Voluntary Carbon Standard
Project Description

19 November 2007

Date of the VCS PD: **15th March 2011**

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1 Description of Project:

1.1 Project title

1.6 MW Bundled Rice Husk Based Cogeneration Plant by M/s Milk food Limited (MFL) in Patiala (Punjab) & Moradabad (U.P) Districts

Version No.:02
Date: 15/04/2011

1.2 Type/Category of the project

TYPE I – Renewable energy power project
Category I.C: Thermal Energy Production with or without electricity

The project activity falls under the Sectoral Scope 1: Energy industries (renewable - / non-renewable sources) as per the sectoral scopes defined by the CDM Executive Board.

This is not a grouped project as it does not involve combination of GHG projects or other project categories. It is a single project and there are no other project participants involved.

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 and 0.6 MW located at Bahadurgarh, Patiala in the state of Punjab and Mugalpur, Moradabad in the state of Uttar Pradesh respectively.

1.3 Estimated amount of emission reductions over the crediting period including project size:

The proposed project activity is estimated to achieve average emission reductions of 69693 tCO_2e per annum over entire crediting period of 10 years. As the amount of emission reductions is greater than 5,000 tCO2e and less than 1,000,000 tCO2e, thus classifying as a project under VCS 2007.1, this is neither a micro project nor a mega project.

Years	Annual Estimate of emission reductions in tonnes of CO2e
2009 – 2010	69693
2010 – 2011	69693
2011 – 2012	69693
2012 – 2013	69693
2013 – 2014	69693
2014 – 2015	69693
2015 – 2016	69693
2016 – 2017	69693
2017 – 2018	69693
2018 – 2019	69693

Total Estimated Emission Reductions (tonnes of CO2e)	696930
No. of Crediting Years(fixed)	10
Annual Average over the crediting period of estimated reductions(tonnes of CO2 e)	696930

Table 1: Annual Estimate of emission reductions in tonnes of CO2e

1.4 A brief description of the 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.

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

Project I

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

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.

Pre – Project Scenario

The electricity demand of Milkfood Limited was met by the grid supply and the steam demand was met by low pressure coal fired boiler of 8 TPH capacity. Coal was consumed in the pre project scenario for thermal energy generation.

As due to additional demand of steam in new casein unit, PP has to increase in-house steam (thermal energy) production. Moreover, being an old and low pressure boiler, it was inefficient and thus PP thought of a new high pressure boiler (45 kg/cm^2) with co-generation system (to meet electricity demand as well) with enhanced capacity i.e. 14 TPH in-order to replace the old coal based boiler.

Project Scenario

In the project scenario, the power supply has partially been displaced and the steam generated from coal fired boiler has completely be displaced by the new rice husk based co-generation plant.

Biomass Collection, Transportation, Processing and Handling

A survey was conducted at the project activity and report has been submitted for availability of Biomass. It is confirmed that there is adequate availability of rice husk within 50 km radius around the sites. The biomass residue used as fuel for the project activity is collected from the local dealers and then transported to the project site through trucks and trolleys. The Biomass laden trucks are weighed on Weigh Bridge (electronic) installed at the entrance gate of the project site. The biomass is stored in the open area at the project site. The biomass does not require any processing as it is ready to be fired as received.

Project II

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

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.

Pre – Project Scenario

The Moradabad plant is a new installation. There was no steam and power demand prior to the proposed project activity as it is a new installation.

Project Scenario

In the project scenario, the electricity and steam will be generated by the biomass based cogeneration plant.

Biomass Collection, Transportation, Processing and Handling

A survey was conducted at the project activity and report has been submitted for availability of Biomass. It is confirmed that there is adequate availability of rice husk within 50 km radius around the sites. The biomass residue used as fuel for the project activity is collected from the local dealers and then transported to the project site through trucks and trolleys. The Biomass laden trucks are weighed on weigh-bridge (electronic) installed at the entrance gate of the project site. The biomass is stored in the open area at the project site. The biomass does not require any processing as it is ready to be fired as received.

1.5 Project location including geographic and physical information allowing the unique identification and delineation of the specific extent of the project:

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:

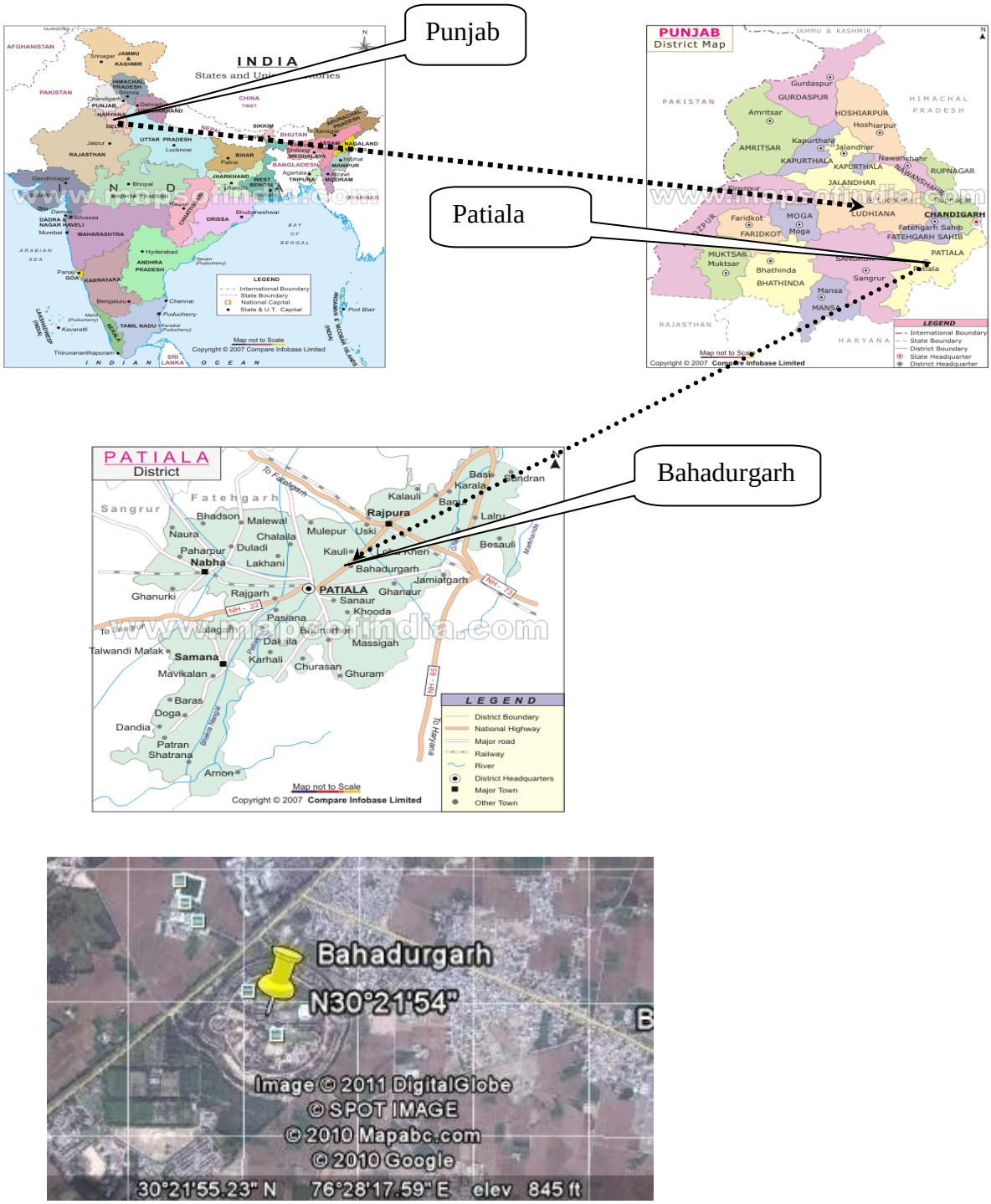


Figure 1: Map and Geo-Coordinates for Bahadurgarh, Patiala.

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:

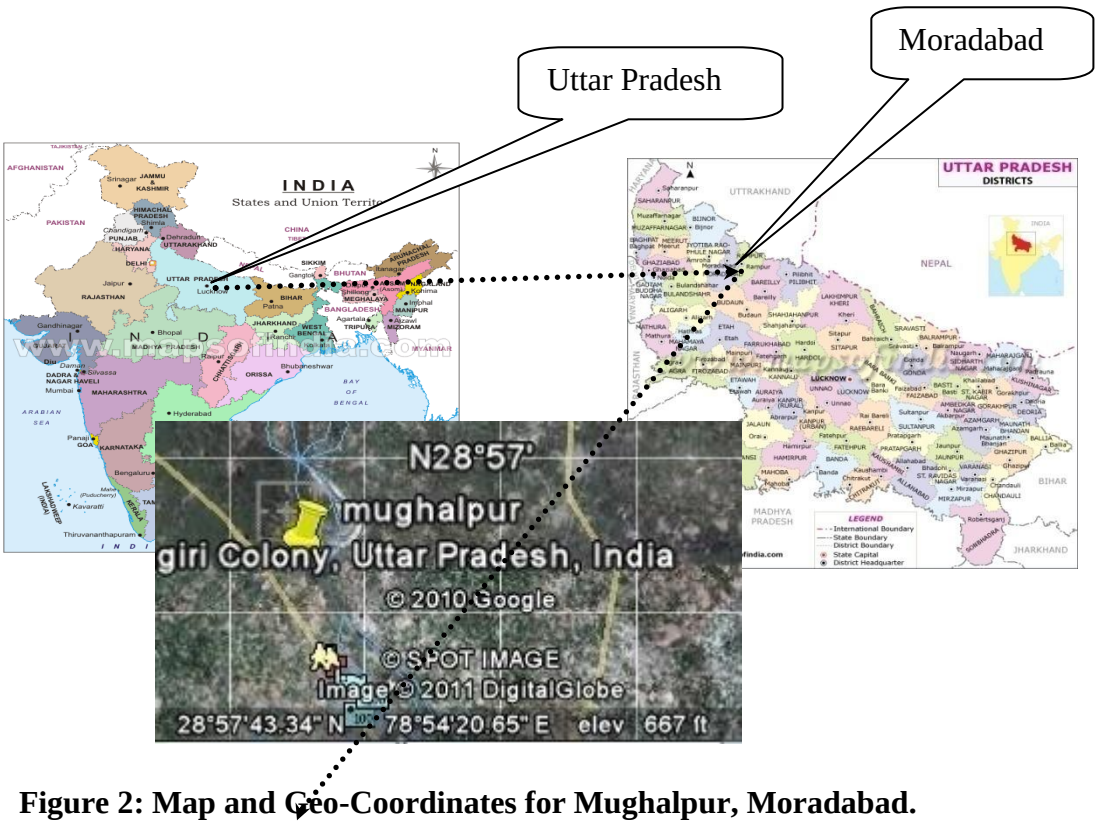


Figure 2: Map and Geo-Coordinates for Mughalpur, Moradabad.

1.6 Duration of the project activity/crediting period:

- Project start date: 6 May 2009; The earliest commissioning of 14 TPH, 45 kg/cm^2 fluidized bed Combustion boiler at Milkfood Limited, Patiala (Project activity I),among both the project activity component.
- Crediting period start date: 6 May 2009[1]
- VCS project crediting period: 10 Years
- Duration of the Project Activity[2] : A maximum of 20 years.

1.7 Conditions prior to project initiation:

Project I

The electricity demand of Milkfood Limited was met by the grid supply and the steam demand was met by coal fired boilers. Coal was consumed in the pre project scenario for thermal energy generation.

Project II

The Moradabad plant is a new installation. There was no steam and power demand prior to the proposed project activity as it is a new installation.

[1] Commissioning certificate.
[2] Chartered engineer certificate.

1.8 A description of how the project will achieve GHG emission reductions and/or removal enhancements:

The proposed project activity is utilizing only biomass as fuel and steam and power is generated. The biomass is a carbon neutral fuel as it does not lead to the emission of any GHG in the atmosphere.

The project will displace steam and electricity generation from Coal consumption leading to an emission reduction of 70444 tonnes CO_2 equivalent every year.

In the absence of the proposed project activity, the steam and electricity would have been supplied to the processing plants by the Coal based Boilers and grid respectively.

1.9 Project technologies, products, services and the expected level of activity:

The project activity entails the commissioning of a biomass residue based Cogeneration Project.

Project I

The key parameters of the Boiler[3] are given below:

Make:	M/s Cheema Boilers Ltd.
Design capacity	14 TPH
Design pressure	45 Kg/cm^2
Steam temperature.	420 ± 5 ^{0}C
Thermal Efficiency (%)	78
Fuel used	Biomass residue (Rice Husk).

Table 2: The key parameters of the Boiler

The key parameters of the Turbine[4] are given below:

Make:	M/S Pentagon Turbines Pvt. Ltd.
Design Capacity:	1000 KW
Inlet Steam Temperature:	430°C
Inlet Steam Pressure:	43 kg/cm2
Purchase date:	16-August 2007

Table 3: The key parameters of the Turbine

Project II

The key parameters of the Boiler[5] are given below:

Make:	M/S Industrial Boiler Ltd.
Design capacity	12 TPH
Design pressure	32 Kg/cm^2

[3] Purchase order from CBL dated 20 July 2007
[4] Purchase order from Pentagon Turbines Pvt. Ltd.
[5] Purchase order from Industrial Boiler Ltd.dated 25 July 2007

Steam temperature.	$400 \pm 5\ ^{0}C$
Thermal Efficiency (%)	78+2
Fuel used	Biomass residue (Rice Husk).

Table 4: The key parameters of the Boiler

The key parameters of the Turbine[6] are given below:

Make:	M/S I.B. Turbo Pvt. Ltd.
Type:	Back pressure turbine
Design Capacity:	600 KW
Inlet Steam Temperature:	360°C
Inlet Steam Pressure:	30 kg/cm2
Purchase date:	25-July 2007

Table 5: The key parameters of the Turbine

To take care of the ash from the biomass fired, Milkfood Limited has installed Wet Ash & Fuel Handling System.

The supply of biomass residues is as per biomass purchase agreement from Suppliers. The Biomass laden trucks are weighed on weigh bridges (electronic) installed at the entrance gate of Milkfood Limited. The weighbridges are calibrated as per statutory requirement once in a three year.

The project does not involve any transfer of technology.

1.10 Compliance with relevant local laws and regulations related to the project:

The project activity does not fall under the purview of the Environmental Impact Assessment (EIA) notification of the Ministry of Environment and Forest, Government of India (As per Ministry of Environment and Forests (MoEF) Notification No. - S.O. 1533, dated 14th September 2006). Also, all applicable laws and regulations in India were complied with. The required certification is obtained from the Deputy Director of Factories/ Boilers under Factories Act and Indian Boiler act. The No Objection Certificate and consent to operate are obtained from the state Pollution Control Board under Air Act and water act.

Details of the approvals are provided below:

Project I :

"Consent to Operate" obtained from PPCB under section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974 and its subsequent amendments dated 27-04-2008

"Consent to Operate" obtained from PPCB under section 21 of the Air (Prevention and Control of Pollution) Act, 1981 and its subsequent amendments dated 27-04-2008.

Project II:

[6] Purchase order from I.B. Turbo Pvt. Ltd.

"Consent to Operate" obtained from UPPCB under section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974 and its subsequent amendments dated 21-04-2008

"Consent to Operate" obtained from UPPCB under section 21 of the Air (Prevention and Control of Pollution) Act, 1981 and its subsequent amendments dated 21-04-2008

1.11 Identification of risks that may substantially affect the project's GHG emission reductions or removal enhancements:

There is no risk involved in terms of availability of biomass residue. However, biomass handling (collection, transportation and storage) is the major constraint and it can put pressure on economic viability of the project.

Also, in addition to above, the use of rice husk as fuel is associated with technical problems because of chemical composition and combustion characteristics of rice husk. High percentage of silica leads to rapid erosion of the equipments. Due to high silica content and the shape of rice husk, leads to high maintenance cost, frequent breakdown and increased downtime.[7]

Further, in rice husk fired boilers, escape of fluidized media along with flue gas is a common problem. This leads to variation in the air requirement; also the fuel flow control with respect to the steam output is difficult in biomass fired boilers. Hence, the operation & control of biomass fired boiler requires skilled boiler operators.

1.12 Demonstration to confirm that the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

Project envisaged use of biomass residues as fuel for steam and electricity generation plant. Biomass residue is renewable source and there were no GHG emissions done primarily and hence no subsequent removal or destruction followed in this project.

1.13 Demonstration that the project has not created another form of environmental credit (for example renewable energy certificates).

The Project has not created another form of environment credit till date. However project is under the validation stage in UNFCCC CDM Program. Thus, the project proponent hereby corroborate that the project has not created any other form of environmental credit till date.[8]

1.14 Project rejected under other GHG programs (if applicable):

[7] http://www.osti.gov/energycitations/servlets/purl/791079-K0YZWO/native/791079.PDF
[8] An undertaking letter by Milk food limited.

The project is not rejected under any other GHG programs. However, project is under the validation stage in UNFCCC CDM Program. Milkfood Limited is applying for VCS programme to avail carbon benefits during the crediting period of the project activity.[9]

1.15 Project proponents roles and responsibilities, including contact information of the project proponent, other project participants:

Roles and Responsibilities:

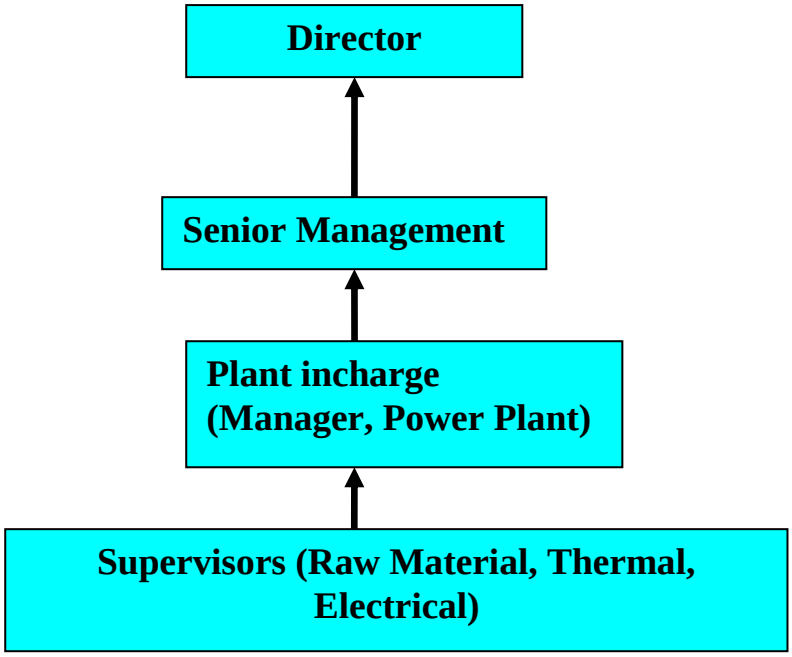
The Milkfood Limited would be the project participant, and all communication with the Validator and /or Verifier as well as with the registry would be the entity listed in the table below:

Organization:	Milkfood Limited
Street/P.O.Box:	
Building:	5th Floor, Bhandari House, 91 Nehru Place
City:	New Delhi
State/Region:	Delhi
Postfix/ZIP:	110019
Country:	India
Telephone:	+91-11-26460670, 26463773
FAX:	+91-11- 26460823
E-Mail:	
URL:	www.milkfoodltd.com
Represented by:	
Title:	
Salutation:	Vice President
Last Name:	Singh
Middle Name:	Baljeet
First Name:	Amar
Department:	
Mobile:	+91 9814084080
Direct FAX:	
Direct tel:	+91-175-2380222
Personal E-Mail:	abs@milkfoodltd.com

For carrying out the task of monitoring, the responsibility would lie with a monitoring team consisting of raw material, thermal and electrical supervisors. These supervisors will be responsible to noting the daily reading and forwarding the same to the plant in-charge. The plant in-charge will review the recorded data on daily basis and will forward a monthly report to senior management for review. The senior management would review the monthly report and will forward it to the director.

Table 6: Roles and responsibility of the Milkfood Limited.

[9] An undertaking letter by Milk food limited.



1.16 Any information relevant for the eligibility of the project and quantification of emission reductions or removal enhancements, including legislative, technical, economic, sectoral, social, environmental, geographic, site-specific and temporal information.):

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 (CO_2) 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.

Legislative:
The Project Proponent has obtained all the relevant approvals required for the establishment and operation of the project activity. All the approvals obtained are mentioned in section 1.10.

1.17 List of commercially sensitive information (if applicable):

All relevant information for the purpose of Project description is included in VCS PD.

None of the information disclosed to the validator was withheld from the public version of the report.

2 VCS Methodology:

2.1 Title and reference of the VCS methodology applied to the project activity and explanation of methodology choices:

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.C/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[10].

[10] http://cdm.unfccc.int/UserManagement/FileStorage/V7N1LH3PYOU6JFAWISGXB89ETCQM0D

Tools Used:

1. EB 50, Annex 14, Methodological tool (Version 2) of UNFCC "Tool to calculate the emission factor for an electricity system"
2. EB 41, Annex 11, Tool to calculate project or leakage CO2 emissions from fossil fuel combustion, Version 02.

2.2 Justification of the choice of the methodology and why it is applicable to the project activity:

This project falls under the "Type I: Renewable energy projects" and "Category I C: Thermal Energy production with or without electricity". According to the methodology:

S.No.	**Applicability condition**	**Justification for project activity**
1	This category comprises renewable energy technologies that supply thermal energy that displaces fossil fuels. Examples include solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass for water heating, space heating, or drying, and other technologies that provide thermal energy that displaces fossil fuel.	The proposed project activity (project I and II) at Milkfood Limited, is rice husk (biomass) based cogeneration plant and producing heat and electricity. This type of project activities is included in the methodology and therefore the methodology fulfills this requirement.
2.	Biomass-based cogeneration systems consisting of steam generator(s) and steam turbine(s) are included in this category. For the purpose of this methodology "cogeneration" shall mean the simultaneous generation of thermal energy and electrical energy in one process. Project activities that produce heat and power in separate element processes (for example, heat from a boiler and electricity from biogas engine) do not fit under the definition of cogeneration project.	The proposed project activity (project I and II) at Milkfood Limitedis rice husk (biomass) based cogeneration plant and producing heat and electricity. This type of project activities is included in the methodology and therefore the methodology fulfills this requirement.
3.	Emission reduction from a biomass cogeneration system can accrue from one of the following activities: (a) Electricity supply to a grid; (b) Electricity and/or thermal energy (steam or heat) for on-site consumption or for consumption by other facilities; (c) Combination of (a) and (b).	As the proposed project activity (project I and II) is a biomass cogeneration system for captive utilization, Thus, Out of the listed options, option (b) is applicable for the project activity. (b) Electricity and/or thermal energy (steam or heat) for on-site consumption or for consumption

		by other facilities
4.	The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal (paragraph 6 for the applicable limits for cogeneration project activities).	The installed thermal energy generation capacity is 22.6 MWth (refer to the excel sheet provided separately) thermal which less than 45 MW thermal. Thus fulfills the criteria.
5.	For co-fired systems, the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel shall not exceed 45 MW thermal (see paragraph 6 for the applicable limits for cogeneration project activities).	No Co-firing system is being utilized in the proposed project.
6.	The following capacity limits apply for biomass cogeneration units: a) If the project activity includes emission reductions from both the thermal and electrical energy components, the total installed energy generation capacity (thermal and electrical) of the project equipment shall not exceed 45 MW thermal. For the purpose of calculating this capacity limit the conversion factor of 1:3 shall be used for converting electrical energy to thermal energy (i.e., for renewable project activities, the maximal limit of 15MW(e) is equivalent to 45 MW thermal output of the equipment or the plant). b) If the emission reductions of the cogeneration project activity are solely on account of thermal energy production (i.e. no emission reductions accrue from electricity component), the total installed thermal energy production capacity of the project equipment of the cogeneration unit shall not exceed 45 MW thermal. c) If the emission reductions of the cogeneration project activity are solely on account of electrical energy production (i.e. no emission reductions accrue from thermal energy component), the total installed electrical energy	Out of the given capacity limits options (b) and (c) are not applicable, option (a) is applicable for the proposed project activity : a) The total installed energy generation capacity (thermal and electrical) of the proposed project is as follows: Project activity I: Thermal Generation: 9.3 $MW_{thermal}$ TG Installed Capacity= 1 MW (3 $MW_{thermal}$) Project activity II: Thermal Generation: 8.48 $MW_{thermal}$ TG Installed Capacity= 0.6 MW (1.8 $MW_{thermal}$) b) Thus the project activity as a whole qualifies this applicability criterion as it is within the limit of 45 MW thermal.

	generation capacity of the project equipment of the cogeneration unit shall not exceed 15 MW.	
7	In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.	This case is not applicable as the electricity as well the steam is being consumed by the producer itself (for captive use).
8	Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category.	The proposed project activity is new installation and therefore this applicability criterion is not applicable for the project activity.
9	The capacity limits specified in the above paragraphs apply to both new facilities and retrofit projects. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the total capacity of the units added by the project should comply with capacity limits in paragraphs 4 to 6 and should be physically distinct from the existing units.	The proposed project activity is new installation and therefore this applicability criterion is not applicable for the project activity.
10.	Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources provided: a) Charcoal is produced in kilns equipped with methane recovery and destruction facility; or b) If charcoal is produced in kilns not equipped with a methane recovery and destruction facility, methane emissions from the production of charcoal shall be considered. These emissions shall be calculated as per the procedures defined in the approved methodology AMS-III.K. Alternatively, conservative emission factor values from peer reviewed literature or from a registered CDM project activity can be used, provided that it can be demonstrated that the parameters from these are	There is no charcoal being used hence this criteria is not applicable.

	comparable e.g. source of biomass, characteristics of biomass such as moisture, carbon content, type of kiln, operating conditions such as ambient temperature.	
11.	If solid biomass fuel (e.g. briquette) is used, it shall be demonstrated that it has been produced using solely renewable biomass and all project or leakage emissions associated with its production shall be taken into account in emissions reduction calculation	The project activity does not utilize any biomass in the form of briquette therefore this applicability criterion is not applicable to the project activity.

Table 7: Applicability criteria and justification for the selected methodology for project I

From the above discussion, it can be concluded that project meets all the applicability criteria set under the selected approved small scale CDM methodology and hence the project category is applicable to the VCS project.

The Combined Electricity as well as Thermal production for Project I (3 MWthermal (1MWe) and 9.3 MWthermal) and Project II (1.8 MWthermal (0.6 MWe) and 8.48 MWth) is 22.56 MWth , which is less than the limit 45MWth, thus determines that the proposed project activity is a small scale project activity.

As demonstrated above the project activity satisfies the qualifying criteria of Type I: Renewable Energy Projects and Category IC: "**Thermal energy for the user with or without electricity**". Hence the choice of project Type and category is justified.

2.3 Identifying GHG sources, sinks and reservoirs for the baseline scenario and for the project:

Project I:

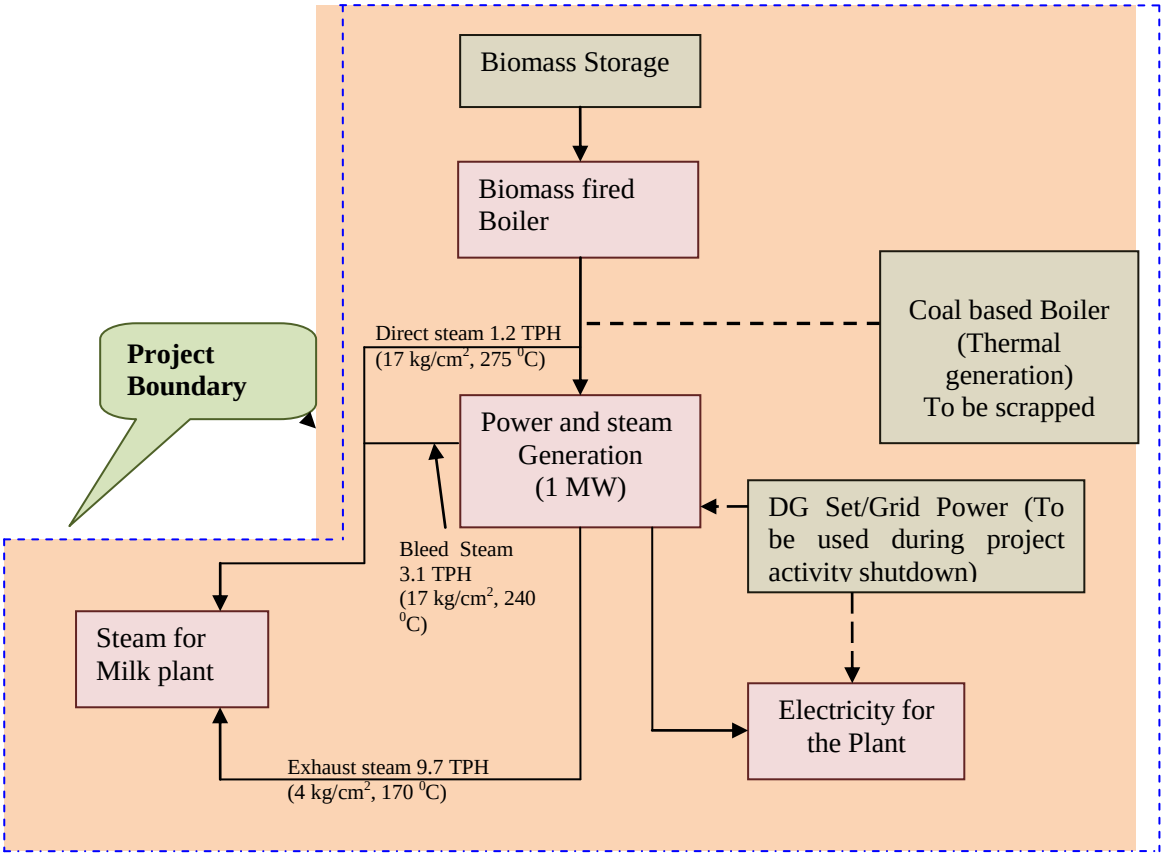


Figure 3: Sources, sink and reservoir for baseline Scenario and for the project I

Please note that the coal based boiler used in the pre-project scenario was already dismantled and it is planned to be scrapped.

Project II:

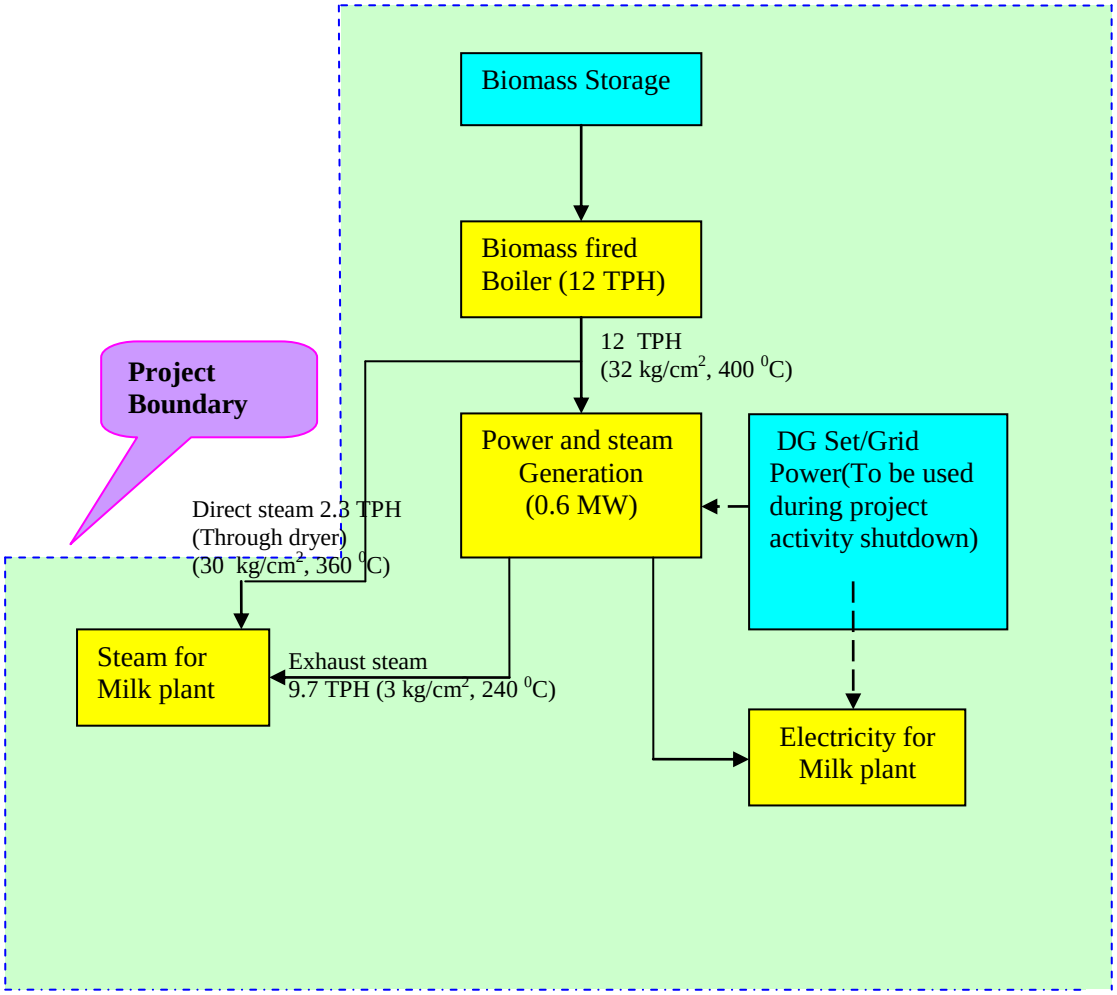


Figure 3: Sources, sink and reservoir for baseline Scenario and for the project II

The description of sources and gases as include in the project boundary is detailed in the following table:

	Source	**Gas**		**Justification/ Explanation**
Baseline	Grid electricity generation	CO2	Included	Main Emission source.
		CH4	Excluded	Excluded for simplification. This is conservative.
		N2O	Excluded	Excluded for simplification. This is conservative.
	Steam generation	CO2	Included	Main Emission source.
		CH4	Excluded	Excluded for simplification. This is conservative.
		N2O	Excluded	Excluded for simplification. This is conservative.
Project Activity	On site fossil fuel and electricity consumption due to the project activity (stationary or mobile)	CO2	Included	The emission due to onsite fossil fuel consumption attributable to the project activity has been included in the project activity.
		CH4	Excluded	
		N2O	Excluded	

	Source	Gas		Justification/ Explanation
Baseline	Grid electricity generation	CO2	Included	Main Emission source.
		CH4	Excluded	Excluded for simplification. This is conservative.
		N2O	Excluded	Excluded for simplification. This is conservative.
	Off site Transportation of biomass residues	CO2	Excluded	Explained in section 4.1
		CH4	Excluded	Excluded for simplification. This is conservative.
		N2O	Excluded	Excluded for simplification. This is conservative.
	Combustion of biomass residues for electricity and/or heat generation	CO2	Excluded	Does not apply to the project activity as there is no uncontrolled burning or decay of biomass residues that would lead to GHG emissions
		CH4	Excluded	
		N2O	Excluded	
	Storage of biomass residues	CO2	Excluded	Does not apply to the project activity as the biomass residues storage period is less than one year.
		CH4	Excluded	
		N2O	Excluded	

Table 9: The description of sources and gases as include in the project boundary

2.4 Description of how the baseline scenario is identified and description of the identified baseline scenario:

Baseline Scenario: As per the Para 15 of AMS.I.C Version 18

Project activities producing both heat and electricity using biomass cogeneration shall use one of the following baseline scenarios:[11]

(a) Electricity is imported from the grid and thermal energy (steam/heat) is produced using fossil fuel;

(b) Electricity is produced in an on-site captive power plant using fossil (with a possibility of export to the grid) and thermal energy (steam/heat) is produced using fossil fuel;

(c) A combination of (a) and (b);

(d) Electricity and thermal energy (steam/heat) are produced in a cogeneration unit using fossil fuel (with a possibility of export of electricity to the grid/other facilities and/or thermal energy to other facilities);

(e) Electricity is imported from the grid and/or produced in an on-site captive power plant using fossil fuels (with a possibility of export to the grid); steam/heat is produced from biomass;

[11] Cases where no historical information is available, the most plausible energy supply sources shall be established in accordance with the guidance on Greenfield projects in the general guidelines to SSC CDM methodologies.

(f) Electricity is produced in an on-site captive power plant using biomass (with a possibility of export to the grid) and/or imported from the grid; steam/heat is produced using fossil fuel;

(g) Electricity and thermal energy (steam/heat) are produced in a biomass fired cogeneration unit (without a possibility of export of electricity either to the grid or to other facilities and without a possibility of export of thermal energy to other facilities):[12]

(h) Electricity and/or thermal energy produced in a co-fired system.

As per the applied methodology, AMS.I.C, version 18, Project activities producing both heat and electricity including cogeneration use following baseline scenarios:

(a) Electricity is imported from the grid and thermal energy (steam/heat) is produced using fossil fuel;

Demonstration of the chosen baseline scenario is represented below:

Project I:

The project proponent had following alternatives in order to fulfill the steam and power requirement of the milk plant processing:

1. Use of fossil fuels like coal, furnace oil and diesel as fuel source
2. Use of biomass (rice husk) as fuel source
3. Use of Natural Gas (NG) as fuel source.

As Natural Gas is not available in the region of Punjab, the alternative 3 is not possible for the project proponent. Among other options the unit cost of energy was the basis for selection as a fuel and the same is analyzed in the following table:

The unit cost of various fuels options available for steam and power generation per unit of energy generation, are shown below.

Fuel type	Fuel NCV	Fuel price	Cost per unit of energy(Rs/TJ)
FO	0.0000404TJ/Kg [13]	27.92 Rs./Kg[14]	691089.1089
Diesel	0.000043 TJ/Kg [15]	34.86 Rs./Lt [16]	988655.71
Coal	0.000019228TJ/Kg [17]	3.2 Rs./Kg [18]	166423.9651

[12] This scenario applies to the situation where new grid connected biomass cogeneration system/s installed by the project activity produces surplus electricity compared to the pre-project situation and all the services provided in baseline i.e. energy supply are maintained at the same level or improved during the crediting period (see paragraph 32).
[13] IPCC default value(http://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1wb1.pdf)
[14] As per the quotation from the supplier.
[15] IPCC default value(http://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1wb1.pdf)
[16] As per the quotation from the Supplier.
[17] As per lab test reports.
[18] As per the quotations from the supplier.

Biomass(rice husk)	0.00001254 TJ/Kg[19]	2.5 Rs./Kg[20]	199362.0415

Table 10: The unit cost of various fuels options available for steam and power generation per unit of energy generation for project I

As is evident from above, coal has the lowest unit cost amongst all the fuel options available (It is substantially low). Therefore coal has been chosen as the possible fuel alternatives for the project activity.

Hence the most plausible baseline scenario for this project activity is "Steam generation using coal"

In the state of Punjab, interrupt and continuous supply of power from grid is a problem and since it was requirement of plant to ensure the continuous and interrupt supply of power to processing unit, Milkfood Limited had to invest for the power unit as well. Now the option for power generation were either power from coal or from rice husk based power unit. Thus basically cost of per unit of power was compared between coal based power unit and rice husk based power unit in addition to the interrupted grid power supply as given below: (Pl. Refer to excel sheet)

Unit cost of electricity imported from the grid: Rs 3.25
Unit cost of electricity based on coal: Rs 0.431
Unit cost of electricity based on rice husk: Rs 0.62

Thus it clearly shows that coal based power unit would be preferable option for Patiala plant which does not faces any barriers and therefore same would have been installed for power generation in the absence of rice husk based cogeneration unit. And thus the coal based power unit is baseline scenario. But to adopt a conservative approach, grid has been considered as baseline scenario for emission reduction calculation.

Project II:

Among the available options the unit cost of energy was the basis for selection of fuel for steam generation and the same is analyzed in the following table.

The unit cost of various fuels options available for steam and power generation per unit of energy generation, are shown below.

Fuel type	**Fuel NCV**	**Fuel price**	**Cost per unit of energy(Rs/TJ)**
FO	0.0000404 TJ/Kg	27.92 Rs/ Kg	691089.11
Diesel	0.000043 TJ/Kg	34.86 Rs/Lt	988655.71
Coal	0.000019228 TJ/Kg	3.2 Rs/ Kg	166423.96
Biomass (rice husk)	0.000012540 TJ/Kg	3.0 Rs/ Kg	239234.44

Table 11: The unit cost of various fuels options available for steam and power generation per unit of energy generation for project II

[19] As per lab test reports.
[20] As per the quotations from the Suppliers.

As is evident from above, coal has the lowest unit cost amongst all the fuel options available. Therefore coal has been chosen as the possible fuel for the project activity. Hence the most plausible baseline scenario for this project activity is **"Steam generation using coal"**

In the state of U.P., interrupt and continuous supply of power from grid is a problem and since it was requirement of plant to ensure the continuous and uninterrupted supply of power to processing unit, Milkfood Limited had to invest for the power unit as well. Now the option for power generation were either power from coal or from rice husk based power unit. Thus basically cost of per unit of power was compared between coal based power unit and rice husk based power unit in addition to the interrupted grid power supply as given below: (Pl. Refer to excel sheet)

Unit cost of electricity imported from the grid: Rs 3.32
Unit cost of electricity based on coal: Rs 0.51
Unit cost of electricity based on rice husk: Rs 0. 74

Thus it clearly shows that coal based power unit would be preferable option for Moradabad plant which does not faces any barriers and therefore same would have been installed for power generation in the absence of rice husk based cogeneration unit. And thus the **coal based power unit** is baseline scenario. But to adopt a conservative approach, grid has been considered as baseline scenario for emission reduction calculation.

Thus the most plausible baseline scenario for project I and project II is in accordance to para 15 (a) of AMS.I.C version 18 i.e. "***Electricity is imported from the grid and thermal energy (steam/heat) is produced using fossil fuel i.e. coal***"

2.5 Description of how the emissions of GHG by source in baseline scenario are reduced below those that would have occurred in the absence of the project activity (assessment and demonstration of additionality):

The project proponent shall in the VCS PD, in addition to describing how the project meets the VCS methodology, demonstrate that the project is additional based on one of the tests, the project test, the performance test, and technology test.

Thus, the additionality of the project activity is explained on the basis of barrier analysis mentioned in Attachment A to Appendix B of Simplified modalities and procedures for small scale project activities as referred by applied methodology i.e. AMS.I.C, version 18. Attachment A to Appendix B mentions the barriers listed below and at least one of the listed barriers should be explained to show that the project activity could not be undertaken due to the barrier and that the VCS revenue would significantly act as an impetus for the project to survive.

1. Investment barrier
2. Technological barrier
3. Barrier due to prevailing practice
4. Other barriers

As mentioned in section 2.4, the project proponent has four alternative fuels to generate thermal energy required for the process; however it may be noted that alternative 4 *i.e.* Use of biomass in the boiler (rice husk) as fuel source faced following barrier which is detailed below:

Investment Barrier

The proposed project activity and the identified baseline alternative generate no financial or economic benefits other than VCS related income. Project faces capital or investment return constraints that can be overcome by the additional revenues associated with the generation of VCUs.A cost comparison is made with data of Milkfood Limited; this suggests the per unit cost in quantitative terms.

Below table provides the unit cost comparison analysis for project I:

Parameter	Coal	Rice husk	Unit	Reference
Quantity of steam generated	14	14	TPH	Feasibility report approved by PEDA and Purchase order
Design efficiency of boiler*	0.82	0.78	%	Feasibility report approved by PEDA
Fuel calorific value	4600	3000	Kcal/kg	Feasibility report approved by PEDA and fuel quotations
Running hours	8030	8030	Hrs per annum	Assumptions considered in Feasibility report
Enthalpy of steam output	3254	3254	KJ/kg	Derived at design temp. and pressure (from steam table)
Enthalpy of feed water	440.274	440.274	KJ/kg	Derived, Liquid properties (Steam table)
Boiler output	39385444	39385444	KJ/hr	Calculated
Energy input in boiler	48031029.27	50494158.97	KJ/hr	Calculated
Specific energy consumption	3430787.805	3606725.641	kJ/Ton of steam	Calculated
Fuel consumption rate	178	288	kg (coal)/Ton of steam	Calculated
Annual fuel requirement	20058.7250	32334	Ton/annum	Calculated
Price	3200	3000	Rs./Tonne	Feasibility report approved by PEDA
Fuel Cost per year	642	808	Rs. Lakhs	Calculated
Total steam generated	112420	112420	Tonnes/year	Calculated

Unit cost of energy generation	**570.97**	**862.85**	**Rs./Tonne**	Calculated

Table 12: unit cost comparison analysis for project I

* Design efficiency of boilers is chosen in a conservative way.

Above table clearly indicates that rice husk is not preferable option as it will cost more than coal which is baseline scenario.

In the state of Punjab, continuous supply of power is a problem and since it was requirement of plant to ensure the continuous and uninterrupted supply of power to processing unit, Milkfood Limited had to invest for the power unit as well. Now the option for power generation were either power from coal or from rice husk based power unit. Thus basically cost of per unit of power was compared between fuel as a coal and fuel as a rice husk. However calculation concludes:

Unit cost of electricity based on coal: Rs 0.43
Unit cost of electricity based on rice husk: Rs 0.62

As demonstrated above, the use of coal is the most cost effective option. It is evident from the above table that the average cost of steam generation using biomass (rice husk) is costlier compared to coal based steam and power generation. Hence the project activity is not a business-as-usual scenario.

The above analysis clearly demonstrates that project I is additional to that would have been implemented in the absence of project.

Below table provides the unit cost comparison analysis for project II:

Parameter	Coal	Rice husk	Unit	Reference
Steam quantity	12	12	TPH	Feasibility report and Purchase order
Design efficiency of boiler*	0.82	0.78	%	Feasibility report
Fuel calorific value	4600	3000	kcal/kg	Feasibility report and fuel quotations
Running hours	8030	8030	Hrs per annum	Assumptions considered in Feasibility report
Enthalpy of steam output	3228	3228	KJ/kg	Derived at design temp. and pressure (from steam table)
Enthalpy of feed water	440.274	440.274	KJ/kg	Derived, Liquid properties (Steam table)

Boiler output	33456192	33456192	KJ/hr	Calculated
Energy input in boiler	40800234.15	42892553.85	KJ/hr	Calculated
Specific energy consumption	3400019.512	3574379.487	kJ/Ton of steam	Calculated
Fuel consumption rate	177	285	kg (coal)/Ton of steam	Calculated
Annual fuel requirement	17039	27466	Ton/annum	Calculated
Price	3200	3000	Rs./Tonne	Feasibility report
Fuel Cost per year	545	824	Rs. Lakhs	Calculated
Total steam generated	96360	96360	Tonnes/year	Calculated
Unit cost of energy generation	**565.84**	**855.11**	**Rs./Tonne**	Calculated

Table 13: unit cost comparison analysis for project II

*Design efficiency of boilers is chosen in a conservative way.

Above table clearly indicates that rice husk is not preferable option as it will cost more than coal which is an actual baseline scenario.

In the state of U.P., continuous supply of power is a problem and since it was requirement of plant to ensure the continuous and uninterrupted supply of power to processing unit, Milkfood Limited had to invest for the power unit as well. Now the option for power generation were either power from coal or from rice husk based power unit. Thus basically cost of per unit of power was compared between fuel as a coal and fuel as a rice husk. However calculation concludes:

Unit cost of electricity based on coal: Rs 0.51
Unit cost of electricity based on rice husk: Rs 0.74

The above analysis clearly demonstrates that project II is additional to that would have been implemented in the absence of project.

As demonstrated above, the use of coal is the most cost effective option. It is evident from the above table that the average cost of steam generation using biomass (rice husk) is costlier compared to coal based steam and power generation. Hence the project activity is not a business-as-usual scenario.

The tabular representation of sensitivity demonstration is as below:

Project I:

Parameter	**Unit Cost of thermal energy generation on coal**	**Unit cost of electrical energy generation (Rs./kwh)**

	(Rs./ton)			
	Coal	**Biomass**	**Coal**	**Biomass**
Variation in Coal and Biomass price				
10% fall in Biomass Price, other parameter remains constant	570.97	776.57	0.4313	0.5166
10% fall in Coal Price, other parameter remains constant	513.87	862.85	0.3881	0.4650
10% hike in Coal Price , other parameter remains constant	628.06	862.85	0.4744	0.5166
10% hike in Biomass price other parameter remains constant	570.97	949.14	0.4313	0.5683
Variation in NCV of coal and biomass				
NCV of biomass increased by 10%, other parameter remains constant	570.97	784.41	0.4313	0.5636
NCV of coal increased by 10%, other parameter remains constant	519.06	862.85	0.392	0.620
NCV of biomass decreased by 10%, other parameter remains constant	570.97	958.73	0.4313	0.688
NCV of coal decreased by 10%, other parameter remains constant	634.41	862.85	0.479	0.620

Project II

Parameter	**Unit Cost of thermal energy generation on coal (Rs./ton)**		**Unit cost of electrical energy generation (Rs./kwh)**	
	Coal	**Biomass**	**Coal**	**Biomass**
Variation in Coal and Biomass price				
10% fall in Biomass Price, other parameter remains constant	565.84	769.60	0.516	0.668
10% fall in Coal Price, other parameter remains constant	509.26	855.11	0.464	0.742
10% hike in Coal Price, other parameter remains constant	622.43	855.11	0.568	0.742
10% hike in Biomass price, other parameter remains constant	565.84	940.63	0.516	0.816
Variation in NCV of coal and biomass				

NCV of biomass increased by 10%, other parameter remains constant	565.84	777.38	0.516	0.674
NCV of coal increased by 10%, other parameter remains constant	514.40	855.11	0.469	0.7424
NCV of biomass decreased by 10%, other parameter remains constant	565.84	950.13	0.516	0.824
NCV of coal decreased by 10%, other parameter remains constant	628.72	855.11	0.573	0.7424

The conclusion of the sensitivity analysis is that the unit cost of steam (thermal) and power generation is very sensitive to calorific value and cost of rice husk. For all analyzed cases, the unit cost of steam generation is well above the unit cost of steam generation in baseline scenario. Even in the case of a maximum decrease in rice husk price or increase in calorific value of rice husk, the unit cost of steam and power production in case of project activity is well above the baseline scenario.

Thus, together the project activity is faces investment barrier and thus additional.

3 Monitoring:

3.1 Title and reference of the VCS methodology (which includes the monitoring requirements) applied to the project activity and explanation of methodology choices:

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.C/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[21].

As already discussed in section 2.2, the project activity I & II at Milkfood Limited is rice husk (biomass) based cogeneration plant and producing heat. This type of project

[21] http://cdm.unfccc.int/UserManagement/FileStorage/V7N1LH3PYOU6JFAWISGXB89ETCQM0D

activities is included in the methodology and therefore the methodology fulfills this requirement. The methodology chosen is appropriate for the proposed project activity.

3.2 Monitoring, including estimation, modelling, measurement or calculation approaches:

- *Purpose of monitoring*

Purpose of monitoring is to archive the data and information that will be collected in order to monitor and calculate the baseline emissions, the project emissions and the emission reductions from the project activity.

- *Monitoring roles and responsibilities*

Operational & Management Structure-

The project proponent has designed a measurement and verification plan in order to ensure the proper, regular measurement and recording of the data pertaining to the GHG emission reduction.
A detail of hierarchy level in Operational & Management Structure of CDM team is provided in section 1.15.

All the measurements taken by the Supervisor and are recorded in the log sheets and these log sheets are verified by the Shift In charge. Every shift data log sheet is submitted to the senior manager and these log sheets are cross verified. The plant incharge will review the recorded data on daily basis and will forward a monthly report to senior management for review. The senior management would review the monthly report and will forward it to the director. By this operational structure the management can monitor the project activity and make amendments immediately, if needed. Hence there is no chance for data loss. All the data is stored in the computer and kept for 15 years.

3.3 Data and parameters monitored / Selecting relevant GHG sources, sinks and reservoirs for monitoring or estimating GHG emissions and removals:

Data and parameters those are 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 to be used:	As per NATCOM (India), 1994, Chapter 2: GHG Inventory Information, pg 37
Value of data applied for the purpose of calculating expected emission reductions	95.81
Description of measurement methods and procedures to be applied:	Default values, as per para 13 of AMS I C version 18, reliable local or national data (data from NATCOM, India) can be used for calculation of emission factor.

QA/QC procedures to be applied:	Not applicable
Any comment:	-

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 to be used:	Manufacturer specification
Value of data applied for the purpose of calculating expected emission reductions	82
Description of measurement methods and procedures to be applied:	This value is provided by the boiler manufacturer.
QA/QC procedures to be applied:	Not applicable
Any comment:	-

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO_2/ MWh
Description:	Combined margin CO2 emission factor for NEWNE grid
Source of data to be used:	Central Electricity Authority (CEA) version 5
Value of data applied for the purpose of calculating expected emission reductions	0.0.84
Description of measurement methods and procedures to be applied:	The Combined Emission Factor for NEWNE grid has been calculated in accordance with Version 2 of "Tool to calculate the emission factor for an electric system". The weightage for Operating and Build margin emission factors are taken as 0. 5 and 0. 5. The operating and build margin values (including imports) have been sourced from CEA Baseline Database, version 05.
QA/QC procedures to be applied:	Not applicable
Any comment:	-

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 to be used:	Table 1.2 & Table 1.4 Chapter 1 Volumes 2 of IPCC, 2006.

Value of data applied for the purpose of calculating expected emission reductions	0.0032
Description of measurement methods and procedures to be applied:	Default values, as per EB 41, Annex 11 (IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 & Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories if values are not provided by the fuel supplier
QA/QC procedures to be applied:	Not applicable
Any comment:	-

Data / Parameter:	**PLF**
Data unit:	%
Description:	Plant load factor
Source of data to be used:	Third party determination
Value of data applied for the purpose of calculating expected emission reductions	90
Description of measurement methods and procedures to be applied:	According to EB48 annex 11 third party determination of the PLF is required and the same value to be used.
QA/QC procedures to be applied:	-
Any comment:	PLF refers to the average generation capacity utilization of the Cogeneration plant.

Data / Parameter:	$\eta_{Bl,biomass}$
Data unit:	%
Description:	The efficiency of the project activity biomass based boiler.
Source of data to be used:	Manufacturer specification
Value of data applied for the purpose of calculating expected emission reductions	78
Description of measurement methods and procedures to be applied:	As per feasibility report approved by PEDA and technical specification provide by boiler supplier
QA/QC procedures to be applied:	Not applicable
Any comment:	-

Data and parameters monitored in Project I and Project II:

Data / Parameter:	**Net Electricity ($EG_{PJ,y}$)**
Data unit:	MWh/yr
Description:	Net electricity generated by project activity I
Source of data to be used:	On site instruments.
Value of data applied for the purpose of calculating expected emission reductions	Project-I: 7227 MWh

Description of measurement methods and procedures to be applied:	Monitoring: electronic energy meters at the sent out point of the project activity plant will measure the data of net electricity generated. If, in case the net electricity is not monitored directly, the net electricity will be calculated by subtracting the electricity used by the project activity auxiliaries from gross 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) would be responsible for regular calibration of the meter Calibration Frequency: once in a three year.
QA/QC procedures to be applied:	Energy meters will be duly calibrated by accredited agency and Yes, Quality Management System will be used and the same procedurally records of net electricity generation will be checked by Plant in charge and a consolidated monthly monitoring report will be submitted to top management for internal review.
Any comment:	Data will be kept for crediting period + 2 years.

Data / Parameter:	**Net Electricity ($EG_{PJ,y}$)**
Data unit:	MWh/yr
Description:	Net electricity generated by project activity II
Source of data to be used:	On site instruments.
Value of data applied for the purpose of calculating expected emission reductions	Project-II: 4336.2 MWh
Description of measurement methods and procedures to be applied:	Monitoring: electronic energy meters at the sent out point of the project activity plant will measure the data of net electricity generated. If, in case the net electricity is not monitored directly, the net electricity will be calculated by subtracting the electricity used by the project activity auxiliaries from gross electricity generated. Data type: Measured or (as well calculated in case net is not monitored). 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 a three year.
QA/QC procedures to be applied:	Energy meters will be duly calibrated by accredited agency and Yes, Quality Management System will be used and the same procedurally records of net electricity generation will be checked by Plant in charge and a consolidated monthly monitoring report will be submitted to top management for internal review.
Any comment:	Data will be kept for crediting period + 2 years.

Data / 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 to be used:	On site measurement; plant log sheet/records.
Value of data applied for the purpose of calculating expected emission reductions	0
Description of measurement methods and procedures to be applied:	Quantity of fossil fuel type i-(coal) used in project activity would be measured using weigh scales and recorded in Log books. Monitoring: Weigh bridge will monitor the data. Data type: Measured. Archiving policy: Paper. Recording Frequency: Daily Responsibility: Manager (power plant) would be responsible for regular calibration of the Weigh bridge. Accuracy of weigh bridge is 0.5 %. Calibration Frequency: once in a three year.
QA/QC procedures to be applied:	The data will be cross checked with the fossil fuel of type i procurement data (Invoices). Weigh scale will be calibrated annually by external accredited agencies.
Any comment:	Data will be kept for crediting period + 2 years.

Data / Parameter:	**FC i,j,y**
Data unit:	litre
Description:	Quantity of fossil fuel (Diesel) of type i combusted in DG set in year y
Source of data to be used:	On site measurement; plant log sheet/records.
Value of data applied for the purpose of calculating expected emission reductions	0
Description of measurement methods and procedures to be applied:	Quantity of fossil fuel type i-(Diesel) used in project activity I & II (DG sets) would be measured through procurement data.

	Monitoring: measurement through invoices. Data type: Measured. Archiving policy: Paper. Recording Frequency: Daily Responsibility: Manager (power plant) would be responsible for regular achieving of quantity of diesel used.
QA/QC procedures to be applied:	-
Any comment:	Data will be kept for crediting period + 2 years.

Data / Parameter:	**Q_{steam}**
Data unit:	tonne
Description:	Quantity of steam generated form project activity biomass boiler
Source of data to be used:	Onsite measurement taken from steam flow meter
Value of data applied for the purpose of calculating expected emission reductions	Project I: 112420 Tonner per annum Project II: 96360 Tonner per annum
Description of measurement methods and procedures to be applied:	Reading will be directly taken from steam flow meter by boiler attendant 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.
QA/QC procedures to be applied:	Steam flow meter will be calibrated once in a three year by external accredited agencies.
Any comment:	Data will be kept for crediting period + 2 years.

Data / Parameter:	**T_{steam}**
Data unit:	Degree Celsius
Description:	Temperature of the steam generated.
Source of data to be used:	On-site measurement from temperature gauge installed at steam outlet from boiler
Value of data applied for the purpose of calculating expected emission reductions	Project I: 420 ºC Project II: 400 ºC
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) would

	be responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
QA/QC procedures to be applied:	Temperature gauge will be calibrated once in a three year by external accredited agencies.
Any comment:	Data will be kept for crediting period + 2 years.

Data / Parameter:	**P_{steam}**
Data unit:	Kg/cm2
Description:	Pressure of the steam generated
Source of data to be used:	On site measurement from pressure gauge.
Value of data applied for the purpose of calculating expected emission reductions	Project I: 45 Kg/cm^2 Project II: 32 Kg/cm^2
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 meter. Calibration Frequency: once in a three year.
QA/QC procedures to be applied:	Pressure gauge will be calibrated once in a three year by external accredited agencies.
Any comment:	Data will be kept for crediting period + 2 years.

Data / 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 to be used:	Onsite measurement taken from steam flow meter
Value of data applied for the purpose of calculating expected emission reductions	Project I: 34529 Tonner per annum
Description of measurement methods and procedures to be applied:	Reading will be 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.
QA/QC procedures to be applied:	Steam flow meter will be calibrated once in a three year by external accredited agencies.

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

Data / Parameter:	$\mathbf{T_{steam,HP,I}}$
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 to be used:	On-site measurement from temperature gauge installed at steam outlet from boiler
Value of data applied for the purpose of calculating expected emission reductions	Project I: 240 ºC
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) would be responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
QA/QC procedures to be applied:	Temperature gauge will be calibrated once in a three year by external accredited agencies.
Any comment:	Data will be kept for crediting period + 2 years.

Data / Parameter:	$\mathbf{P_{steam,\ HP},I}$
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 to be used:	On site measurement from pressure gauge.
Value of data applied for the purpose of calculating expected emission reductions	Project I: 17 Kg/cm^2
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 meter. Calibration Frequency: once in a three year.
QA/QC procedures to be applied:	Pressure gauge will be calibrated once in a three year by external accredited agencies.
Any comment:	Data will be kept for crediting period + 2 years.

Data / Parameter:	$\mathbf{Q_{steam,HP,II}}$

Data unit:	tonne
Description:	Quantity of steam used in the process at high pressure side.
Source of data to be used:	Onsite measurement taken from steam flow meter
Value of data applied for the purpose of calculating expected emission reductions	Project II: 18469 Tonner per annum
Description of measurement methods and procedures to be applied:	Reading will be 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.
QA/QC procedures to be applied:	Steam flow meter will be calibrated once in a three year by external accredited agencies.
Any comment:	Data will be kept for crediting period + 2 years.

Data / Parameter:	**$T_{steam,HP}$**
Data unit:	Degree Celsius
Description:	Temperature of the steam used in the process at high pressure(at high pressure side)
Source of data to be used:	On-site measurement from temperature gauge installed at steam outlet from boiler
Value of data applied for the purpose of calculating expected emission reductions	Project II: 360 ºC
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) would be responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
QA/QC procedures to be applied:	Temperature gauge will be calibrated once in a three year by external accredited agencies.
Any comment:	Data will be kept for crediting period + 2 years.

Data / Parameter:	**P_{steam}**
Data unit:	Kg/cm2
Description:	Pressure of the steam used in the process at high pressure(at high pressure side)
Source of data to be used:	On site measurement from pressure gauge.

Value of data applied for the purpose of calculating expected emission reductions	Project II: 30 Kg/cm^2
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 meter. Calibration Frequency: once in a three year.
QA/QC procedures to be applied:	Pressure gauge will be calibrated once in a three year by external accredited agencies.
Any comment:	Data will be kept for crediting period + 2 years.

Data / Parameter:	**$Q_{steam,LP}$**
Data unit:	Tonne
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 to be used:	Onsite measurement taken from steam flow meter
Value of data applied for the purpose of calculating expected emission reductions	Project I: 77891 Tonner per annum Project II: 77891 Tonner per annum
Description of measurement methods and procedures to be applied:	Reading will be 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.
QA/QC procedures to be applied:	Steam flow meter will be calibrated once in a three year by external accredited agencies.
Any comment:	Data will be kept for crediting period + 2 years.

Data / 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 to be used:	On-site measurement from temperature gauge installed at steam outlet from boiler
Value of data applied for the purpose of	Project I: 170ºC

calculating expected emission reductions	Project II: 240ºC
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) would be responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
QA/QC procedures to be applied:	Temperature gauge will be calibrated once in a three year by external accredited agencies.
Any comment:	Data will be kept for crediting period + 2 years.

Data / Parameter:	**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 to be used:	On site measurement from pressure gauge.
Value of data applied for the purpose of calculating expected emission reductions	Project I: 4 Kg/cm^2 Project II: 3 Kg/cm^2
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 meter. Calibration Frequency: once in a three year.
QA/QC procedures to be applied:	Pressure gauge will be calibrated once in a three year by external accredited agencies.
Any comment:	Data will be kept for crediting period + 2 years.

Data / Parameter:	**T_{FW}**
Data unit:	Degree Celsius
Description:	Temperature of the feed water in the boiler.
Source of data to be used:	On-site measurement from temperature gauge installed at feed water inlet.
Value of data applied for the purpose of calculating expected emission reductions	105ºC
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) would be responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
QA/QC procedures to be applied:	Temperature gauge will be calibrated once in a three year by external accredited agencies.
Any comment:	Data will be kept for crediting period + 2 years.

Data / Parameter:	**$Q_{biomass, i,y}$**
Data unit:	Tonnes
Description:	Quantity of rice husk consumed annually
Source of data to be used:	On site measurement.
Value of data applied for the purpose of calculating expected emission reductions	
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) would be responsible for regular calibration of the meter. Calibration Frequency: once in a three year.
QA/QC procedures to be applied:	The data will be cross checked with the biomass (rice husk) procurement data (Invoices). Weigh scale will be calibrated once in three year by external accredited agencies.
Any comment:	Data will be kept for crediting period + 2 years.

Data / Parameter:	**$NCV_{biomass}$**
Data unit:	kcal/kg
Description:	Net calorific Value of biomass residues
Source of data to be used:	Third party (lab test of biomass)
Value of data applied for the purpose of calculating expected emission reductions	3000
Description of measurement methods and procedures to be applied:	Monitoring: Net calorific value of biomass will be checked through Govt. approved independent laboratory. Data type: Estimated/measured Archiving policy: Paper. Recording Frequency: Once in a year. Responsibility: Manager (power plant) would be responsible for regular calibration of the meter.
QA/QC procedures to be applied:	Not applicable
Any comment:	Data will be kept for crediting period + 2 years.

3.4 Description of the monitoring plan

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

Management of Milkfood 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. More over all the equipment are calibrated once in a three year to ensure proper data value.

Internal audit will be carried out by the upper management once in three months. In case of having corrective action or preventive action it will be checked in next internal audit.

Responsibility and competence of persons taking measurement, when the measurement should take place and controls of records are established.

Data, which are collected, are safely stored. Records such as log books, purchase receipts, calibration records of measuring devices, and public data such as IPCC and CEA are maintained for the retention period specified.

Data of inputs and outputs are summarized on monthly basis and calculation of emission reduction is updated.

Emergency preparedness: The project activity will not result in any unidentified activity that can result in substantial emissions from the project activity. No need for emergency preparedness in data monitoring is visualized.

4 GHG Emission Reductions:

4.1 Explanation of methodological choice:

As established in Section 2.2 above the proposed project activity falls under Category I.C.

A. Baseline Emission Reduction

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, the emission factor ($EF_{grid,CM,y}$) is calculated in a transparent and conservative manner based on combined margin approach. The emission factor ($EF_{grid,CM,y}$) is calculated from the CEA data base and user guide version 05 (A publicly available official source http://www.cea.nic.in), which comes to 0.84 tCO2e/MWh .

The detailed approach for the calculation of combined margin emission factor for NEWNE grid is provided as Annex-1 of the PD.

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

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:

The baseline emissions are calculated as follows:

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

Where:

$BE_{thermal,\ Co2,y}$ The baseline emission from steam/heat displaced by the steam activity during the year y in tCO_2e.

$EG_{thermal,y}$ The net quantity of heat supplied by the project activity during the year y TJ.

$EF_{EF,CO2}$ The CO_2 emission factor per unit of the energy of the fuel that would had been use in the base line plant in (tCO_2/ TJ), obtained from reliable local or national data if available, otherwise, IPCC Default emission factor should be used.

$\eta_{BL,\ thermal}$ The efficiency of the plant using fossil fuel that would have been used in the absence of the project activity.

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

Project emissions:

For ex-post calculation, project emission (in case of coal used as a fuel in stand by boiler) and diesel used in DG sets, will be calculated based on para.43 of AMS.I.C, version 18 and followed by EB 41, Annex 11.

$$PE_{FC,j,y} = \sum_{i} FC_{i,j,y} \times COEF_{i,y}$$

PE FC,j,y= the CO2 emissions from fossil fuel (coal, diesel) combustion in process j during the year y (tCO2/yr);

FC i,j,y = the quantity of fuel type (coal, diesel) i combusted in process j during the year y (mass or volume unit/yr);

COEFi,y= the CO2 emission coefficient of fuel type (coal) i in year y (tCO2/mass or volume unit)

i = the fuel types (coal) combusted in process j during the year y

Leakage:

As per Para 45 of AMS I C version 18, if the energy generating equipment currently being utilized is transferred from outside the boundary to the project activity, leakage is to be considered. The equipments utilized in the project activity are not transferred from any other activity. Besides, no existing equipment has been transferred from the project site. Hence leakage for this part is zero.

As per Para 46 of AMS I C version 18, the leakage has to be considered if the biomass residue are transported over a distance of more than 200 Km due to the implementation of the project activity otherwise it can be neglected. The project activity is procuring and utilizing biomass available within the 75 Km radius from Milkfood Limited.Hence leakage for this part is Zero.[22]

Emission reduction:

ERy = BEy – PEy – LEy

Where:

ERy = Emission reductions in year y (t CO2e)
BEy = Baseline emissions in year y (t CO2e)
PEy = Project emissions in year y (t CO2)
LEy = Leakage emissions in year y (t CO2)

4.2 Quantifying GHG emissions and/or removals for the baseline scenario:

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:

[22] Footnote Para 46 AMS I C version 18

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).

= 7227 MWh x 0.84 (tCO2e/MWh).

= 6070 **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:

The baseline emissions are calculated as follows:

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

= (268.19 TJ / yr / .82) X 95.81 tCO_2/ TJ

= 31336.75 **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 = 6070 tCO2e + 31336.75 tCO_2/ yr

= **37407 tCO_2/ yr**

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, the emission factor ($EF_{grid,CM,y}$) is calculated in a transparent and conservative manner based on combined margin approach. The emission factor ($EF_{grid,CM,y}$) is calculated from the CEA data base and user guide version 05 (A publicly available official source http://www.cea.nic.in), which comes to 0.84 tCO2e/MWh .

The detailed approach for the calculation of combined margin emission factor for NEWNE grid is provided as Annex-1 of the PD.

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

= 4336.2 MWh x 0.84 (tCO2e/MWh).

= **3642 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:

The baseline emissions are calculated as follows:

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

= (245.14 TJ / yr / .82) X 95.81 tCO_2/ TJ

= 28643.17 **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 Reduction = **3642**tCO2e + **28643.17** tCO_2/ yr

= **32285 tCO_2/ yr**

4.3 Quantifying GHG emissions and/or removals for the project:

For ex-post calculation, project emission (in case of coal used as a fuel in stand by boiler) will be calculated and for the ex-ante estimation, project emission from this source is taken as zero.

4.4 Quantifying GHG emission reductions and removal enhancements for the GHG project:

Emission reduction:

Project I :

ERy = BEy – PEy – LEy

= 37407tCO2/ yr + 0 + 0

= 37407 tCO2/ yr

Project II:

ERy = BEy – PEy – LEy

= **32285** tCO2/ yr + 0 + 0

= **32285 tCO2/ yr**

Total Emission Reduction:

= **Project I + Project II**

= **37407+ 32285tCO2/ yr**

= 69693 **tCO2/ yr**

The detailed calculation has been provided in the Excel Sheet.

5 Environmental Impact:

The project activity does not fall under the purview of the Environmental Impact Assessment (EIA) notification of the Ministry of Environment and Forest, Government of India (As per Ministry of Environment and Forests (MoEF) Notification No. - S.O. 1533, dated 14th September 2006).

6 Stakeholder's comments:

Project I

1 MW captive power plant is installed within the company's premises and no additional land is procured for the project. The stakeholders involved in the project, other than the company, are

- Punjab State Electricity Board (PSEB)
- Punjab Pollution Control Board (PPCB)
- Punjab Energy Development Agency (PEDA)
- Authorities of the local administration
- Rice husk suppliers
- Local villagers and village panchayat

Invitation for stakeholders consultation meetings were sent out by Milkfood Limited via advertisement in the newspaper (dated 17th July, 2009) and personal letters. The village Panchayat/local villagers have been informed through munadi (announcement by a hired person in the village/localities) about the project and requested to attend the meeting communicate any suggestions / objections regarding the project activity. A public notice was affixed at main gate of Milkfood limited.

Milkfood Limited organized stakeholder consultation meetings on 27th July 2009 held at its unit at Bahadurgarh and Patiala District of Punjab. The objective of the meeting was to inform the stakeholders about the environmental and social impacts of the project activity and discuss their concerns regarding the same, if any. The comments and suggestions were invited throughout the period of Stakeholders meet.

Ongoing communication with stakeholders and interested parties is maintained through an open invitation of feedback and criticism. At the gate of Milkfood Limited, a complaint and feedback register is kept for comments of stakeholders and

to inform them back for action taken on the comments. A display is maintained to inform the purpose of the register and to encourage any feedback from stakeholders that they may like to convey to Milkfood Limited. Up to the date of preparation of this report, there are no adverse comments from stakeholders regarding implementation of the project.

Project II

0.6 MW captive power plant is installed within the company's premises and no additional land is procured for the project. The stakeholders involved in the project, other than the company, are

- Uttar Pradesh State Electricity Board (UPSEB)
- Uttar Pradesh Pollution Control Board (UPPCB)
- Uttar Pradesh New and Renewable Energy Development Agency (UPNEDA)
- Authorities of the local administration
- Rice husk suppliers
- Local villagers and village panchayat

Invitation for stakeholders consultation meetings were sent out by Milkfood Limited via advertisement in the newspaper (dated 17th July, 2009) and personal letters. The village Panchayat/local villagers have been informed through munadi (announcement by a hired person in the village/localities) about the project and requested to attend the meeting communicate any suggestions / objections regarding the project activity. A public notice was affixed at main gate of Milkfood Limited.

Milkfood Limited organized stakeholder consultation meetings on 30th July 2009 held at its unit at Village Mugalpur urf Agwanpur Mustakam, and Moradabad district of UP. The objective of the meeting was to inform the stakeholders about the environmental and social impacts of the project activity and discuss their concerns regarding the same, if any. The comments and suggestions were invited throughout the period of Stakeholders meet.

Ongoing communication with stakeholders and interested parties is maintained through an open invitation of feedback and criticism. At the gate of Milkfood Limited, a complaint and feedback register is kept for comments of stakeholders and to inform them back for action taken on the comments. A display is maintained to inform the purpose of the register and to encourage any feedback from stakeholders that they may like to convey to Milkfood Limited. Up to the date of preparation of this report, there are no adverse comments from stakeholders regarding implementation of the project.

7 Schedule:

Frequency of monitoring and reporting:
The details of frequency of monitoring and reporting are included in Section 3.4 in detail.

Project period:
Crediting period – 10 years
Crediting period start –6 May 2009

Duration of the project activity[23] – 20 years

GHG project cycle:
The following are important project activities in the GHG cycle for this project activity:

S.No.	Milestone	Date	References
1.	The Minutes of Board Meeting of Milkfood Limited Resolved: to put Biomass (rice husk) fired cogeneration plant and considered CDM revenues.	6th June, 2007	Minutes of board meeting
2.	Purchase Order placed : Project I: to M/S Cheema Boilers Ltd. for Fluidized Bed Combustion Boiler	20th July, 2007	PO
3.	Purchase Order placed : Project II: to M/S Industrial Boiler Ltd.	25th July, 2007	PO
4.	Purchase Order placed : Project II: to M/S I.B. Turbo Pvt. Ltd. for 600KW Back Pressure Turbine	25th July, 2007	PO
5.	Purchase Order placed : Project I: to M/S Pentagon Turbines Pvt. Ltd. for 1000KW Steam Turbine	16th August, 2007	PO
6.	Successful Commissioning of Project activity I	6th May, 2009	Commissioning certificate
7.	Successful Commissioning of Project activity II	4th June, 2009	Commissioning certificate
8.	Crediting period start date:	6th May, 2009	

Table 14: GHG project cycle.

8 Ownership:

8.1 Proof of Title:

Owner of the project activity is Milkfood Limited and documents showing proof of title and ownership of the emission reductions are as follows:

- Certificate of Incorporation.
- Purchase order of Boilers.
- Purchase orders of biomass(rice husk)

[23] Chartered engineer certificate.

8.2 Projects that reduce GHG emissions from activities that participate in an emissions trading program (if applicable):

Not Applicable.

Annex 1

BASELINE INFORMATION

The grid emission factor has been calculated ex-ante using *'Tool to calculate the emission factor for an electricity system*', Version 02, EB 50

The step-by-step calculation of base line emission factor is as follows:

STEP 1. Identification of relevant electric system

The relevant electricity system applicable to the project activity is the NEWNE grid electricity system according to the CEA database version 05.

STEP 2. Choose whether to include off-grid power plants in the project electricity system (optional)

The values of operating margin as well as build up margin are taken from the latest version of CEA database and thus only the grid power plants are included for calculation of the Operating margin and Build up margin as per option-I.

STEP 3, Select a method to determine operating margin (OM)

The calculation of the operating margin emission factor (EFgrid,OM,y) is based on one of the following methods:

(a) Simple OM, or
(b) Simple adjusted OM, or
(c) Dispatch data analysis OM, or
(d) Average OM.

As per the tool, simple OM method (option a) can only be used if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production. The low-cost/must-run resources are defined as power plants with low marginal generation costs or power plants that are dispatched independently of the daily or seasonal load of the grid. They typically include hydro, geothermal, wind, low-cost biomass, nuclear and solar generation.

Table: Share of Low Cost / Must-Run (% of Net Generation)

	2004-05	2005-06	2006-07	2007-08	2008-09
NEWNE	16.8%	18.0%	18.5%	19.0%	17.4%
South	21.6%	27.0%	28.3%	27.1%	22.8%
India	18.0%	20.1%	20.9%	21.0%	18.7%

Ref: CO2 Baseline Database for the Indian Power Sector – CEA, Version 03, Version 04 and Version 5.

Percentage of total grid electricity generation by low cost/ must run plants in the NEWNE Grid (on the basis of average of five most recent years): 17.92%

The calculation above shows that the generation from low-cost/must-run resources constitutes less than 50% of total grid generation, hence usage of the Simple OM method in the project

case is justified. Further, the ex-ante approach has been used for determination of Simple of OM based on a 3-year generation-weighted average.

Step 4. Calculate the operating margin emission factor according to the selected method

The simple OM emission factor has been calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO2/MWh) of all generating power plants serving the system, not including low-cost / must-run power plants / units. As per the option A of the Tool to calculate the emission factor for an electricity system the determination of simple OM is based on the total net electricity generation of all power plants serving the system and the type of fuels and total fuel consumption of the project electricity system as per option B. The simple OM emission factor is calculated as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_i \left(FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}\right)}{EG_y}$$

Where,

$EF_{grid,OMsimple,y}$	=	Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)
$FC_{i,y}$	=	Amount of fossil fuel type i consumed by power plant / unit m in year y (mass or volume unit)
$NCV_{i,y}$	=	Net calorific value (energy content) of fossil fuel type i in year y (GJ / mass or volume unit)
$EF_{CO2,i,y}$	=	CO_2 emission factor of fossil fuel type i in year y (tCO_2/GJ)
EG_y	=	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year y (MWh)
i	=	All fossil fuel types combusted in power sources in the project electricity system in year y
Y	=	Three most recent years data available (ex-ante option) at the time of submission of the VCS-PD to the DOE for validation

Step 5. Identify the group of power units to be included in the build margin

The sample group of power units *m* used to calculate the build margin consists of either:

(a) The set of five power units that have been built most recently, or

(b) The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently[24].

In terms of vintage of data, the following option has been used:

For the entire crediting period, the build margin emission factor ex-ante based on the most recent information available on units already built for sample group *m* at the time of CDM-PDD submission to the DOE for validation has been used

[24] If 20% falls on part capacity of a unit, that unit is fully included in the calculation. Power plant registered as CDM project activities should be excluded from the sample group *m*.

Step 6. Calculate the build margin emission factor

The build margin emissions factor is the generation-weighted average emission factor (tCO2/MWh) of all power units m during the most recent year y for which power generation data is available, calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}}$$

Where:

$EF_{grid,BM,y}$	=	Build margin CO_2 emission factor in year y (tCO_2/MWh)
$EG_{m,y}$	=	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{EL,m,y}$	=	CO_2 emission factor of power unit m in year y (tCO_2/MWh)
M	=	Power units included in the build margin
Y	=	Most recent historical year for which power generation data is available

Step 7. Calculate the combined margin emissions factor

It is calculated as the generation-weighted average emission factor (t CO_2/GWh) of a sample of power plants *m* of grid, as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM}$$

Where:

$EF_{grid,BM,y}$	=	Build margin CO_2 emission factor in year y (tCO_2/MWh)
$EF_{grid,OM,y}$	=	Operating margin CO_2 emission factor in year y (tCO_2/MWh)
w_{OM}	=	Weighting of operating margin emissions factor (%)
w_{BM}	=	Weighting of build margin emissions factor (%)

where the weights $\mathbf{W_{OM}}$ = 0.50 and $\mathbf{W_{BM}}$ = 0.50 for other energy systems (including biomass).

$$BE_y = EF_y \times EG_y$$

Where

$\mathbf{BE_y}$:	Baseline emissions due to displacement of electricity during the year y (tCO_2)
$\mathbf{EG_y}$:	Net quantity of electricity generated by the project activity during the year y (GWh)
$\mathbf{EF_y}$:	CO_2 baseline emission factor for the electricity displaced due to the project activity (tCO_2/GWh) = $EF_{grid,CM,y}$

The estimation of ex-ante emission factor has been done as per the methodology describe above. As per the Carbon Dioxide Emission Factor database, version 5.0, given by CEA, a statutory body under the Ministry of Power, the ex – ante emission factor for the Grid is the following.

The emission factor for the project activity has been arrived at by calculating the weighted average of Simple Operating margin (w = 0.50), Build Margin (w = 0.50) as specified for other energy generating systems (Including biomass).

Estimation of Baseline Emission Factor (tCO_2/MWh)								
No.	**Particulars**	**Unit**	**06-07**	**07-08**	**08-09**	**Weighted Average**	**Weight**	
1	Simple Operating Margin (incl. Imports)	tCO2/MWh	1.01	0.99990	1.00655			
2	Net generation	GWh	379,471	401,641.586	421,802.633	1.004	0.50	0.420
3	Build Margin (not adjusted for imports)	tCO2/MWh				0.68	0.50	0.502
4	Combined Margin (incl. Imports) (Wt. Avg. of OM & BM)	tCO2/MWh						0.84
5	Baseline Emissions Factor	tCO2/MWh						0.84

Source: Baseline Carbon Dioxide Emission Database Version 5.0
http://www.cea.nic.in