



Monitoring report form for CDM project activity
(Version 08.0)

MONITORING REPORT

Title of the project activity	Biomass based steam generation project at Raichur, India		
UNFCCC reference number of the project activity	3926 ¹		
Version number of the PDD applicable to this monitoring report	5.0		
Version number of this monitoring report	01		
Completion date of this monitoring report	07/09/2021		
Monitoring period number	2		
Duration of this monitoring period	01/01/2013 to 31/12/2020 (first and last dates included)		
Monitoring report number for this monitoring period	NA		
Project participants	Shilpa Medicare Limited		
Host Party	India		
Applied methodologies and standardized baselines	AMS-I.C. - Thermal energy production with or without electricity, Version 16 ² Standardized baselines : Not Applicable		
Sectoral scopes	Sectoral scope 01: Energy Industries (renewable/non-renewable sources)		
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013 until 31 December 2020	Amount achieved from 1 January 2021
	0	77,442 tCO ₂ e	0
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	281,696 tCO ₂ e		

¹ <https://cdm.unfccc.int/Projects/DB/DNV-CUK1282194434.38/view>

² <https://cdm.unfccc.int/UserManagement/FileStorage/JPDYLFAR5MKUVZ97G31H84TS0CEBQN>

SECTION A. Description of project activity

A.1. General description of project activity

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Established in 1987, Shilpa Medicare Limited produces and exports consistently high-quality active pharmaceutical ingredients, fine chemicals, intermediates, herbal products and specialty chemical products using sophisticated technology, meticulously following international specifications. Shilpa Medicare Limited (hereafter referred to as SML) has planned to invest in a pharmaceutical manufacturing unit which is in creation of modern state of art facility expansion in Raichur district, one of the important districts in Karnataka. In this green field unit SML is going to install a biomass based steam generation facility of a combined capacity of 16.0 TPH to meet the process energy requirements of the thermal energy intensive pharmaceuticals manufacturing processes.

Purpose of the project activity:

The project activity involves installation of rice husk based boilers having combined capacity of 16TPH, which is providing thermal energy to meet the energy requirement of SML, Raichur. This project activity is resulting in avoidance of GHG emissions associated with generation of equivalent amount of steam in any carbon intensive fossil fuel (i.e. coal) based boiler unit which is the common practice in other similar industries.

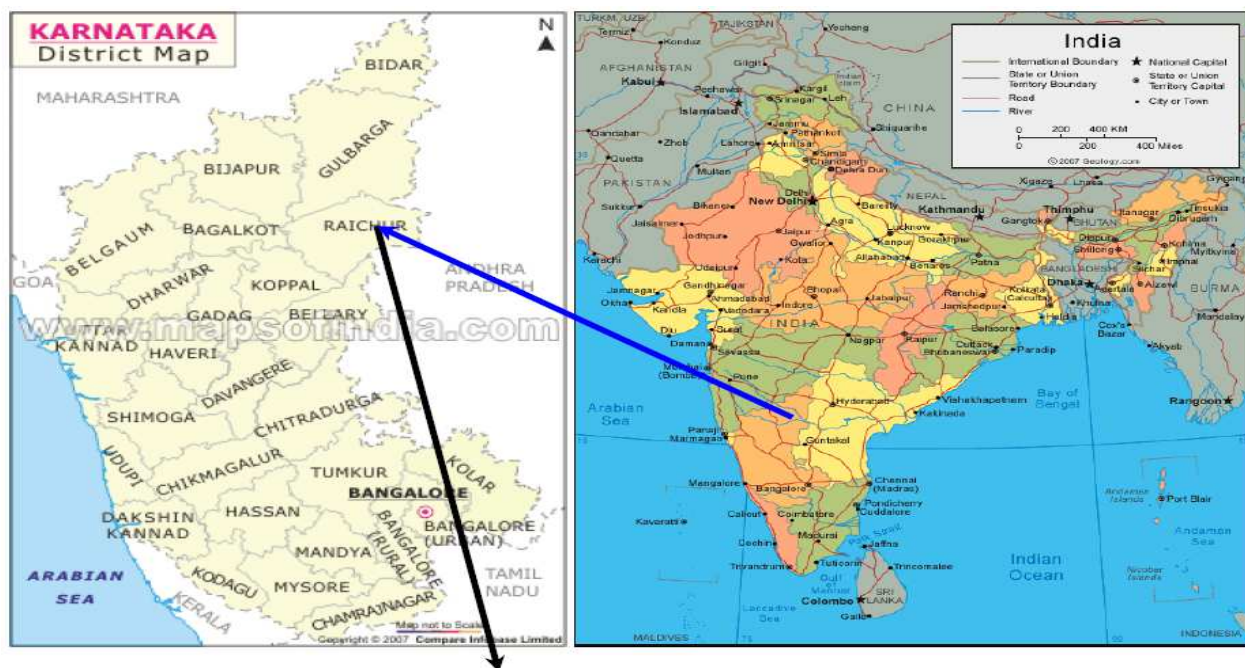
A.2. Location of project activity

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Host Party	: India
State	: Karnataka
City/town/community	: Chicksugur, District. Raichur

The project site is located 2.5 Km away from Chicksugur railway station which is the nearest railhead from project site. The co-ordinates of the project activity presented here below for its unique identification.

Latitude: – 16° 12' N
Longitude: – 77° 20' E



A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (host Party)	Private Entity: Shilpa Medicare Limited	No

A.4. References to applied methodologies and standardized baselines

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Referring to the UNFCCC CDM website, the approved baseline and monitoring methodology applied to the small-scale project activity is:

AMS- I. C. Thermal energy for the user with or without electricity³ (Version 16: Valid from 18/12/2009 onwards).

³ <https://cdm.unfccc.int/UserManagement/FileStorage/JPDYLFAR5MKUVZ97G31H84TS0CEBQN>

A.5. Crediting period type and duration

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Type of crediting period : Fixed Crediting Period
 Crediting period : 01/01/2011 – 31/12/2020

SECTION B. Implementation of project activity**B.1. Description of implemented project activity**

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Under the project activity SML have installed two biomass based boiler having capacity of 6.0 TPH and 10.0 TPH, each of which generates steam at 10.54 kg/ cm² (g). Steam generated from the biomass fired boiler is being supplied to the bulk drug manufacturing process. Thus it has resulted in avoidance of GHG emissions associated with combustion of fossil fuel for steam generation in fossil fuel fired boiler plant of equivalent capacity. Technology employed provides controlled combustion facility that uses the calorific value of biomass to generate steam and utilizes it in the process plant. In terms of the safe and sound technology, the technology provider is experienced in this field. The boilers are being checked by the boiler inspector in regular interval insuring that its operation is safe.

Technology Details:

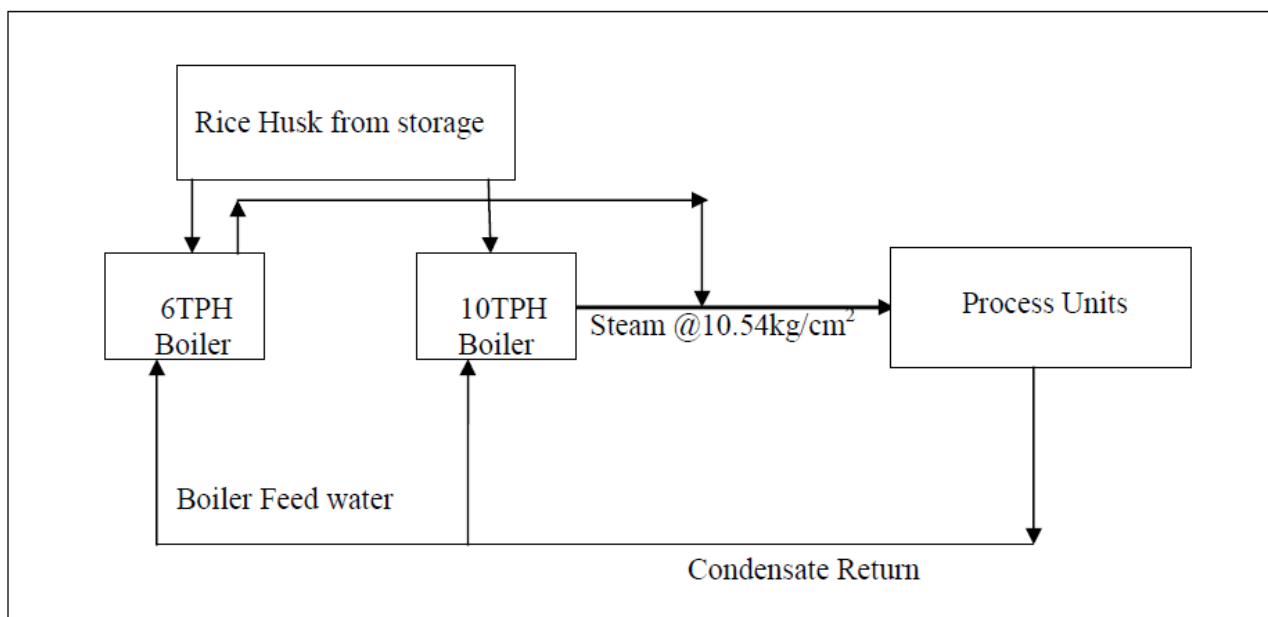
In this project activity, both boilers are rice husk fired having horizontal multi-tubular shell. These multitubes are smoke tube type with water wall furnace. These boilers have capacity to produce 6.0 TPH and 10.0TPH steam @ 10.54 kg/ cm² (g). The steam is sent for use in the process.

Steam Generation unit

The boiler is supplied by Thermax Limited, India and the technical details of the boiler system are provided here below.

Type of boiler	Horizontal multi-tubular shell type smoke tube with water wall furnace
Model	CPFD-60
Number of Boilers	1
Boiler Capacity	6.0 TPH
Boiler Steam Outlet pressure	10.54 kg/cm ² g
Boiler thermal efficiency on GCV as per B.S. 845	
Design Code	IBR 1950 with latest amendments
Mode of firing	Over bed firing
Ash removal mode	Manual

Type of boiler	Horizontal multi-tubular shell type smoke tube with water wall furnace
Model	CPFD-100
Number of Boilers	1
Boiler Capacity	10.0 TPH
Boiler Steam Outlet pressure	10.54 kg/cm ² g
Boiler thermal efficiency on GCV as per B.S. 845	
Design Code	IBR 1950 with latest amendments
Mode of firing	Over bed firing
Ash removal mode	Manual



Relevant dates for the project activity:

Sr. No.	Rating of Boiler	Date of Commissioning
1	6 TPH	19/11/2008
2	10 TPH	20/11/2008

Plant is in operation since being commissioned. The installation details of the equipments at the project site are remained the same during this monitoring period and there are no exchange of equipments. Also, there are no events / situations leading to changes in project activity that occurred during the monitoring period.

B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

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The project activity is not applied for a temporary deviations from registered monitoring plan or applied methodology during this monitoring period. Hence, Not Applicable.

B.2.2. Corrections

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There are no corrections to project information or parameters fixed at the registration or renewal of crediting period of the project activity. Hence, Not Applicable.

B.2.3. Changes to the start date of the crediting period

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There is no request for the change to the start date of the crediting period. Hence, Not Applicable

B.2.4. Inclusion of monitoring plan

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Not Applicable for the present Monitoring period.

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

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There are no permanent changes to the registered monitoring plan, or permanent deviation of monitoring from applied methodologies, applied standardized baseline, or other methodological regulatory documents. Hence, Not Applicable.

B.2.6. Changes to project design

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There are no changes to the project design of the project activity. Hence, Not Applicable.

B.2.7. Changes specific to afforestation or reforestation project activity

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Not Applicable for the project activity.

SECTION C. Description of monitoring system

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The data monitoring involves:

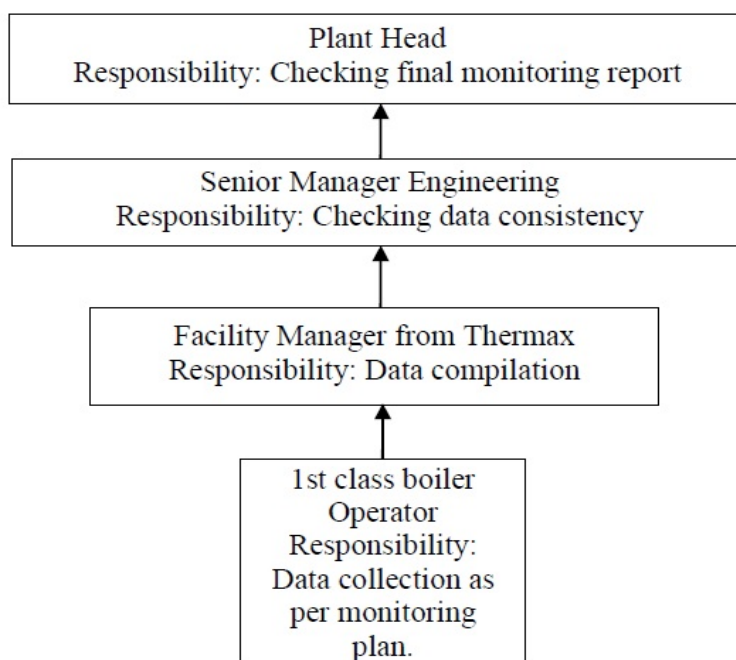
1. Monitoring the steam generation in the project activity
2. Monitoring of biomass consumption
3. Monitoring of fossil fuel consumption
4. Monitoring of temperature and pressure of the steam at the boiler outlet
5. Monitoring of data related to transportation.

The data are monitored as mentioned in section B.7.1 of the registered PDD. SML has a very robust data management system called EffiMax 300 supplied by Forbes Marshall Pvt. Ltd. Data related to steam generation, steam pressure and temperature are monitored by EffiMax.

The data from EffiMax are stored in soft copy format in the plant computers. All the meters are calibrated at least once a year to ensure proper functioning and calibration reports are made available during verification. Also the data are kept for the entire crediting period and for two years after it.

Operational & Management Structure:

The operational and management structure of the team who are directly related to the project is basically consists of four levels as follows:



Specific responsibilities of the above said team are as follows:

- Maintaining Logs for amount of steam generated in the boiler plant.
- Maintaining Logs for temperature and pressure of steam generated in the boiler plant.
- Calibration of measuring instruments once in a year
- Keep a track of any changes in the meters.
- Prepare the monthly monitoring report.
- Reviewing the monthly monitoring report.
- Internal audit for CDM project in every six months

SECTION D. Data and parameters**D.1. Data and parameters fixed ex ante**

Data/Parameter	EF_{FF,CO_2}
Unit	tCO ₂ e / TJ
Description	CO ₂ emission factor per unit of energy of the fuel that would have been used in the baseline plant
Source of data	http://www.natcomindia.org/pdfs/chapter2.pdf . - National Communication of India.
Value(s) applied	95.81 (Non-coking Indian coal has been considered as the baseline fuel).
Choice of data or measurement methods and procedures	The data source selected is an official and authentic source.
Purpose of data/parameter	This data are used to calculate baseline emission
Additional comments	Value are updated as per any revisions made in NATCOM value during the crediting period.

Data/Parameter	$\eta_{BL,thermal}$
Unit	%
Description	Efficiency of plant using fossil fuel that would have been used in the absence of the project activity.
Source of data	Tool to determine the baseline efficiency of thermal or electric energy generation systems
Value(s) applied	84% - (Highest of the operational efficiency of similar specification as mentioned in the offer letter of two boiler manufacturer.)
Choice of data or measurement methods and procedures	Not Applicable
Purpose of data/parameter	This data are used to calculate baseline emission
Additional comments	Two boiler manufacturer quotations were used to arrive at the aforesaid value

Data/Parameter	$EF_{CO_2,truck}$
Unit	tCO ₂ e/Km
Description	CO ₂ emission factor of truck used for transportation (tCO ₂ e/Km)
Source of data	This is a derived value
Value(s) applied	0.00054
Choice of data or measurement methods and procedures	<p>This data is derived from standard values, taken from authentic sources. The values used are:</p> <ul style="list-style-type: none"> • Mileage of diesel trucks: 5 Km/Lt (Taken from IPCC 2006, Vol 2, Ch 3) • NCV of diesel: 43.0 TJ/KT (Taken from IPCC 2006, Vol 2 Ch1) • CO₂ emission factor of diesel: 74.1 tCO₂e/TJ (Taken from IPCC 2006, Vol 2 Ch1) • Density of diesel: 0.84 kg/Lt (Taken from IOCL, a Government of India, company)

Purpose of data/parameter	This data are used to calculate the leakage emission
Additional comments	-

Data/Parameter	Biomass surplus availability
Unit	%
Description	Surplus biomass (type/s used in the project activity) availability in the region
Source of data	Based on report from Bhagwat Technologies and Energy Conservation Pvt. Ltd.
Value(s) applied	58.0
Choice of data or measurement methods and procedures	The data is used from third party assessment report.
Purpose of data/parameter	-
Additional comments	-

Data/Parameter	SEC_{ff}
Unit	TJ /MWh
Description	Specific energy consumption of boiler when fired with coal
Source of data	Calculated from boiler efficiency with sub-bituminous coal, energy generated by the boilers and NCV of the fossil fuel from the supplier, enthalpy of saturated steam at boiler outlet pressure.
Value(s) applied	Coal - 0.004286 (fixed ex-ante)
Choice of data or measurement methods and procedures	The above value is calculated based on the boiler default efficiency; the output enthalpy is taken from the steam tables for saturated steam at the boiler operating pressure and the NCV value is the IPCC default value at the upper limit of the uncertainty at 95% confidence interval as provided in table 1.2 of Chapter 1 of Vol 2 of 2006 IPCC Guidelines on National GHG Inventories.
Purpose of data/parameter	-
Additional comments	Specific energy consumption of coal is fixed ex-ante.

Data/Parameter	SEC_{biomass}
Unit	TJ /MWh
Description	Specific energy consumption of boiler when fired with biomass (rice husk)
Source of data	Calculated from manufacturer supplied boiler efficiency with rice husk, energy generated by the boilers and NCV of the rice husk from the supplier, enthalpy of saturated steam at boiler outlet pressure.
Value(s) applied	Rice husk - 0.004390 (fixed ex-ante)
Choice of data or measurement methods and procedures	The above value is calculated based on the boiler efficiency (highest value) as supplied by the boiler manufacturer; the output enthalpy is taken from the steam tables for saturated steam at the boiler operating pressure and the NCV value is taken from supplier quotation.
Purpose of data/parameter	-
Additional comments	Specific energy consumption of coal is fixed ex-ante.

D.2. Data and parameters monitored

Data/Parameter	EG_{thermal,y}
Unit	TJ
Description	Net quantity of steam/heat (thermal energy) supplied by the project activity during the year y
Measured/calculated/default	Calculated
Source of data	In house plant record.

Value(s) of monitored parameter	679
Monitoring equipment	Steam flow meter
Measuring/reading/recording frequency	The steam quantity of steam and pressure of steam are collated on a monthly basis
Calculation method (if applicable)	The thermal energy are calculated from total steam ($Q_{\text{steam},y}$) supplied by the boiler to the process multiplied by the enthalpy of the steam. The enthalpy of the steam generated are taken based on saturated steam condition and its corresponding pressure.
QA/QC procedures	The necessary QA/QC are ensured by annual calibration of steam flow meters, pressure sensors.
Purpose of data/parameter	This data are used to calculate the baseline emission reduction
Additional comments	Data are maintained both in hardcopy and soft copy format for the crediting period + 2 years.

Data/Parameter	EF_{CO₂,Coal}
Unit	tCO ₂ e / GJ
Description	Weighted average CO ₂ emission factor of Coal
Measured/calculated/default	Default
Source of data	IPCC default value at the upper limit of the uncertainty at 95% confidence interval. The data source selected is an official and authentic source. This is selected as per the guidance given in "Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion" for the calculation of project emission.
Value(s) of monitored parameter	0.100
Monitoring equipment	-
Measuring/reading/recording frequency	-
Calculation method (if applicable)	-
QA/QC procedures	Any future revision of the IPCC Guidelines will be taken into account
Purpose of data/parameter	This data are used to calculate the baseline emission reduction
Additional comments	Sub-bituminous coal may be fired during emergencies only.

Data/Parameter	NCV_{Coal}
Unit	GJ/ton
Description	Weighted average net calorific value of Coal
Measured/calculated/default	Default
Source of data	IPCC default value at the upper limit of the uncertainty at 95% confidence interval. The data source selected is an official and authentic source. This is selected as per the guidance given in "Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion" for the calculation of project emission.
Value(s) of monitored parameter	26.0 (Value for Sub-bituminous coal, as provided in table 1.2 of Chapter 1 of Vol 2 of 2006 IPCC Guidelines on National GHG Inventories)
Monitoring equipment	-
Measuring/reading/recording frequency	-
Calculation method (if applicable)	-
QA/QC procedures	Any future revision of the IPCC Guidelines will be taken into account

Purpose of data/parameter	This data are used to calculate the baseline emission reduction
Additional comments	Sub-bituminous coal has not been fired during the crediting period being considered. It was supposed to be fired during emergencies only.

Data/Parameter	Q_{steam,y}
Unit	Tonnes
Description	Total quantity of steam produced in the project activity during the year y
Measured/calculated/default	Measured
Source of data	In house plant record.
Value(s) of monitored parameter	255,773.60
Monitoring equipment	Steam flow meter
Measuring/reading/recording frequency	Data is recorded continuously and hourly records have been collated into daily steam generation figure.
Calculation method (if applicable)	The daily steam generation values are used to calculate the monthly steam generation and monthly steam generation data are aggregated to arrive at the yearly steam generation data.
QA/QC procedures	The meter used for measurement is under the purview of the SML and necessary QA/QC are ensured by periodic calibration, carried out with respect to national standards once in a year. Details of flow meter and calibration are provided in Appendix 1
Purpose of data/parameter	This data are used to calculate the baseline emission reduction
Additional comments	Data are maintained both in hardcopy and soft copy format for the crediting period + 2 years.

Data/Parameter	P_{steam,y}
Unit	kg/cm ² g
Description	Average pressure of steam at the boiler outlet during the year y.
Measured/calculated/default	Measured
Source of data	In house plant record.
Value(s) of monitored parameter	8.47
Monitoring equipment	Electronic Pressure Sensor
Measuring/reading/recording frequency	The data is recorded continuously. Average daily steam pressure is then collated into monthly data which is used for the determination of steam enthalpy.
Calculation method (if applicable)	The daily steam pressure data are used to calculate the average monthly steam pressure.
QA/QC procedures	The meter used for measurement is under the purview of the SML and necessary QA/QC are ensured by periodic calibration, carried out with respect to national standards once in a year. The meter and calibration details are provided in Appendix 1
Purpose of data/parameter	This data are used to calculate the steam enthalpy
Additional comments	Data are maintained both in hardcopy and soft copy format for the crediting period + 2 years.

Data/Parameter	FC_{biomass,y}
Unit	Tonnes
Description	Amount of biomass used in the boiler in year y
Measured/calculated/default	Measured

Source of data	Plant record.
Value(s) of monitored parameter	65,004.16
Monitoring equipment	Solid fuel Metering System
Measuring/reading/recording frequency	The data are monitored daily and the same are collated into monthly biomass consumption.
Calculation method (if applicable)	The monthly biomass procurement data are used to calculate the biomass consumption data(Closing Reading-Opening Reading)
QA/QC procedures	The necessary QA/QC are ensured by annual calibration of the metering system. The same data are verified from the biomass procurement record. The calibration and meter details are provided in Appendix 1
Purpose of data/parameter	This data are used to calculate the total biomass consumption
Additional comments	Data are maintained both in hardcopy and soft copy format for the crediting period + 2 years.

Data/Parameter	FC_{coal,y}
Unit	Tonnes
Description	Amount of coal used in the boiler in year y
Measured/calculated/default	Measured
Source of data	Plant record.
Value(s) of monitored parameter	0 (No coal is used during the current monitoring period)
Monitoring equipment	Solid fuel Metering System
Measuring/reading/recording frequency	The data are monitored daily and the same are collated into monthly coal consumption.
Calculation method (if applicable)	The monthly coal procurement data are used to calculate the coal consumption data(Closing Reading-Opening Reading)
QA/QC procedures	The necessary QA/QC are ensured by annual calibration of the metering system. The same data are verified from the biomass procurement record.
Purpose of data/parameter	This data are used to calculate the total coal consumption
Additional comments	Data are maintained both in hardcopy and soft copy format for the crediting period + 2 years.

Data/Parameter	AVD_y
Unit	Km
Description	Average roundtrip distance per trip for transporting rice husk during the year y
Measured/calculated/default	Measured
Source of data	Distance as recorded from Standard Maps
Value(s) of monitored parameter	15
Monitoring equipment	Not Applicable
Measuring/reading/recording frequency	Once in a year.
Calculation method (if applicable)	Maximum distance of biomass source from the power plant has been used for estimation of leakage.
QA/QC procedures	The distance data has been taken from Google map.
Purpose of data/parameter	To calculate leakage emission.
Additional comments	Data are maintained both in hardcopy and soft copy format for the crediting period + 2 years.

Data/Parameter	N _y
Unit	No. of trips/yr
Description	Number of truck trips required to transport rice husk to the project site, during the year y
Measured/calculated/default	Measured
Source of data	Weigh bridge records
Value(s) of monitored parameter	1853
Monitoring equipment	Not Applicable
Measuring/reading/recording frequency	Monitoring Frequency: Daily Recording Frequency: Monthly
Calculation method (if applicable)	Based on the number of truck trips, the data are collated into a monthly figure. Yearly figure are calculated based on the monthly figure
QA/QC procedures	Fuel purchase invoices can be used to cross check the value.
Purpose of data/parameter	This data are used to calculate the leakage emission
Additional comments	All data will be archived for a period of 2 years after the end of crediting period.

D.3. Implementation of sampling plan

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Not Applicable

SECTION E. Calculation of emission reductions or net anthropogenic removals

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

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Baseline emissions: $BE_{thermal,CO_2,y}$

$$BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$$

Where

 $BE_{thermal,CO_2,y}$: Baseline emission during the year y, tCO₂e $EG_{thermal,y}$: Net quantity of steam/heat supplied by the project activity during the year y, in TJ $\eta_{BL,thermal}$: Efficiency of the plant using fossil fuel that would have been used in the absence of the project activity. EF_{FF,CO_2} : CO₂ emission factor per unit of energy of the fuel (i.e. non-coking coal) that would have been used in the baseline plant (tCO₂e /TJ).

Year	$EG_{thermal,y}$ (TJ)
01/01/2013 to 31/12/2013	108
01/01/2014 to 31/12/2014	96
01/01/2015 to 31/12/2015	85
01/01/2016 to 31/12/2016	95
01/01/2017 to 31/12/2017	83
01/01/2018 to 31/12/2018	66
01/01/2019 to 31/12/2019	92
01/01/2020 to 31/12/2020	54
Total Steam/Heat Supplied by the project activity	679

From the table above, the baseline emissions have been calculated as follows:-

 $BE_{thermal,CO_2,y} = (679/0.84) * 95.81 = 77,442 \text{ tCO}_2\text{e}$

Year wise Baseline Emission:

Data / Parameter:	$EG_{thermal,y}$	EF_{FF,CO_2}	$\eta_{BL,thermal}$	$BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FFCO_2}$
Description	Net quantity of steam/heat supplied by the project activity during the year y	CO ₂ emission factor per unit of energy of the fuel (i.e. non-coking coal) that would have been used in the baseline plant in	Efficiency of the plant using fossil fuel that would have been used in the absence of the project activity.	Baseline emission during the year y
Unit	TJ	tCO _{2e} /TJ	%	tCO _{2e}
01/01/2013 to 31/12/2013	108	95.81	84.00%	12,318
01/01/2014 to 31/12/2014	96	95.81	84.00%	10,949
01/01/2015 to 31/12/2015	85	95.81	84.00%	9,695
01/01/2016 to 31/12/2016	95	95.81	84.00%	10,835
01/01/2017 to 31/12/2017	83	95.81	84.00%	9,466
01/01/2018 to 31/12/2018	66	95.81	84.00%	7,527
01/01/2019 to 31/12/2019	92	95.81	84.00%	10,493
01/01/2020 to 31/12/2020	54	95.81	84.00%	6,159
Total	679	95.81	84.00%	77,442

E.2. Calculation of project emissions or actual net removals

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Project Emission: $PE_{FC,y}$

$$PE_{FC,y} = FC_{Coal,y} \times COEF_{Coal}$$

$$COEF_{Coal} = NCV_{Coal} \times EF_{CO_2,Coal}$$

Where

- $PE_{FC,y}$: CO₂ emissions from fossil fuel combustion during the year y (tCO₂ / yr)
 $FC_{Coal,y}$: Quantity of fossil fuel combusted during the year y (mass or volume unit/yr);
 $COEF_{Coal}$: CO₂ emission coefficient of coal (tCO₂ / mass or volume unit);
 NCV_{Coal} : Weighted average net calorific value of Coal (GJ/mass or volume unit)
 $EF_{CO_2,Coal}$: Weighted average CO₂ emission factor of Coal (tCO₂/GJ)

As the project activity didn't use fossil fuel during the monitoring period being considered, hence the project emissions have been considered as zero.

$$PE_{FC,y} = 0$$

E.3. Calculation of leakage emissions

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Leakage Emission: LE_y

$$LE_y = N_{truck,y} \times AVD_y \times EF_{CO_2,truck}$$

Where

LE_y : Leakage emission due to transportation of biomass residues to project site in year

$y, \text{tCO}_2/\text{yr}$
N_{truck,y} : Number of truck trips from the biomass source to the project plant in year y
AVD_y : Average roundtrip distance per trip for transporting rice husk during the year y, Km
EF_{CO2,truck} : CO₂ emission factor of truck used for transportation (tCO₂e/Km)

As per Section B.6.3 of the registered PDD, “leakage from biomass transportation is to be considered only for cases where biomass is transported over a distance of 200 km or more.” and based on the biomass surplus availability report biomass is available in plenty within a distance of 50 Km radius around the project site.

As per footnote 11 of AMS-I.C. version 16, “If biomass residues are transported over a distance of more than 200 kilometres due to the implementation of the project activity then this leakage source attributed to transportation shall be considered, otherwise it can be neglected.” For ex ante estimation, leakage emission would be considered zero, based on the biomass surplus availability report, which proves biomass is available in plenty within a distance of 200 Km radius around the project site. However, for ex post calculation, emission due to biomass transportation would be monitored and neglected, only if the average distance for biomass transportation is lower than 200 kms. It may be noted that for the aforesaid project activity, the average distance for biomass transportation is 15 kms (which is lower than 200 kms). Hence the leakage emission for the project activity has been neglected.

So,
 $LE_y = 0.0 \text{ tCO}_2\text{e}$

Emission Reduction: ER_y

$$ER_{\text{thermal,CO}_2,y} = BE_{\text{thermal,CO}_2,y} - PE_{FC,y} - LE_y$$

Where

ER_{thermal,CO2,y}	:	Emission reduction during the year y, tCO₂e	77,442 tCO₂e
BE_{thermal,CO2,y}	:	Base line emission during the year y, tCO ₂ e	77,442 tCO ₂ e
PE_{FC,y}	:	Project emission during the year y, tCO ₂ e	0 tCO ₂ e
LE_y	:	Leakage, during the year y, tCO ₂ e	0 tCO ₂ e

E.4. Calculation of emission reductions or net anthropogenic removals

	Baseline GHG emissions or baseline net GHG removals (t CO ₂ e)	Project GHG emissions or actual net GHG removals (t CO ₂ e)	Leakage GHG emissions (t CO ₂ e)	GHG emission reductions or net anthropogenic GHG removals (t CO ₂ e)			
				Before 01/01/2013	From 01/01/2013 until 31/12/2020	From 01/01/2021	Total amount
Total	77,442	0	0	0	77,442	0	77,442

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO ₂ e)	Amount estimated ex ante for this monitoring period in the PDD (t CO ₂ e)
77,442	281,696

E.5.1. Explanation of calculation of “amount estimated ex ante for this monitoring period in the PDD”

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Estimated Emission Reduction according to PDD = 35,188 tCO₂e per annum

Total number of days in this monitoring period = 2922 days

The ex-ante estimated ER for the current monitoring period has been calculated by factorizing the annualized projected ER value for the equivalent days of the current monitoring period.

$$= (35,188 * 2922) / 365 = 281,696 \text{ tCO}_2\text{e}$$
E.6. Remarks on increase in achieved emission reductions

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During the present monitoring period, actual emission reductions achieved are 77,442 tCO₂e whereas estimated emission reductions was 281,696 tCO₂e.

The actual emission reduction achieved is 72.51% lower than the estimated in the registered PDD. This is due to the lower continuous plant operational period.

E.7. Remarks on scale of small-scale project activity

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The project activity is still a small-scale project activity.

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
08.0	6 April 2021	Revision to: <ul style="list-style-type: none"> • Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).
07.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; • Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; • Make editorial improvements.
06.0	7 June 2017	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 01.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		