Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT

Title: 33 MW Biomass based Grid-connected Biomass Power Project of M/s SMSMPSSKL, Maharashtra by EASPL

Version 1.0

Date 24/04/2023

First CoU Issuance Period: 10 Years

Monitoring Period: 01/01/2013 to 31/12/2022

Monitoring Report	
Title of the project activity	**Title:** 33 MW Biomass based Grid-connected Biomass Power Project of M/s SMSMPSSKL, Maharashtra by EASPL
UCR Project Registration Number	265
Version	1.0
Completion date of the MR	24/04/2023
Monitoring period number and duration of this monitoring period	**Monitoring Period Number:** 01 **Duration of this monitoring Period:** 10 Years (first and last days included (01/01/2013 to 31/12/2022)
Project participants	**Project Proponent:** M/s Sahakar Maharshi Shankarrao Mohite-Patil Sahakari Sakhar Karkhana Ltd. **Aggregator:** Energy Advisory Services Pvt. Ltd.
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: **ACM0006**: Electricity and heat generation from biomass (Ver. 16) & UCR Standard for Emission Factor
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Actual amount of GHG emission reductions for this monitoring period	2013: 45,989 CoUs
	2014: 61,510 CoUs
	2015: 69,121 CoUs
	2016: 35,537 CoUs
	2017: 23,578 CoUs
	2018: 55,407 CoUs
	2019: 37,234 CoUs
	2020: 46,235 CoUs
	2021: 45,899 CoUs
	2022: 51,994 CoUs
	Total: 4,72,504 CoUs

SECTION A. Description of project activity

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

The proposed project activity with title under UCR "33 MW Biomass based Grid-connected Biomass Power Project of M/s SMSMPSSKL, Maharashtra by EASPL", implements a cogeneration power project of 33 MW capacity. The project generates 5,39,929 MWh during the monitoring period of 01/01/2013 to 31/12/2022 and 100% of the generated electricity is sold to the state Discom i.e., MSEDCL. The project is commercially operation since 06-03-2011 with continuous reduction of GHG, currently being applied under "Universal Carbon Registry" (UCR).

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

The project activity is the construction and operation of a power plant/unit that uses renewable energy sources and supplies electricity to the grid as well as generate heat for the captive consumption at 10,000 TCD sugar mill. At designed level, the project will generate clean energy and after meeting the captive requirement export the surplus energy to MSEDCL. The project activity is thus the displacement of electricity that would be provided to the grid by more-GHG-intensive means and provides long-term benefits to the mitigation of climate change. It is established that the project saves 4,85,931 tons of CO_2 being generated due to the consumption of electricity from the national grid. This project activity was commissioned on 02/03/2011 but the commercial operation started from 06/03/2011. The electricity export to the MSEDCL grid will displace the fossil fuel-based electricity in the national grid system.

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

The project activity employs 33 MW aggregated generators along with boilers, One 140 TPH boiler and One 50 TPH boiler with high pressure and temperature configuration (87 kg/cm2 and 515 °C).
During off-season only 50 TPH boiler will be operating and 10,000 MT of bagasse will be acquired from the neighboring area.

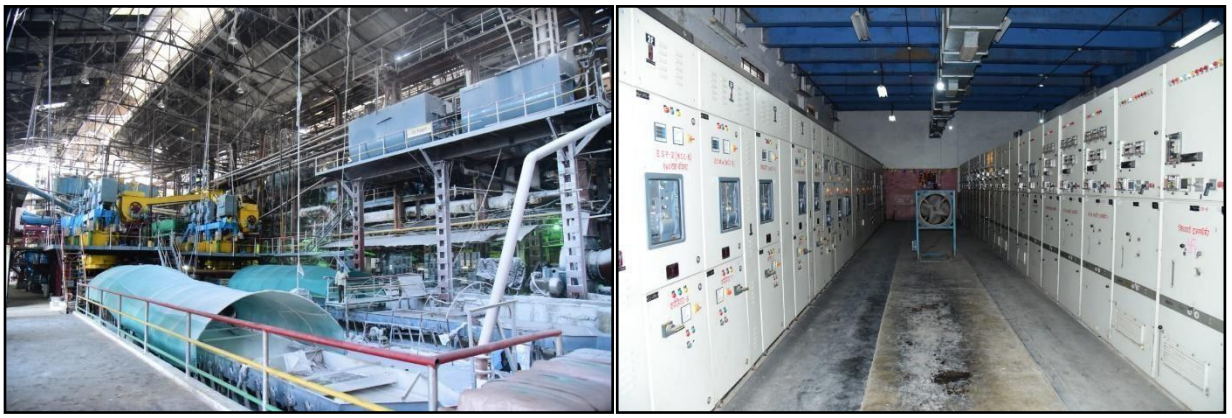


Figure 1 Project activity photographs

The Project activity in a process flow diagram is expressed below:

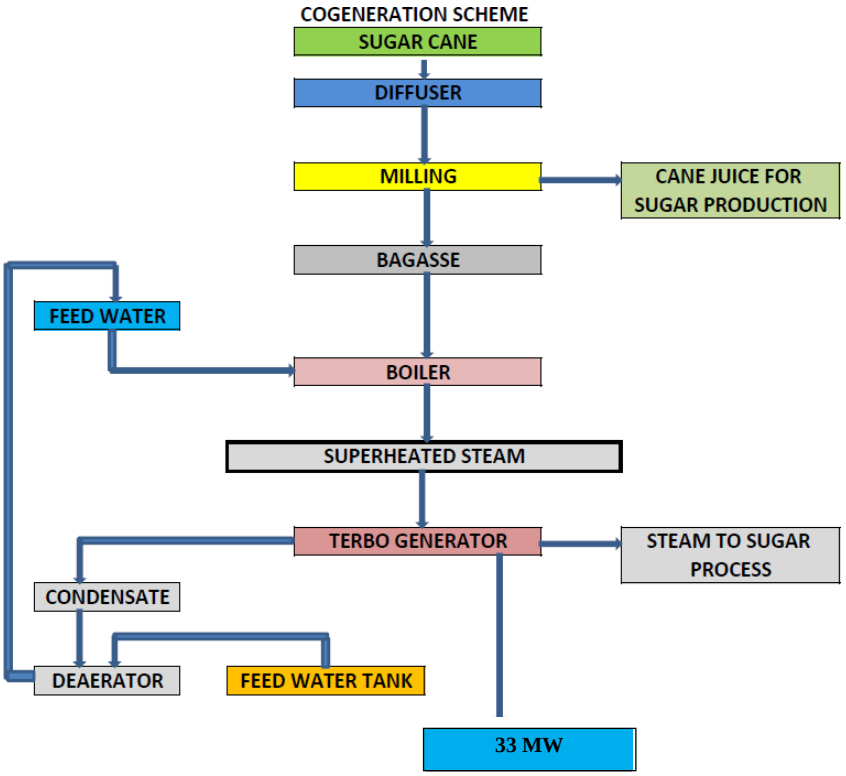


Figure 2 Flow Diagram

Some of the salient features of the project equipment can be found in the below mentioned table:

Parameters/Description	**140 TPH**	**50 TPH**
Boiler	1 No.	1 No
Steam Temperature (°C)	515°C	515°C
Rated Steam Pressure (kg/cm^2)	87 kg/cm^2	87 kg/cm^2
Feed Water Temperature (°C)	117°C	117°C
Registry No. of Boiler	MR/14935	MR/14986
Steam Flowmeter	Differential Pressure Transmitter	Differential Pressure Transmitter

Tag No	FT-202	FT-201
Serial No	01928993	01929313
Steam Pressure Transmitter		
Serial no	01929087	01939321
Range	0 to 150 Kg/cm^2	0 to 150 Kg/cm^2
Steam Pressure gauge		
Tag No	B2_PG-06	B1_PG-06
Range	0 to 160 Kg/cm^2	0 to 160 Kg/cm^2
Steam Temperature Gauge		
Tag no	B2_TG-02	B2_TG-02
Range	0 to 700 °C	0 to 700 °C

Table 1 Technical Specifications

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

The duration of the crediting period corresponding to the monitoring period is covered in this monitoring report.

UCR Project ID	:	265
Start Date of Crediting Period	:	01/01/2013
The project was commissioned on	:	02/03/2011

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	30/12/2022
Total ERs generated (tCO_{2eq})	4,72,504 tCO2eq

Table 2

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".**

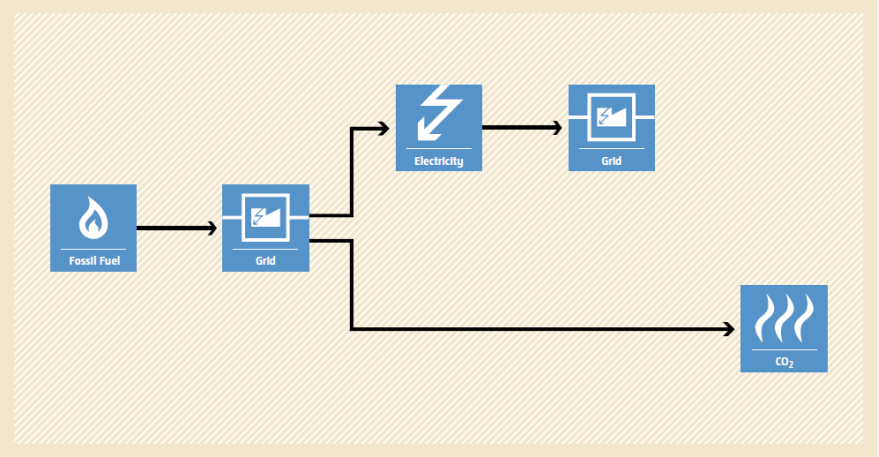
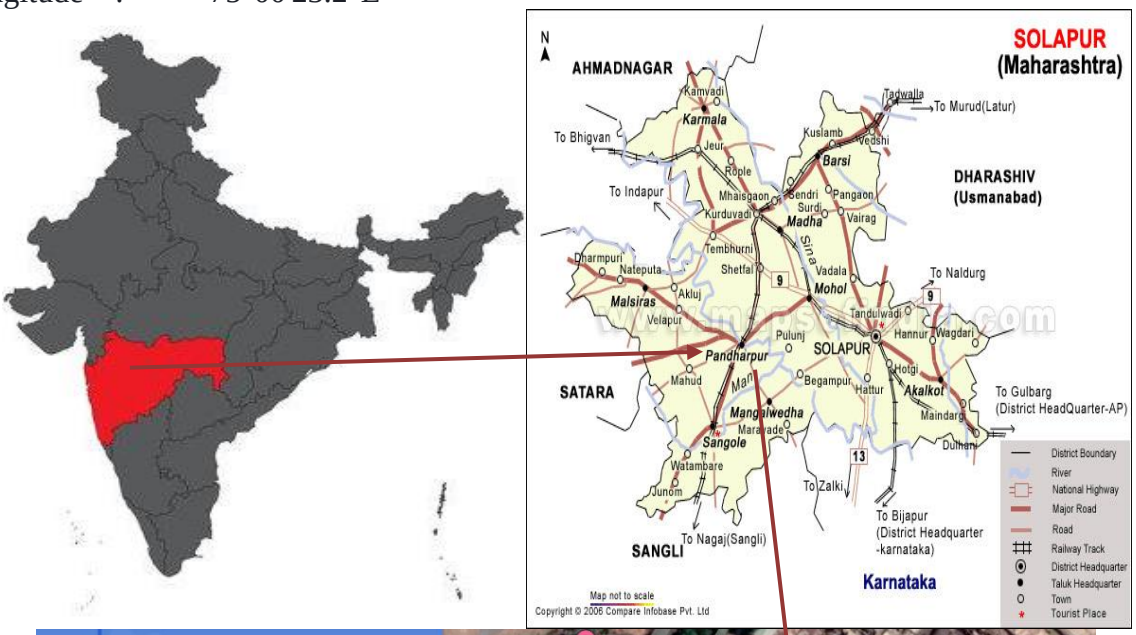
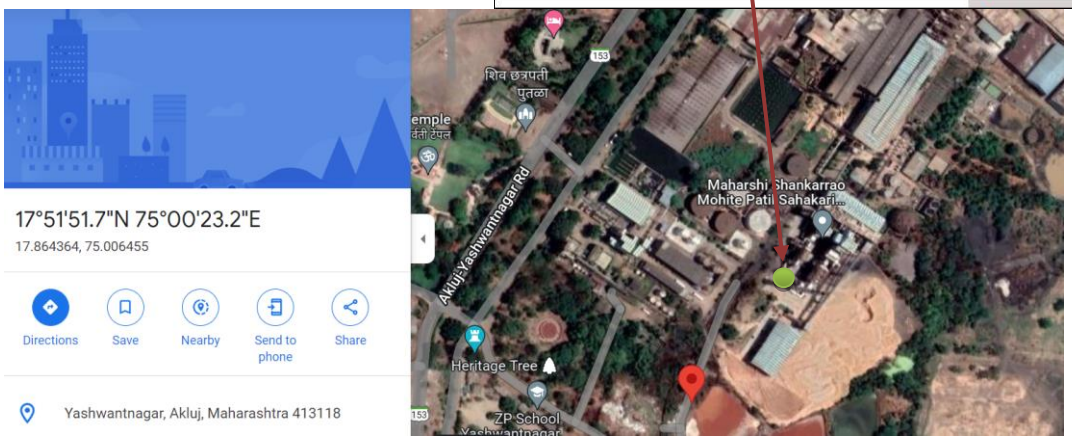


Figure 3 Baseline Scenario

A.2. Location of project activity>>

Country	:	India
Village	:	Yashwantnagar
State	:	Maharashtra
Latitude	:	17°51'51.7"N
Longitude	:	75°00'23.2"E





A.3. Parties and project participants >>

Party (Host)	Participants
India	**Project Owner:** M/s Sahakar Maharshi Shankarrao Mohite-Patil Sahakari Sakhar Karkhana Ltd. Shankarnagar at Akluj Taluka Malshiras, District Solapur, Maharashtra- 413118. **Project Aggregator:** Energy Advisory Services Pvt Limited, Bangalore, Karnataka. Email: manoj@easpl.co.in

Table 3

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

SECTORAL SCOPE - 01 Energy industries (Renewable/Non-Renewable Sources)

TYPE - Renewable Energy Projects

CATEGORY - ACM0006: "Electricity and heat generation from biomass" Version 16.0

A.5. Crediting period of project activity >>

Start date	:	01/01/2013
Crediting period corresponding to this monitoring period 01/01/2013 to 31/12/2022 (Both the dates are inclusive)	:	10 Years

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

Name : Manoj Vyas
Contact No : +91 7303201778
E-Mail : manoj@easpl.co.in

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 technical details of the project activity can be found out in **section A1. (b)** of the document.

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

The technical details of the project activity can be found out in **section A1. (b)** of the document.

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

Indian economy is highly dependent on "Coal" as fuel to generate energy and for production processes. Thermal power plants are the major consumers of coal in India and yet the basic electricity needs of a large section of population are not being met. This results in excessive demands for electricity and places immense stress on the environment.
Changing coal consumption patterns will require a multi-pronged strategy focusing on demand, reducing wastage of energy and the optimum use of renewable energy (RE) sources. This project is a greenfield activity where grid power is the baseline. The renewable power generation is gradually contributing to the share of clean & green power in the grid; however, grid emission factor is still on higher side which defines grid as distinct baseline.
The Government of India has stipulated following indicators for sustainable development in the interim approval guide lines for such projects which are contributing to GHG mitigations. The Ministry of Environment, Forests & Climate Change, has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. It has been envisaged that the project shall contribute to sustainable development using the following ways.

Social well-being: The project would help in generating direct and indirect employment benefits accruing out of ancillary units for implementation of the cogeneration power plant and for maintenance during operation of the project activity. It will lead to development of infrastructure around the project area in terms of improved road network etc. and will also directly contribute to the development of renewable infrastructure in the region.

Environmental well-being: The project utilizes biomass energy for generating electricity which is a clean source of energy. The project activity will not generate any air pollution, water pollution or solid waste to the environment which otherwise would have been generated through fossil fuels. Also, it will contribute to reduction GHG emissions. Thus, the project causes no negative impact on the surrounding environment contributing to environmental well-being.

Economic well-being: Being a renewable resource, using biomass energy to generate electricity contributes to conservation precious natural resources. The project contributes to the economic sustainability through promotion of decentralization of economic power, leading to diversification of the national energy supply, which is dominated by conventional fuel based generating units.

Locally, improvement in infrastructure will provide new opportunities for industries and economic activities to be setup in the area. Apart from getting better employment opportunities, the local people will get better prices for their land, thereby resulting in overall economic development.

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

B.3. Baseline Emissions>>

In the absence of the project activity, the equivalent amount of electricity would have been imported from the regional grid (which is connected to the unified Indian Grid system (NEWNE Grid)), which is carbon intensive due to predominantly sourced from fossil fuel-based power plants.

Baseline Scenario:

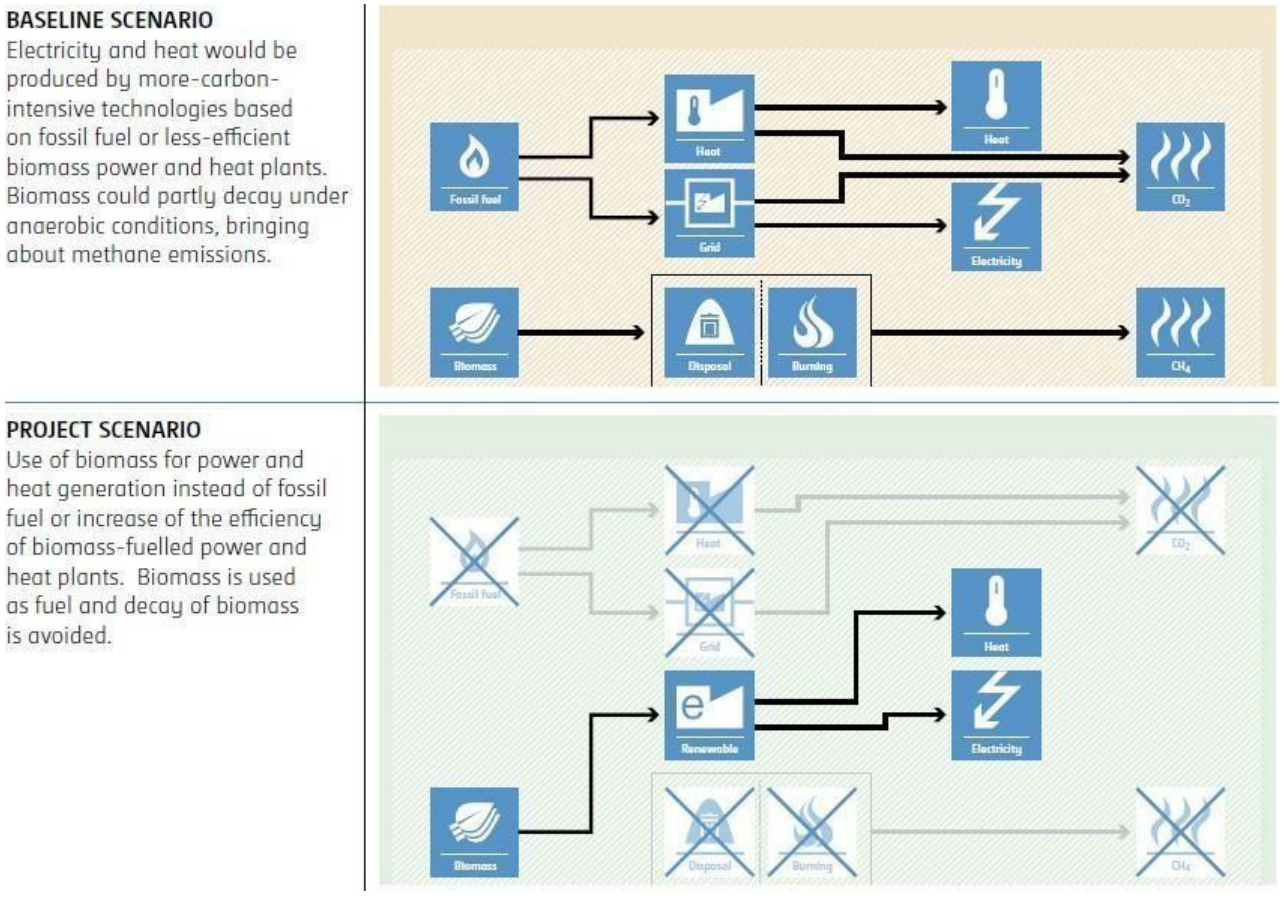


Figure 4

Thus, this project activity was a voluntary investment which replaced equivalent amount of electricity from the Indian grid. The project proponent was not bound to incur this investment as it was not mandatory by national and sectoral policies. Thus, the continued operation of the project activity would continue to replace fossil fuel-based power plants and fight against the impacts of

climate change. The Project Proponent hopes that carbon revenues accumulated as a result of carbon credits generated will help repay the loans and help in the continued maintenance of this project activity.

B.4. Debundling>>

This project activity is not a de-bundled component of a larger 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.

Applied Baseline Methodology: ACM0006: "Electricity and heat generation from biomass" Version 16.0

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

The project activity involves generation of grid connected electricity from the construction and operation of a cogeneration power-based project and selling the additional generation to the national grid. The project activity has installed capacity of 33 MW which will qualify for a large-scale project activity under Type-I of the Large-Scale methodology. The project status is corresponding to the methodology ACM0006, Version 16 and applicability of methodology is discussed below:

Applicability Criteria	Project Condition
1. The methodology is applicable under the following conditions: (a) Biomass used by the project plant is limited to biomass residues, biogas, RDF2 and/or biomass from dedicated plantations; (b) Fossil fuels may be co-fired in the project plant. However, the amount of fossil fuels co-fired does not exceed 80% of the total fuel fired on energy basis. (c) For projects that use biomass residues from a production process (e.g., production ofsugar or wood panel boards), the implementation of the project does not result in an increase of the processing capacity of (the industrial facility generatingthe residues) raw input (e.g., sugar, rice, logs, etc.) or in other substantial changes (e.g., product change) in this process; (d) The biomass used by the project plant is not stored for more than one year; (e) The biomass used by the project plant is not processed chemically or biologically (e.g.,	**1.** The project is implemented to use 100% of the bagasse in the crushing season, during off season bagasse is imported from outside hence the criteria points (c), (d) and (e) are applicable.

through esterification, fermentation, hydrolysis, pyrolysis, bio- or chemical-degradation, etc.) prior to combustion. Drying and mechanical processing, such as shredding and palletization, are allowed.	
2. In the case of fuel switch project activities, the use of biomass or the increase in the use of biomass as compared to the baseline scenario is technically not possible at the project site without a capital investment in: (a) The retrofit or replacement of existing heat generators/boilers; or (b) The installation of new heat generators/boilers; or (c) A new dedicated supply chain of biomass established for the purpose of the project (e.g., collecting and cleaning contaminated new sources of biomass residues that could otherwise not be used for energy purposes); or (d) Equipment for preparation and feeding of biomass.	2. The project is a new greenfield project and hence this criterion is not applicable.
3. If biogas is used for power and heat generation, the biogas must be generated by anaerobic digestion of wastewater, and: (a) If the wastewater generation source is registered as a CDM project activity, the details of the wastewater project shall be included in the PDD, and emission reductions from biogas energy generation are claimed using this methodology; (b) If the wastewater source is not a CDMproject, the amount of biogas does not exceed 50% of the total fuel fired on energy basis.	3. There is no production of biogas and hence this criterion is not applicable.
4. In the case biomass from dedicated plantations is used, the "TOOL16: Project and leakage emissions from biomass" shall apply to determine the relevant project and leakage emissions from cultivation of biomass and from the utilization of biomass residues.	4. The bagasse produced as a waste of the sugar mill is being used for the generation of steam, and during. and hence this criterion is also not applicable. During offseason biomass will be bought.

C.3Applicability of double counting emission reductions >>

The project was not applied under any other GHG mechanism. Hence project will not cause double accounting of carbon credits (i.e., COUs).

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

The spatial extent of the project boundary encompasses:

1. All plants generating power and/or heat located at the project site, whether fired with biomass, fossil fuels or a combination of both.
2. All power plants connected physically to the electricity system (grid) that the project plant is connected to.
3. The means of transportation of biomass to the project site.
4. As the feedstock is biomass residues, the site where the biomass residues would have been left for decay or dumped.

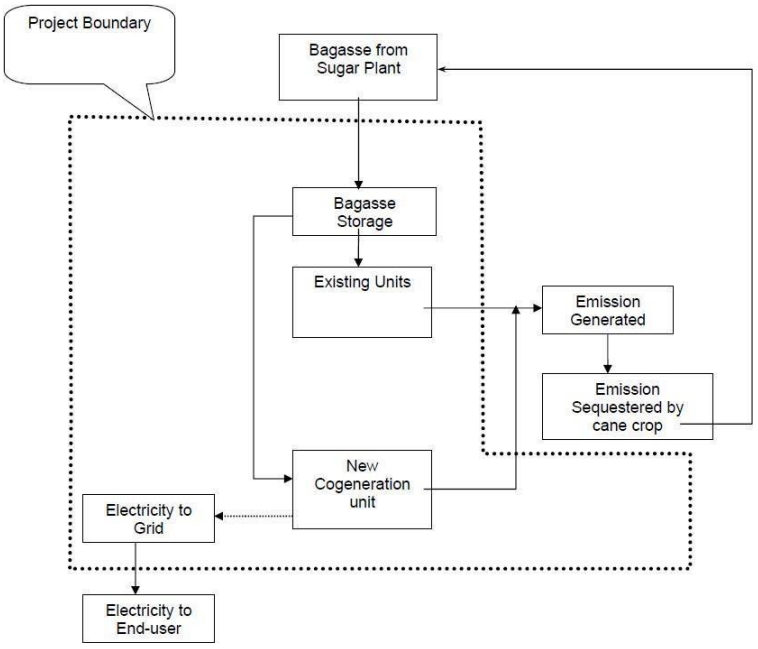


Figure 5

By using locally sourced GHG-neutral biomass, the PP is successfully able to avoid the fossil fuel emissions and thereby GHG emissions due to in-house cogeneration energy requirements and also vehicular emissions avoiding sourcing of biomass fuel from a large distance.

	Source	GHG	Included?	Justification/Explanation
Baseline	CO_2 Emissions from burning of fossil fuels in boilers	CO_2	**Included**	Major source of GHG emissions
		CH_4	Excluded	Excluded for simplification.
		N_2O	Excluded	Excluded for simplification.
Project Activity	Emissions from Biomass Project Activity	CO_2	Excluded	Excluded for simplification.
		CH_4	Excluded	Excluded for simplification.
		N_2O	Excluded	Excluded for simplification.

Figure 6

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

As per para 20 of the approved consolidated methodology ACM0006 Version 16, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

"All plants generating power and/or heat located at the project site, whether fired with biomass, fossil fuels or a combination of both".

Net GHG Emission Reductions and Removals

- Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y \quad \text{(Eq. 1)}$$

Where,

ER_y = Emissions reductions in year y (t CO_2)

BE_y = Baseline emissions in year y (t CO_2)

PE_y = Project emissions in year y (t CO_2)

LE_y = Leakage emissions in year y (t CO_2)

- The Baseline emissions in year y can be calculated as follows:

$$BE_y = EL_{MWhy} \text{ X } EF_{Gridy} \quad \text{(Eq. 2)}$$

Where,

EL_{MWhy} = Quantity of net electricity supplied to the grid as a result of the implementation of the project activity in year y (MWh)

EF_{Gridy} = Grid emission factor in year y (tCO_2/MWh)

BE_y = 5,39,929 x 0.9 = 4,85,931

- Since this is a biomass fired cogeneration project, emission reduction is calculated for the net electricity imported to the grid.

$$PE_y = 0 \quad \text{(Eq. 3)}$$

- It is an integrated Cogen plant. The biomass is the output of the sugar mill and which is beingconsumed hence there is no leakage emissions being generated.

$$LE_y = 0 \quad \text{(Eq. 4)}$$

Total Emission reduction by the project for the current monitoring period is calculated as below:

Hence,

ER_y = 4,85,931 – 14925 – 0 = 4,72,504 CoUs

Year	Ery
2013	45,989
2014	61,510
2015	69,121
2016	35,537
2017	23,578
2018	55,407
2019	37,234
2020	46,235
2021	45,899
2022	51,994
Total (kWh)	**472,504**

Figure 7

C.6. Prior History>>

The project activity is a large-scale Biomass cogeneration project and was not applied under any other GHG mechanism prior to this registration with UCR. Also, project has not been applied for any other environmental crediting or certification mechanism. Hence project will not cause double accounting of carbon credits (i.e., COUs).

C.7. Monitoring period number and duration>>

First Monitoring Period : 10 Years
01/01/2013 to 31/12/2022 (inclusive of both dates)

C.8. Changes to start date of crediting period >>

There is no change in crediting date as mentioned in the PCN, i.e., crediting period start date is 01/01/2013.

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

There are no permanent changes from registered PCN monitoring plan and applied methodology.

C.10. Monitoring plan>>

Parameter	$EG_{PJ,y}$
Data unit	MWh
Description	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.
Source of data Value(s) applied	Monthly generation reports of the exported electricity to the grid, according to the meters installed at the project site.

Procedures	The Net electricity generated and forwarded to t h e g r i d by the project activity is recorded at the sub-station. At the end of every month Electricity generation report is generated based on the total monthly electricity exported to the grid orconsumed by nearby local community.

Monitoring frequency	Monthly
Purpose of data	To Calculate Baseline Emission

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 unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO_2/MWh for the 2013 - 2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.
Source of data	https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UCRCoUStandardAug2022updatedVer6_090822220127104470.pdf
Value applied	0.9
Measurement methods and procedures	-
Monitoring frequency	Ex-ante fixed parameter
Purpose of Data	For the calculation of Emission Factor of the grid
Additional Comment	The combined margin emission factor as per CEA database (current Version 16, Year 2021) results into higher emission factor. Hence for 2021 vintage UCR default emission factor remains conservative.