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

Document Prepared By

Enen Management Group

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1 PROJECT DETAILS

1.1 Summary Description of Project

The purpose of the project activity is to utilize rice husk available in the region for steam and electricity generation for captive consumption. The project undertaken is a bundle of two cogeneration plants of capacity 1.0 MW (with 14TPH steam generation) and 0.6 MW (with 12 TPH steam generation) located at Bahadurgarh, Patiala in the state of Punjab and Mugalpur, Moradabad in the state of Uttar Pradesh respectively.

Due to the project activity, the power supply had partially been displaced and the steam generated from coal fired boiler had completely displaced by the new rice husk based co-generation plant.

The two projects that form the VCS 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/cm2 (g), and temperature as 420 ^{0}C. The part of the steam generated in the boiler i.e. 1.2 TPH at 17kg/cm2, 275 ^{0}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/cm2, 3.1 TPH, 240^{0}C and the exhaust steam flow from the turbine is at 4 kg/cm2, 9.7 TPH, 170^{0}C. This steam is further 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/cm2, and temperature as 400 ^{0}C. Out of 12 TPH steam generated in the boiler 2.3 TPH is fed to a Dryer at 17 Kg/ cm² , 360 ^{0}C and another 9.7 TPH of steam is fed to a Back Pressure TG set at 30 Kg/cm² , 360 ^{0}C, the exhaust steam is at 3 kg/cm2 , 240^{0}C. The electricity generating capacity is 0.6 MW.

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

Milk-food Limited
5th Floor, Bhandari House, 91 Nehru Place
New Delhi-110019 (India)
Tel: +91-11-26460670, 26463773

MFL is responsible for overall administration and implementation of the project activity.

1.4 Other Entities Involved in the Project

There are no other entities involved in the project

1.5 Project Start Date

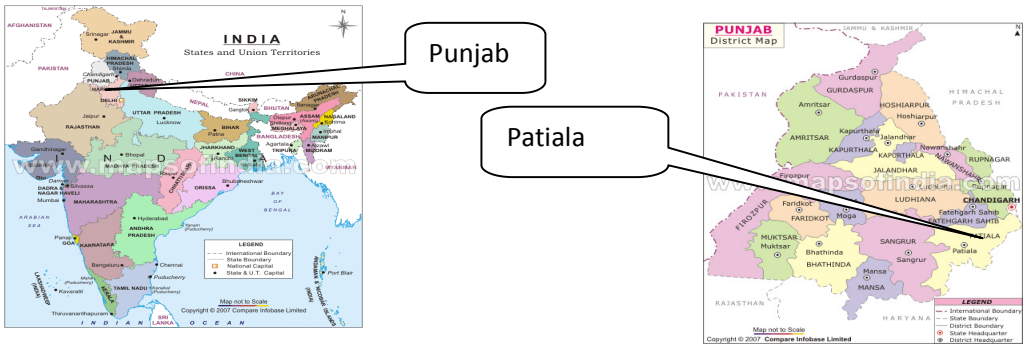
The project start date is 06-May-2009 (The Earliest commissioning of 14 TPH , 45 Kg/cm2 fluidized bed combustion boiler at Milk food Limited, Patiala(Project activity I), among both the project activity component.)

1.6 Project Crediting Period

The validated choice of crediting period is 10 years (renewed twice). The first crediting period is 06-May-2009 to 05-May-2019.1st Monitoring Period: 06 May 2009 to 31 May 2011
2nd Monitoring Period: 01 June 2011 to 13 February 2012
The project has also been registered under CDM and the crediting period for the CDM project chosen is of 10 years (fixed) and would started by 14 February 2012.Thus for the 2nd monitoring period PP has been claiming ER for the period from 01 June 2011 to 13 February 2012 to avoid double counting.

1.7 Project Location

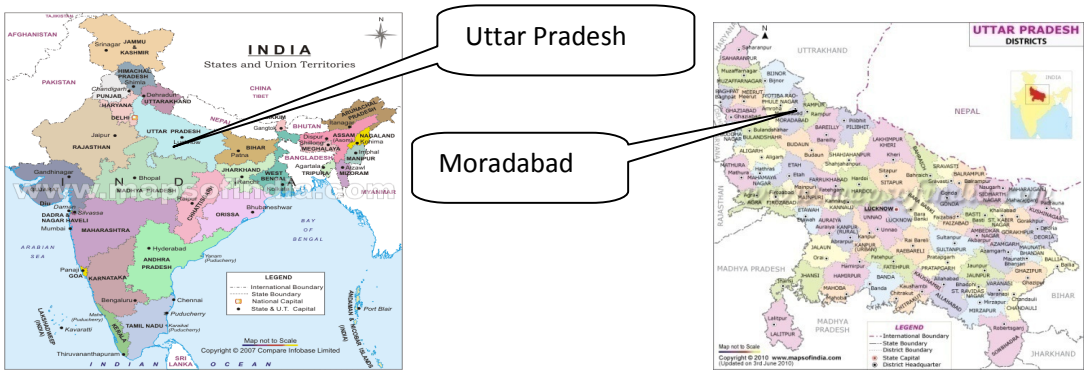
Project I
The project is located at Milk food Limited at P.O. Bahadurgarh and Patiala District of Punjab. The project site is located within latitude 30°21'55.23" N and longitude 76°28'17.59" E respectively. The map with location of the project plant is depicted below:



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.

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 operational at full capacity. Project activity was operational during the first monitoring period (06-May-2009 to 31-May-2011).

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 on emission reduction.

2.2 Deviations from the Monitoring Plan

No deviation is from the validated monitoring plan has been observed for the monitoring period under consideration.

2.3 Grouped Project

The project is not a grouped project thus this is not applicable.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data Unit / 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
Purpose of the data:	Data is used for project emission calculations
Any comment:	-

Data Unit / 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
Purpose of the data:	Data is used for Baseline and project emission calculations
Any comment:	-

Data Unit / 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
Purpose of the data:	Data is used for Baseline emission calculations
Any comment:	-

Data Unit / 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
Purpose of the data:	Data is used for Leakage emission calculations
Any comment:	-

Data Unit / Parameter:	**PLF**
Data unit:	%
Description:	Plant Load Factor
Source of data:	Third party Determination

Value applied:	90
Purpose of the data:	Data is used for Baseline emission calculations
Any comment:	-

Data Unit / Parameter:	$\eta_{BI,biomass}$
Data unit:	%
Description:	The efficiency of the project activity biomass based boiler.
Source of data:	Manufacturer specification
Value applied:	78
Purpose of the data:	Data is used for Baseline emission calculations
Any comment:	-

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:	4827.51 (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 : 23/04/2011 Calibration due date : 23/04/2012 Calibration agency : Alisha Instruments 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.
Calculation method:	-
Any comment:	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:	2426.27 (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 : 01/06/2011 Calibration due date : 31/05/2012 Calibration agency : Precision Calibration and Testing Centre 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 archiving were done in accordance with Quality Management System. Net energy generations (supplied to milk processing plant) were monthly reviewed.
Calculation method:	-
Any comment:	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 : Project I: EB98H018 Project II: EB04W256 Calibrations details of weighbridge:

	Project I : calibration date :18/11/2010 Calibration date : 23/12/2011 Calibration agency : Controller of Legal Meteorology (Weights and Measures) Govt of Punjab Project II: calibration date : 24/02/2011 Calibration date:01/03/2012 Calibration agency : Controller of Legal Meteorology (Weights and Measures) Govt of UP
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
Calculation method:	-
Any comment:	Data will be kept for crediting period + 2 years.

Data Unit / Parameter:	**FC i,j,y**
Data unit:	litres
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 I: 26620 (cumulative value for the monitoring period) Project II: 29743 (cumulative value for the monitoring period)
Monitoring equipment:	
QA/QC procedures to be applied:	-

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

Data Unit / Parameter:	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 be applied:	Reading is directly taken from steam flow meter by boiler attendant supervisor on hourly basis. 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: 78216.30 (cumulative value for the monitoring period) Project II: 62238.30 (cumulative value for the monitoring period)
Monitoring equipment:	Equipment : Steam 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 : 11/04/2011 Calibration due date : 10/04/2012 Calibration agency : Modern Electronics Results: under the specified limits. Project II:

	Last calibration date : 01/06/2011 Calibration due date : 31/05/2012 Calibration agency : Precision Calibration and Testing Centre Results: under the specified limits.
QA/QC procedures to be applied:	Steam flow meters were calibrated by external accredited agencies.
Calculation method:	-
Any comment:	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: 419 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 : 13/04/2011 Calibration due date : 12/04/2012 Calibration agency : Modern Electronics Results: under the specified limits.

	Project II: Last calibration date : 01/06/2011 Calibration due date : 31/05/2012 Calibration agency : Precision Calibration and Testing Centre Results: under the specified limits.
QA/QC procedures to be applied:	Temperature gauges were calibrated by external accredited agencies.
Calculation method:	-
Any comment:	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: 44.52 Kg/cm^2 Project II: 32 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 : 12/04/2011 Calibration due date : 11/04/2012 Calibration agency : Modern Electronics Results: under the specified limits. Project II: Last calibration date : 01/06/2011 Calibration due date : 31/05/2012 Calibration agency : Precision Calibration and Testing Centre Results: under the specified limits.
QA/QC procedures to be applied:	Pressure gauges were calibrated by external accredited agencies.
Calculation method:	-
Any comment:	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: 24115 (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 : 04/04/2011 Calibration due date : 03/04/2012 Calibration agency : Modern Electronics Results: under the specified limits.
QA/QC procedures to be applied:	Steam flow meter was calibrated by external accredited agencies.
Calculation method:	-
Any comment:	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: 239 ºC
Monitoring equipment:	Equipment: temperature gauge. Type : Electronic Accuracy : 0.5s Serial number of equipment : 06D0023 Calibration details: Last calibration date : 12/04/2011 Calibration due date : 11/04/2012

	Calibration agency : Modern Electronics 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.
Calculation method:	-
Any comment:	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: 16.56 Kg/cm^2
Monitoring equipment:	Equipment: Pressure gauge. Type : Electronic Accuracy : 0.5s Serial number of equipment : 04B0078 Calibration details: Last calibration date : 09/04/2011 Calibration due date : 08/04/2012 Calibration agency : Modern Electronics 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.
Calculation method:	-
Any comment:	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: 12771.9 (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 : 01/06/2011 Calibration due date : 31/05/2012 Calibration agency : Precision Calibration and Testing Centre Results: under the specified limits.
QA/QC procedures to be applied:	Steam flow meter is calibrated by external accredited agencies.
Calculation method:	-
Any comment:	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 : 01/06/2011 Calibration due date : 31/05/2012 Calibration agency : Precision Calibration and Testing Centre 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.
Calculation method:	-
Any comment:	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 : 01/06/2011 Calibration due date : 31/05/2012 Calibration agency : Precision Calibration and Testing Centre Results: under the specified limits.
QA/QC procedures to be applied:	Pressure gauge was calibrated by external accredited agencies.
Calculation method:	-
Any comment:	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: 54101.30 (cumulative value for the monitoring period) Project II: 49466.40 (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 : 04/04/2011 Calibration due date : 03/04/2012 Calibration agency : Modern Electronics Results: under the specified limits. Project II: Last calibration date : 01/06/2011 Calibration due date : 31/05/2012 Calibration agency : Precision Calibration and Testing Centre Results: under the specified limits.
QA/QC procedures to be applied:	Steam flow meter was calibrated by external accredited agency.
Calculation method:	-
Any comment:	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: 169 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 : 12/04/2011 Calibration due date : 11/04/2012 Calibration agency : Modern Electronics Results: under the specified limits. Project II: Last calibration date : 01/06/2011 Calibration due date : 31/05/2012 Calibration agency : Precision Calibration and Testing Centre Results: under the specified limits.
QA/QC procedures to be applied:	Temperature gauge were calibrated by external accredited agencies.
Calculation method:	-
Any comment:	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 : 12/04/2011 Calibration due date : 11/04/2012 Calibration agency : Modern Electronics Results: under the specified limits. Project II: Last calibration date : 01/06/2011 Calibration due date : 31/05/2012 Calibration agency : Precision Calibration and Testing Centre Results: under the specified limits.
QA/QC procedures to be applied:	Pressure gauges were calibrated by external accredited agencies.

Calculation method:	-
Any comment:	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: 104.32ºC Project II: 104.36 ℃
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 : 11/04/2011 Calibration due date : 11/04/2012 Calibration agency : Modern Electronics Results: under the specified limits. Project II: Last calibration date : 01/06/2011 Calibration due date : 31/05/2012 Calibration agency : Precision Calibration and Testing Centre

	Results: under the specified limits.
QA/QC procedures to be applied:	Temperature gauge were calibrated by external accredited agencies.
Calculation method:	-
Any comment:	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: 18232 Project II: 15572
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 : calibration date :18/11/2010 Calibration date : 23/12/2011 Calibration agency : Controller of Legal Meteorology (Weights and Measures) Govt of Punjab Project II: calibration date : 24/02/2011 Calibration date:01/03/2012 Calibration agency : Controller of Legal Meteorology (Weights and Measures) Govt of UP

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.
Calculation method:	-
Any comment:	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:	-
Monitoring equipment:	-
QA/QC procedures to be applied:	-
Calculation method:	-
Any comment:	Data will be kept for crediting period + 2 years.

3.3 Description of the 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.

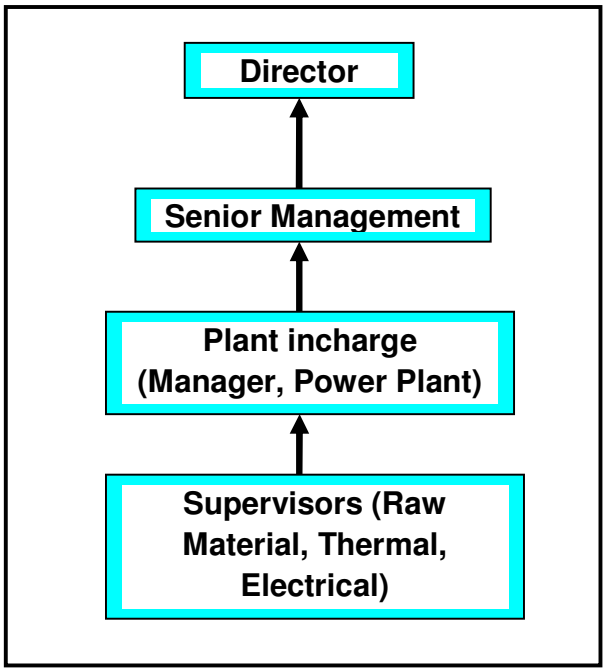
Operational & Management Structure-

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).

= 4827.51 MWh x 0.84 (tCO2e/MWh).

= **4055 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:

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

= (210.30 TJ / yr / .82) X 95.81 tCO_2/ TJ

= 24579.88 **tCO2**

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 = 4055 tCO2e + 24579.88 tCO_2/ yr

= **28634 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).

= 2426.27 MWh x 0.84 (tCO2e/MWh).

= 2038 **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:

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

= (180.28 **TJ / yr / .82) X 95.81 tCO2/ TJ**

= 21068.49 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 = 2038 tCO2e + 21068.49 tCO_2/ yr

=**23106 tCO2/ yr** (round down Value)

4.2 Project Emissions

Coal fired boiler at both the project site was scrapped out and in the current running boilers there is no coal was consumed.

The diesel consumption in DG sets were used as details are mentioned below:

Project I:
Project Emission = Total diesel consumption * NCV of Diesel* Emission factor of Diesel
= 26620 lt * 10294 Kcal/Kg * 74 tCo2 / TJ
= 75.47 tCO2

Project II:
Project Emission = Total diesel consumption * NCV of Diesel* Emission factor of Diesel
= 29743 lt * 10294 Kcal/Kg * 74 tCo2 / TJ
= 84.32 tCO2

Total Project Emission = 75.47 tCO2e + 84.32. tCO_2/ yr

=**159 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 Summary of GHG Emission Reductions and Removals

$ER_y = BE_y – PE_y – L_y$

BE_y = Baseline Emissions as calculated in Section 4.1

PE_y = Project émissions

L_y = Leakages = 0

So, ERy = BEy - PE y

Emission Reductions = (28634 + 23106) – 159 tCO2 e
= 51580 tCO2 e

Hence, total emission reductions of 51,580 tCO2e are achieved by project activity from 01-June-2011 to 13-February 2012.

5 ADDITIONAL INFORMATION

All relevant information for the purpose of the report preparation is included.

Comparison between Actual VERs Generated v/s VERs Estimated in the Registered PD

Description	Values (tCO2e)
VERs estimated in Registered PD for 12 months	69693
Estimated VERs as per the registered PD for the verification period 01/06/2011 to 13/02/2012 or say 258 days	49262
Actual VERs during the current monitoring period 01/06/2011 to 13/02/2012 (both days included)	51580
% Difference in estimated VERs in PD and actual generated VERs for the current monitoring period	4.49%

Difference between estimated VERs in PD and actual generated VERs (tCO2e) is 4.49% for the 2nd monitoring period from 1st June 2011 to 13th Feb 2012. PP has done the analysis for the current monitoring period as following:

Thermal Energy Component	
Thermal energy estimated in Registered PD for 12 months	513.33 TJ
Estimated Thermal Energy as per the registered PD for the verification period 01/06/2011 to 13/02/2012 or 258 days	362.85 TJ
Actual Thermal energy monitored for the current monitoring period 01/06/2011 to 13/02/2012 (both days included)	390.69 TJ
% Difference in estimated thermal energy in PD and actual generated thermal energy for the current monitoring period	7.67 %

Electricity Component	
Electricity energy estimated in Registered PD for 12 months	11563.2 MWh
Estimated Electricity Energy as per the registered PD for the verification period 01/06/2011 to 13/02/2012 or 258 days	8173.44 MWh
Actual Electricity energy monitored for the current monitoring period 01/06/2011 to 13/02/2012 (both days included)	7253.77 MWh
% Difference in estimated Electricity energy in PD and actual generated thermal energy for the current monitoring period	- 11.25 %

With above table it is clear that the difference is due to slightly higher PLF achieved during the current monitoring period for boiler which is already under sensitivity analysis.