CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)
Version 03 - in effect as of: 22 December 2006

CONTENTS

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
03	22 December 2006	• The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.

SECTION A. General description of small-scale project activity

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

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"Generation of thermal energy utilizing renewable biomass" at Udham Singh Nagar, Uttaranchal by M/s Greenply Industries Limited, India
Version 05
19/09/2007

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

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The proposed project deals with the generation of thermal energy by utilizing locally available biomass at Greenply Industries Ltd. (**"GIL"**), District Udham Singh Nagar in the state of Uttaranchal, India. The Steam generation is carried out through sustainable means without causing any adverse impact on the environment and in the process supports climate change mitigation.

Greenply Industries Limited is planning to set up a plywood and pre-laminated particleboard unit at Udham Singh Nagar, Uttaranchal. The steam requirement for manufacturing the plywood and particleboard will be met by burning the biomass in the boiler. The project activity involves the replacement of the fossil fuel by locally sourced biomass.

The proposed project was made possible by the fact that it was eligible for generating carbon credits under the Clean Development Mechanism of the Kyoto Protocol, as it results 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 boundaries for mitigation of GHG due to the biomass utilisation 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 project leads to generation of employment at the local levels for 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 installed (and operational) capacity of the project is 46GJ/Hr of thermal energy for the production process within the site. The rated energy output from the boiler is 12.79MW. The project thus qualifies for the use of Small Scale CDM Modalities and Procedures.

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.

Ministry of Environment & Forests is the Designated National Authority for CDM in India, which 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 to the local population for various activities involved in transportation, loading, unloading and stacking of biomass in the plant etc. This will also improve the income generation of the persons involved with biomass 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 will use biomass that is abundantly available in the region and which otherwise gets accumulated, leading to possible environmental hazards.

- ***Technological well-being***
  - Adopting an advanced and sustainable technology for long-term benefits.
  - This project will generate 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	Greenply Industries Limited	No

(Host Country)	(Private entity, project participant)	

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

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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Uttaranchal State

A.4.1.3. City/Town/Community etc:

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Rudrapur, Udham Singh Nagar District

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

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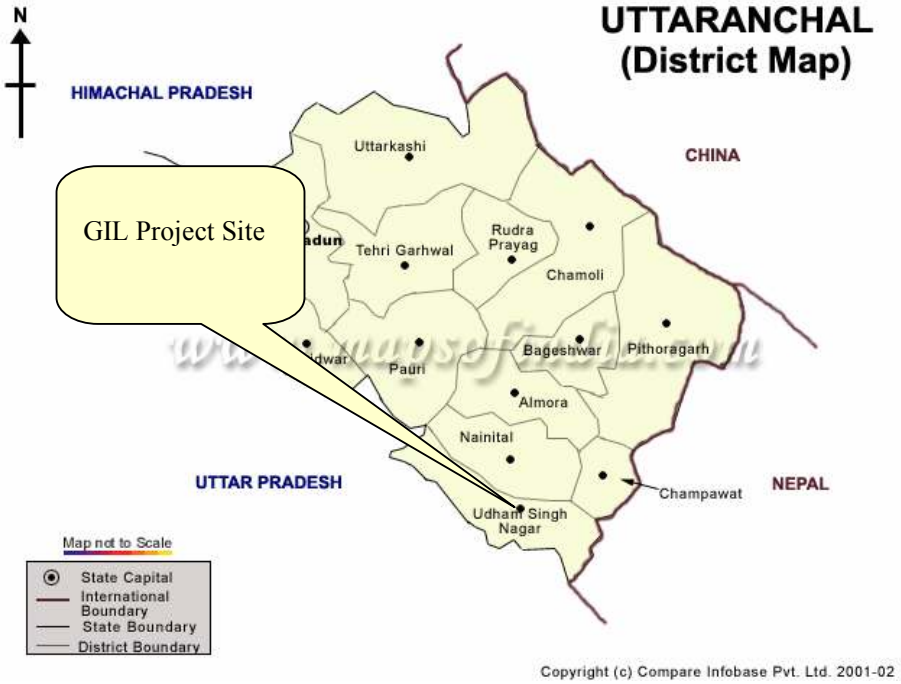
The CDM project involves the generation of thermal energy by utilizing the biomass available in the surrounding areas of Rudrapur in Udham Singh Nagar District of Uttaranchal, instead of fossil fuel.

The site is well connected with road and railway routes to all the major cities in the Northern region of the country. The nearest airport Pantnagar, is only 11km away. Udham Singh Nagar (Rudrapur) railhead is well connected to Delhi, Lucknow and Kolkata by direct broad gauge line. The physical location of the project is 27.34 N Latitude and 76.38 E Longitude.

Location of the state Uttaranchal in India



Location of Udham Singh Nagar district in the state of Uttaranchal

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

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As per 'Appendix B to the simplified modalities and procedures for small – scale CDM project activities' the project activity falls under

Type: Renewable Energy Projects (Type I)
Sub category: Thermal Energy for the user with or without electricity (Type I.C.), Version 12, EB33

Technology employed:
The proposed project activity is setting up of a biomass based manufacturing unit. The heat production from the biomass used in the project is 46GJ/hr. The primary technology proposed for the project activity involves direct combustion of biomass in the boilers to generate thermal energy. During combustion chemical energy contained in the biomass is converted into thermal energy, which is utilized for steam generation. The generated heat will be used in the process to cater their thermal energy needs within the site.

The primary technology proposed for the project activity involves direct combustion of biomass in the FBC boilers and Manual fired boilers to generate steam. The generated steam will then be utilized in

- Drying veneer
- Seasoning of timber
- Plywood pressing
- Logs dipping etc.

Brief technical details of the project design

Boiler capacity	: 6 TPH
Number of boilers	: 4
Biomass requirement	: 117 Tons/day
Generation Pressure	: 17.5 Kg/cm^2
Generation Temperature	: 240˚C
Type of boiler	: Two Fluidised Bed Combustion boilers & Two Manual Fired Boilers

A.4.3 Estimated amount of emission reductions over the chosen crediting period:

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The total emissions reduction for the first crediting period (7years) is expected to be as under:

Years	Annual estimation of emission reductions in tonnes of CO2 e
2007	38,750
2008	38,750
2009	38,750
2010	38,750
2011	38,750
2012	38,750
2013	38,750

Total estimated reductions (tonnes of CO2 e)	2,71,248
Total number of crediting years	21 years (7 x 3)
Annual average over the crediting Period of estimated reductions (tones of CO2 e)	38,750

In the above table, the year 2007 corresponds to the period starting from the date of registration of the project with CDM EB.

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 large scale project activity:

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 and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring 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 with and without electricity, I.C./Version 12, EB 33.

B.2 Justification of the choice of the project category:

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This project falls under the "Type I: Renewable energy projects" and "Category I C: Thermal energy for the user with or without electricity", I.C./Version 12, EB 33.

This project involves the installation of biomass-fired boilers, which replaces the fossil fuel (coal) based system in the baseline for the generation of thermal energy. The heat generated in the project boundary will be used for steam generation and consumed internally.

The chosen methodology for the project is AMS I.C. The choice of the methodology is accurate for the project and is justifiable since the project activity meets all the applicability conditions as discussed below:

Justification of the choice of the methodology

The Methodology	The proposed project activity	Justification
This category comprises renewable energy technologies that supply individual households or users with 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. Biomass-based co-generating systems that produce heat and electricity are included in this	The project activity utilizes thermal energy in their industrial unit that displaces fossil fuel (coal) with a renewable source of biomass and is eligible.	The project supplies thermal energy to an individual user (GIL plant)

category.		
Where thermal generation capacity is specified by the manufacturer, it shall be less than 45 MW.	The project activity's capacity as specified by the manufacturer is 12.79 MW which is below 45 MW and is eligible	YES
For co-fired systems the aggregate installed capacity of all systems affected by the project activity shall not exceed 45 MWth. Cogeneration projects that displace/ avoid fossil fuel consumption in the production of thermal energy (e.g. steam or process heat) and/or electricity shall use this methodology. The capacity of the project in this case shall be the thermal energy production capacity i.e. 45 MWth.	As the project utilizes only thermal energy from the boiler this will not be applicable.	Not Applicable
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 be lower than 45 MWth and should be physically distinct from the existing units.	The project activity involves installation of new renewable energy unit and there were no units existing earlier.	Not Applicable

B.3. Description of the project boundary:

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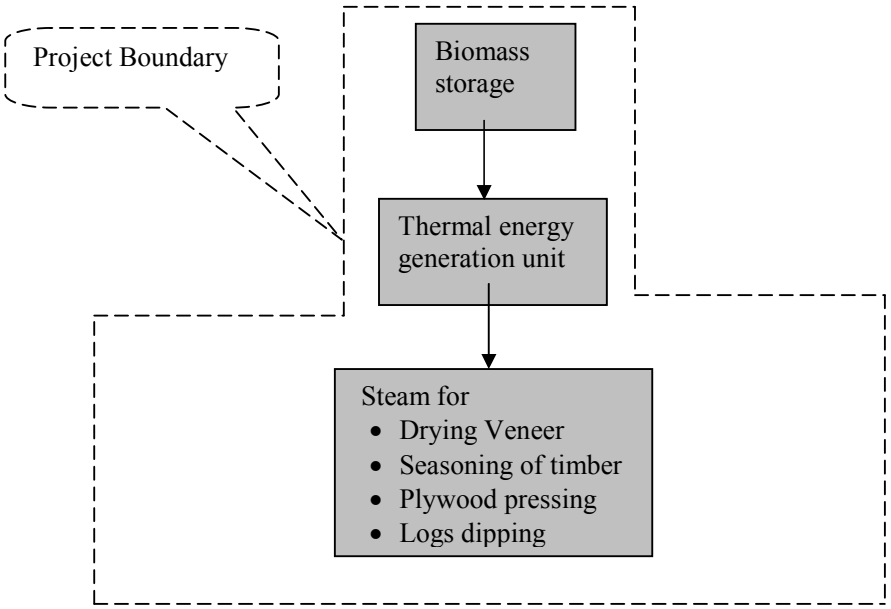
As mentioned in the methodology AMS.I.C. "The physical, geographical site of the renewable energy generation delineates the project boundary.

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.4. Description of baseline and its development:

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As described in the paragraph 6 of Approved Methodology AMS.I.C.Version12 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. IPCC default values for emission coefficients may be used.

GIL has identified plausible project options for baseline scenario, which include all possible actions that could have been adopted in order to generate steam for heating applications. Further an evaluation was conducted for each alternative to project activity with respect to the risks/barriers associated to implementation and their thermal energy generation costs, in order to arrive at the baseline scenario i.e. the most likely scenario in absence of the project activity.

GIL has identified the following plausible alternatives to meet heat requirements. These alternatives are illustrated below:

Alternative 1 - Coal based thermal energy generation
In absence of CDM project activity, GIL could have generated thermal energy with coal as fuel to meet its requirement. This alternative is in compliance with all applicable legal and regulatory requirements and may be a part of the baseline. Therefore the Alternative 1 is considered further for arriving at the baseline scenario.

Alternative 2- Biomass based thermal energy generation (Project activity not undertaken as CDM)
In absence of CDM project activity, GIL could have generated thermal energy from Biomass as a fuel, to meet its requirement. This alternative is in compliance with all applicable legal and regulatory requirements. The promoter has gone on record with their reluctance to set up proposed project, primarily on account of the high running cost and the risks involved. In fact it was only when the CDM related revenue was highlighted to the investor group and concrete offers were produced to the investors, that they considered the project. Otherwise, the investor was of the opinion that the project was very risky and preferred to use coal for thermal applications in their plant.

Moreover GIL has been one among the leading units in the plywood sector and in the case of the project activity. The project promoters have made the investment to achieve relatively more efficient steam production, which is not the natural course of action for a company whose core business is manufacture and sale of plywood. Cost of thermal energy generation using coal is 521.43 INR/Mkcal. Cost of thermal energy generation using biomass is 856.83 INR/Mkcal. Thus the option to undertake this project as a non-CDM project is not a viable baseline scenario.

Moreover since the availability of biomass is governed by external factors like climatic conditions and rainfall there are uncertainties related to annual availability of biomass residues. Further the price mechanism is not structured and fluctuates between wide ranges. The pricing of biomass depends mainly on annual rainfall, farm produce and the demand scenario in that area. Under these circumstances GIL has taken a challenge to invest in the project activity that would rely on biomass residues to meet its thermal energy requirement. Hence without the CDM revenue, this alternative is not a feasible option for GIL to adopt. This alternative option is not the Baseline Scenario. Hence alternative 1 would have been the most plausible (and reliable) option.

The project reduces anthropogenic GHG emissions by using the renewable biomass to generate thermal energy. The use of biomass is considered to be 'carbon neutral'. This CDM project generates / supplies about 46GJ/Hr of thermal energy that is to be used for the production process within the site.

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

1. 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: In the absence of the project activity, the fuel used to meet the energy requirements for the project would be coal, which results in CO_2 emissions in to the atmosphere.

The combustion of coal in boiler is considered as the baseline and corresponding emissions will be evaluated. The baseline emissions are calculated as per the formulae given in the applied methodology.

B.5. 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:

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 had started its activity from 01/09/2005. Since the project participant does not wish to have crediting period starting prior to the registration of their project activity the Step 0 is satisfied.

Sub step 1 a: Identification of alternatives to the project activity
In absence of the proposed project activity, the use of coal for the thermal applications in the manufacturing unit perhaps would have been the most likely and economically feasible option.

The key advantage with the coal (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 is 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 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 generation of the thermal energy using 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 of time where 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 be new to the sector to secure registration under the CDM, 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 unemployed men and women residing near the project site, by enabling them to collect the biomass debris and sell it to GIL directly 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 has been one among the leading units in the plywood sector and in the case of the project activity. The project promoters have made the investment to achieve relatively more efficient steam production, which is not the natural course of action for a company whose core business is manufacture and sale of plywood.

The main investment barriers for the project activity are discussed below:

- In an event of any technical failures in the project activity there is a serious risk of interests building up and threatening the financial capacity of GIL.
- After the success of this project activity it is natural that there will be similar projects which will push the biomass prices upwards. Therefore escalation of biomass prices due to increase in demand for this fuel could hamper the financial prospects of the project activity.
- Conceiving this project without CDM benefits would have been impossible. The CDM fund will help the project proponent to run the plant smoothly in-spite of rising biomass prices. CDM funding to project participants would also encourage other similar industries to follow suit and thereby contribute towards GHG emission reduction.
- The major investment barrier to the project is the perceived risk in case of reduced supply of biomass or increased biomass prices in future. Investors are worried that shortage in supply of biomass in future, may lead to steep rise in prices of biomass which might render the project financially unstable.

With the generation capacity of 11Mkcal/hr the production cost comparative analysis with coal and biomass has been carried out by the project proponent. Running cost analysis for the project activity:

Description	Unit	Running cost of power with coal	Running cost of power with Biomass
Heat requirement	Kcal/hr	11000000	11000000
Calorific value of fuel used (NCV)	kcal/kg	4500	3000
Quantity of fuel required	kg/hr	3055.556	4583.333
Cost of fuel	Rs/kg	1.80	2.00
Cost of fuel for power generation	Rs/hr	5500	9167
Annual expenses on fuel cost	Rs (lacs)/annum	435.60	726.00
No. of operator	nos.	6	6
No. of helpers	nos.	6	12
Salary of operators	Rs./month	6000	6000
Salary of helpers	Rs./month	2500	2500
Total manpower cost	Rs (lacs)/annum	6.12	7.92
Annual inspection cost	Rs (lacs)/annum	0.25	0.25
Ash handling cost	Rs (lacs)/annum	12.00	12.00
Maintenenace exp.	Rs (lacs)/annum	0.30	0.30
Annual expenses on operation	Rs (lacs)/annum	18.67	20.47
Total running cost per year	Rs (lacs)/annum	454.27	746.47
Cost per unit	INR/Mkcal	521.43	856.83

From the analysis it has been identified that the running cost bring upon as 521Rs/Mkcal from using coal and 856.8Rs/Mkcal from using biomass. It is quite evident from the above analysis that the investment for running the biomass is high when compared to coal based system. Hence the installation of coal based system was the cheapest alternative which the promoter had while conceiving the project activity. As per the prevailing prices of CER the CDM fund will compensate the risk in high investment as well increase in the biomass prices. The CDM revenue will help to improve the sustainability of the project which will otherwise be rendered financially unstable. The coal based cogeneration project would not have been faced such barriers.

Added to that due to high initial investment i.e, 670.65Lakhs in starting the plant and due to its associated financial risk mentioned above it was not possible for the project proponent to install biomass based plant. The project proponent had an alternative to install coal based cogeneration plant which is risk free and cheaper option with respect to coal based plant. In spite of these factors, GIL is one such entrepreneur to initiate this GHG abatement project under Clean Development Mechanism. It is ascertained here that, if GIL is successful in securing the proposed carbon financing, it will help in offsetting this barrier and encourage other entrepreneurs to come up with similar project activities.

GIL management took the decision to pursue with the project activity amidst the uncertainties, keeping in mind the transaction under the CDM, rate of CER and other technological and operational risks associated with the project implementation.

Hence, GIL has borne a financial risk and taken a pro-active approach by showing confidence in the Kyoto protocol and therefore the CDM system. Besides the direct financing risk, GIL is also shouldering the additional transaction costs related to the preparation of project documents, supporting CDM initiatives and also developing and maintaining M&V protocol to fulfill CDM requirements.

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 is not prevalent in such type of industries).

Use of biomass based thermal energy generation is not a time-tested proposition. There are certain known risks associated with this using the biomass 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:
GIL is aware of the serious technological issues associated with the combustion of biomass residues namely:

- Biomass ash contains high percentage of silica which leads to rapid erosion of the equipments. Due to high silica content equipments get eroded which leads to high maintenance cost, frequent breakdown and increased downtime.
- Presence of silica in biomass ash also corrodes boiler which require frequent maintenance of the boiler, 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.
- Further, in biomass fired boilers, escape of fluidized media along with flue gas is a common problem. To compensate this and to maintain fluidized bed thickness, fluidizing media is required to be added at regular intervals. 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 and control of biomass fired boiler requires skilled boiler operators.

GIL had perceived above mentioned technological risks associated with the biomass utilization. CDM revenue would definitely compensate this additional investment in overcoming the technical problems

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

Barrier due to prevailing practice
The project activity is one of its kinds in the state and is not a common practice adapted for thermal energy generation till date. As per the study conducted by the project proponent there were 13 plywood industries in the state of Uttaranchal. Out of all GIL is the one using biomass for meeting the thermal energy requirements where as except one company rest is using coal for the in-house requirements. This further justifies that the project is not a part of the baseline scenario.

The use of biomass as fuel will result 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.

Other barriers:

Storage of biomass:
Since biomass 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 labor 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.

Biomass availability: 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.

Biomass procurement risk: Procuring biomass from the biomass suppliers is 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 lot of biomass available, the success of the project will attract more investment in the region in terms of more biomass based plants, but this will further push 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 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.

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.6. Emission reductions:

B.6.1. Explanation of methodological choices:

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This project involves the installation of biomass-fired boilers, which replaces the fossil fuel (coal) based system in the baseline for the generation of thermal energy. The heat generated in the project boundary will be used for steam generation and consumed internally.

The procedure followed for estimating the emissions reductions from this project activity during the crediting period are as per the following steps which corresponds with AMS I.C. / version 12, EB 33.

Procedure for calculating baseline emissions (BE,y) As per Paragraph 10 of AMS I.C. the procedure is:

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

$BE_y = HG_y * EF\ CO_2 / \eta_{th}$

where:

BE_y the baseline emissions from steam/heat displaced by the project activity during the year y in tCO2e.

HG_y the net quantity of steam/heat supplied by the project activity during the year y in TJ.

EFCO2 the CO2 emission factor per unit of energy of the fuel that would have been used in the baseline plant in (tCO2 / TJ), obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used.

η_{th} the efficiency of the plant using fossil fuel that would have been used in the absence of the project activity.

B.6.2. Data and parameters that are available at validation:

(Copy this table for each data and parameter)

Data / Parameter:	**NCVcoal**
Data unit:	Kcal/Kg
Description:	Net Calorific Value of Coal
Source of data used:	Default value applied
Value applied:	4500 kcal/kg
Justification of the choice of data or description of measurement methods and procedures actually applied :	This is used to estimate the amount of coal saved by implementing the project activity. The data is assumed value based on the local available data.
Any comment:	-

Data / Parameter:	**EF coal**
Data unit:	tCO2/TJ
Description:	Emission factor of coal (baseline fuel)
Source of data used:	NCVcoal and IPCC values
Value applied:	96.0667
Justification of the choice of data or description of measurement methods and procedures actually applied :	The value applied is taken from IPCC Guidelines for National Greenhouse Gas Inventories: Workbook.

Any comment:	-

B.6.3 Ex-ante calculation of emission reductions:

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Baseline emissions:

Procedure for calculating baseline emissions (BE,y) As per Paragraph 10 of AMS I.C. the procedure is:

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

$BE_y = HG_y * EF\ CO_2 / \eta_{th}$

where:

BE_y the baseline emissions from steam/heat displaced by the project activity during the year y in tCO2e.

HG_y the net quantity of steam/heat supplied by the project activity during the year y in TJ.

EFCO2 the CO2 emission factor per unit of energy of the fuel that would have been used in the baseline plant in (tCO2 / TJ), obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used.

η_{th} the efficiency of the plant using fossil fuel that would have been used in the absence of the project activity.

Boiler capacity	: 6 TPH
Number of boilers	: 4
Total heat output capacity	: 11 Mkcal/hr or 403.363 TJ/yr
CO2 Emission factor of coal	: 96.0667 tCO2/TJ
Emission reductions per year	: 38,750 tcO2/yr

Leakage:

As per the Attachment C to Appendix B of Indicative simplified baseline and monitoring methodologies of SSC, project has to identify potentially significant sources of leakage from renewable biomass. The project participant shall evaluate if there is a surplus of the biomass in the region of the project activity, which is not utilised.

Demonstration of use of the biomass will not result in increase of fossil fuel consumption elsewhere: The biomass resource assessment was conducted by the project promoter- to study the biomass resources availability, their consumption and the surplus biomass availability.

Biomass assessment was carried out in 50 kms radius. The basic objective of the study was to assess the biomass resources availability, their consumption and therefore, the surplus biomass availability.

There are at 9, 50,400 tonne per annum of biomass is available from the paddy huller / miller and bagasse suppliers of capacity about 3-5 ton per day in an around 30kms and 1,80,000 tonne per annum of biomass is available from large size millers.

The quantity of biomass available with in 50Kms = 11, 30,400 tons
The quantity of biomass that is utilized (including the present plant) = 36000 tonnes

Hence the available biomass in the region is less than 25% over and above that quantity which is utilized. Therefore implementation of the project activity will not divert the biomass from other users to the project plant and no net emissions from the fossil fuel combustion due to diversion are accounted and are considered negligible. Therefore the source of leakage can be neglected.

B.6.4 Summary of the ex-ante estimation of emission reductions:

>>

Emissions Reductions during the crediting period

Year	2007	2008	2009	2010	2011	2012	2013
Baseline emissions, tCO_2	38,750	38,750	38,750	38,750	38,750	38,750	38,750
Project emissions, tCO_2	0	0	0	0	0	0	0
Leakage tCO_2	0	0	0	0	0	0	0
Emissions Reductions, tCO_2	38,750	38,750	38,750	38,750	38,750	38,750	38,750

In the above table, the year 2007 corresponds to the period starting from the date of registration of the project with CDM EB.

B.7 Application of a monitoring methodology and description of the monitoring plan:

B.7.1 Data and parameters monitored:

(Copy this table for each data and parameter)

Data / Parameter:	**HGy**
Data unit:	TJ/yr
Description:	Net quantity of steam supplied by the boiler
Source of data to be used:	Plant records
Value of data	403.36 is based on ex-ante. Exact Value is recorded based on actual
Description of measurement methods and procedures to be applied:	Measuring equipment is the steam flow meter. Data will be recorded in the paper and will be archived according to internal procedures, until 2years after the end of the crediting period. The actual measured data is used to calculate the emission reductions from the project activity.
QA/QC procedures to be applied:	Steam generated from the biomass-fired boiler and its temperature and pressure will be measured by using the meters. The data will be accurately measured and recorded. Regular calibration of the meter would be carried out to ensure the correctness of the reading.
Any comment:	-

Data / Parameter:	**$Q_{biomass}$**
Data unit:	Tons per annum
Description:	Quantity of Biomass to be combusted in the project activity
Source of data to be used:	Plant records
Value of data	Biomass per unit of thermal energy generated as per ex-ante calculations is

	4.87TPH for generating 46GJ/Hr of thermal energy, out of which 11TPD will be plant generated biomass and the rest will be procured from outside the plant. This specific fuel consumption specified is Ex-ante. Actual biomass consumption value is recorded based on actuals. The amount of thermal energy generated using biomass fuel calculated as per specific fuel consumption shall be compared with the amount of biomass fuel used. The lower of the two values will be used to calculate emission reductions.
Description of measurement methods and procedures to be applied:	The quantity of biomass used be measured using a weigh bridge and recorded in the factory log books. Data will be recorded in the paper and will be archived according to internal procedures, until 2years after the end of the crediting period.
QA/QC procedures to be applied:	The amount of biomass fed into the boiler will be monitored and recorded in plant logbooks. The amount of biomass used can be cross checked by the purchase orders and stock inventory for biomass. Regular calibration of the feeding mechanism would be carried out to ensure the correctness of the feeding mechanism
Any comment:	-

Data / Parameter:	**$NCV_{biomass}$**
Data unit:	Kcal/Kg
Description:	Net Calorific value of biomass
Source of data to be used:	Plant records/Laboratory Test reports
Value of data	3000 (Value is recorded based on actuals)
Description of measurement methods and procedures to be applied:	Sample test carried out in internal and external laboratories for estimation of calorific value of the biomass. Data will be recorded in the paper and will be archived according to internal procedures, until 2years after the end of the crediting period.
QA/QC procedures to be applied:	Regular tests would be carried out for the calorific value of biomass to reduce the uncertainty. The calorific value of the biomass is fairly constant and thus no QA/QC procedures are required.
Any comment:	-

Data / Parameter:	**Q_{ff}**
Data unit:	Tonnes per annum
Description:	Amount of fossil fuel consumed for the project activity per annum
Source of data to be used:	Project records and log books maintained by the plant authorities.
Value of data	Value is recorded based on actuals. Amount of fossil fuel used in the project activity will be measured. In case if any fossil fuel used in future with in the project boundary the data will be monitored and used for calculating the project emissions from combusting the fossil fuel.
Description of measurement methods and procedures to be applied:	The data will be measured on daily basis in tonnes. The data will be recorded on daily basis and archived in papers and will be available upto two years after the crediting period.

QA/QC procedures to be applied:	All instruments are calibrated and marked at regular interval to ensure accuracy of weighing instruments.
Any comment:	-

B.7.2 Description of the monitoring plan:

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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, 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.

B.8 Date of completion of the application of the baseline and monitoring methodology and the name of the responsible person(s)/entity(ies)

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Date of completion of the application of the baseline and monitoring methodology: 19/09/2007
Name of the responsible person(s)/entity (ies): Greenply Industries Limited and their consultants

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

>>
01/09/2005

C.1.2. Expected operational lifetime of the project activity:

>>
30y-0m

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

The project activity has chosen renewable crediting period

C.2.1. Renewable crediting period

(7 x 3) years

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

>>
15/12/2007 (or from the date of registration)

C.2.1.2. Length of the first crediting period:

>>
7y-0m

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>
Not Applicable

C.2.2.2. Length:

>>
Not Applicable

SECTION D. Environmental impacts

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

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The project does not fall under the purview of the Environment Impact Assessment (EIA) notification of the Ministry of Environment and Forest, Government of India. As the biomass waste will be used for energy production with an efficient combustion and emission control. There are therefore no significant environmental impacts of the project activity. The project proponent has considered the environmental implications of the project activity and the environment and safety aspects of the project activity are discussed as follows:

Land use
There is no change in land use. The project activity is carried out inside the existing plant.

Air pollution
The project activity resulting in replacement of coal has an inherent environmental benefit as regards air pollution. Abating coal combustion for thermal energy generation will result in lesser emissions related to coal combustion. Apart from reduced GHG (CO_2) emissions the project results in reduced SPM, SO_X and NO_X load on the environment. 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 pollution
Project activity will not contribute to any additional water pollution.

Noise pollution
The project activity will not contribute to any additional noise pollution.

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

Socio-economic Aspect
There is a marginal increase in employment, as the handling of biomass required labour. This has helped in 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.

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

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

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No environmental procedures as required by the host party.

SECTION E. Stakeholders' comments

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

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Since the project activity is the thermal energy generation using biomass, it has no significant negative environmental impacts to air, noise and water pollution outside the facilities. The project is located in the existing plant of GIL at Rudrapur. The major stakeholders identified are:

Gram Panchayat
Uttaranchal Pollution Control Board

Name of the Stakeholder	Summary
Gram Panchayat	Accords permission for setting up of the project under the jurisdiction of the village. The local elected body of representatives administering the local area is a true representative of the local population in a democracy like India. Hence the public comments received from the Gram Panchayat / elected body of representatives administering the local area give a proper reflection of the opinions of the local people. There will be no major concerns raised by the local people, since the project activity is implemented in the GIL factory premise, it will not cause any displacement of local population. Furthermore it is creating a significant job opportunities for the local people. Thus, the project will not cause any adverse social impacts on local population. Instead, it will help in improvising the quality of life. Furthermore the project has environmental benefits. Hence the local population will have no objection on its implementation. GIL has received consent for the project from the Gram Panchayat, a representative of the local people. He admitted that the project would help in environment conservation and he has provided NOC for the project on behalf of the local people.
Uttaranchal Pollution Control Board (UPCB)	UPCB, a regulatory body to monitor environmental impacts and environmental management of industries. Accords clearances for setting up of industries in the state after ensuring adherence to the statutory regulations. Also gives consent to start the operation of the project if satisfied with the environmental management and pollution control measures. The project has received the necessary clearances from UPCB. Stakeholders appreciated efforts from GIL and extended their support. They told that the project activity would help in pollution reduction in the region.

E.2. Summary of the comments received:

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Gram Panchayat (elected representative of the local populace), local populace and the Uttaranchal Pollution Control Board are the identified as stakeholders.

GIL has contacted the UPCB authority and got NOC to establish the unit, the formal approval had been received on 6th July 2005. Gram Pradhan (head of the local gram panchayat and representative of the local people) had sent his consent letter to the GIL stating their willingness to the project. He admitted that the project would help in environment conservation and he has provided NOC for the project on behalf of the local people.

GIL had conducted the local people for the stakeholder meeting in the company premises. The local people raised no major concerns as this project implementation helps the livelihood of the rural households and population in terms of the environmental cleanliness and improved economic condition and moreover the project does not involve any displacement of the rural community.

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

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As no comments were received no action has been taken in this regard

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

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Middle Name:	
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Personal E-Mail:	

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

There is no funding from Annex- I parties

Annex 3

BASELINE INFORMATION

Please refer to section B.4 for baseline and its development for the project activity

Annex 4

MONITORING INFORMATION

Please refer to section B.7, B.7.1 and B.7.2 explains the monitoring methodology and description of monitoring plan