1.6 MW BUNDLED RICE HUSK BASED COGENERATION PLANT BY M/S MILKFOOD LIMITED (MFL) IN PATIALA (PUNJAB) & MORADABAD (U.P) DISTRICTS NAME OF PROJECT

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Project Title	1.6 MW Bundled Rice Husk Based Cogeneration Plant by M/s Milkfood Limited (MFL) in Patiala (Punjab) & Moradabad (U.P) Districts Name of project
Version	01.0
Report ID	MR-01.0
Date of Issue	26-March-2018
Project ID	784
Monitoring Period	01-February-2014 to 31-December-2017
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PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The purpose of the project activity is to utilize rice husk (biomass) available in the region for cogeneration of steam and electricity for captive consumption at two locations of Milkfood Limited viz. Patiala and Moradabad. The implementation of the bundled project activity has resulted in the partial displacement of power supply and the complete displacement of steam generation new rice husk based co- generation plants.

As the project activity utilizes a carbon neutral fuel, it thereby reduces the anthropogenic Green House Gas (GHG) emission that would have been generated as a result of continued operation ofcoal based boilers.

Brief description of the installed technology and equipment:

The two projects that form the proposed bundled CDM project activity are:

Project I: 1 MW Rice Husk Based Cogeneration Plant at Post Office (P.O.) Bahadurgarh, Distt. Patiala –147021,Punjab,India:

The boiler of this cogeneration plant generates 14 TPH of steam with the outlet parameters i.e. pressure 45 kg/cm^2, and temperature as 420°C. The part of the steam generated in the boiler i.e. 1.2 TPH at 17kg/cm^2, 275°C is fed directly to the process and the rest 12.8 TPH is fed to a back pressure turbine-generator. The bleed steam flow from the turbine is at 17 kg/cm^2, 3.1 TPH, 240°C and the exhaust steam flow from the turbine is at 4 kg/cm^2, 9.7 TPH, 170°C. This steam isfurther sent for process requirement. The electricity generating capacity is 1 MW.

Project II: 0.6 MW Rice Husk Based Cogeneration Plant at Village: Mugalpur urf Agwanpur Mustakam, Dist.: Moradabad, Uttar Pradesh, India:

The boiler involved in this cogeneration plant generates 12 TPH of steam with the outlet parameters i.e. pressure 32 kg/cm^2, and temperature as 400°C. Out of 12 TPH steam generated in the boiler 2.3 TPH is fed to a Dryer at 17 Kg/ cm^2 , 360°C and another 9.7 TPH of steam is fed to a Back PressureTG set at 30 Kg/cm^2 , 360°C, the exhaust steam is at 3 kg/cm^2 , 240°C. The electricity generating capacity is 0.6 MW.

Relevant dates for the project activity:

Project Activity I was commissioned on 6th May, 2009

Project Activity II was commissioned on 4th June, 2009

Both the project activities have been operational since then at full capacity.

Total GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period (01/02/2014 – 31/12/2017): 249,667 tCO2e

1.2 Sectoral Scope and Project Type

The project belongs to Sectoral Scope 1, Energy industries (renewable - / non-renewable sources)

The type is project with less than 1,000,000 tCO_2e per year. Further, the project is not a part of any grouped project.

1.3 Project Proponent

Organization name	Milkfood Limited
Contact person	Amar Baljeet Singh
Title	Mr.
Address	5th Floor, Bhandari House, 91 Nehru Place New Delhi-110019 (India)
Telephone	+91-11-26460670, 26463773
Email	abs@milkfoodltd.com

1.4 Other Entities Involved in the Project

Organization name	Enen Green Services Private Limited
Role in the project	Project participant
Contact person	Dhiraj Sharma
Title	Mr.
Address	3 H, Gopal Tower,25 Rajendra Place , New Delhi-110008
Telephone	+91-9953935506
Email	enengreen@gmail.com

1.5 Project Start Date

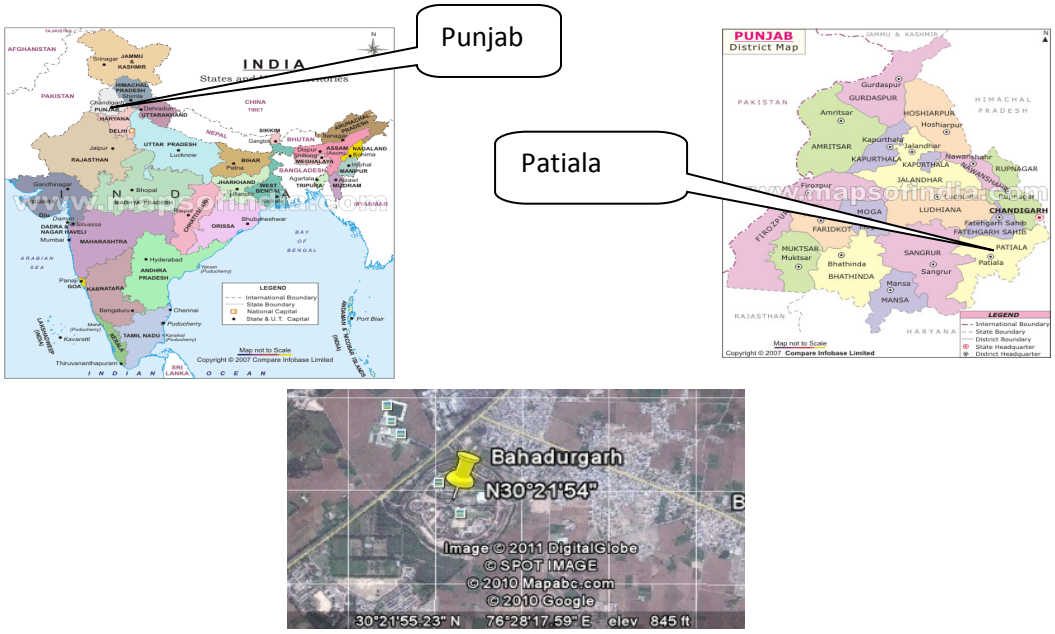
The project start date is 06-May-2009

1.6 Project Crediting Period

The validated choice of crediting period is 10 years (renewed twice). The first crediting period is 06-July-2009 to 05-July-2019

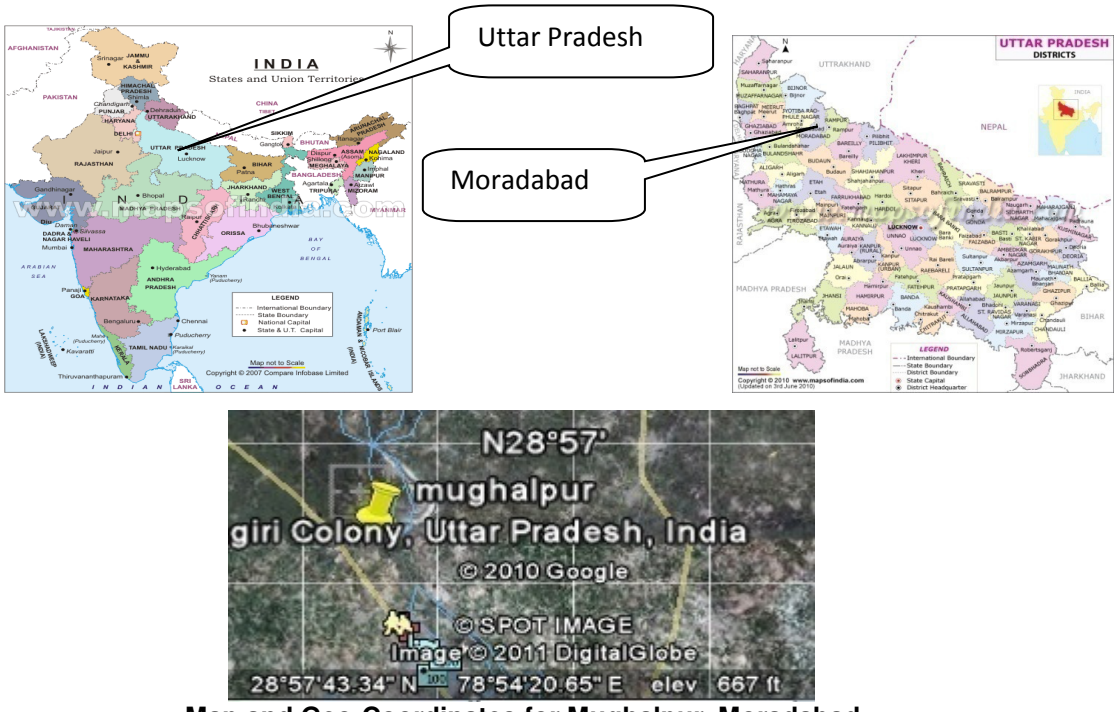
1.7 Project Location

Project I; The project is located at Milk food Limited at P.O. Bahadurgarh and Patiala District of Punjab. The project site is located within latitude 30°21'55.23" N and longitude 76°28'17.59" E respectively. The map with location of the project plant is depicted below:



Map and Geo-Coordinates for Bahadurgarh, Patiala.

Project II: The proposed project activity site is located at Village: Mugalpur urf Agwanpur Mustakam, and Moradabad district of UP. The latitude and longitude for the district are 28° 57'43.34" N and 78° 54'20.65" E respectively. The map with location of the Project Plant is depicted below:



Map and Geo-Coordinates for Mughalpur, Moradabad

1.8 Title and Reference of Methodology

Title of the methodology applied: **Thermal energy production with or without electricity**
Type I – Renewable energy project
Category I.C: Thermal Energy production with or without electricity; I.C/Version 18
Sectoral Scope: 1

Type I – Renewable energy project
Category I.D: Grid connected renewable electricity generation; I.D Version 16
Sectoral Scope: 1

The reference has been taken from the list of the small-scale CDM project activity categories contained in Appendix B of the simplified M&P for small-scale CDM project activities.

1.9 Other Programs

The project is also registered under CDM mechanism of UNFCCC. Reference no of project is 5219. Credits from period 14/02/2012 - 31/01/2014 is claimed as CDM project. However for the current monitoring period there is no application for verification under CDM mechanism in order to avoid double counting.

1.10 Sustainable Development

Project's contribution to Sustainable Development

The contributions of proposed project activity towards sustainable development are explained with indicators like social, economical, environmental and technological well-being, as follows:

Environmental well-being
The project activity will conserve coal by avoiding the process steam and power generation from coal fired boiler. Also helps in Mitigating the emission of GHG (CO2) as rice husk is a carbon neutral fuel.

Social well being
The project activity will pave the way for development and increases the social status and living conditions and the prevailing living standard in the vicinity of the project activity and thus results in empowering the nearby population (supplier of the major amount of workforce for construction of the project activity).Also it will Contribute to a small increase in the local employment by employing skilled and un-skilled personnel for operation and maintenance of the equipment. This Proposed Project Activity will result in reduced migration of the local population.

Economic well being
The project has created a business opportunity during construction phase for local stakeholders such as suppliers, contractors, bankers etc. contributing to economic well-being aspects. Further, the project also influences creation of employment opportunities for local people, which would enhance their social status. Also it Saves the coal and HSD and thus allows it to be diverted to other needy sections of the economy

Technological well being
The project activity utilizes biomass as fuel to generate steam and electricity. It is an advanced and sustainable technology for long term benefits. The project activity is expected to increase awareness and interest among the industry players to make investments in similar areas.

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

Project I (part of VCS project activity) was commissioned on 06th May 2009 followed by Project II (part of VCS project activity) on 04th June 2009. Since then project is operation at full capacity. Project activity was operational during the first monitoring period.

However, all equipments (Boiler, TG units and other accessories) were undergone daily maintenance (planned shutdown for 2 hours) There is no exchange of equipment during the monitoring period. There is no event occurred during this monitoring period, which may have impact on the applicability of the methodology as well as emission reduction.

2.2 Deviations

2.2.1 Methodology Deviations

No deviation from methodology is sought during this monitoring period.

2.2.2 Project Description Deviations

There is no deviation from registered project description.

2.3 Grouped Project

This is not a grouped project.

2.4 Safeguards

2.4.1 No Net Harm

There is no potential negative environmental and socio-economic impacts.

2.4.2 Local Stakeholder Consultation

Both the plants have register and contact details at reception for local stakeholders to communicate. Local stakeholders may even meet after prior appointment with appointed person by management for any issues or concern. Appointed person will resolve their issues if any and also notify higher management about their concern and steps taken to resolve their issues. The same will be recorded and reviewed on quarterly basis.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data / Parameter:	**$EF_{EF,CO2}$**
Data unit:	tCO_2/ TJ
Description:	The CO2 emission factor per unit of energy of coal that would have been used in the baseline plant in absence of the project activity
Source of data:	As per NATCOM (India), 1994, Chapter 2: GHG Inventory Information, pg 37
Value applied:	95.81
Justification of choice of data or description of measurement methods and procedures applied	Sourced from Registered PD.
Purpose of the data:	Data is used for project emission calculations
Comments	-

Data / Parameter:	**$\eta_{BL, thermal}$**
Data unit:	%
Description:	The efficiency of the boiler using coal that would have been used in the absence of the project activity.
Source of data:	Manufacturer specification
Value applied:	82
Justification of choice of data or description of measurement methods and procedures applied	Sourced from Registered PD.
Purpose of the data:	Data is used for Baseline and project emission calculations
Comments	-

Data / Parameter:	**$EF_{grid,CM,y}$**
Data unit:	tCO_2/ MWh
Description:	Combined margin CO2 emission factor for NEWNE grid
Source of data:	Central Electricity Authority (CEA) version 5
Value applied:	0.84
Justification of choice of data or description of measurement methods and procedures applied	Sourced from Registered PD.
Purpose of the data:	Data is used for Baseline emission calculations

Comments	-

Data / Parameter:	**$COEF_{i,y}$**
Data unit:	tCO_2/ litre
Description:	The CO2 emission coefficient of fuel type I (Diesel) (tCO2/mass or volume unit) It is calculated based on EB 41, Annex 11; $COEF_{i,y} = NCV_{i,yx} EF_{CO2,i,y}$ Where, $NCV_{i,y}$= weighted average net calorific value of the fuel type i (Diesel) in year y (GJ/mass or volume unit) $EF_{CO2,i,y}$ = weighted average CO2 emission factor of fuel type I (Diesel) in year y (tCO2/GJ)
Source of data:	Table 1.2 & Table 1.4 Chapter 1 Volumes 2 of IPCC, 2006.
Value applied:	0.0032
Justification of choice of data or description of measurement methods and procedures applied	Sourced from Registered PD.
Purpose of the data:	Data is used for Leakage emission calculations
Comments	-

Data / Parameter:	**PLF**
Data unit:	%
Description:	Plant Load Factor
Source of data:	Third party Determination
Value applied:	90
Justification of choice of data or description of measurement methods and procedures applied	Sourced from Registered PD.
Purpose of the data:	Data is used for Baseline emission calculations
Comments	-

Data / Parameter:	$\eta_{BI,biomass}$
Data unit:	%
Description:	The efficiency of the project activity biomass based boiler.
Source of data:	Manufacturer specification

Value applied:	78
Justification of choice of data or description of measurement methods and procedures applied	Sourced from Registered PD.
Purpose of the data:	Data is used for Baseline emission calculations
Comments	-

3.2 Data and Parameters Monitored

Data Unit / Parameter:	**Net Electricity ($EG_{PJ,y}$)**
Data unit:	MWh
Description:	Net electricity generated by project I
Source of data:	On-site instruments (energy meter)
Description of measurement methods and procedures to be applied:	Monitoring: electronic energy meter at the sent out point of the project activity plant is used to measure the data of net electricity generated. Data type: Measured Accuracy : 0.5s Archiving policy: Paper. Recording Frequency: hourly Responsibility: Manager (power plant) is responsible for regular calibration of the meter Calibration Frequency: once in a three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	14893.00 (cumulative value for the monitoring period)
Monitoring equipment:	Equipment : Energy meter Type : Electronic Accuracy : 0.5s Serial number of equipment : 1047071223-3706 Calibration details: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	Energy meter was duly calibrated. It was calibrated by accredited agency

	Data recording and achieving were done in accordance with Quality Management System. Net energy generation (supplied to milk processing plant) was monthly reviewed.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	**Net Electricity ($EG_{PJ,y}$)**
Data unit:	MWh
Description:	Net electricity generated by project II
Source of data:	On-site instruments (energy meter)
Description of measurement methods and procedures to be applied:	Monitoring: electronic energy meters at the sent out point of the project activity plant is used to measure the data of net electricity generated. Data type: Measured (as well calculated in case net is not monitored). Accuracy : 0.5s Archiving policy: Paper. Recording Frequency: hourly Responsibility: Manager (power plant) is responsible for regular calibration of the meter Calibration Frequency: once in a three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	12964.00 (cumulative value for the monitoring period)
Monitoring equipment:	Equipment : Energy meters Type : Electronic Accuracy : 0.5s Serial number of equipment : 104707/227-3706 Calibration details: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	Energy meter was duly calibrated. It was calibrated by accredited agency i.e. Data recording and achieving were done in accordance with

	Quality Management System. Net energy generations (supplied to milk processing plant) were monthly reviewed.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	$Q_{fossil, i,y}$
Data unit:	Tonnes
Description:	Quantity of fossil fuel (coal) of type i combusted in boiler in year y
Source of data:	On site measurement; plant log sheet/records.
Description of measurement methods and procedures to be applied:	Monitoring: Weigh bridge will monitor the data (If used) Data type: Measured. Archiving policy: Paper. Recording Frequency: Daily Responsibility: Manager (power plant) is responsible for regular calibration of the Weigh bridge Accuracy of weigh bridge is 0.5 %. Calibration Frequency: once in a three year.
Frequency of monitoring/recording:	Daily
Value monitored:	0
Monitoring equipment:	Equipment : Weigh bridge Type : Electronic Accuracy : 0.5s Serial number of equipment : EB98H018 Calibration details: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	Coal was not used during the monitoring period. No coals were procured during the monitoring period. Weigh scale was calibrated annually by external accredited agencies
Purpose of the data	Calculation of baseline emissions

Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	**FC i,j,y**
Data unit:	M3
Description:	Quantity of fossil fuel (diesel) combusted in boiler in year y
Source of data:	On site measurement; plant log sheet/records.
Description of measurement methods and procedures to be applied:	Quantity of fossil fuel type i-(Diesel) DG sets was not operated. Monitoring: Measurement through invoices. Data type: Measured Archiving policy: Paper. Recording Frequency: Daily Responsibility: Manager (power plant) is responsible for regular achieving of diesel used.
Frequency of monitoring/recording:	Daily
Value monitored:	Project 1: 59.04 Project 2: 57.73
Monitoring equipment:	Log book
QA/QC procedures to be applied:	It is crosschecked against invoices.
Purpose of the data	Calculation of project emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	$\mathbf{Q_{steam}}$
Data unit:	Tonnes
Description:	Quantity of steam generated from project activity biomass fired boiler.
Source of data:	On site measurement taken from steam flow meters.
Description of measurement methods and procedures to	Reading is directly taken from steam flow meter by boiler attendant supervisor on hourly basis.

be applied:	Monitoring: steam flow meter. Data type: Measured. Accuracy: 0.5s Archiving policy: Paper. Recording Frequency: hourly Responsibility: Manager (power plant) is responsible for regular calibration of the meter. Calibration Frequency: Once in three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	Project I: 404721.00 (cumulative value for the monitoring period) Project II: 348109.00 (cumulative value for the monitoring period)
Monitoring equipment:	Equipment : Stem flow meter Type : Paper and Electronic Accuracy : 0.5s Serial number of equipment : Project I: 2K6100973 Project II : F3056 Calibration details: Project I : Last calibration date : Pl. refer to appendix 1. Results: under the specified limits. Project II: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	Steam flow meters were calibrated by external accredited agencies.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	T_{steam}
Data unit:	Degree Celsius
Description:	Temperature of the steam generated.

Source of data:	On site measurement taken from temperature gauge installed at steam outlet from the boiler.
Description of measurement methods and procedures to be applied:	Monitoring: temperature gauge Data type: Measured Accuracy: 0.5s Archiving policy: Paper Recording Frequency: hourly Responsibility: Manager (power plant) is responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	Project I: 396 ºC Project II: 400 ºC
Monitoring equipment:	Equipment: Temperature gauge. Type : Electronic Accuracy : 0.5s Serial number of equipment : Project I : 170RP Project II : 3440-M3-07 Calibration details: Project I: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits. Project II: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	Temperature gauges were calibrated by external accredited agencies.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	$\mathbf{P_{steam}}$
Data unit:	Kg/cm2
Description:	Pressure of the steam generated.

Source of data:	On site measurement from pressure gauge.
Description of measurement methods and procedures to be applied:	Monitoring: Pressure gauge Data type: Measured. Accuracy: 0.5s Archiving policy: Paper Recording Frequency: hourly Responsibility: Manager (power plant) is responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	Project I: 41 Kg/cm^2 Project II: 31 Kg/cm^2
Monitoring equipment:	Equipment: Pressure gauge. Type : Electronic Accuracy : 0.5s Serial number of equipment : Project I : DP150KA Project II: 424-P5-07 Calibration details: Project I : Last calibration date : Pl. refer to appendix 1. Results: under the specified limits. Project II: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	Pressure gauges were calibrated by external accredited agencies.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	$Q_{steam,HP,I}$

Data unit:	Tonne
Description:	Quantity of steam used in the process at high pressure(after conjunction point of direct and bleed steam)(at high pressure side)
Source of data:	Onsite measurement taken from steam flow meter.
Description of measurement methods and procedures to be applied:	Reading is directly taken from steam flow meter by boiler supervisor on hourly basis. Monitoring: steam flow meter at plant. Data type: Measured. Accuracy: 0.5s Archiving policy: Paper. Recording Frequency: hourly Responsibility: Manager (power plant) is responsible for regular calibration of the meter. Calibration Frequency: Once in three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	Project I: 220038 (cumulative value for the monitoring period)
Monitoring equipment:	Equipment: Steam flow meter. Type : Electronic Accuracy : 0.5s Serial number of equipment : 0612220 Calibration details Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	Steam flow meter was calibrated by external accredited agencies.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	$T_{steam,HP,I}$
Data unit:	Degree Celsius
Description:	Temperature of the steam used in the process at high pressure(after conjunction point of direct and bleed steam)(at

	high pressure side)
Source of data:	On-site measurement from temperature gauge installed at steam outlet from boiler
Description of measurement methods and procedures to be applied:	Monitoring: temperature gauge Data type: Measured Accuracy: 0.5s Archiving policy: Paper. Recording Frequency: hourly Responsibility: Manager (power plant) is responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	Project I: 316 ºC
Monitoring equipment:	Equipment: temperature gauge. Type : Electronic Accuracy : 0.5s Serial number of equipment : 06D0023 Calibration details: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits
QA/QC procedures to be applied:	Temperature gauge will be calibrated once in a three year by external accredited agencies.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	$\mathbf{P}_{\mathbf{steam}, HP,I}$
Data unit:	Kg/cm2
Description:	Pressure of the steam used in the process at high pressure(after conjunction point of direct and bleed steam)(at high pressure side)
Source of data:	On-site measurement from Pressure gauge.
Description of measurement methods and procedures to be applied:	Monitoring: Pressure gauge Data type: Measured

	Accuracy: 0.5s Archiving policy: Paper. Recording Frequency: hourly Responsibility: Manager (power plant) would be responsible for regular calibration of the gauge. Calibration Frequency: once in a three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	Project I: 17.60 Kg/cm^2
Monitoring equipment:	Equipment: Pressure gauge. Type : Electronic Accuracy : 0.5s Serial number of equipment : 04B0078 Calibration details: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	Pressure gauge will be calibrated once in a three year by external accredited agencies.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	$Q_{steam,HP,II}$
Data unit:	Tones
Description:	Quantity of steam used in the process at high pressure side.
Source of data:	On-site measurement from Steam flow meter.
Description of measurement methods and procedures to be applied:	Reading is directly taken from steam flow meter by boiler supervisor on hourly basis. Monitoring: steam flow meter at plant. Data type: Measured. Accuracy: 0.5s Archiving policy: Paper. Recording Frequency: hourly Responsibility: Manager (power plant) would be responsible

	for regular calibration of the meter. Calibration Frequency: Once in three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	Project II: 96130 (cumulative value for the monitoring period)
Monitoring equipment:	Equipment: Steam flow meter. Type : Electronic Accuracy : 0.5s Serial number of equipment : 08092501 Calibration details: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	Steam flow meter is calibrated by external accredited agencies.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	$T_{steam,HP,II}$
Data unit:	Degree Celsius
Description:	Temperature of the steam used in the process at high pressure (at high pressure side).
Source of data:	On-site measurement from temperature gauge installed at steam outlet from boiler.
Description of measurement methods and procedures to be applied:	Monitoring: temperature gauge Data type: Measured Accuracy: 0.5s Archiving policy: Paper. Recording Frequency: hourly Responsibility: Manager (power plant) is responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	Project II: 360 ºC

Monitoring equipment:	Equipment: Temperature gauge. Type : Electronic Accuracy : 0.5s Serial number of equipment : 3440-M3-07 Calibration details: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	Temperature gauge will be calibrated once in a three year by external accredited agencies.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	$P_{steam,HP,II}$
Data unit:	Kg/cm2
Description:	Pressure of the steam used in the process at high pressure (at high pressure side).
Source of data:	On-site measurement from pressure gauge.
Description of measurement methods and procedures to be applied:	Monitoring: pressure gauge Data type: Measured Accuracy: 0.5s Archiving policy: Paper. Recording Frequency: hourly Responsibility: Manager (power plant) is responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	Project II: 30 Kg/cm^2
Monitoring equipment:	Equipment: Pressure gauge. Type : Electronic Accuracy : 0.5s Serial number of equipment : 424-P5-07 Calibration Details: Last calibration date : Pl. refer to appendix 1.

	Results: under the specified limits.
QA/QC procedures to be applied:	Pressure gauge was calibrated by external accredited agencies.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	$Q_{steam,LP}$
Data unit:	Tonnes
Description:	Quantity of steam extracted from the turbine that is used in the process at low pressure (Exhaust Steam at the outlet of the turbine) (at Low pressure side)
Source of data:	On-site measurement from steam flow meter.
Description of measurement methods and procedures to be applied:	Monitoring: steam flow meter Data type: Measured Accuracy: 0.5s Archiving policy: Paper. Recording Frequency: hourly Responsibility: Manager (power plant) is responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	Project I: 184,682.60 (cumulative value for the monitoring period) Project II: 251,979.70 (cumulative value for the monitoring period)
Monitoring equipment:	Equipment: steam flow meter. Type : Electronic Accuracy : 0.5s Serial number of equipment : Project I : 0612221 Project II : 08092502 Calibration details Project I :

	Last calibration date : Pl. refer to appendix 1. Results: under the specified limits. Project II: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	Steam flow meter was calibrated by external accredited agency.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	$T_{steam,LP}$
Data unit:	Degree Celsius
Description:	Temperature of the steam extracted from the turbine that is used in the process(at low pressure side)
Source of data:	On-site measurement from temperature gauge installed at steam outlet from boiler.
Description of measurement methods and procedures to be applied:	Monitoring: Temperature gauge. Data type: Measured Accuracy: 0.5s Archiving policy: Paper. Recording Frequency: hourly Responsibility: Manager (power plant) is responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	Project I: 215 ºC Project II: 240 ºC
Monitoring equipment:	Equipment: Temperature gauge. Type : Electronic Accuracy : 0.5s Serial number of equipment : Project I: 06-0093/14

	Project II : 91218274 Calibration details: Project I : Last calibration date : Pl. refer to appendix 1. Results: under the specified limits. Project II: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	Temperature gauge were calibrated by external accredited agencies.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	$\mathbf{P_{steam}}$
Data unit:	Kg/cm2
Description:	Pressure of the steam extracted from the turbine that is used in the process(at low pressure side)
Source of data:	On-site measurement from Pressure gauge.
Description of measurement methods and procedures to be applied:	Monitoring: Pressure gauge. Data type: Measured Accuracy: 0.5s Archiving policy: Paper. Recording Frequency: hourly Responsibility: Manager (power plant) is responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	Project I: 4 Kg/cm^2 Project II: 3 Kg/cm^2
Monitoring equipment:	Equipment: Pressure gauge. Type : Electronic Accuracy : 0.5s

	Serial number of equipment : Project I: 06-0093/06 Project II : I-05.5443 Calibration details: Project I : Last calibration date : Pl. refer to appendix 1. Results: under the specified limits. Project II: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	Pressure gauges were calibrated by external accredited agencies.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	T_{FW}
Data unit:	Degree Celsius
Description:	Temperature of the feed water in the boiler.
Source of data:	On-site measurement from temperature gauge installed at feed water inlet.
Description of measurement methods and procedures to be applied:	Monitoring: temperature gauge Data type: Measured Accuracy: 0.5s Archiving policy: Paper. Recording Frequency: hourly Responsibility: Manager (power plant) is responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
Frequency of monitoring/recording:	Hourly
Value monitored:	Project I: 102ºC Project II: 96.48 °C
Monitoring equipment:	Equipment: Temperature gauge.

	Type : Electronic Accuracy : 0.5s Serial number of equipment : Project I : 03122 Project I : EC965 Calibration details: Project I : Last calibration date : Pl. refer to appendix 1. Results: under the specified limits. Project II: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	Temperature gauge were calibrated by external accredited agencies.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	$Q_{biomass,\ i,y}$
Data unit:	Tones
Description:	Quantity of rice husk consumed annually.
Source of data:	On-site measurement.
Description of measurement methods and procedures to be applied:	Monitoring: weigh bridge Data type: measured Archiving policy: Paper Recording Frequency: Daily Responsibility: Manager (power plant) is responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
Frequency of monitoring/recording:	Daily
Value monitored:	Project I: 26875 Project II: 19919
Monitoring equipment:	Equipment: Weigh bridge. Type : Electronic Accuracy : 0.5s

	Serial number of equipment : Project I: EB98H018 Project II: EB04W256 Calibrations details of weighbridge: Project I : Last calibration date : Pl. refer to appendix 1. Results: under the specified limits. Project II: Last calibration date : Pl. refer to appendix 1. Results: under the specified limits.
QA/QC procedures to be applied:	The data were cross checked with the Invoices raised by biomass (rice husk) suppliers. Weigh scale were calibrated by external accredited agencies.
Purpose of the data	Calculation of baseline emissions
Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	**$NCV_{biomass}$**
Data unit:	Kcal/kg
Description:	Net Calorific Value of biomass residue (rice husk).
Source of data:	Third party (lab test of biomass)
Description of measurement methods and procedures to be applied:	Monitoring: Net calorific value of biomass was checked through Govt. approved independent laboratory. Data type: Estimated Archiving policy: Paper. Recording Frequency: Once in a year. Responsibility: Manager (power plant) is responsible for regular calibration of the meter.
Frequency of monitoring/recording:	Annually
Value monitored:	2944
Monitoring equipment:	Third party lab test reports
QA/QC procedures to be applied:	-
Purpose of the data	Calculation of baseline emissions

Calculation method:	-
Comments	Data will be kept for crediting period + 2 years.

3.3 Monitoring Plan

For above stated parameters for which monitoring and measurements apply, Supervisors take measurements and records are made.

Management of Milk food Limited ensures that appropriate equipments required for the measurement are provided.

These measuring instruments viz., Weigh Bridge, thermoguages, Pressure gauges and energy meters are calibrated from third party instrumentation labs once in a three years, and records of it are maintained.

All the monitoring equipments required for the calculation of emission reductions have been installed after procedural check; therefore there is less possibility of defects. However, all these equipments are daily inspected by the concerned operator while taking the reading. In case of any irregular reading or unexpected reading the shift in charge is informed for further check and calibration of the equipments. Moreover, all the monitoring equipments were well calibrated.

Monthly report of the cogeneration plant performance parameters were submitted to the top management for review and regular internal audits were conducted by the top management in every three months. No, ambiguities/NC was detected during the internal audits.

Monitoring Data are achieved properly. Plant records such as log books, purchase receipts, calibration certificates of measuring devices, and public data such as IPCC and CEA are maintained systematically during the 1st monitoring period and same will be kept for the retention period specified.

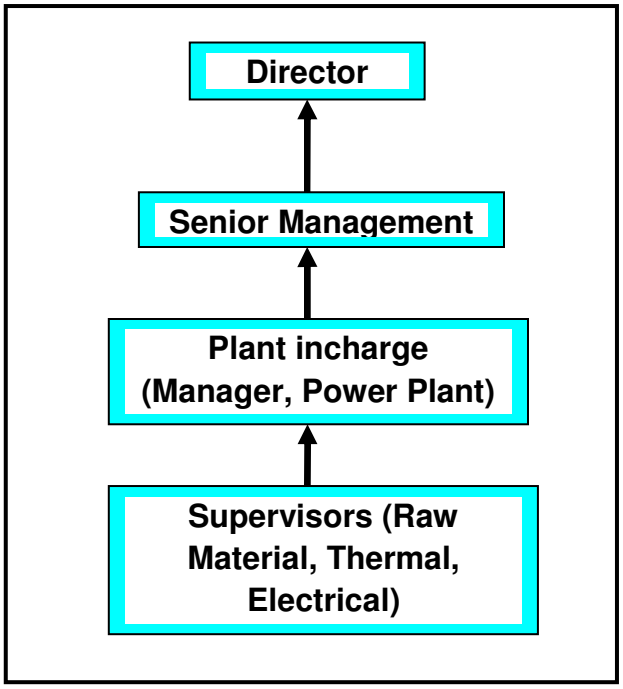
Operational & Management Structure-

The project proponent has practiced the monitoring as per the designed measurement & verification plan and ensures the proper, regular measurement and recording of the data pertaining to the GHG emission reduction.

For carrying out the task of monitoring, the responsibilities were lined with a monitoring team consisting of supervisors (raw material, thermal and electrical). Hourly and daily recording of all monitoring parameters were done by supervisors. Daily plant records were properly reviewed by plant in-charge.

Monthly consolidated reports and periodical internal review reports were made available to the top management.

An organogram regarding the hierarchy of monitoring and QA/QC is given below:



4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Project I:

A. Baseline Emission

1. Baseline emissions for supply of electricity to and / or displacement electricity from a grid shall be calculated as per the procedures detailed in AMS I. D.

As per the Para 12 of the AMS.I.D version 16 and section 4 of validated VCS PD:

Combined margin emission factor is taken from the CEA data base and used guide version 05 (A publicly available official source), which provides CM equal to 0.84 tCO2e/MWh.

Baseline emission (tCO2) = Electricity generated (MWh) x 0.84 (tCO2e/MWh).

Baseline emission (tCO2) = Net Electricity generated (MWh) x 0.84 (tCO2e/MWh).

= 14893 MWh x 0.84 (tCO2e/MWh).

= **12510.10 tCO2e**

2. For steam/ heat produced using fossil fuels the baseline emissions are calculated as follows:

As per the Para 16 of the AMS.I.C version 18 and section 4 of validated VCS PD:

The baseline emissions are calculated as follows:

$$BE_{thermal,\ Co2,y} = (EG_{thermal,y} / \eta_{BL,thermal})^{*} EF_{EF,CO2}$$

= (1036.50 TJ / yr / .82) X 95.81 tCO_2/ TJ

= 121105.87 **tCO2/ yr**

The detailed calculation has been provided in the Excel Sheet.

"Since the project activity displaces both grid power and steam from coal fired boiler, the baseline is summation of both 1 and 2."

Total Baseline Emission Reduction = 12510.10 tCO2e + 121105.87 tCO_2/ yr

= **133615 tCO_2/ yr** (round down Value)

Project II:

A. Baseline Emission

1. Baseline emissions for supply of electricity to and / or displacement electricity from a grid shall be calculated as per the procedures detailed in AMS I. D.

As per the Para 12 of the AMS.I.D version 16 and section 4 of validated VCS PD:

Baseline emission (tCO2) = Net Electricity generated (MWh) x 0.84 (tCO2e/MWh).

= 12964.69 MWh x 0.84 (tCO2e/MWh).

= 10890 **tCO2e**

2. For steam/ heat produced using fossil fuels the baseline emissions are calculated as follows:

As per the Para 16 of the AMS.I.C version 18 and section 4 of validated VCS PD:

The baseline emissions are calculated as follows:

$$BE_{thermal,\ Co2,y} = (EG_{thermal,y} / \eta_{BL,thermal})^{*} EF_{EF,CO2}$$

= (903.27 **TJ** / **yr** / **.82) X 95.81 tCO2**/ **TJ**

= 105539.54 tCO2/ **yr**

"Since the project activity displaces both grid power and steam from coal fired boiler, the baseline is summation of both 1 and 2."

Total Baseline Emission = 10890.00 tCO2e + 105539.54 tCO_2/ yr

=**116429 tCO2**/ **yr** (round down Value)

4.2 Project Emissions

The diesel consumption details are mentioned below:

Project I:

Project Emission = Total diesel consumption * NCV of Diesel* Emission factor of Diesel

= 59.04 m3 * 43.40 GJ/m3 * 0.07 tCo2 / GJ

= 191.65 tCO2

Project II:
Project Emission = Total diesel consumption * NCV of Diesel* Emission factor of Diesel
= 57.73.04 m3 * 43.40 GJ/m3 * 0.07 tCo2 / GJ
= 187.37 tCO2

Total Project Emission =**376 tCO2/ yr** *(*round down Value)

4.3 Leakage

As per section 4.1 of VCS PD, project proponents confirm that the renewable energy technology is not equipment transferred from another activity. Hence, no leakage calculation is required.

Also, project activity had procured and utilized biomass (rice husk) available within the 50 km radius from project sites. Hence leakage for this part is Zero.

4.4 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
01/02/2014 - 31/12/2014	58,200.00	88.00	0	58,112.00
01/01/2015 - 31/12/2015	64,200.00	96.00	0	64,104.00
01/01/2016 - 31/12/2016	63,971.00	96.00	0	63,875.00
01/01/2017 - 31/12/2017	63,672.00	96.00	0	63,576.00
Total	250,043			249,667

Appendix 1

Calibration details:

SL. NO.	NAME	LOCATION	APPLICATION	ACCURACY CLASS	LEAST COUNT	SR. NO.	CALIB. DATE
1	DIGITAL ENERGY	STEAM	MONITORING ENERGY	0.5s	1 KWH	0 7880005	26.05.2017

	METER	TURBINE	PROD BY TURBINE				25.05.2018
2	DIGITAL FLOW INDICATOR AND TOTALISER	MAIN STEAM LINE	MAIN STEAM FLOW INDICATOR AND TOTALISER	0.5s	0.01%	N/A	29.03.2017 28.03.2018
3	FLOW TRANSMITTER	MAIN STEAM LINE	MAIN STEAM FLOW TRANSMITTER	0.5s	0.1 MMH2O	0 237802	09.02.2015 08.02.2018
4	DIGITAL PRESSURE INDICATOR	MAIN STEAM LINE	SUPER HEATER HEADER PRESSURE	0.5s	0.01KG/CM^2	DP150KA	01.04.2017 31.03.2018
5	PRESSURE TRANSMITTER	MAIN STEAM LINE	MAIN STEAM PRESSURE TRANSMITTER	0.5s	0.1 BAR	08D0011	09.02.2015 08.02.2018
6	DIGITAL PID CONTROLLER	MAIN STEAM LINE	MAIN STEAM TEMPRATURE MEASURING	0.5s	0.1 DEG.C	T1P521531	27.06.2017 26.06.2018
7	DIGITAL FLOW INDICATOR AND TOTALISER	BLEED STEAM LINE	BLEED STEAM FLOW INDICATOR AND TOTALISER	0.5s	0.01 TPH	FTX55PL	13.05.2017 12.05.2018
8	FLOW TRANSMITTER	BLEED STEAM LINE	BLEED STEAM FLOW TRANSMITTER	0.5s	0.1 MMH2O	91M728060	09.02.2015 08.02.2018
9	DIGITAL PID CONTROLLER	BLEED STEAM LINE	BLEED STEAM PRESSURE MEASURING	0.5s	0.01KG/CM2	04B0078	01.04.2017 31.03.2018
10	PRESSURE TRANSMITTER	BLEED STEAM LINE	BLEED STEAM PRESSURE	0.5s	0.1 BAR	0 249655	09.02.2015 08.02.2018
11	DIGITAL PID CONTROLLER	BLEED STEAM LINE	BLEED STEAM TEMPRATURE	0.5s	0.1 DEG.C	06D0023	01.04.2017 31.03.2018

			MEASURING				
12	DIGITAL FLOW INDICATOR AND TOTALISER	EXHAUST STEAM LINE	EXHAUST STEAM FLOW INDICATOR AND TOTALISER	0.5s	0.01 TPH	0 612221	05.04.2017 04.04.2018
13	FLOW TRANSMITTER	EXHAUST STEAM LINE	EXHASUT STEAM FLOW TRANSMITTER	0.5s	0.1 MMH2O	0027111809/06	09.02.2015 08.02.2018
14	DIGITAL PID CONTROLLER	EXHAUST STEAM LINE	EXHAUST STEAM PRESSURE	0.5s	0.01KG/CM2	05L0012	27.01.2017 26.01.2018
15	PRESSURE TRANSMITTER	EXHAUST STEAM LINE	EXHAUST STEAM PRESSURE	0.5s	0.1 KG/CM2	06G0098	09.02.2015 08.02.2018
16	TEMPERATURE GAUGE 4 INCH	EXHAUST STEAM LINE	EXHAUST TEMP. MEASURING	0.5s	1 DEG.C	06-0093/14	01.04.2017 31.03.2018
17	PRESSURE GAUGE 4 INCH (ADDITIONAL)	EXHAUST STEAM LINE	EXHAUST PRESSURE MEASURING	0.5s	0.1 KG/CM2	06-0093/06	10.03.2017 09.03.2018
18	DIGITAL TEMP. INDICATOR	STEAM BOILER	FEED WATER TEMPRATURE INDICATION	0.5s	1 DEG.C	0 3122	05.04.2017 04.04.2018
19	DIGITAL WEIGHING INDICATOR	WEIGH BRIDGE	MATERIAL WEIGHING INDICATION	1	5 KG	14WB00381	02.08.2017 01.08.2018