CLEAN DEVELOPMENT MECHANISM
SIMPLIFIED PROJECT DESIGN DOCUMENT
FOR SMALL-SCALE PROJECT ACTIVITIES (SSC-CDM-PDD)
Version 02

CONTENTS

SECTION A. General description of the small-scale project activity

A.1. Title of the small-scale project activity:

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Fuel switch from fossil fuel to renewable biomass for thermal energy application, in North India.

A.2. Description of the small-scale project activity:

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Prior to the project activity (as is the industry practice) the said plant of GIL used fossil fuel to generate the heat required for its manufacturing process (the drying, hot press and the treater machines).

The plant requires thermal energy for threeof their hot presses and one treater machine. The installed (and operational) capacity of the project is 4.2 million Kcal/hr of thermal energy for the production process within the site. The rated energy output from the boiler is 4.876 MW. The project thus qualifies for the use of Small Scale CDM Modalities and Procedures.

The proposed project activity involved the generation of thermal energy by utilizing locally available biomass (eg. mustard-husk, coconut shells, rice husk etc.) to replace fossil fuel used in the boiler(s) at Greenply Industries Ltd. (**"GIL"**), District Alwar in the state of Rajasthan, India, one of India's leading manufacturers of laminates like sunmica, decorative veneers, plywood etc.

The required biomass will be procured from the local farmers of the area within an approximate radius of 15-30 kms. The transportation of the biomass from the field to the project site is by Camel carts; tractors are rarely used for the above purpose. The project has also resulted in the generation of employment at the local levels for the collection and supply of biomass, thus increasing the income of the local farmers (as they are now able to get money for their surplus agro-residue which was hitherto being burnt in the fields / land filled).

The project, apart from mitigating the emission of GHG, reduces the local emissions of sulphur and other pollutants like smoke/soot, etc associated with the burning of fossil fuels. The project is in line with the development priorities of the local government, to encourage the use of renewable sources of energy.

The project boundaries for mitigation of GHG due to the fuel switch for generating the process steam will be the physical boundaries of the process plant. The generated energy will help for sustainable economic growth, conservation of environment and Green House Gas (GHG) emission reduction.

The additional revenue as well as the positive publicity from the registration of the project under the Clean Development Mechanism of the Kyoto Protocol was a very strong motivation for undertaking the project activity. In fact, the fuel switch, was made possible by the fact that the

project was / is eligible for generating carbon credits under the Clean Development Mechanism of the Kyoto Protocol, as it would result in the reduction of green house gas emissions on account of the fossil fuel used in the baseline scenario.

The additional revenue, together with the enhanced project profile was a critical factor responsible for convincing the management of GIL to consider investing in the proposed project. (Details to establish this can be verified from documents available for inspection to the Operational Entity.)

The project expects to generate approximately 17,475 CERs per annum.

Project's contribution to sustainable development
Coal and Oil has been / is the traditional source of fuel to meet the thermal energy requirements of Indian industry. This practice has negative environmental impact both locally and globally, due to the emissions of greenhouse gases, SOx and NOx emissions.

The Designated National Authority for CDM is India, which is the Ministry of Environment & Forests, has stipulated the following indicators for sustainable development in the interim approval guidelines for Indian CDM projects. The project complies with the stipulations as under:

- ***Social well-being:***
    - The CDM project activity quite clearly leads to the alleviation of poverty by generating additional employment of 45 direct as well as indirect job opportunities to the local population for various activities involved in transportation, loading, unloading and stacking of husk in the plant etc. This has also improved income generation of the persons involved with husk collection, transportation and handling, resulting in to betterment of their livelihoods. Further the project activities also cater to the growing power demand of the country.
    - Setting up of the project is going to benefit the area for better infrastructure and would have positive effect on landscaping.

- ***Economic well-being***
    - Conserving coal and other non-renewable natural resource;
    - Saving the scarce fossil fuels and allowing it to be diverted to other needy sections of the economy, thereby reducing the import of oil (currently 70%).
    - Helping to abridge the gap of electricity demand and supply at local level.

- ***Environmental well-being***
    - Eliminating the generation of heat using conventional fuel
    - Mitigating emission of GHG (CO_2), as the biomass used is carbon neutral;
    - The project uses biomass that is abundantly available in the region and would otherwise have accumulated, leading to possible environmental hazards.

- ***Technological well-being***

- Adopting an advanced and sustainable technology for long-term benefits.
- This project generates steam to cater its in-house requirement (thereby replacing the coal based heat generation) is in itself clean project as they replace the fossil fuel based energy (steam) by renewable biomass fuel based energy. Since, this project uses biomass, a carbon neutral fuel, which, in itself, has no negative environmental impact and its use is in line with state government's priorities. However, there is no law enforcing the use of these biomass fuels.

Each of the above indicators has been studied in the context of the project activity to ensure that the project activity contributes to the sustainable development.

A.3. Project participants:

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Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Government of India (Host Country)	Public	No
Greenply Industries Limited	Private	Yes

GIL will be the sole owner of the CERs generated. The contact details of the owner and the official contact for the CDM project activity are in Annex 1.

A.4. Technical description of the small-scale project activity:

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A.4.1. Location of the small-scale project activity:

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A.4.1.1. Host Party(ies):

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India

A.4.1.2. Region/State/Province etc.:

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Rajasthan State

A.4.1.3. City/Town/Community etc:

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Alwar District

A.4.1.4. Detail of physical location, including information allowing the unique identification of this small-scale project activity(ies):

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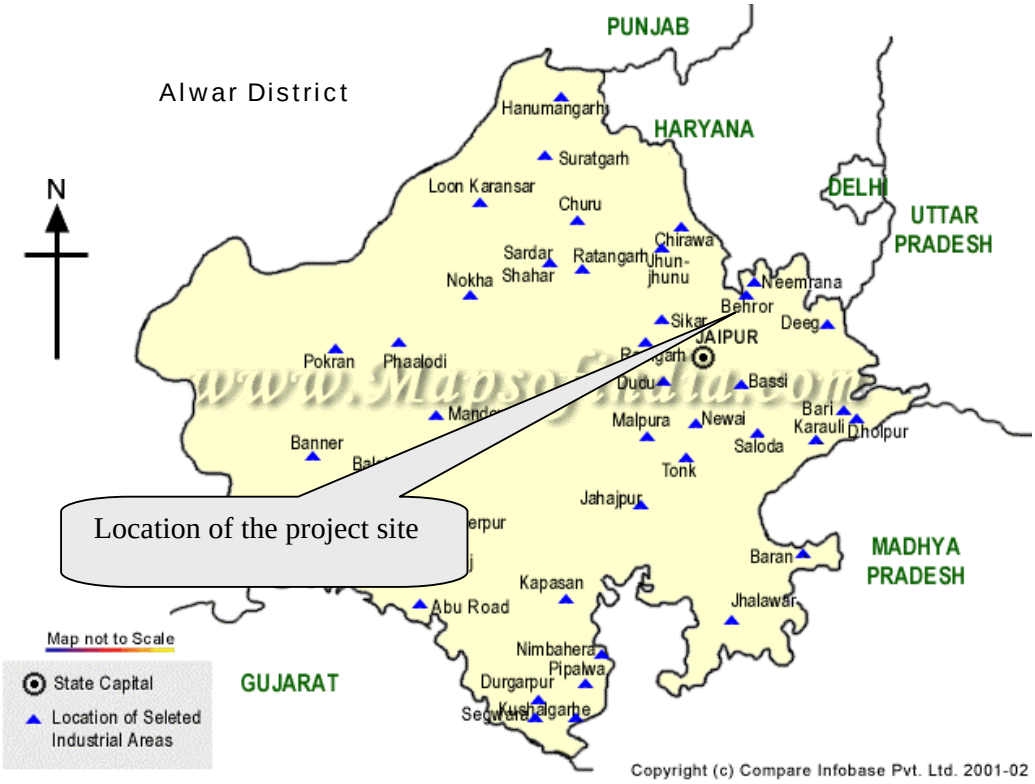
The CDM project involves the generation of thermal energy by utilizing the biomass available in the surrounding areas of the behror tehsil of the Alwar District of Rajasthan, instead of fossil fuel.

Alwar district (Latitude 27.34 N and Longitude 76.38 E) is situated in the Northeastern part of Rajasthan. Gurgaon of Haryana in the North, Bharatpur district in Northeast and Mahendragarh of Haryana bound it. The project site lies in the mid way of the Delhi-Jaipur Highway and at a distance of 120 Kms from the Delhi Airport. It is well connected by Rail and road from Delhi, Rajasthan and all other major cities in India. The nearest airport is Jaipur airport at a distance of 143 kms.

Location of the state Rajasthan in India

Location of Alwar district in the state of Rajasthan



A.4.2. Type and category(ies) and technology of the small-scale project activity:

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The project falls under the Appendix B of the simplified modalities and procedures for small-scale CDM project activities as per the Version 06: 30th September 2005.

Project Category: Renewable Energy Projects (Type I)
Sub category: Thermal Energy for user (Type I C)

The project falls under the "Type I: Renewable energy projects" and "Category I C: Thermal energy for the user". The total capacity of the boiler (mentioned under this project) is about 4.876 MW, which is less than 15MW, and these replace the fossil fuel.

Technology employed:
The proposed project activity is setting up of a biomass (mustard stalk and groundnut shells) based manufacturing unit. The heat production from the biomass used in the project is 4.2 million kcal/hr. The total annual biomass requirement is around 14,731 tonnes (to replace 9820.8 tonnes coal per annum).

The installed coal-fired fluidized bed combustion boiler was converted to biomass-fired boiler. FBC system is technologically more advanced and efficient technology for solid fuel firing.

The primary technology proposed for the project activity involves direct combustion of biomass in the boiler to generate steam. The generated steam is then utilized in presses and treater machine.

The thermal energy requirement of the plant is 4.2 million kcal of steam per hour.

Name of the equipment	Number of equipments	Thermal energy requirement (million Kcal/hr)
Hot Press	3	2.2
Treater	1	2.0

The technology employed for steam generation is converting the chemical energy available in the fuel into thermal energy by burning the renewable biomass. The generated heat will be used in the process to cater their thermal energy needs within the site.

Brief technical details of the project design

Boiler capacity	: 6 TPH
Biomass requirement	: 44 Tons/day
Operating pressure of the boiler	: 21 Kg/cm^2
Generation Pressure	: 24.6 Kg/cm^2
Type of boiler	: Fluidised Bed Combustion boiler

A.4.3. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed small-scale project activity, including why the emission reductions would not occur in the absence of the proposed small-scale project activity, taking into account national and/or sectoral policies and circumstances:

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The project reduces anthropogenic GHG emissions by displacing fossil fuel with biomass to generate thermal energy. The use of biomass is considered to be 'carbon neutral'. This CDM project generates / supplies about 4.2 million Kcal/hr of thermal, to be used for the production process within the site.

The expected CO_2 emission reductions from the project are as under:

1. **Methane Avoidance:** Methane emissions reduction on account of the biomass being used in the plant instead of being burnt in the fields / land filled. *However, as a matter of abundant caution credit for the same has not been claimed in this project document, as it is difficult to estimate the actual quantity.*

2. **Fuel switch:** The replacement of coal with biomass results in the reduction of approximately 17,475 tonnes of CO2e per annum. In the absence of the project activity, the same energy load would be met in the existing boiler by the use of fossil fuel (primarily coal), which results in CO2 emissions in to the atmosphere.

In the absence of any regulatory (national / sectoral) guidelines mandating the use of biomass, it should be pointed out that the said project activity was among the first laminate units in the country to opt for fuel switch from coal to biomass. The fuel switch was considered to be operationally very risky, given the sensitive nature of the operation and lack of prior track record of successful use of biomass.

It should be pointed out that:

1. There is no regulatory / other regulations requiring laminate manufacturers to use biomass as fuel;
2. Uncertainty with regards to biomass supply and its availability (largely dependant on the monsoons), and setting up a new system for aggregating the same was and remains a key operational concern, as the losses due to any fuel storage could be significant;

Owing to the above, it can be concluded that biomass based thermal energy generation project is NOT the business as usual scenario in Indian Laminate industry.

A.4.3.1 Estimated amount of emission reductions over the chosen crediting period:

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The project activity started generating emissions reduction from February 2004. The total emissions reduction for the 10-year fixed crediting period is expected to be as under:

Years	Annual estimation of

	emission reductions in tonnes of CO2 e
2004	17,475
2005	17,475
2006	17,475
2007	17,475
2008	17,475
2009	17,475
2010	17,475
2011	17,475
2012	17,475
2013	17,475
Total estimated reductions (tonnes of CO2 e)	174,750
Total number of crediting years	10 years
Annual average over the crediting Period of estimated reductions (tones of CO2 e)	17,475

A.4.4. Public funding of the small-scale project activity:

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No public funding is involved in the project activity

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a larger project activity:

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As per the Appendix C, paragraph 2 of the latest version of Simplified Modalities and Procedures for Small-Scale CDM project activities states:

"A proposed small-scale project activity shall be deemed to be a debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- With the same project participants;
- In the same project category and technology/measure; and
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

As there is no registered CDM project currently at the site either large scale or small scale, it is confirmed that the small-scale project activity is not a de-bundled component.

SECTION B. Application of a baseline methodology:

B.1. Title and reference of the approved baseline methodology applied to the small-scale project activity:

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Title: Indicative simplified baseline and monitoring methodologies for selected small- scale CDM project activities.

Reference of project categories: appendix B of the simplified modalities and procedures for small-scale CDM project activities.

Type I: Renewable Power Projects
Type I C: Thermal Energy for the user

B.2 Project category applicable to the small-scale project activity:

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This project falls under the "Type I: Renewable energy projects" and "Category I C: Thermal energy for the user".

This project involves the switch from a fossil fuel (coal) based system to biomass-fired boilers for the generation of thermal energy.

The heat generated in the project boundary is used for steam generation and consumed internally. Therefore, the applicable categories for this project is *I.C-Thermal energy for user* under 'Type 1- Renewable Energy Projects' as mentioned in appendix B of the simplified M&P for small-scale CDM project activities.

The choice of the methodology is accurate for the project and is justifiable since the project activity meets all the applicability conditions:

Justification of the choice of the methodology

The Methodology	The proposed project activity	Justification
As per the Technology/Measure specified in the methodology this category comprises renewable energy technologies that supply individual households or users with thermal energy that displaces fossil fuels or non-renewable	The project activity utilizes thermal energy in their industrial unit that displaces fossil fuel (coal) with a renewable source of biomass (Mustard husk and coconut shell) and eligible.	YES

sources of biomass.		
Upgrading of existing equipment is not allowed.	The project activity does not involve any upgrading of the existing equipment and is thus eligible. Please note that the project involves a fuel switch using primarily existing equipment.	YES
Where generation capacity is specified by the manufacturer, it shall be less than 15MW.	The project activity's capacity as specified by the manufacturer is 4.8 MW which is below 15 MW and eligible	YES
For co-generation systems and/or co-fired systems to qualify under this category, the energy output shall not exceed 45 MWthermal	As project only utilizes thermal energy from the boiler this will not be applicable.	YES

Baseline:

Baseline for renewable energy technologies that displace technologies using fossil fuels, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission coefficient for the fossil fuel displaced based on conservative appendix B to the Small Scale CDM Modalities and Procedures). In this case, the baseline emissions would have been on account of the continued usage of fossil fuel (coal).

Leakage:

Leakage is not considered because there is no transfer of energy generating equipment from another project activity and no transfer of existing energy equipment to another activity.

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

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The additionality of the project activity is assessed and demonstrated based on the stipulations contained in Attachment A to Appendix B of the Simplified Modalities and Procedures for small-scale CDM project activities.

Step 0: Starting date of the project activity:

The said project activity started in Feb 2004. Therefore the starting date of the project activity falls between 1 January 2000 and the date of registration of the first CDM project activity, which is 18th November 2004. Necessary evidence to establish the same would be furnished to the Operational Entity.

Sub step 1 a: Identification of alternatives to the project activity

In absence of the project activity, continued use of fossil fuel for the thermal applications in the manufacturing unit would perhaps have been the most likely and economically feasible option. The same is still the case with a majority of players in the industry.

The key advantage with the fossil fuel based thermal generation system is the assured quantity and quality of the fuel supply (and thus the related project and operation risk) is very low. This was a key factor under consideration by the project developers.

Sub step 1 b: Legal compliance:

There was/is no regulatory requirements for GIL to invest in the high efficiency biomass based plant, nor are there any (to the best of GIL's knowledge) planned regulations that will require it to implement the project activity within the crediting period.

The alternative to the project activity would be the continued generation of the thermal energy required through the use of fossil fuel, as this meets all the applicable legal requirements. Being a lower cost and risk option, this was the preferred option for the company.

The implementation of this biomass based project activity was a voluntary step undertaken by GIL with no direct or indirect mandate by law. At the point in time in which the decision to take up the said project was being discussed, GIL had very seriously considered the possible incremental revenue from the sale of carbon credits generated by the project. The additional revenue together with the fact that it would the first player in its industry to secure registration under the CDM, thus enhancing its environment friendly profile were the key factors that convinced the management of the company to undertake the said project.

In addition, the project activity would also result in the generation of lively hood for over 100 then unemployed men and women residing near the project site, by enabling them to collect the biomass debris and sell it to GIL (directly / indirectly) for economical value.

The perceived risk and the barriers for the project activity are discussed in the sequential order as explained in the Attachment A to Appendix B

Investment barrier:
GIL was the first project proponent in the state to utilize renewable biomass for generating thermal energy in the laminate manufacturing sector. Till date the project activity is one of the only of its kind in the state and that region.

Reasons for the low penetration of such renewable energy project and reluctance on the part of the unit owners to invest in similar kind of project activity and change the current practice in the region are because of the: The investment burden on the project may arise from issues like (a) capital investment requirement to shift the fuel feeding system/arrangement, (b) appropriate changes in the furnace area, (c) material of construction changes in the boiler tube surfaces etc

along with the operational breakdown risk on account of shortage of biomass /fuel characteristics.

1. **High Capital investment:** The capital investment required for the project is significant (especially when you add the additional investments required to put in place the biomass procurement, handling and management system), considering the indifferent performance (at that point in time) of the sector in general and company in particular, as such there was no significant incentive for the company to switch to the biomass based energy system. In addition, the switch to the biomass based energy generation system would have rendered their existing system redundant, thereby causing financial loss to the company.

2. **Uncertainty w.r.t. biomass supply:** Rajasthan, where the project is located is a dry state, as such the availability of biomass depends, to a large extent on the climate and monsoons. The availability and price of the biomass used, is thus uncertain. The additional risk being that, in case of a biomass fuel shortage, the plant stops production, causing immense losses to the company. In addition, escalation of biomass prices due to increase in demand in the future as biomass based power plants coming up in the state and region cannot be ignored.

3. **Biomass procurement risk**: Procuring biomass from over 100 independent sellers was a new exercise for GIL. In order to operate the new biomass based energy system, GIL had to develop infrastructure in terms of manpower and financial resources so as to ensure continuous fuel availability. This would be a daunting task as it involved the setting up of a system for the collection of biomass from a large number of sellers, since one single supplier cannot supply the quantity of biomass required for the project activity. This requires experience in managing rural and not necessarily educated sellers. Also the continuous supply of fuel for the project activity requires good managerial skills, commitment and resources.

It should be pointed out that since there is availability of biomass, the success of the project will attract more investment in the region in terms of more biomass based plants and was expected to further increase the prices of the biomass. In absence of the CDM credits the price increase may act as a driver for switching over to other fossil fuels as primary fuels.

The project developer had considered the following at the point in time when the decision to invest in the project was taken:

The incremental returns from sale of carbon credits was expected to be sufficient to meet the additional expenses required for sourcing the biomass, in addition to subsidizing the cost of the project.

Technological barrier

The biomass boiler is more laborious/onerous than fossil fuel based in terms of fuel handling, fuel segregation, and proper fuel supply and requires employment and training of new workers (as this was the first plant of its kind in the industry).

Use of biomass based thermal energy generation is not a time-tested proposition. There are certain known risks associated with this using the mustard husk as fuel because the fuel has tendency to stick in the boiler tube surfaces.

An unexpected frequent fluctuation in the quality of the biomass affects the life of the equipment and increasing the cost of the maintenance.

Fuel characteristics:

To Asses the technical feasibility and risks of the project, GIL contracted Thermal Associate Pvt Ltd (TAPL), an Indian company with broad expertise on providing technical consultancy services for biomass-based power plants. Being aware of the difficult combustion characteristics of the mustard residues (especially it's alkaline and chloride content, accounting for approximately 25% of its composition), TAPL took specific precaution with respect to the design (larger furnace, convective heat transfer surfaces, efficient soot blowers and conservative furnace outlet temperature). More over it recommended GIL to contract Thermax Ltd for the supply of the boiler. As such GIL is aware of the serious technological issues associated with the combustion of mustard residues namely:

- The fuel has lot of dust, fine particles, scaling, fouling, corrosion which in turn results in poor PLF which is a detrimental factor while investing in the boiler..

- The boiler also provided with additional over-fire nozzles with high investment to increase the residence time of the fuel in the boiler to ensure complete combustion

- A special alloy on the super heater surface is also provided to ensure that there would be less fouling in the surface of the tubes.

It should be mentioned that additional revenues through carbon credits were considered essential to counterbalance the risks.

Barrier due to prevailing practice

The use of fossil fuel was well established in the plant and the industry. A change to biomass as fuel, resulted in higher maintenance and operational costs, like biomass storage operations, biomass handling operations, payment of, hiring of new workers, training of operators and maintenance technicians.

The project activity is one of its kinds in the state and is not a common practice adapted for thermal energy generation till date. The other units situated near to this region are as follows:

Sl No	Name of the Industry	Fuel used

1	Paras Laminates	Coal
2	Saffron Mica	Coal
3	Safe Dekor	Coal
4	Super Mica	Coal
5	Jay Door	Coal
6	Greenply Industries limited	Biomass

This further justifies that the project is not a part of the baseline scenario. As a pioneer in this initiative, GIL had to invest significant time and resources for the success of this project activity. In the absence of the project proponent's initiative to implement the project, the present and future thermal energy demand of the manufacturing facility would have been met by operating fossil based systems which are the most appropriate baseline. With the implementation of this project activity about ten thousand tons of scarce fossil fuel usage being reduced and at the same time reduces GHG emissions.

Other barriers:

Storage of biomass:

The harvesting of mustard crop takes place in the period from February to April every year. Since mustard crop residues are only available for three to six months a year, adequate storage facilities are required, which in turn occupied lot of space in the unit. The characteristics of biomass fuels will also change quickly within short time. Most importantly, the calorific value decreases due to the loss of volatiles and deterioration of biomass, which affects the performance of the plant equipment. Hence, biomass materials cannot be stored for long periods.

The proposed project activity involves the following additional barriers and uncertainties.

a) The success of the biomass power plant mainly depends on the availability of biomass materials. Biomass availability is highly subject to seasonal fluctuations due to the vagaries of the nature.

b) Biomass prices continuously fluctuate depending on seasonal variations, making the cost of generation unstable.

c) Biomass is widely dispersed in small quantities. Hence, collection and transportation of biomass materials to the project site become a constraint. In addition, the cost of collection and transportation charges will increase every year due to the increasing trend in the cost of labour and cost of fossil fuels used for transportation (mainly diesel).

d) Since biomass power generation was a relatively new technology, the effects of combusting biomass fuels on the life cycle of the plant equipment were not established the cost of maintenance is one indicator on the life cycle of the plant and machinery.

e) The biomass conversion efficiency is very low compared to fossil fuel energy conversion efficiencies.

Impact of CDM Registration
It can be concluded that, but for the additional revenue (and marketing mileage) on account of successfully registering the project under the CDM, the said project activity would not have occurred, as the costs and risks involved were disproportionately high when compared to its benefits.

As per the above mentioned step the project activity is additional and the anthropogenic emission of the GHG by the sources will be reduced below those that would have occurred in the absence of the project activity or in other words the approval and registration of the CDM project activity will alleviate the identified barriers by providing additional revenue to plant from the sale of emission reductions.

This adequately demonstrates that the project activity cannot proceed on a business-as-usual basis. Therefore, all measures adopted by GIL are over and above any requirement under national law or regulation.

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the small-scale project activity:

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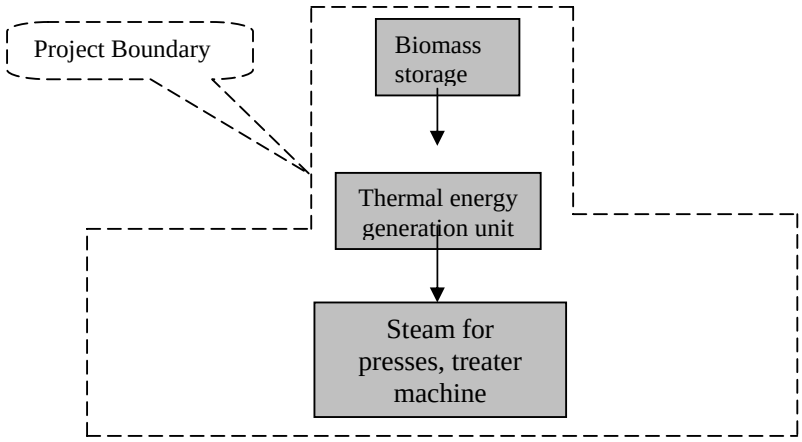
As mentioned in the Appendix B of simplified modalities and procedures for small scale projects, the project boundary encompasses the physical, geographical site of the renewable energy generation delineates the project boundary.

For the proposed project the project boundary is from the point of fuel storage to the point of thermal energy supply to the plant. Thus the project boundary includes the fuel storage, steam generator and all other accessory equipments. Project boundary is illustrated in the diagram:



B.5. Details of the baseline and its development:

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Date of completing the final draft of this baseline section *(DD/MM/YYYY)*: 01/09/ 2005

Name of person/entity determining the baseline: Greenply Industries Ltd

The detailed contact address of the above entity is given in Annex 1.

SECTION C. Duration of the project activity / Crediting period:

C.1. Duration of the small-scale project activity:

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C.1.1. Starting date of the small-scale project activity:

>>

December 2003

C.1.2. Expected operational lifetime of the small-scale project activity:

>>

20y-0m

C.2. Choice of crediting period and related information:

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C.2.1. Renewable crediting period:

>>

Not Applicable

C.2.1.1. Starting date of the first crediting period:

>>

Not Applicable

C.2.1.2. Length of the first crediting period:

>>

Not Applicable

C.2.2. Fixed crediting period:

>>

C.2.2.1. Starting date:

>>

01/02/2004

C.2.2.2. Length:

>>

10y-0m

SECTION D. Application of a monitoring methodology and plan:

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D.1. Name and reference of approved monitoring methodology applied to the small-scale project activity:

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The monitoring methodology chosen is as per the Appendix B of the simplified modalities and procedures for small-scale CDM project activities. This project is of category I.C (Thermal energy for user). Thus as per paragraph 8 (clause b) of this Appendix, "Monitoring shall consist of metering of the thermal and electrical energy generated for co-generation projects."

D.2. Justification of the choice of the methodology and why it is applicable to the small-scale project activity:

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This project falls under the "Type I: Renewable energy projects" and "Category I C: Thermal energy for the user".

This project involves conversion of fossil fuel fired boiler to biomass which is renewable source of energy and it displaces the use of fossil fuel i.e. coal. The steam generated in the project boundary is being used for heat generation and consumed internally. Therefore, the applicable categories for this project is *I.C-Thermal energy for user* under 'Type 1- Renewable Energy Projects' as mentioned in appendix B of the simplified M&P for small-scale CDM project activities.

The choice of the methodology is accurate for the project and is justifiable since the project activity meets all the applicability conditions:

Monitoring of biomass fuel consumption by the boiler will be monitored and the equivalent coal replaced by the project activity times an emission coefficient for the fossil fuel displaced gives the emission reductions.

Leakage is not considered because there is no transfer of energy generating equipment from another project activity and no transfer of existing energy equipment to another activity.

The approved methodology thus provides measured data on the amount of thermal energy generated through the steam flow meters installed at the boiler. The baseline emission due to combustion of coal in boiler is considered. Only additional data, which needs to be monitored, is any oil/coal consumption by biomass-fired boiler in case of any emergency such as non-availability of biomass. With above data, a reliable and accurate estimation of the amount of emission reduction can be made.

D.3 Data to be monitored:

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ID number	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)
1	*Steam Generated by the boiler*	*tonnes*	*m*	*monthly*	*100%*	*Electronic and Paper*
2	*Quantity*	*tons*	*m*	*monthly*	*100%*	*Electronic and*

	of Biomass					*Paper*
3	*Calorific value of biomass*	*Kcal/kg*	*m*	*monthly*	*100%*	*Electronic and Paper*

D.4. Qualitative explanation of how quality control (QC) and quality assurance (QA) procedures are undertaken:

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Data	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
1	*Low*	*Steam Generated from the biomass-fired boiler will be measure by using the flow meter. The data will be accurately measured and recorded.*
2	*Low*	*The amount of biomass fed into the boiler will be monitored and recorded in plant logbooks.*
3	*Low*	*This data is used for calculation of emission reductions by project activity*

D.5. Please describe briefly the operational and management structure that the project participant(s) will implement in order to monitor emission reductions and any leakage effects generated by the project activity:

>>

GIL has maintenance and operations procedures, which include the monitoring of process variables, instruments calibration and quality control, in accordance with company policies, engineering best practices and ISO9001 certification, For this reason, no major changes in monitoring and QA/QC procedures will be required for the CDM project activity related variables and parameters.

Particularly for the project activity, the only monitored variable is the consumption of biomass, in volume units. The plant through purchasing receipts and local inspection of trucks controls it.

D.6. Name of person/entity determining the monitoring methodology:

>>

Greenply Industries Limited

The detailed contact address of the above entity is given in Annex 1.

SECTION E.: Estimation of GHG emissions by sources:

E.1. Formulae used:

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E.1.1 Selected formulae as provided in appendix B:

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As per category I.C, the small scale simplified modalities and procedures do not indicate a specific formula to calculate the GHG emission reduction by sources.

E.1.2 Description of formulae when not provided in appendix B:

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For emission reduction due to avoidance of burning of coal in boilers:

CO_2 emission reduction (tonnes)/year = (Tonnes of coal saved per year) X (Carbon Emission Factor of coal)

E.1.2.1 Describe the formulae used to estimate anthropogenic emissions by sources of GHGs due to the project activity within the project boundary:

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There is no emission of GHG from the project activities. The project activity uses renewable biomass as energy source. The net balance of CO2 emissions from renewable biomass is considered zero because the emissions would be useful for the carbon recycling. Hence, Project Emissions are zero.

E.1.2.2 Describe the formulae used to estimate leakage due to the project activity, where required, for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities

>>

The project will not give rise to leakage. Leakage is not considered because there is no transfer of energy generating equipment from another project activity and no transfer of existing energy equipment to another activity.

E.1.2.3 The sum of E.1.2.1 and E.1.2.2 represents the small-scale project activity emissions:

>>

Zero project activity emissions

E.1.2.4 Describe the formulae used to estimate the anthropogenic emissions by sources of GHGs in the baseline using the baseline methodology for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities:

>>

The amount of fuel that would have been used in the baseline is multiplied by the respective Emission Factor to calculate the baseline emissions.

CO_2 emission reduction (tonnes)/year = (Tonnes of coal saved per year) X (Carbon Emission Factor of coal)

The emission factor of coal is 1.77943 tonnes of CO2/ ton of coal, is the IPCC default factor.

$BE = C * EF$ tCO2

Where,

- BE is the baseline emissions, in tCO2.
- C is the consumption of Coal in tons that would be required in each year to substitute biomass
- EF is the carbon emission factor of Coal, in tCO2/tons of coal.

$C = BIO * CV_{Biomass} / CV_{Coal}$

Where,

- BIO is the amount of biomass consumed in each year of the crediting period, in tons.
- $CV_{Biomass}$ is the Calorific value of biomass, in kcal/kg. $CV_{Biomass}$ = 3000 kcal/kg
- CV_{Coal} is the calorific Value of the Coal, in kcal/kg. CV_{Coal} = 4500 kcal/kg

$C = 1.86*330*24*3000/4500$

Therefore $C = 9820.8$ tons /year

$BE = C * EF$ tCO2

$BE = 9820.8 * 1.77943 = 17{,}475$ tCO_2/year

E.1.2.5 Difference between E.1.2.4 and E.1.2.3 represents the emission reductions due to the project activity during a given period:

>>

The following formula is used to determine emission reduction:

E.2 Table providing values obtained when applying formulae above:

>>

Emissions Reductions during the crediting period

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Baseline emissions, tCO_2	17,475	17,475	17,475	17,475	17,475	17,475	17,475	17,475	17,475	17,475
Project emissions, tCO_2	0	0	0	0	0	0	0	0	0	0
Leakage tCO_2	0	0	0	0	0	0	0	0	0	0
Emissions Reductions, tCO_2	17,475	17,475	17,475	17,475	17,475	17,475	17,475	17,475	17,475	17,475

SECTION F.: Environmental impacts:

F.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

>>

The environment impact assessment (EIA) study has carried out for the plant. It covered the following aspects:

- Ambient Air quality
- Water quality
- Noise level
- Soil quality
- Socio-economic aspect
- Flora Fauna details
- Vibration effects

The aim of the study was to assess the present environmental status in respect of the above listed aspects and to predict the likely impact the industry will have on the environment of the region.

However, for conversion of the coal fired boilers to biomass do not require any EIA study. The emissions from the chimney are monitored at regular intervals and the same has verified by state pollution control board (SPCB)

Ambient Air quality

The Ambient Air quality is within the standards prescribed by the State Pollution Control Board in view of the gaseous emission control systems installed.

Water quality

The effluent treatment plant installed treats effectively the plant's liquid waste to a final discharge, which is well within the standard norms. No adverse effect on ground water quality is observed.

Noise Levels

Provisions of established engineering practices for equipments such as vacuum pumps; nitrogen and air compressors, and boilers keep the noise levels at acceptable levels (less than 80 db) within the plant premise.

Soil quality

There is no adverse impact on soil quality due to this industry.

Socio-economic Aspect

The company has provided a suitable job to at least one member of each displaced family as an obligation. Such a large investment in this backward region has given a fillip to the economic progress of the area and the potential for jobs has gone up because of the large labour requirements, both permanent and for various contractors involved in the project.

Flora/Fauna

There is no negative impact in this respect. The Industry has already planted trees. The elaborate green belt is developed by the company shall improve the ecology of the region to a great extent.

Vibration effects

Adequate provisions are made in the equipment installations to control vibrations. No adverse effects are observed.

SECTION G. Stakeholders' comments:

G.1. Brief description of how comments by local stakeholders have been invited and compiled:

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The stakeholders identified for the present project are as under:

Village Panchayat (local stakeholder review)
Rajasthan PCB (national stakeholder review)
MOEF (national stakeholder review)

The institutions are already in place for the local and national stakeholder review and we will report these during the final phase of validation.

G.2. Summary of the comments received:

>>

The relevant comments and important clauses mentioned in the project documents / clearances like detailed DPR, environmental clearances, local clearance etc., were considered while preparation of CDM PDD.

G.3. Report on how due account was taken of any comments received:

>>

The relevant comments and important clauses mentioned in the project documents / clearances like detailed DPR, environmental clearances, local clearance etc., were considered while preparation of CDM PDD.

Annex 1
CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

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Represented by:	
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Middle Name:	
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

There is no funding from Annex- I parties

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