



# Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT



**Title: 15 MW BIOMASS PROJECT, AT SHANTI GD ISPAT AND POWER PVT LTD**

Version : 03

Date 23/04/2023

First CoU Issuance Period: \_08\_ years, \_11\_ months  
Monitoring Period: 01/01/2014 to 30/11/2022



Monitoring Report (MR)  
CARBON OFFSET UNIT (CoU) PROJECT

Monitoring Report	
Title of the project activity	15 MW BIOMASS PROJECT, AT SHANTI GD ISPAT AND POWER PVT LTD
UCR Project Registration Number	UCR(ID# 254)
Version	03
Completion date of the MR	23/04/2023
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 01 Duration of this monitoring Period: (first and last days included (01/01/2014 to 30/11/2022)
Project participants	Shanti G.D. Ispat & Power Private Limited
Host Party	India
Applied methodologies and standardized baselines	AMS-I.D.: Grid connected renewable electricity generation --- Version 18.0 <sup>1</sup>
Sectoral scopes	1- Energy industries (renewable - / non-renewable sources)
Estimated amount of GHG emission reductions for this monitoring period in the registered PCN	2014: 81,163 CoUs (81163 tCO <sub>2eq</sub> )
	2015: 91,010 CoUs (91,010 tCO <sub>2eq</sub> )
	2016: 98,198 CoUs (98,198 tCO <sub>2eq</sub> )
	2017: 95,336 CoUs (95,336 tCO <sub>2eq</sub> )
	2018: 96,798 CoUs (96,798 tCO <sub>2eq</sub> )
	2019: 101,861CoUs (101,861 tCO <sub>2eq</sub> )
	2020: 100,630CoUs (100,630 tCO <sub>2eq</sub> )
	2021: 101,560CoUs (101,560 tCO <sub>2eq</sub> )
	2022: 77,373CoUs (77,373 tCO <sub>2eq</sub> )
	<b>843,929CoUs (843,929 tCO<sub>2eq</sub>)</b>
<b>Total:</b>	

<sup>1</sup> <https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK>

## **SECTION A. Description of project activity**

### **A.1. Purpose and general description of project activity >>**

#### **a) Purpose of the project activity and the measures taken for GHG emission reductions >>**

Shanti G.D. Ispat & Power Private Limited (SGDPL), has set up a 15 MW Biomass based power generation unit at Janjgir Village in Champa District in the state of Chhattisgarh, India. This is a Greenfield project. The purpose of the project is the construction and operation of a grid connected electricity generation unit using biomass (renewable source). By implementing this project activity, which has a capacity of 15MW, SGDIPL would help mitigate and marginally displace carbon intensive GHG emissions from the, and help conserve non-renewable fossil fuels. The project brings in local as well as global environmental benefits and also contributes to socio- economic development. Hence, project activity is displacing the estimated annual net electricity generation i.e., 88,128 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<sub>2</sub>e emission reductions by the project activity are expected to be 95,790tCO<sub>2</sub>e, whereas actual emission reduction achieved during the first CoU period shall be submitted as a part of first monitoring and verification. 1<sup>st</sup> Monitoring Period: 01/01/2014 to 30/11/2022 and total 843,929CoUs (843,929tCO<sub>2eq</sub>).

#### **b) Brief description of the installed technology and equipment>>**

The biomass project generation facility will involve installation of a 75 TPH nominal capacity Circulating Fluidized Bed Combustion Boiler. The boiler and the turbo-generator is installed with the necessary auxiliary plants and systems required for the efficient operation of the biomass based power plant.

The power generated is at 11 kv and then stepped up from 11/33 kv transformers and supplied to grid and then it is stepped up further from 33/132 kv at champa substation, which is a part of Unified Indian grid system in place of what would otherwise be a mix of sources consisting predominantly of fossil fuel based).

#### **c) Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.)>>**

UCR Project ID or Date of Authorization: \_ UCR(ID# 254)

Start Date of Crediting Period: 01/01/2014

Project Commissioned: 23/09/2013

#### **d) Total GHG emission reductions achieved or net anthropogenic GHG removals by sinks achieved in this monitoring period>>**

The total GHG emission reductions achieved in this monitoring period is as follows:

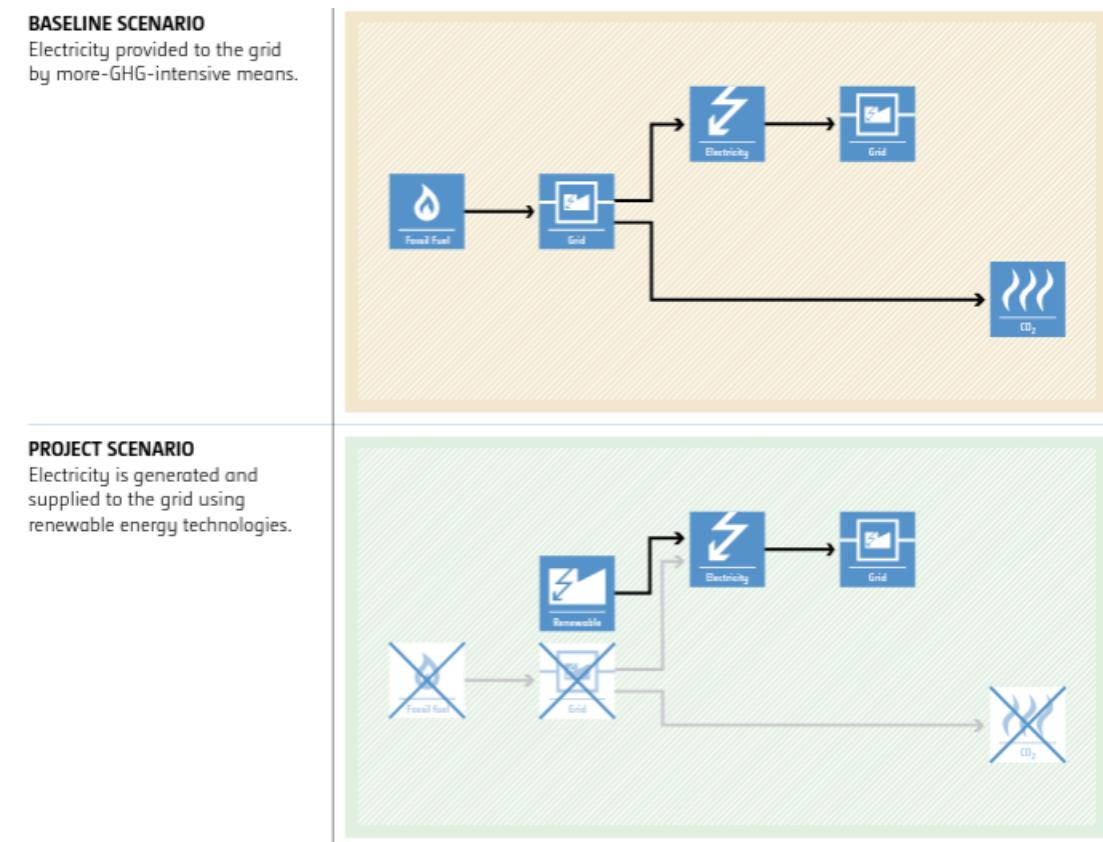
<b>Summary of the Project Activity and ERs Generated for the Monitoring Period</b>	
Start date of this Monitoring Period	01/01/2014
Carbon credits claimed up to	30/11/2022

Total ERs generated (tCO <sub>2</sub> eq)	<b>843,929 tCO<sub>2</sub>eq</b>
Leakage	0 tCO <sub>2</sub> eq

### e) 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.

### DIAGRAM OR FLOW SHOWING BASELINE SCENARIO



### A.2. Location of project activity>>

Country: India  
 District: Janjir-Champa  
 Village: Mahuda  
 State: Chhattisgarh

### Google map & other map showing location of the project activity





### A.3. Parties and project participants >>

Party (Host)	Participants
India	Shanti G.D. Ispat & Power Private Limited

### A.4. 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 17 of the methodology as the project is a CDM registered project under the CDM<sup>2</sup> with the version 17 of the applied methodology. The project was registered at CDM on 01/09/2012 with first crediting period of 10 years (from 01/09/2012 to 31/08/2022).

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.

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.

### A.5. Crediting period of project activity >>

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.

Length of the crediting period corresponding to this monitoring period: \_08 years –10\_ months.  
01/01/2014 to 30/11/2022

### A.6. Contact information of responsible persons/entities >>

Name	O R Rao
Organisation	Shanti GD Ispat & Power Pvt. Ltd.
Role:	Chief General Manager
Email ID:	orr.sgd@gmail.com
Mobile No:	+91-9340848186

<sup>2</sup> <https://cdm.unfccc.int/Projects/Validation/DB/M99B3U3I32W89NNPJM6AFG9BI3FSH8/view.html>



## **SECTION B. Implementation of project activity**

### **B.1. Description of implemented registered project activity >>**

a) Provide information on the implementation status of the project activity during this monitoring period in accordance with UCR PCN>>

The purpose of the project is the construction and operation of a grid connected electricity generation unit using biomass (renewable source). The biomass project generation facility will involve installation of a 75 TPH nominal capacity Circulating Fluidized Bed Combustion Boiler. The boiler and the turbo-generator is installed with the necessary auxiliary plants and systems required for the efficient operation of the biomass based power plant.

The power generated is at 11 kv and then stepped up from 11/33 kv transformers and supplied to grid and then it is stepped up further from 33/132 kv at champa substation, which is a part of Unified Indian grid system in place of what would otherwise be a mix of sources consisting predominantly of fossil fuel based).

By implementing this project activity, which has a capacity of 15MW, SGDIPL would help mitigate and marginally displace carbon intensive GHG emissions from the Indian grid, and help conserve nonrenewable fossil fuels. The project brings in local as well as global environmental benefits and also contributes to socio-economic development. The project participant lists below the various aspects of the project activity under each sustainable development indicator as required by the host country:

The project activity under consideration is 15th March 2011 (Date of placing the Purchase order for Turbine)and commissioning, start of operation 23/09/2013.

b) For the description of the installed technology(ies), technical process and equipment, include diagrams, where appropriate>>

The plant machinery of the project activity consists of one number multi-fuel fired boiler, one number steam turbo-generator, power evacuation system and fuel handling system. The basic technology is direct combustion of biomass residues in the multi-fuel fired boiler to generate high pressure and high temperature steam, which drives a steam turbine generator set thereby converting heat energy to electrical energy. The electricity voltage level generated by the turbo generator, is stepped to the voltage that is suitable to interface with the grid electricity for evacuation. Other equipment of plant includes ash handling system, power distribution facilities, Water treatment plant, Cooling Water system, etc. The technology of power generation through direct combustion of fuels is already established in India, but this is the case of application of an established technology in a region newly.

The capacity of the turbo generator set is of 15000 kW ( 15 MW) which generates electricity at a voltage level of 11 kV, the gross generation of power at alternator terminals will be 15000 kW. Out of this approximately 10% of gross electricity generated will be consumed by the plant auxiliary equipment's and balance power will be export to grid. Therefore, the technology is environmentally safe and sound.

A key technical specification of the major equipments for the project is as given in the below table:

<b>Boiler</b>	
Type	Multi fuel fired, Circulating Fluidized Bed Combustion Boiler

No. of boilers	1
Boiler capacity/steam flow rate	75 TPH
Steam pressure at super heater outlet	90 Kg/Cm <sup>2</sup>
Steam temperature at super heater outlet	515°C +/- 5%
<b>Turbo-Generator Rated</b>	
Type	Extraction cum condensing
Capacity	15 MW /15000 KWh
Steam parameter at TG inlet	84 Kg/Cm <sup>2</sup>
Steam temperature at TG inlet	515 °C
Generator Voltage	11 KV
Frequency	50 Hz
RPM	6053
Power factor	0.9

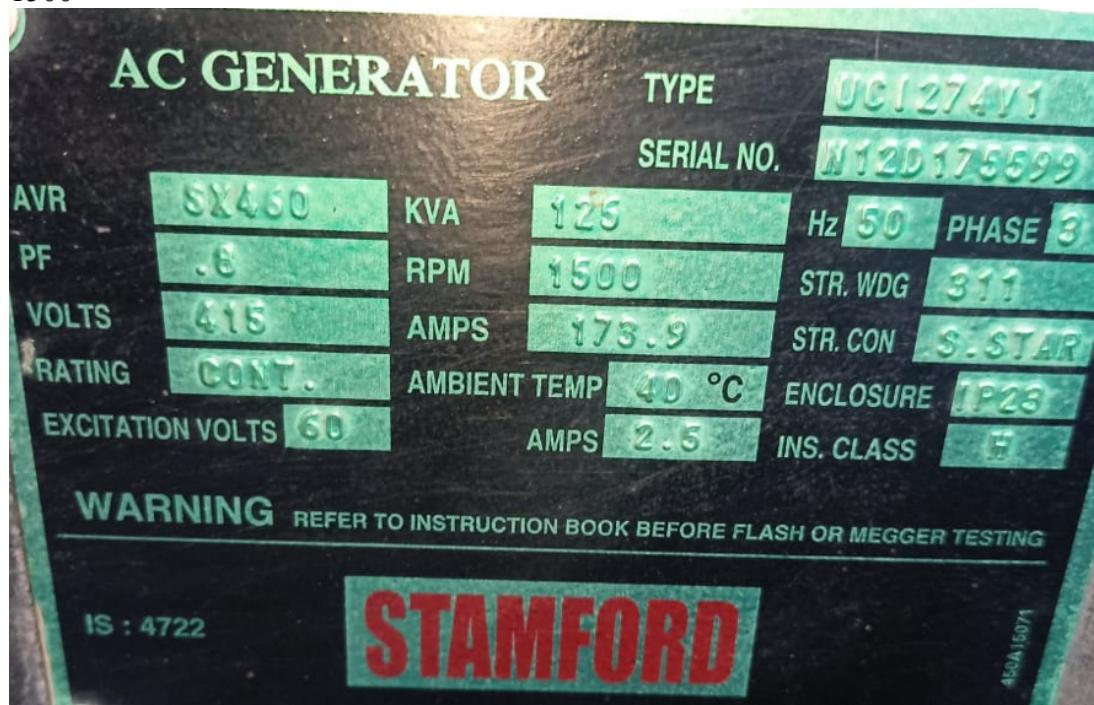
DETAILS OF DG SET ARE AS FOLLOWS:

Make – Stamford

Type – 3 Phase , 50 Hz, 415 Volts

IP ratings – IP 28

RPM – 1500



## **B.2 Do no harm or Impact test of the project activity>>**

### **Social benefits:**

The project would level up (which is a major concern in India) collection, processing and supply of the biomass fuels envisaged.

Create jobs for operating the plant as well for fuel collection system, transportation of fuel material to the project plant from sources.

The generation of eco-friendly green power and contribution to the availability of quality power in the rural area where the plant is located which brings about socio economic development of rural.

### **Environmental benefits:**

The project activity utilises biomass potential available for power generation, which otherwise is dominated by fossil fuels such as coal, lignite and gas.

The project contributes to climate change mitigation, through renewable energy generation and reducing the demand for fossil fuel based power.

### **Economic benefits:**

Employment generation for the local population which results in economic well-being.

Generation of additional income for rural farmers due to creation of commercial value for the neglected biomass in and around the project region would bring in additional investment consistent with the needs of the people.

**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, 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 15 MW non-conventional renewable energy source (i.e., biomass)

The GHG emissions of the combustion process, mainly CO<sub>2</sub> are sequestered by Crop Husk/ 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)
- Chhattisgarh Rajya Vidyut Prasaran Nigam Ltd (CRVPNL)
- Chhattisgarh Renewable Energy Corporation Limited (CREC)
- Chhattisgarh State Pollution Control Board (CSPCB)
- Ministry of Environment Forest & Climate Change (MoEF & CC), 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.

### B.3. Baseline Emissions>>

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<sub>2</sub> emission factor (tCO<sub>2</sub>/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<sub>2</sub>/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.

Baseline emissions include only CO<sub>2</sub> 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 <sub>2</sub> )
$EG^{BL,y}$	=	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 <sub>2</sub> /MWh has been considered. (Reference: General Project Eligibility Criteria and Guidance, UCR Standard, page 4)

### B.4. Debundling>>

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 has never taken any issuance during the crediting period as no verification has been done, However PP will provide declaration letter for no double accounting signed on his letter head during the period of verification of this project activity.**

## **SECTION C. Application of methodologies and standardized baselines**

### **C.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 17 of the methodology as the project is a CDM registered project under the CDM<sup>3</sup> with the version 17 of the applied methodology. The project was registered at CDM on 01/09/2012 with first crediting period of 10 years (from 01/09/2012 to 31/08/2022).

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.

### **C.2. Applicability of methodologies and standardized baselines >>**

<b>Applicability Criterion</b>	<b>Project Case</b>
<p>1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, biomass-based electricity generation unit tidal/wave, wind, geothermal and renewable biomass:</p> <ul style="list-style-type: none"> <li>(a) Supplying electricity to a national or a Unified Indian Grid; or</li> <li>(b) Supplying electricity to an identified consumer facility via national/Unified Indian Grid through contractual arrangement such as wheeling.</li> </ul>	The project comprises of renewable generation units, such as photovoltaic, hydro, biomass-based electricity generation unit tidal/wave, wind, geothermal and renewable biomass: 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.
<p>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 by the user) applies included in Table 2</p>	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 AMS-I.A: Electricity generation by the user) applies is included in Table 2
<b>Applicability Criterion</b>	<b>Project Case</b>
<p>3. This methodology is applicable to project activities that:</p> <ul style="list-style-type: none"> <li>(a) Install a Greenfield plant;</li> <li>(b) Involve a capacity addition in (an) existing plant(s);</li> <li>(c) Involve a retrofit of (an) existing plant(s);</li> <li>(d) Involve a rehabilitation of (an) existing</li> </ul>	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).

<sup>3</sup> <https://cdm.unfccc.int/Projects/Validation/DB/M99B3U3I32W89NNPJM6AFG9BI3FSH8/view.html>

<p>plant(s); or</p> <p>(e) Involve a replacement of (an) existing plant(s).</p>	
<p>4. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:</p> <p>(a) The project activity is implemented in existing reservoir, with no change in the volume of the reservoir; or</p> <p>(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<sup>2</sup>.</p> <p>(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/m<sup>2</sup></p>	<p>The criterion is not applicable to the project activity as the project is a biomass project.</p>
<p>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.</p>	<p>The project activity involves the installation of a turbine generator with an installed capacity of 15 MW based on the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit set by the methodology.</p>
<p>6. Combined heat and power (co-generation) systems are not eligible under this category</p>	<p>The project is not a combined heat and power plant and hence this criterion is not applicable.</p>
<p>7. In the case of project activities that involve the 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.</p>	<p>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.</p>
<p>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.</p>	<p>The project is a Greenfield project as there is no 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.</p>
Applicability Criterion	Project Case
<p>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</p>	<p>The project activity involves the installation of a turbine generator with an installed capacity of 15 MW based on the renewable 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</p>

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.	
10. In case biomass is sourced from dedicated plantations, the applicability criteria in the tool “Projects sourced from the dedicated plantations. emissions from cultivation of biomass” shall apply.	Project activity is not based on the biomass emissions from cultivation of biomass” shall apply. Hence, this criterion is not applicable

### C.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 17 of the methodology as the project is a CDM registered project under the CDM<sup>3</sup> with the version 17 of the applied methodology. The project was submitted at CDM on 01/09/2012 with first crediting period of 10 years (from 01/09/2012 to 31/08/2022), but the project was not registered.

### C.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 <sub>2</sub>	Yes	<b>CO<sub>2</sub> emissions from electricity generation in fossil fuel fired power plants</b>
	CH <sub>4</sub>	No	Minor emission source
	N <sub>2</sub> O	No	Minor emission source
	Other	No	No other GHG emissions were emitted from the project
Project Greenfield Biomass Power Project Activity	CO <sub>2</sub>	No	No CO <sub>2</sub> emissions are emitted from the project
	CH <sub>4</sub>	No	Project activity does not emit CH <sub>4</sub>
	N <sub>2</sub> O	No	Project activity does not emit N <sub>2</sub> O
	Other	No	No other emissions are emitted from the project

### C.5. Establishment and description of baseline scenario (UCR Protocol) >>

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<sub>2</sub> emission factor (tCO<sub>2</sub>/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<sub>2</sub>/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<sub>y</sub> = BE<sub>y</sub> - PE<sub>y</sub> - LE<sub>y</sub>** Where:

ER<sub>y</sub> = Emission reductions in year y (tCO<sub>2</sub>/y)

BE<sub>y</sub> = Baseline Emissions in year y (t CO<sub>2</sub>/y)

PE<sub>y</sub> = Project emissions in year y (tCO<sub>2</sub>/y)

LE<sub>y</sub> = Leakage emissions in year y (tCO<sub>2</sub>/y)

- Baseline Emissions**

Baseline emissions include only CO<sub>2</sub> 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 <sub>2</sub> )
$EG^{BL,y}$	=	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 <sub>2</sub> /MWh has been considered. (Reference: General Project Eligibility Criteria and Guidance, UCR Standard,

## 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.

CO<sub>2</sub> emissions from fossil fuel combustion in the project activity are calculated based on the quantity of fuels combusted and the CO<sub>2</sub> emission factor of those fuels, as follows:

$$PE^{FC,y} = \sum FC_{i,y} \times NCV_{i,y} \times EF^{CO2,i}$$

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 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

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

### 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.

$$\text{Hence, } LE_y = 0$$

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 (BEy)

Ex-ante calculation of emission reductions is equal to ex-ante calculation of baseline emissions as project emissions and leakage are nil.

### **Combined CO<sub>2</sub> emission factor of the INDIAN Grid = 0.9 t CO<sub>2</sub>/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)  
= (937702 \* 0.9) = **843,929t CO<sub>2</sub>/yr**

Emission Reductions from the project activity = **843,929tCO<sub>2</sub>/yr (ROUNDDOWN)**

#### **C.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 17 of the methodology as the project is a CDM was submitted but not registered project under the CDM<sup>4</sup> with the version 17 of the applied methodology. The project proponent had earlier applied for carbon credits under the CDM mechanism in 2012.

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

#### **C.7. Monitoring period number and duration>>**

First Monitoring Period:

08 years, 11 months

01/01/2014 to 30/11/2022 (inclusive of both dates)

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

#### **C.8. 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.

#### **C.9. Permanent changes from PCN monitoring plan, applied methodology or applied standardized baseline >>**

Not Applicable

<sup>4</sup> <https://cdm.unfccc.int/Projects/Validation/DB/M99B3U3I32W89NNPJM6AFG9BI3FSH8/view.html>

## C.10. Monitoring plan>>

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

Data / Parameter	UCR recommended emission factor
Data unit	tCO <sub>2</sub> /MWh
Description	A "grid emission factor" refers to a CO <sub>2</sub> emission factor (tCO <sub>2</sub> /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 <sub>2</sub> /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	<a href="https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UCRCoUStandardAug2022updatedVer6_09082220127104470.pdf">https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UCRCoUStandardAug2022updatedVer6_09082220127104470.pdf</a> <sup>5</sup>
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 <sub>k,y</sub>
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	- (an average value is given for representation)
Measurement methods and procedures	IPCC Default Value is considered. <i>OR</i> Monitoring equipment – Bomb Calorimeter Water equivalent = $H \cdot M \cdot (CV_t + CV_w) / T$ Where:

<sup>5</sup> [https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UCRCoUStandardAug2022updatedVer6\\_09082220127104470.pdf](https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UCRCoUStandardAug2022updatedVer6_09082220127104470.pdf)

	$H$ = 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	$EF^{CO2,i}$
Data unit	tCO <sub>2</sub> e/TJ
Description	CO <sub>2</sub> 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 CO <sub>2</sub> 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.

### **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 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																																															
	<table border="1"> <thead> <tr> <th>S n o</th><th>Installati on date</th><th>Date Replace ment</th><th>Meter Locatio n</th><th>Make</th><th>Meter service no</th><th>Accur acy Class</th><th>condit ion</th></tr> </thead> <tbody> <tr> <td>1</td><td>Since Commissioning</td><td>IN SERVICE</td><td>GENERATION</td><td>L&amp;T</td><td>120231 57</td><td>0.5S</td><td>runnin g</td></tr> <tr> <td>2</td><td>12-Apr-17</td><td>IN SERVICE</td><td>EXPORT BILLING CSEB (ABT Check METER )</td><td>secur e</td><td>Y03196 73</td><td>0.2S</td><td>runnin g</td></tr> <tr> <td>3</td><td>12-Apr-17</td><td>30-Jun-21</td><td>EXPORT BILLING CSEB ( ABT MAIN METER)</td><td>secur e</td><td>Y03196 72</td><td>0.2S</td><td></td></tr> <tr> <td>4</td><td>21-Jun-21</td><td>IN SERVICE</td><td>EXPORT BILLING CSEB ( ABT MAIN METER)</td><td>secur e</td><td>CSE521 57</td><td>0.2S</td><td>runnin g</td></tr> </tbody> </table>								S n o	Installati on date	Date Replace ment	Meter Locatio n	Make	Meter service no	Accur acy Class	condit ion	1	Since Commissioning	IN SERVICE	GENERATION	L&T	120231 57	0.5S	runnin g	2	12-Apr-17	IN SERVICE	EXPORT BILLING CSEB (ABT Check METER )	secur e	Y03196 73	0.2S	runnin g	3	12-Apr-17	30-Jun-21	EXPORT BILLING CSEB ( ABT MAIN METER)	secur e	Y03196 72	0.2S		4	21-Jun-21	IN SERVICE	EXPORT BILLING CSEB ( ABT MAIN METER)	secur e	CSE521 57	0.2S	runnin g
S n o	Installati on date	Date Replace ment	Meter Locatio n	Make	Meter service no	Accur acy Class	condit ion																																									
1	Since Commissioning	IN SERVICE	GENERATION	L&T	120231 57	0.5S	runnin g																																									
2	12-Apr-17	IN SERVICE	EXPORT BILLING CSEB (ABT Check METER )	secur e	Y03196 73	0.2S	runnin g																																									
3	12-Apr-17	30-Jun-21	EXPORT BILLING CSEB ( ABT MAIN METER)	secur e	Y03196 72	0.2S																																										
4	21-Jun-21	IN SERVICE	EXPORT BILLING CSEB ( ABT MAIN METER)	secur e	CSE521 57	0.2S	runnin g																																									
	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.																																															
Measurement Frequency:	Monthly																																															

Value applied:	937,702MWh
QA/QC procedures applied:	<p>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.</p> <p><b>Cross Checking:</b> 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.</p>
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.