

# PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT



# Title: 28.7 MW Bundled Bagasse Based Cogen Plant

at M/s CBKSSKN Chikkodi by Energy Advisory Services

Version 4.0 Date 02/12/2023

First CoU Issuance Period: 10 years, 0 months Date: 01/01/2013 to 31/12/2022



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

BASIC INFORMATION		
Title of the project activity	28.7 MW Bundled Bagasse Based Cogen Plant at M/s CBKSSKN Chikkodi by Energy Advisory Services	
Scale of the project activity	Large Scale	
Completion date of the PCN	02/12/2023	
Project participants	Project Proponent: M/s Chidanand Basaprabhu Kore Sahakari Sakkare Karkhane Niyamit Chikkodi Aggregator: Energy Advisory Services Pvt. Ltd.	
Host Party	INDIA	
Applied methodologies and standardized baselines	Applied Baseline Methodology: ACM0006 Large-scale Consolidated Methodology Electricity and heat generation from biomass Version 16.0 & UCR Standard for Emission Factor Standardized Methodology: Not Applicable.	
Sectoral scopes	01- Energy industries (Renewable/Non-Renewable Sources)	
Estimated amount of total GHG emission reductions per year	44,884 CoUs (44,884 tCO2eq)	
Estimated total amount of average GHG emission reductions for the entire monitoring period	448,840 CoUs (448,840 tCO2eq)	

#### SECTION A. Description of project activity

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

The project titled <u>"28.7 MW Bundled Bagasse Based Cogen Plant</u> is in Village Nanadi, Tehsil Chikodi, District Belagavi, State Karnataka, Country INDIA.

Co-Generation (Cogen) Power Project is having two units, 20.7 MW and 8.0 MW. The first unit of 20.7 MW unit was successfully commissioned by Karnataka Power Transmission Corporation Limited (KPTCL) on 25/03/2004 and in operation from that date. The second unit of 8.0 MW was commissioned KPTCL on 20/02/2020 and operational since that date. The Project is owned and operated by M/s Chidanand Basaprabhu Kore Sahakari Sakkare Karkhane Niyamit Chikkodi. (Hereby to be called as Project Proponent (PP))

The details of the registered project are as follows:

#### Purpose of the project activity:

The PP has set up an integrated new sugar mill of 5500 TCD capacity along with eco-friendly 20.7 MW capacity Cogen power project for decentralized generation of exportable surplus power, mainly from renewable source of fuel (bagasse). The capacity of the sugar mill enhanced to 10,000 TCD in the year 2020 and the Cogen power plant from 20.7 MW to 28.7 MW in the year 2020.

The integrated project comprises of a sugar mill for the manufacture of high-quality sugar and ethanol. The by-product (bagasse) from the sugar mill is used in the Cogen power plant during crushing season.

The Cogen power project of 28.7 MW capacity operates on bagasse for around 160 season days of the sugar mill operation. At designed level, it is expected that the project will generate 11 million kWh/y of clean energy and export about 54 million kWh/y through KPTCL grid for sale to KPTCL or to third party consumer as per the prevailing tariff.

All the steam and power requirements of the sugar mill and Cogen power plant will be met internally from the project itself. The project activity employs three boiler and two turbo-generators of the following capacity along with all auxiliaries.

- a. 1\*150 TPH boiler with high pressure and temperature configuration (66kg/cm<sup>2</sup> and 495°C),
- b. 1\*50 TPH boiler with medium pressure and temperature configuration (45kg/cm<sup>2</sup> and 495°C)
- c. 1\*15 TPH boiler with low pressure and temperature configuration (10kg/cm<sup>2</sup> and 180°C)
- d. 1\*20.7 MW Double extraction cum condensing Turbine Generator set, as well as ESP for emission control and DCE control system for efficient operation.
- e. 1\*8 MW Double extraction cum condensing Turbine Generator set, as well as ESP for emission control and DCE control system for efficient operation.

The power plant also includes the Balance of plants like, bagasse handling/feeding system, ash handling system, compressed air system, cooling towers, electrical system and DCS control system for efficient operation of the plant.

The project activity is the construction and operation of a Cogen power plant/unit that uses bagasse as a renewable energy sources to generate electricity as well as steam and supplies electricity and steam to the 10,000 TCD sugar mill and 30 KLPD ethanol plant.

The excess power is sold to KPTCL/third party through KPTCL grid. The project activity is thus the displacement of electricity that would be provided to the grid by more-GHG-intensive means like coal, oil and provides long-term benefits to the mitigation of climate change.



Figure 1: 10T cane unloading crane



Figure 2: Overview of 150tph bagasse boiler

Table 1: Sugar production from 2018-19 to 2021-22

	2022-2023	2021-2022	2020-2021	2019-2020	2018-2019
Crushing Capacity (Ton/Day)		10000	10000	10000	10000
Cane Crushed (Lakh M.T.)		11.78	10.14	6.58	9.29
Sugar Produced (Lakh Qtl)		12.68	11.31	7.00	10.85
Sugar Recovery (%)		11.80	11.53	11.76	11.68
Molasses Produced (M.T.)		63900	49760	38580	37050
Sugarcane Rate/Ton (Rs.)					

Data Source: https://www.anekantprakashan.com/sugar-factory/chidanand-basavprabhu-kore-sahakari-sakhar-karkhana-niyamit-shree-doodhaganga-krishna-ssk-niyamit-chikodi-karnataka/263

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

This project is a greenfield activity where grid power is the baseline. The Indian grid system has been predominantly dependent on fossil fuel-powered plants. Renewable power generation is gradually contributing to the share of clean & green power in the grid; however, the grid emission factor is still on the higher side which defines the grid as a distinct baseline.

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

#### • Social benefits:

- The main objective of business is to encourage proper devolvement of agricultural industrial amongst members on co-operative lives by promotions of co-operative and joint forming methods to secure best merits of modern large-scale agriculture production to the owners of the lands. The nature of business is to encourage self-help, thrift and co-operate amongst members
- The project activity contributed to employment generation in the local area for both skilled & unskilled people for operation and maintenance of the plant. The project creates several permanent jobs, in addition to persons gaining indirect jobs through the supply of sugarcane to the plant. Apart from the direct and indirect employment generation, the project also encourages indirect employment by setting up other agro-based industries due to availability of power supply from the project.
- It has created steady higher value jobs and skilled workers at the facility. The project activity is contributing to the national energy security by reducing consumption of fossil fuels.
- The technology being used in the project is proven and safe for power generation. An increase in such kind of projects shall enable all the technology suppliers to continuously innovate and modernize on the technology front. The local people will know the technological advancement and will help in capacity building.

#### • Environmental benefits:

- The project activity is a renewable energy project, which utilizes bagasse as a fuel for power generation and heat, a move that is voluntary and not mandated under current environmental laws of India. Since this project activity generates green energy in the form of power and heat, it has positively contributed towards the reduction in (demand) use of finite natural resources like coal, gas and oil, minimizing depletion and in turn increasing its availability to other important purposes. Therefore, this project activity helps to environment sustainability by reducing GHG emission in the atmosphere.
- Avoids global and local environmental pollution, leading to reduction of GHG emissions.
- The bagasse generated in sugar mills is generally more than the requirement of the sugar mill and hence get disposed in unplanned ways including dumping into nearby land or rivers. The excess bagasse is used to generate electricity and supplied to the grid. This will help to reduce the GHG emission from the coal/oil-based power plant by reducing the power generation by these plants to some extent.

#### • Economic benefits:

- The project activity creates employment opportunities during the project stage and operation and maintenance of the Cogen power plant. The project activity results in saving the coal and allowing it to be diverted to other needy section of the economy.
- The project activity helps in conservation of fast depleting natural resources like coal, gas and oil thereby contributing to the economic wellbeing of country.
- The increase in demand of bagasse exerted by the project has had a local effect on its price and generates additional revenue for the sugarcane farmers. The bagasse-based power generating plant facilitates the availability of continuous and sustained power to the local industries and agricultural farmers located in remote areas, thereby avoiding the load shedding and low frequency of power.
- The various other benefits due to the project activity ensure that the project is contributing to the sustainable development of the region by bringing in green technologies and processes to a backward region. The technology is indigenous and by implementing such projects the country is showcasing its GHG mitigation actions in its efforts to combat climate change.

## A.3. Location of project activity >>

1	Country	India
2	State	Karnataka
3	District	Belagavi
4	Tehsil	Chikodi
5	Village	Nanadi
6	Coordinates	Latitude : 16 <sup>0</sup> 30'26" N
		Longitude : 74 <sup>0</sup> 36'51" E

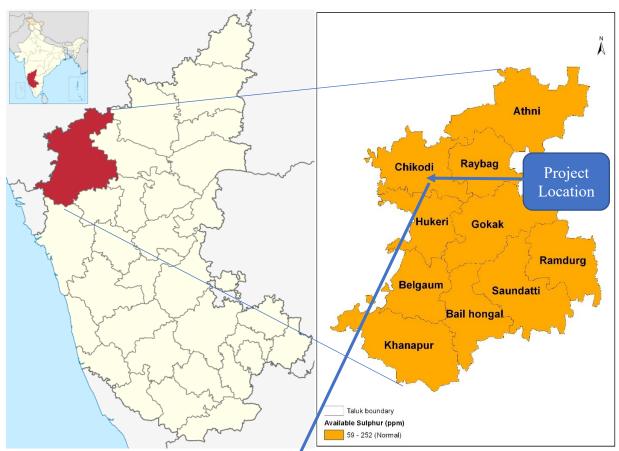


Figure 3: Location of Chikodi Taluk



Figure 4: Location of the plant near Chikodi

# A.4. Technologies/measures >>

The project activity involves three (3) boilers and two (2) steam turbo generators in the plant to generate steam and power using Bagasse as fuel in the boilers.

the technologies or workings of the system. Provide diagrams of flow, process flow chart (cradle to

grave), critical systems, overview of design etc. Mention the renewable fuel, process involved, end use. Provide installation tables if the project activity involves multiple sub installations in phased approaches etc. Provide pictures where applicable of the installation or technology.

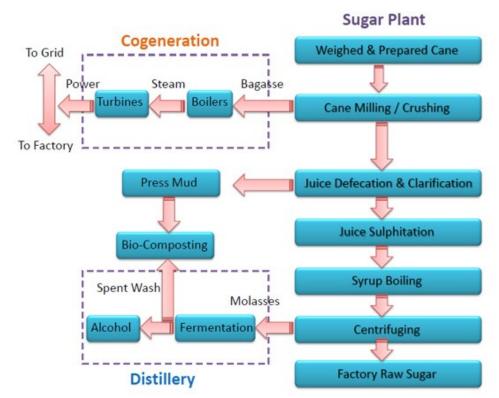


Figure 5: Sugar & Cogen power plant process flow chart

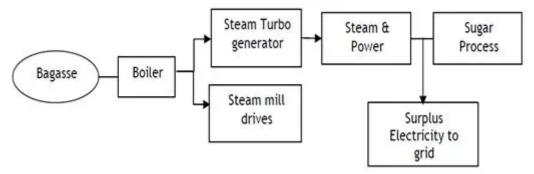


Figure 6: Typical Cogen power plant

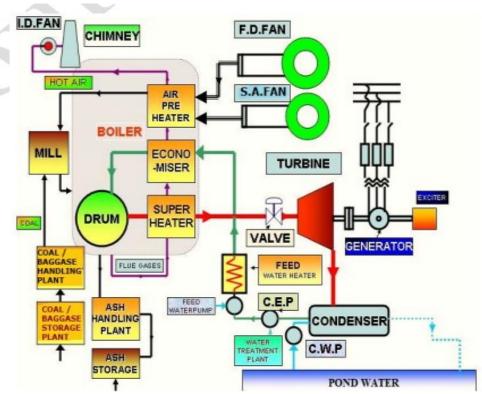


Figure 7: Typical Bagasse based power plant

**Table 2: Technical specification of Boiler** 

Description	UoM	Value		
		150 tph	50 tph	15 tph
Make		Walchandnagar	Walchandnagar	Industrial Boiler
Commissioning year		2004	1995	
Fuel		Bagasse	Bagasse with 50% moisture	Bagasse
Furnace type		Travelling grate with continuous font ash discharge		Packaged
MCR steam flow	tph	150	50	15
Steam pressure at superheater outlet	Kg/cm <sup>2</sup>		45	10.55
Steam temperature at superheater outlet	<sup>0</sup> C		500	186
Feed water temperature at the inlet of economiser				
Efficiency at MCR			70%	

**Table 3: Technical specification of Steam Turbo Generator** 

Description	UoM	Value	
		20.7 MWe	8 MWe
Make		BHEL	Arani Power Systems (P) Limited
Commissioning year		2004	
Туре		Extraction cum condensing	Back pressure
MCR steam flow	tph	125	50
Steam pressure at turbine inlet	ata	64	43
Steam temperature at turbine inlet	<sup>0</sup> C	490	495
Extraction pressure -1	ata	16	NA
Extraction pressure - 2	ata	3	
Exhaust steam pressure	ata	0.075	3
Exhaust steam temperature	$^{0}$ C		194
Generator type			Totally enclosed (IP54) horizontal, brushless type, 3-phase synchronous generator
Generator rated voltage	kV	11	11+/-10%
Rated frequency	Hz	50+/-5%	50+/-5%
Power output at generator terminal@ 0.8pf	MWe	20.7	8

# A.5. Parties and project participants >>

Party (Host)	Participants
India	Project Owner: M/s Chidanand Basaprabhu Kore Sahakari Sakkare Karkhane Niyamit Chikkodi
	Project Aggregator: Energy Advisory Services Pvt Limited, Bangalore, Karnataka. Email: manoj@easpl.co.in

#### A.6. Baseline Emissions>>

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

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

Schematic diagram showing the baseline scenario:

**BASELINE SCENARIO:** Electricity and heat would be produced by more-carbon intensive technologies based on fossil fuel or less-efficient biomass power and heat plants. Biomass could partly decay under anaerobic conditions, bringing about methane emissions.

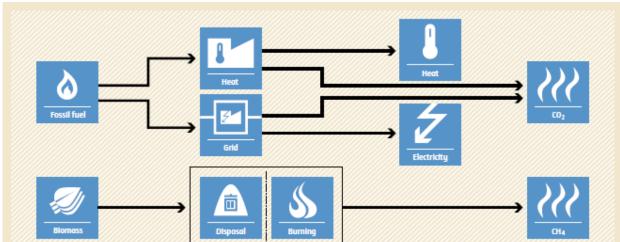


Figure 8: Baseline scenario

**PROJECT SCENARIO:** Use of biomass for power and heat generation instead of fossil fuel or increase of the efficiency of biomass fuelled power and heat plants. Biomass is used as fuel and decay of biomass is avoided.

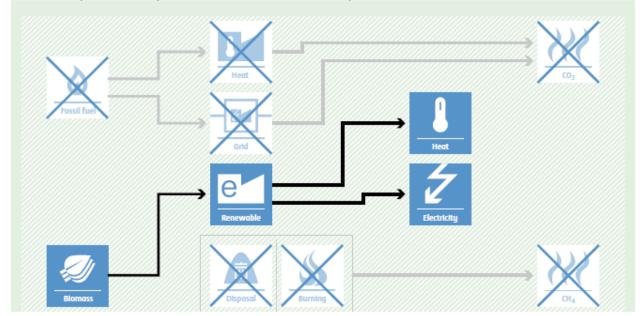


Figure 9: Project scenario

The proposed project activity uses bagasse as fuel for the cogeneration power plant. The bagasse being a renewable bio-mass fuel, it does not add any net carbon-dioxide to the atmosphere because of the carbon recycling during growth of sugar cane. Therefore, the project activity will lead to zero CO<sub>2</sub> on-site emissions associated with bagasse combustion.

The crushing season of around 160 days is envisaged per year for project activity operation. Without this project activity, the energy load equal to electricity supplied to grid would have been taken-up by grid mix and emission of CO<sub>2</sub> would have occurred due to combustion of conventional fossil fuels. Considering the export of clean electricity, to the fossil fuel dominated grid, by the project activity there will be continuous GHG reductions, as it would avoid equivalent GHG emissions.

# A.7. De-bundling>>

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

### SECTION B. Application of methodologies and standardized baselines

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

SECTORAL SCOPE – Energy industries (renewable - / non-renewable sources)

PROJECT TYPE - Type I: Biomass energy project activities

CATEGORY – ACM0006 Large-scale Consolidated Methodology Electricity and heat generation from biomass Version 16.0

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

This methodology is applicable to project activities that operate biomass (co-)fired power-and-heat plants. The Cogen plant can be considered as per the below applicability:

Applicable Criteria	Project condition
The methodology is applicable under the following	The project is implemented to use 100% of
conditions:	the bagasse in the crushing season, hence the
(a) Biomass used by the project plant is limited	criteria points (b), (c), (d) and (e) are
to biomass residues, biogas, RDF2 and/or	applicable.
biomass from dedicated plantations;	аррисаотс.
(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 of sugar	
or wood panel boards), the implementation of the project does not result in an increase of the	
± •	
processing capacity of (the industrial facility generating the 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.	
through esterification, fermentation, hydrolysis,	
pyrolysis, bio- or chemical-degradation, etc.)	
prior to combustion. Drying and mechanical	
processing, such as shredding and pelletisation,	
are allowed.	
In the case of fuel switch project activities, the use	The project is a new greenfield project and
of biomass or the increase in the use of biomass as	hence this criterion is not applicable.
compared to the baseline scenario is technically not	hence this criterion is not applicable.
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.

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 CDM project, the amount of biogas does not exceed 50% of the total fuel fired on energy basis.

There is no production of biogas and hence this criterion is not applicable.

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.

The bagasse generated as a waste from the sugar mill is being used for the generation of steam & power and hence this criterion is also not applicable.

The methodology is only applicable if the baseline scenario, as identified per the "Selection of the baseline scenario and demonstration of additionality" section hereunder, is:

- (a) For power generation: scenarios P2 to P7, or a combination of any of those scenarios; and
- (b) For heat generation: scenarios H2 to H7, or a combination of any of those scenarios;
- (c) If some of the heat generated by the CDM project activity is converted to mechanical power through steam turbines, for mechanical power generation: scenarios M2 to M5:
  - a. In cases M2 and M3, if the steam turbine(s) are used for mechanical power in the project, the turbine(s) used in the baseline shall be at least as efficient as the steam turbine(s) used for mechanical power in the project;
  - b. In cases M4 and M5, steam turbine(s) generating mechanical power to be used for the same purpose as in the baseline are not allowed;
- (d) For the use of biomass residues: scenarios

As per the UCR list of eligible projects and methodologies found in the UCR Program Manual Ver. 4, this criterion is not applicable.

B1 to B5, or a combination of any of those scenarios;

(e) For the use of biogas: scenarios BG1 to BG3, or a combination of any of those scenarios.

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

The project is not registered in any other GHG mechanism.

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 a dedicated commissioning certificate and connection point,
- Project is associated with energy meters which are dedicated to the consumption point for the project developer.

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

The project boundary includes the physical, geographical site(s) of:

- 1. All plants generating power and/or heat located at the project site, whether fired with biomass (bagasse), 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 (bagasse) to the project site.
- 4. If the feedstock is biomass (bagasse) residues, the site where the biomass residues would have

been left for decay or dumped.

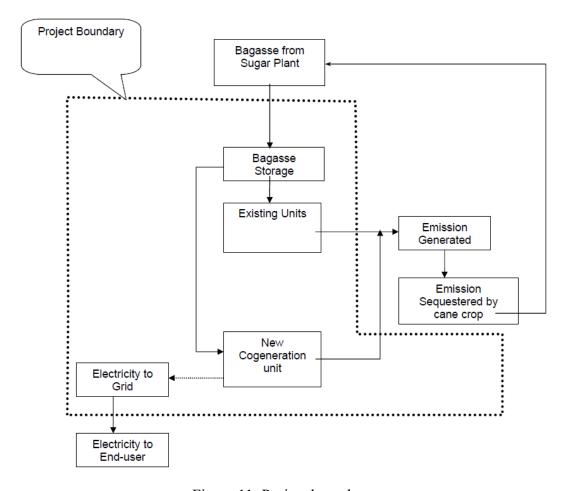


Figure 11: Project boundary

	Source	GHG	Included?	Justification/Explanation
Baseline		$CO_2$	Included	Major source of emission
	Emissions from grid connected power	CH <sub>4</sub>	Excluded	Negligible source of emission
	plants using non- renewable energy	$NO_2$	Excluded	Minor source of emissions
	sources as fuel	Others	Excluded	No other GHG emissions were emitted from the project
Project Activity		$CO_2$	Excluded	Project activity does not emit CO2
	Emissions from greenfield biomass- based Cogen Project Activity	CH <sub>4</sub>	Excluded	Project activity does not emit CH4
		$NO_2$	Excluded	Project activity does not emit NO2
		Others	Excluded	Project activity does not emit any other GHG gases

# B.5. Establishment and description of baseline scenario (UCR Standard or Methodology) >>

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 a new biomass-based Cogen plant. 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 CO<sub>2</sub> emission factor (tCO<sub>2</sub>/MWh) that 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 2013 - 2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Also, for the vintage 2021-2022, the combined margin emission factor calculated from the CEA database in India results in higher emissions than the default value. Hence, the same emission factor has been considered to calculate the emission reduction under a conservative approach.

#### **B.5.1** Net GHG Emission Reductions and Removals

Thus,  $ER_v = BE_v - PE_v - LE_v$ 

Where:

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

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

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

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

#### • 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:

$$BEy = EGPJ, y \times EFgrid, y$$

BEy = Baseline emissions in year y (t CO2)

EGPJ,y = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation

and red into the grid as a result of the implemental

of the CDM 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)

Estimated annual baseline emission reductions (BEy)

49,871 MWh/year \*0.9 tCO2/MWh

= 44,884 tCO<sub>2</sub>/MWh/year

=

### • Project Emissions

In furtherance of the UCR CoU Standard's conservative principle application in emission reductions quantification, prevention of over-generation of credits and based on stakeholder comments on project emissions, effective immediately project activities seeking registration and using approved CDM related methodologies (i.e related to biomass based grid power supply projects and captive thermal energy/power projects for select non-BAU industries) will apply the following default parameters when determining project emissions resulting from transportation of biomass and biomass residues or biomass briquettes:

- (a) For microscale and small-scale project activities, apply a default emission factor of 0.0142 tCO2/tonne of biomass residue or biomass-based briquettes, to determine the final amount of emission reductions that can be claimed per vintage.
- (b) For large-scale project activities, apply a net-to-gross adjustment of 10%, i.e. multiply the emission reductions determined based on the applied methodology by 0.9 to determine the final amount of emission reductions that can be claimed per vintage.

Thus,

 $PE = 44,884*0.10 = 4,488 \text{ tCO}_2/\text{MWh/year}$ 

#### • Leakage Emission

As per paragraph 42 of AMS-I.D. version-18, 'If the energy generating equipment is transferred from another activity, leakage is to be considered.' In the project activity, there is no transfer of energy-generating equipment and therefore the leakage from the project activity is considered zero. 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:

Hence,

Net GHG emission reduction, = 44,884-4,488-0 = 44,884 tCO<sub>2</sub>/year (i.e., 44,884 CoUs/year)

### **B.6. Prior History>>**

The project was uploaded for CDM prior consideration however, the project did not go ahead. The PP i.e., CBKSSN has confirmed the same. Hence, as of now, the project is not under validation or is not registered with CDM.

https://cdm.unfccc.int/Projects/Validation/DB/2RJSNGPFQ026L7WMYQVWABQFJVA6HV/view. Html

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

The start date of crediting period is 01/01/2013

# B.8. 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

# **B.9.** Monitoring period number and duration>>

First Issuance Period: 10 years, 0 months – 01/01/2013 to 31/12/2022

## **B.8.** Monitoring plan>>

# USE THE FOLLOWING TABLES TO FOR PARAMETERS BEING MONITORED OR USED IN EMISSION REDUCTIONS DETERMINATION

Data/Parameter	$EF_{\mathrm{Grid}y}$
Data unit	tCO <sub>2</sub> /MWh
Description	A "grid emission factor" refers to a CO <sub>2</sub> emission factor (tCO2/MWh) which will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO2/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.
Source of data	Website link to be updated
Value(s) applied	0.9 as a conservative figure
Measurement methods and procedures	Joint meter reading
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 18, Year 2022) results into higher emission factor. Hence for 2021 vintage UCR default emission factor remains conservative.

Data / Parameter:	<i>EL</i> MWhy
Data unit:	MWh/year
Description:	Quantity of net electricity supplied to the grid as a result of the
	implementation of the project activity in year y (MWh)
Source of data:	Monthly Joint Meter Readings (JMRs)
Measurement	Data Type: Measured
procedures (if any):	Monitoring equipment: Energy Meters are used for monitoring Recording Frequency: Continuous monitoring and Monthly recording from Energy Meters, Summarized Annually Archiving Policy: Paper & Electronic Calibration frequency: 5 years (as per CEA provision)
	Generally, the calculation is done by the Authority/Discom and

	the project proponent has no control over the authority for the calculation. Therefore, based on the joint meter reading certificates/credit notes, the project shall raise the invoice for monthly payments.  EL = E(export)- E(import)
Monitoring frequency:	Monthly
Values applied	To be applied as per actual data
QA/QC procedures:	Calibration of the Main meters will be carried out once in five (5) years as per National Standards (as per the provision of CEA, India) and faulty meters will be duly replaced immediately as per the provision of power purchase agreement.  Cross Checking:
	Quantity of net electricity supplied to the grid will be cross checked from the invoices raised by the project participant to the grid.
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 periods.