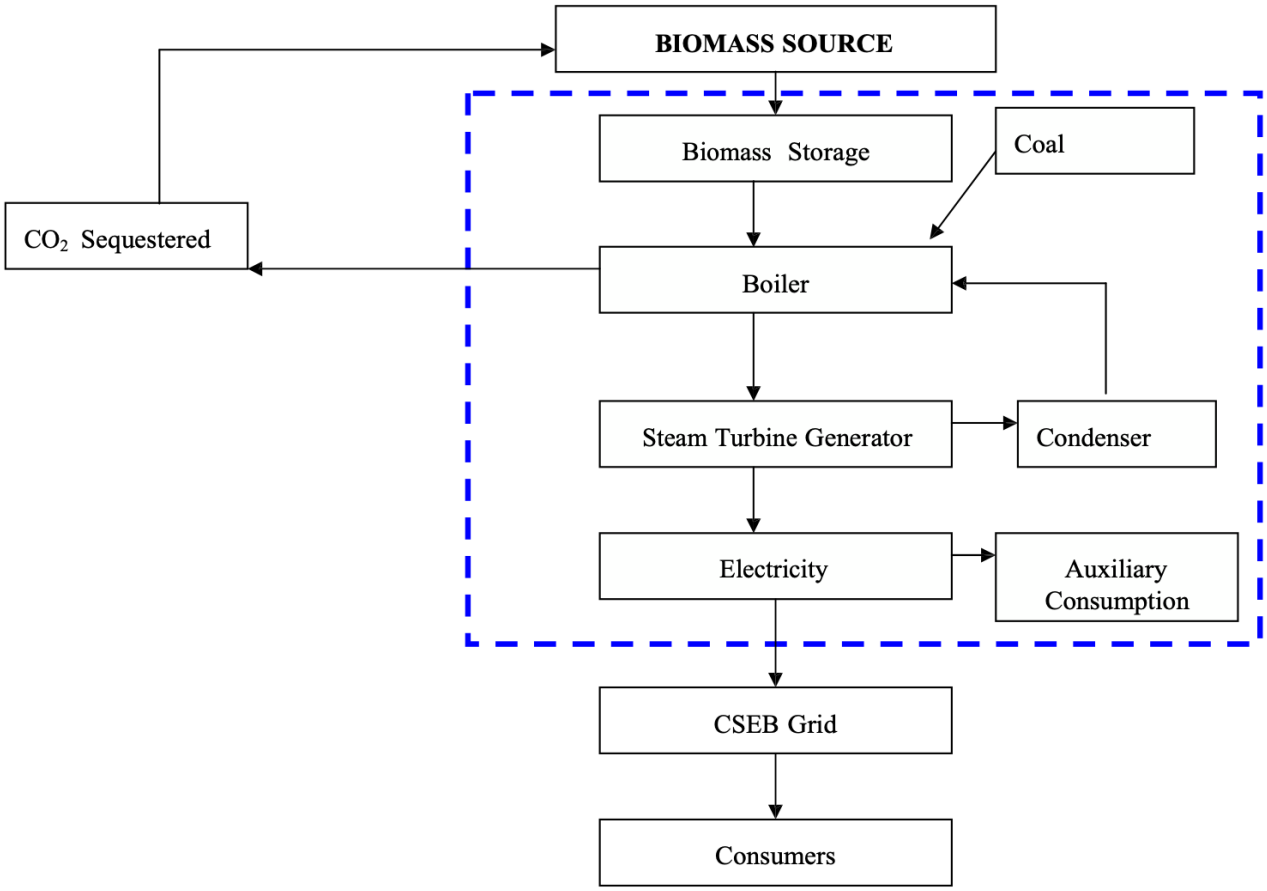
1. Air cooled heat exchanger is used to cool the circulating water. This reduces water wastage and losses that would have occurred in water-based cooling tower.
2. The conveying of biomass in the plant to boiler is done through closed type conveying system.
3. The ash generated is collected and conveyed to the closed silo so that no ash will be affecting the environment.
4. The boiler uses latest technology and controls so that maximum heat is recovered.
5. ESP is provided to control point sources emissions below accepted standards.
6. The waste water is used for green belt irrigation.

A.5. Parties and project participants >>

Party (Host)	Participants
India	M/s R. R. Energy Limited

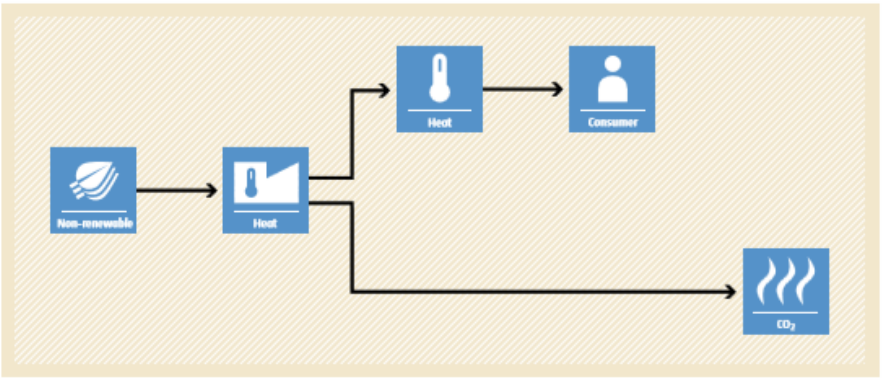
A.6. Baseline Emissions>>

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:

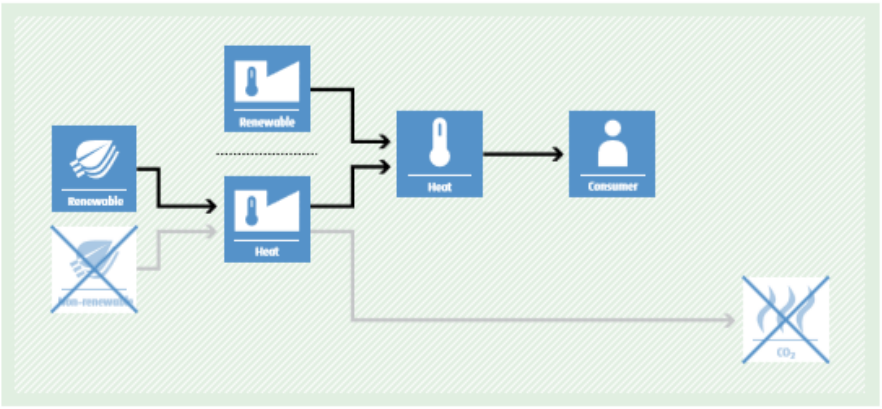


Baseline Scenario: As per the approved consolidated methodology AMS-I.D. Version 18, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following: "The baseline scenario is that the electricity delivered to the grid by the project 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 Unified 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.

BASELINE SCENARIO
Thermal energy would be produced by more-GHG-intensive means based on the use of non-renewable biomass.



PROJECT SCENARIO
Use of renewable energy technologies for thermal energy generation, displacing non-renewable biomass use.



A.7. Debundling>>

This project 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 INSERT PROJECT TYPE: I - Renewable Energy Projects

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

Note: PP had applied the version 08 of the methodology as the project is a CDM registered project under the CDM[1] with the version 08 of the applied methodology. The project was registered at CDM on 28/10/2006 with first crediting period of 10 years (from 01/02/2007 to 31/01/2017).

But PP has never taken any issuance during the crediting period as no verification has been done. 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 15 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 Unified Indian Grid; or (b) Supplying electricity to an identified consumer facility via national/Unified Indian Grid through a contractual arrangement such as wheeling.	The project comprises of renewable biomass-based electricity generation unit which will supply electricity to a Unified Indian 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/ Unified Indian Grid" is applicable under AMS I.D. As the project activity supplies the electricity to Unified Indian grid which is a Unified Indian Grid, the methodology AMS-I.D. is applicable
Applicability Criterion	**Project Case**

[1] https://cdm.unfccc.int/Projects/DB/SGS-UKL1158161760.22/view

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/m2. (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 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 14 MW based on the renewable biomass (Husk) 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 14 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

PP had applied the version 08 of the methodology as the project is a CDM registered project under the CDM[2] with the version 08 of the applied methodology. The project was registered at CDM on 28/10/2006 with first crediting period of 10 years (from 01/02/2007 to 31/01/2017).

Note -But PP has never taken any issuance during the UCR crediting period as verification has been done till 31/12/2011, However PP will provide declaration letter for no double accounting signed on his letter head during the period of verification of this project activity.

[2] https://cdm.unfccc.int/Projects/DB/SGS-UKL1158161760.22/view

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 (UCR Standard or Methodology) >>

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 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.

Estimated Emission Reductions: $ER_y = BE_y - PE_y - LE_y$

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)
L_{ey} = 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:

$$BEy = EG_{BL,y} \times EFg_{rid,y}$$

Where-

BEy	=	Baseline emissions in year y (t CO_2)
EGBL,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)
$EFgrid,y$	=	UCR recommended emission factor of 0.9 tCO2/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 India, 15% of conventional fossil fuel can be used in case of any emergency.
CO2 emissions from fossil fuel combustion in the project activity are calculated based on the quantity of fuels combusted and the CO2 emission factor of those fuels, as follows:

$PEFC,y = \Sigma\ FCi,y \times NCVi,y \times EF\ CO2,i$

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 tones (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 utilized. 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 utilized 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, LEy = 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 (BEy)

Ex-ante calculation of emission reductions is equal to ex-ante calculation of baseline emissions as project emissions and leakage are nil.
Baseline emission factor (Combined Margin) ($\mathbf{EF_{grid,\ CM,\ y}}$ / $\mathbf{EF_{grid,\ CO2,y}}$) = 0.9 tCO_2e/MWh
Annual gross electricity generation = 14 MW (project capacity) × 90% (PLF) × 8760 (operating hours)
= 88300.8MWh/yr.

Combined CO_2 emission factor of the INDIAN Grid = 0.9 t CO_2/MWh

Baseline emissions from the project activity = (net electricity from the project activity* emission factor of the INDIAN grid)

Baseline emissions from the project activity = (net electricity from the project activity* emission factor of the INDIAN grid)
= (88,300.8* 0.9)
= 79,470.72tCO_2/yr
Emission Reductions from the project activity = 79,470.72tCO_2/yr.

Hence, the total emission reductions after rounding off the above result, is 79470.72 tons of CO_2 annually and 794707.2 tons of CO_2 for the entire duration of the crediting period.

B.6. Prior History>>

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

PP had applied the version 08 of the methodology as the project is a CDM registered project under

the CDM[3] with the version 08 of the applied methodology. The project was registered at CDM on 28/10/2006 with first crediting period of 10 years (from 01/02/2007 to 31/01/2017).

Note -But PP has never taken any issuance during the UCR crediting period as verification has been done till 31/12/2011, However PP will provide declaration letter for no double accounting signed on his letter head during the period of verification of this project activity.

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 01/01/2014.

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:
09 years, 00 months
01/01/2014 to 31/12/2022 (inclusive of both dates)

Crediting period of the project activity is from 01/01/2014 to 31/12/2023

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 Value(s) applied	https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UCRCoUStandardAug2022updatedVer6_090822220127104470.pdf[4]

[3] https://cdm.unfccc.int/Projects/DB/SGS-UKL1158161760.22/view
[4] https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UCRCoUStandardAug2022updatedVer6_090822220127104470.pdf

	0.9
Measurement methods and procedures	-
Monitoring frequency	EX-ante fixed parameter
Purpose of data	For the calculation of Emission Factor of the grid

Data/Parameter	$NCV_{k,y}$
Data unit	GJ/mass or volume unit
Description	Net calorific value of biomass type k
Source of data Value(s) applied	Laboratory record (Archived on Paper) -(an average value is given for representation)
Measurement methods and procedures	IPCC Default value is considered OR Monitoring equipment – Bomb calorimeter Water equivalent = $H \times M \times (CV_t + CV_w) / T$ 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
Monitoring frequency	-
Purpose of data	Calculation of Base-line emission

Data/Parameter	$EF_{CO2,i}$
Data unit	tCO_{2e} /TJ
Description	CO_2 emission factor of fossil fuel i
Source of data Value(s) applied	IPCC default value 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.
Monitoring frequency	-
Purpose of data	Calculation of project emission

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.

Main Monitoring Parameter for calculation:

Data / Parameter:	E_{Gen}
Data unit:	MWH/month
Description:	Net electricity generated at generating point by project activity
Source of data:	Monthly Meter Reading Performa by CSEB
Measurement procedures (if any):	Monitoring equipment – MAIN Energy Meter Accuracy class - 0.2s Calibration frequency- once in five years Monitoring equipment – CHECK Energy Meter Accuracy class - 0.2s Calibration frequency- once in five years Measured readings of the energy meter installed at the plant switchyard outgoing feeder grid interconnection point. This will be recorded every month by Monthly Meter Reading by CSEB. This record will be archived and stored.
Monitoring frequency:	Continuously/monthly
QA/QC procedures:	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
Any comment:	All the data will be archived till a period of two years from the end of the crediting period.