Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT

Title: 10 MW Biomass based Power Project by Sanjog Sugars & Eco-Power Private Limited

Version: 02
Date: 06/02/2025

CoU Issuance Period: 12 years, 00 months
Monitoring Period under UCR: 01/01/2013 to 31/12/2024

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

Monitoring Report	
Title of the project activity	10 MW Biomass-based Power Project by Sanjog Sugars & Eco-Power Private Limited
UCR Project Registration Number	494
Version	02
Completion date of the MR	06/02/2025
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 01 Duration of this monitoring Period: (first and last days included (01/01/2013 to 31/12/2024)
Project participants	Sanjog Sugars & Eco-Power Private Limited
Host Party	India
Applied methodologies and standardized baselines	AMS I.D.- "Grid-connected Renewable electricity generation", Version 18.0 Standardized Methodology: Not Applicable.
Sectoral scopes	01- Energy Industries (renewable/non-renewable sources)
Estimated amount of GHG emission reductions for this monitoring period in the registered PCN	2013: 5,547 CoUs (5,547 tCO2eq)
	2014: 2,739 CoUs (2,739 tCO2eq)
	2015: 2,419 CoUs (2,419 tCO2eq)
	2016: 49,723 CoUs (49,723 tCO2eq)
	2017: 53,431 CoUs (53,431 tCO2eq)
	2018: 51,652 CoUs (51,652 tCO2eq)
	2019: 50,614 CoUs (50,614 tCO2eq)
	2020: 54,476 CoUs (54,476 tCO2eq)
	2021: 52,430 CoUs (52,430 tCO2eq)
	2022: 53,324 CoUs (52,324 tCO2eq)
	2023: 48,382 CoUs (48,382 tCO2eq)
	2024: 49,229 CoUs (49,229 tCO2eq)
Total:	**473966 CoUs (473966 tCO2eq)**

SECTION A. Description of project activity

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

The project activity involves setting up of 10 MW biomass-based power generation project at Sangaria, Hanumangarh District of Rajasthan, India and is promoted by Sanjog Sugars & Eco-Power Private Limited (SSEPPL). The project activity generates electricity and supplies to the Unified Indian Grid system (earlier as regional (Northern, Eastern, Western, North Eastern-NEWNE) electricity grid)[1]. The project activity consists of installation of one 47 TPH boiler with outlet parameters of 475° C and 66 kg/cm^2 (atm) pressure and one bleed cum condensing turbine of capacity 11.5 MW (normal output) with a rated output of 10 MW. The Biomass which is used for power generation in the project activity mainly includes cotton stalks and mustard husk available in the region. Other seasonally available renewable biomass residues in small quantities like paddy straw, sugar cane, groundnut husk, rice husk is utilised in force majeure conditions like change in cropping pattern. The project activity was commissioned on 07/10/2011.

The purpose of the project activity is to utilize the surplus biomass available in the region for generation of electricity and supply to the Indian Grid System to meet the ever-increasing demand for energy in the region and country. Thus, the project activity results in the reduction of GHG emission associated with generation of equivalent amount of power in the fossil fuel dominant electricity grid.

The electricity generated from the current monitoring period from 01/01/2013 to 31/12/2024 is 5,66,816 MWh. The total emission reduction achieved by project activity is 473966 tCO$_2$e.

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

The project activity is implemented as per the registered PDD. The primary biomass used for this project activity is cotton stalk and mustard stalk which is easily available in the region, also other seasonally available biomass residues like paddy straw, sugar cane, groundnut husk, rice husk. The proposed system consists of steam generator of 47 TPH capacity at 66 kg/cm2 (atm) pressure, 475 °C temperature. The boiler is bi-drum, natural circulation and balanced draft type. The combustion system of the boiler shall be travelling grate with spreader stoker. The boiler unit includes superheater, economizer, drum and air-preheater. The boiler includes sub systems like pressure parts, feeding system, firing system, draft system, feed water system, Electro Static Precipitator (ESP) and chimney.

The steam generated from the boiler drives the steam turbine of bleed cum condensing type with a normal output of 11.5 MW and rated output of 10 MW. The turbo generator unit is provided with all necessary auxiliary equipment including condensate pump, ejectors, gland steam condenser, ejector condenser. The power generated will be fed to the Indian Grid.

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

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[1] At the time of registration of the project, it was nominated under regional grid, called NEWNE grid. However, currently all regional grids are unified under Indian Grid System.

UCR Project ID or Date of Authorization: 494
Start Date of Crediting Period: 01/01/2013
Project Commissioned: 07/10/2011
Monitoring Period: 01/01/2013 to 31/12/2024

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:

Summary of the Project Activity and ERs Generated for the Monitoring Period	
Start date of this Monitoring Period	01/01/2013
Carbon credits claimed up to	31/12/2024
Total ERs generated (tCO2eq)	**473966** tCO2eq
Leakage	0

e) Baseline Scenario>>

The baseline scenario identified at the PCN stage of the project activity 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.

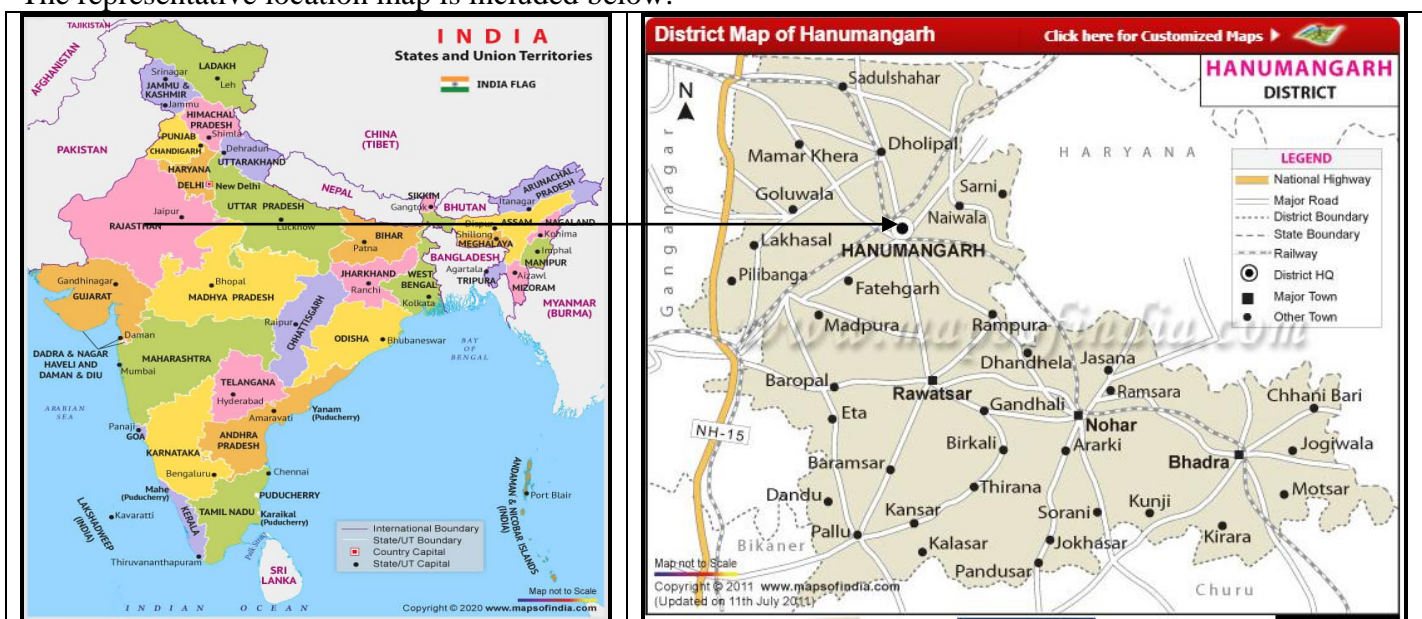**A.2. Location of project activity>>**
Country: India
District: Hanumangarh
Village: Sangaria
State: Rajasthan
Pincode: 125101

Latitude   : 29° 45'16.86''N
Longitude : 74° 28'00.70" E
The representative location map is included below:

(Image courtesy: Google maps & images)

A.3. Parties and project participants >>

Party (Host)	Participants
India	Private Entity (Project Owner) M/s Sanjog Sugars & Eco-Power Private Limited

Other Parties:

Party (Host)	Participants
India	M/s. Creduce Technologies Private Limited (Aggregator) Contact person: Shailendra Singh Rao Mobile: +91 9016850742, 9601378723 Address: 2-O-13,14 Housing Board Colony, Banswara, Rajasthan -327001, India

A.4. References to methodologies and standardized baselines >>

SECTORAL SCOPE: 01- Energy Industries (renewable/non-renewable sources)

TYPE - I: Renewable energy project

CATEGORY:
AMS I.D.- Grid-connected renewable electricity generation, Version 18.0

The tools referenced in this methodology used for the proposed project includes:
- Guidance on the Assessment of Investment Analysis- Version 5[2]
- Tool to calculate the emission factor for an electricity system- Version 2.2.0[3]
- General guidance on leakage in biomass project activities, version 3[4].

Applicability of methodologies and standardized baselines >>
The scale of the activity is under the project Type-I and the project activity remained under the limit of 15 MW every year during the crediting period. Therefore, the GHG emission reductions that are claimed remains within the limit of its type as per the applied methodologies.

A.5. Crediting period of project activity >>

Length of the crediting period corresponding to this monitoring period: 12 years, 00 months.
Date: 01/01/2013 to 31/12/2024 (inclusive of both dates).

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[2] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v13.pdf/history_view

[3] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.pdf

[4] http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid04.pdf

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

Details	Information
Name of entity:	M/s. Creduce Technologies Private Limited (Aggregator)
Role:	Project Consultant (Authorized Representative of PP)
Contact:	Shailendra Singh Rao Mobile: +91 9016850742, 9601378723

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 project activity is implemented as per the registered PCN. The primary biomass used for this project activity is cotton stalk and mustard stalk which is easily available in the region, also other seasonally available biomass residues like paddy straw, sugar cane, groundnut husk, rice husk. The proposed system consists of steam generator of 47 TPH capacity at 66 kg/cm^2(atm) pressure, 475 °C temperature. The boiler is bi-drum, natural circulation and balanced draft type. The combustion system of the boiler shall be travelling grate with spreader stoker. The boiler unit includes superheater, economizer, drum and air-preheater. The boiler includes sub systems like pressure parts, feeding system, firing system, draft system, feed water system, Electro Static Precipitator (ESP) and chimney.

The steam generated from the boiler drives the steam turbine of bleed cum condensing type with a normal output of 11.5 MW and rated output of 10 MW. The turbo generator unit is provided with all necessary auxiliary equipment including condensate pump, ejectors, gland steam condenser, ejector condenser. The power generated will be fed to the Indian Grid.

(a) Description of the installed technologies, technical processes and equipment;

The technical specifications of all the equipment are as follows:

Technical specification of Travelling grate boiler:

Description	Specifications
Make	ISGEC JOHN THOMPSON
Type	Natural circulation, vertical bi-drum, semi-outdoor installation
Maximum continuous rating	47TPH
Grate	Travelling grate water tube
Steam pressure at superheater outlet	66 kg/cm^2
Steam temperature at superheater outlet	475± 5°C
Feed water temperature at economizer inlet	130 °C
Registered No. and Manufacture year	RJ-1765, 2008

Technical parameters of Turbogenerator:

Description	Specifications
Make	Triveni Engineering & Industries Limited
Type	Multistage, Horizontal axle blade design, Impulse type bleed cum condensing steam turbine
Rated capacity of turbine	10000 kW
Steam pressure of turbine inlet	64 kg/cm^2
Steam temperature at turbine inlet	475°C
Condenser pressure	0.1 kg/cm^2
Cooling water temperature at inlet to condenser	32°C

Technical specification of Air-cooled condenser:

Description	Specifications
Make	GEI Industrial Systems Ltd.
Turbine exhaust steam flow rate	41.7 tons/hr
Turbine back pressure	0.18 bar
Turbine exhaust steam enthalpy	576.93 kcal/kg
ACC design ambient temperature	42 °C

Technical specification of Electrostatic precipitator:

Description	Specification
Make	Thermax Ltd.
Gas Flow	124200 Am^3/hr
Gas temperature	160°C
Dust concentration at ESP inlet	10 gm/Nm^3
Clean gas burden at ESP outlet with all fields	50 mg/Nm^3

Technical specification of AC generator:

Description	Specifications
Make	TDPS
Output	15000 kVA
Standard	IS 4722
Voltage (AC)	11000 V
Current (AC)	767 A
Frequency	50 Hz

The plant has been successfully commissioned on 07/10/2011. The plant has been in operation continuously since commissioning. However, during the current monitoring period i.e. 01/01/2013 to 31/12/2024.

B.2 Do no harm or Impact test of the project activity>>
There was no harm identified form the project and hence no mitigations measures are applicable.

Rational: as per the project owner has obtained Commissioing certificate from Pollution Control Board to install and operate boiler and adheres to the environmental compliance mentioned in CTO, hence project activity has no damage to environment.

Under Environment:
Environmental criteria may include a company's energy use, waste, pollution, natural resource conservation, and treatment of animals, etc. For the project proponent, the energy use pattern is now based on waste generation due to the project and it also contributes to GHG emission reduction and conservation of depleting energy sources associated with the project baseline. Also, the criteria can be further evaluated on the basis of any environmental risks that the company might face and how those risks are being managed by the company. Here, as the power generation will be based on waste generation, the risk of environmental concerns associated with non-renewable power generation and risk related to increasing cost of power, etc. are now mitigated. Hence, the project contributes to ESG credentials. Page | 6

Under Social:
Social criteria reflect on the company's business relationships, qualitative employment, working conditions with regard to its employees' health and safety, interests of other stakeholders' etc. With respect to this project, the project proponent has robust policies in place to ensure equitable employment, health & safety measures, local jobs creation etc. Also, the organizational CSR activities directly support local stakeholders to ensure social sustainability. Thus, the project contributes to ESG credentials.

Under Governance:
Governance criteria relate to overall operational practices and accounting procedure of the organization. With respect to this project activity, the PP practices a good governance practice with transparency, accountability and adherence to local and national rules & regulations etc. This can be further referred from the company's annual report. The electricity generated from the project can be accurately monitored, recorded and further verified under the existing management practice of the company. Thus, the project and the proponent ensure good credentials under ESG.

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".

B.4. Debundling>>

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

However, this project actual implementation was considered only for 10 MW capacity which is the current project activity. Hence, there is no concern related to de-bundling from the project implementation aspect as well.

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 project

CATEGORY: AMS I.D.- Grid connected renewable electricity generation, Version 18.0

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

Applicability as per AMS-I. D version 18.0	Project Case
1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal sand 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 activity is a renewable energy project i.e., a biomass-based power project which falls under applicability criteria option 1 b) the project owner has done a power purchase agreement with RVPN to supply the electricity generated by power plant.
1. 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)/ unit(s); or e. Involve a replacement of (an) existing plant(s).	The option (a) of applicability criteria is applicable as the project is a greenfield plant/unit. Hence the project activity meets the given applicability criterion.
2. 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 an existing reservoir with no change in the volume of reservoir; b. The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4	The project activity involves the installation of 47 TPH Thermal boiler having turbine capacity of 10 MW; hence, this criterion is not applicable.

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 grated than 4 W/m^2	
3. 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 47 TPH Thermal boiler having turbine capacity of 10 MW; hence, this criterion is not applicable.
4. Combined heat and power (co-generation) systems are not eligible under this category.	The project is not cogeneration system; hence this criterion is not applicable.
5. 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.	There is no capacity addition, thus the criterion is not applicable to this project activity
6. In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	The project activity involves the installation of 47 TPH Thermal boiler having turbine capacity of 10 MW; hence, this criterion is not applicable.
7. 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 47 TPH Thermal boiler having turbine capacity of 10 MW; hence, this criterion is not applicable.
8. In case biomass is sourced from dedicate plantations, the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply.	The project activity does not involve biomass sourced from dedication plantations.

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:
- The project is uniquely identifiable based on its location coordinates,
- The project has a dedicated commissioning certificate and connection point,
- The project is associated with energy meters which are dedicated to the generation/feeding point with the grid.
- Project is a CDM Registered activity, but have not issued credits under CDM. More details and explanations provided under Section C.6 (Prior History)

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

As per applicable methodology AMS I.D.- "Grid-connected Renewable electricity generation", Version 18.0 "The spatial extent of the project boundary encompasses the biomass feedstock collection and handling systems, the biomass combustion or conversion unit (e.g., boiler or gasifier), energy conversion equipment such as the steam turbine and generator, auxiliary systems, heat recovery units, power transmission and synchronization systems, steam flow piping, flue gas ducts, and other related infrastructure, as well as the end-user facilities where the generated electricity will be consumed."
Thus, the project boundary includes the waste heat recovery power plant and the Indian grid system.

	Source	Gas	Included?	Justification/Explanation
Baseline	Grid connected electricity generation	CO_2	Yes	Main emission source
		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 based power generation 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

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

As per the approved consolidated methodology AMS I.D.- Grid connected renewable electricity generation, Version 18.0, if the project activity is the installation of biomass base energy generation project, 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 biomass base energy generation project and to use for sell to grid purpose. 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 "grid emission factor" refers to a CO2 emission factor (tCO$_2$/MWh) that will be associated with each unit of electricity provided by an electricity system. Since the project activity is registered CDM activity and verified by third party verifier, the emission factor of 0.84 has been considered

for the period 2013-2020. The UCR recommends an emission factor of 0.9 tCO2/MWh for the 2021-2023 years as a fairly conservative estimate. Also, for the vintage 2024, the combined margin emission factor calculated from the CEA database in India results in lower emissions than the UCR recommended emission factor, hence 0.757 tCO$_2$/MWh Hence, the CEA recommended emission factor has been considered to calculate the emission reduction under a conservative approach.

- **Net GHG Emission Reductions and Removals**

Thus, ERy = BEy – PEy – LEy
Where:
ERy = Emission reductions in year y (tCO2e/y)
BEy = Baseline Emissions in year y (tCO2e/y)
PEy = Project emissions in year y (tCO2e/y)
LEy = Leakage emissions in year y (tCO2e/y)

Baseline Emissions:
Baseline emissions include only CO2 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:

$BE_{elec,y}$	=	Baseline emissions due to displacement of electricity during the year *y* in tons of CO$_2$
$EG_{i,j,y}$	=	The quantity of electricity supplied to the recipient *j* by generator, that in the absence of the project activity would have been sourced from *i*[th] source (*i* can be either grid or identified existing source) during the year *y* in MWh.
$EF_{Elec,i,j,y}$	=	The CO$_2$ emission factor for the electricity source *i* (grid or identified existing source), displaced due to the project activity, during the year *y* in tons CO$_2$/MWh.

- **Project Emissions**

As per the UCR notification dated 04/10/2023 for the biomass-based grid power supply projects "For microscale and small-scale project activities, apply a default emission factor of 0.0142 tCO$_2$/tonne of biomass or biomass residue or biomass-based briquettes, to determine the final amount of emission reductions that can be claimed per vintage"
Hence for the period 2021-2024, UCR recommended emission factor of 0.0142 tCO$_2$/tonne of biomass has been applied in project emissions and subsequently emission reductions are calculated.

- **Leakage Emission**

No leakage is applicable under this methodology.
Hence, LE = 0

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

Year	Biomass consumption (Tonnes)	Net Electricity supplied to the grid	Emission factor	Baseline Emissions	Project Emissions	Leakage Emissions	Emission Reductions
		$EG_{BL,y}$ MWh	tCO$_2$/MWh	tCO$_2$	tCO$_2$	tCO$_2$	tCO$_2$
2013	17159	6604	0.84*	5547	0	0	5547
2014	6357	3261		2739	0	0	2739
2015	5153	2880		2419	0	0	2419
2016	102214	59194		49723	0	0	49723
2017	126192	63609		53431	0	0	53431
2018	125264	61491		51652	0	0	51652
2019	124510	60254		50614	0	0	50614
2020	146535	64852		54476	0	0	54476
2021	121566	60174	0.9**	54156	1726.2372	0	54156
2022	114615	61057		54951	1627.533	0	54951
2023	115875	55586		50027	1645.425	0	50027
2024	150550	67855	0.757***	51367	2137.81	0	51367
Total	1155989	566816	-	481103	7137.0052	0	473966

Notes:
*CDM verified Emission factor
** UCR recommended emission factor
***CEA recommended emission factor

Hence Net GHG emission reduction:
= Baseline Emission – Project Emission – Leakage Emission

= 481103-7137.00-0 = 473966 tCO$_2$e (i.e., 473966 CoUs)

C.6. Prior History>>

This is a CDM Registered Project with CDM ID 5723.
The project registration details are as follows:
CDM Registration Date: 13 Feb 20212
Monitoring Period under CDM verification: 13 Feb 2012 - 31 Dec 2020
Current Status of Verification: On hold, verified but did not proceed for issuance. See the note below for more details.
Project Link: https://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1327658707.14/view

Note: PP has developed the project under CDM and also successfully verified the Carbon Credits till 31/12/2020. However, due to the uncertainty of CDM mechanism under Article 6 of Paris Agreement PP did not proceed with submission of Request For Issuance at UNFCCC. Hence, the verified credits under CDM has never been issued, hence never utilized.

Therefore, PP has decided to register the project under UCR and avail the credits under UCR till 31/12/2024 where Credits till 31/12/2020 are already verified & approved, followed by addition of credits from 01/01/2021 to 31/12/2024 to capture the entire period of 12 years under UCR.

C.7. Monitoring period number and duration>>

Number: First Monitoring Period under UCR
Duration: 12 years, 00 months 01/01/2013 to 31/12/2024 (inclusive of both dates)

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 01/01/2013.

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

Not applicable.

C.10. Monitoring plan>>

C.1. Data and parameters fixed ex ante

Data/Parameter	$EF_{grid,OM,y}$
Unit	tCO_{2e}/MWh
Description	Operating margin emission factor of NEWNE grid
Source of data	CEA data, CO2 Baseline Database, Version 5, http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver5.pdf
Value(s) applied	1.004
Choice of data or measurement methods and procedures	The CO_2 database is an official publication of Government of India for the purpose of CDM baselines. It is based on most recent data available to the CEA and hence considered authentic. (Weighted average of three years: 2006-07, 2007-08, 2008-09 is considered.)
Purpose of data/parameter	For the calculation of baseline emissions and its value remains fixed for the entire crediting period.
Additional comments	

Data/Parameter	$EF_{grid,BM,y}$
Unit	tCO_{2e}/MWh
Description	Combined margin emission factor of NEWNE grid
Source of data	CEA data, CO2 Baseline Database, Version 5, http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver5.pdf
Value(s) applied	0.675
Choice of data or measurement methods and procedures	The CO_2 database is an official publication of Government of India for the purpose of CDM baselines. It is based on most recent data available to the CEA and hence considered authentic. (BM for the year 2008-09 is considered)
Purpose of data/parameter	For the calculation of baseline emissions and its value remains fixed for the entire crediting period.
Additional comments	

Data/Parameter	$EF_{CO2,grid}$
Unit	tCO_{2e}/MWh
Description	Combined margin emission factor of NEWNE grid
Source of data	CEA data, CO_2 Baseline Database, Version 5, http://www.cea.nic.in/planning/c%20and%20e/user_guide_ver5.pdf
Value(s) applied	0.84
Choice of data or measurement methods and procedures	The CO_2 database is an official publication of Government of India for the purpose of CDM baselines. $$EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$$ $$= (0.5 * 1.004) + (0.5 * 0.675)$$ $$= 0.84 \ tCO_2/MWh$$ $$= EF_{CO_2,grid,y}$$
Purpose of data/parameter	For the calculation of baseline emissions.
Additional comments	its value remains fixed for the entire crediting period.

Data/Parameter	$EF_{grid,BM,y}$
Unit	tCO_{2e}/MWh
Description	Combined margin emission factor of NEWNE grid
Source of data	CEA data, CO_2 Baseline Database, Version 20 https://cea.nic.in/wp-content/uploads/2021/03/User_Guide_Version_20.0.pdf
Value(s) applied	0.757
Choice of data or measurement methods and procedures	The CO_2 database is an official publication of Government of India for the purpose of CDM baselines. It is based on most recent data available to the CEA and hence considered authentic. (CM for the year 2023-24 is considered)
Purpose of data/parameter	For the calculation of baseline emissions and its value remains fixed for the entire crediting period.
Additional comments	

Data/Parameter	$PE_{BRT,y}$
Unit	tCO_2/Tonne of biomass
Description	Project emissions resulting from transportation of biomass/biomass residues in year y
Source of data	UCR notification dated 04/10/2023 Biomass Based Power/Thermal Energy Project Emissions Related Default Parameters (Small/Large Scale)	by Universal Carbon Registry	Medium
Value(s) applied	0.0142
Choice of data or measurement methods and procedures	
Purpose of data/parameter	For the calculation of project emissions
Additional comments	its value remains fixed for the entire crediting period.

C.2. Data and parameters monitored

Data/Parameter	$EG_{export,y}$
Unit	MWh
Description	Electricity exported to the grid in the year y
Measured/calculated/ Default	Measured
Source of data	Joint meter reading records.
Value(s) of monitored parameter	<table><tr><th>Year</th><th>Net Electricity exported</th></tr><tr><td>2013</td><td>6906</td></tr><tr><td>2014</td><td>3557</td></tr><tr><td>2015</td><td>3066</td></tr><tr><td>2016</td><td>59408</td></tr><tr><td>2017</td><td>63781</td></tr><tr><td>2018</td><td>61735</td></tr><tr><td>2019</td><td>60519</td></tr><tr><td>2020</td><td>65056</td></tr><tr><td>2021</td><td>60401</td></tr><tr><td>2022</td><td>61263</td></tr><tr><td>2023</td><td>55874</td></tr><tr><td>2024</td><td>68046</td></tr><tr><td>Total</td><td>569612</td></tr></table>
Monitoring equipment	The "ABT" digital energy meter <table><tr><th colspan="3">Energy meter – Main meter, check meter</th></tr><tr><td>Make</td><td colspan="2">SECURE METERS LTD.</td></tr><tr><td>Serial No.</td><td>APMB-2215 (Main meter)</td><td>APMB-2216 (Check meter)</td></tr><tr><td>Accuracy Class</td><td>0.2s</td><td>0.2s</td></tr><tr><td>Date of Calibration</td><td>16/01/2012 14/01/2014 20/07/2017 04/09/2020 to 03/09/2021</td><td>15/01/2012 14/01/2014 20/07/2017 25/03/2019 to 24/03/2021</td></tr></table>
Measuring/reading/recording frequency	The energy meter readings are recorded continuously, measure hourly and recorded monthly.
Calculation method (if applicable)	Measure readings of the energy meter installed at the grid interconnection point. This will be recorded every month jointly by representative officials of SSEPPL and the grid/license. This record is archived and stored.
QA/QC procedures	The "ABT" digital energy meter of standard make and accuracy (0.2s) and Identical check meters will be installed at the grid interconnection point. The energy meter readings will be monitored continuously, measured hourly and recorded monthly. In case the main meter becomes defective, the readings would be based on readings recorded on the check meter. The electricity exported will be cross verified against invoices raised by SSEPPL. The meter will be calibrated annually.
Purpose of data/parameter	For calculation of baseline emissions
Additional comments	The data will be archived electronically and the archived data will be kept for 2 years beyond the Crediting Period. In case of failure of both main meter as well as check meter at a time, no emission reduction will be claimed for the period starting from the date of failure to the date of replacement.

Data/Parameter	$EG_{BL,y}$
Unit	MWh
Description	Net electricity supplied to the grid in the year y
Measured/calculated/ Default	Calculated
Source of data	Joint meter reading
Value(s) of monitored parameter	566816 MWh
Monitoring equipment	Energy meters **Energy meter – Main meter, check meter** <table><tr><td>Make</td><td colspan="2">SECURE METERS LTD.</td></tr><tr><td>Serial No.</td><td>APMB-2215 (Main meter)</td><td>APMB-2216 (Check meter)</td></tr><tr><td>Accuracy Class</td><td>0.2s</td><td>0.2s</td></tr><tr><td>Date(s) of Calibration</td><td>16/01/2012 14/01/2014 20/07/2017 04/09/2020 to 03/09/2021</td><td>15/01/2012 14/01/2014 20/07/2017 25/03/2019 to 24/03/2021</td></tr></table>
Measuring/reading/recording frequency	Continuous monitoring, hourly measurement, monthly recording
Calculation method (if applicable)	Calculated based on energy meter reading of electricity export and electricity import Net Electricity supplied to the grid in the year y =(Electricity exported to the grid in the year y) – (Electricity imported from the grid in the year y) = $EG_{export,y}$ - $EG_{import,y}$
QA/QC procedures	This is calculated as the difference of the electricity exported and the electricity imported as monitored above. The energy meter readings are monitored continuously, measured hourly and recorded monthly. These readings can be cross checked based on bills invoices raised by SSEPPL. This is the major parameter for calculation of emission reductions and is based on readings of the main or check meter installed at the interconnection point.
Purpose of data/parameter	For calculation of baseline emissions
Additional comments	The data will be archived electronically and the archived data will be kept for 2 years beyond the Crediting Period.

C.3.   Implementation of sampling plan

>> No sampling of data is required as all the parameters are being monitored individually.

SECTION D.   Calculation of emission reductions or net anthropogenic removals

D.1.   Calculation of baseline emissions or baseline net removals

>>The procedures and formulas used for estimation of the baseline emission factor and the assumptions made have been detailed below. The emission reduction of the small scale project activity is the net electricity exported to the grid ($EG_{BL,y}$) in MWh multiplied by the baseline emission factor ($EF_{CO2,grid,y}$) in tCO_2/MWh.

$BEy = EG_{BL,y} \times EF_{CO2,grid,y}$ -- Eq. 1

Year	Biomass consumption (Tonnes)	Net Electricity supplied to the grid	Emission factor	Baseline Emissions	Project Emissions	Leakage Emissions	Emission Reductions
		$EG_{BL,y}$	tCO_2/MWh	tCO_2	tCO_2	tCO_2	tCO_2
		MWh					
2013	17159	6604		5547	0	0	5547
2014	6357	3261		2739	0	0	2739
2015	5153	2880		2419	0	0	2419
2016	102214	59194	0.84	49723	0	0	49723
2017	126192	63609		53431	0	0	53431
2018	125264	61491		51652	0	0	51652
2019	124510	60254		50614	0	0	50614
2020	146535	64852		54476	0	0	54476
2021	121566	60174		54156	1726.2372	0	54156
2022	114615	61057	0.9	54951	1627.533	0	54951
2023	115875	55586		50027	1645.425	0	50027
2024	150550	67855	0.757	51367	2137.81	0	51367
Total	1155989	566816	-	481103	7137.0052	0	473966