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

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>.

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

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

Biomass Based Cogeneration Units at Uttar Pradesh

Version 04;

Date: 02/05/2007

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

KR Pulp & Papers Ltd (KRPPL) and Garg Duplex & Paper P Ltd (GDPL) are into business of paper manufacturing. In terms of energy consumption, Paper industry ranks 5th falling behind steel, fertiliser, cement industries.

Pre-project activity scenario

Power requirement at KRPPL in pre-project scenario was being met by 5 Diesel Generators (2 x 1000 kW, 2 x 500 kW and 1 x 1250 kW) and one furnace oil based generator (2500 kW). Process steam requirement was being met by two numbers of low pressure Atmospheric Fluidized Bed Combustion (AFBC) boilers (one 8 tons per hour (TPH), 10 Kg/cm^2, 150^{0}C and second 10 TPH, 10 Kg/cm^2, 150^{0}C) , of which were fed with rice husk and coal.

Power requirement at GDPL in pre-project scenario was being met by 14 Diesel Generators (6 x 380 kW, 7 x 500 kW, 1 x 750 kW) and process steam requirement was being met by two numbers of low pressure Atmospheric Fluidized Bed Combustion (AFBC) boilers (12 TPH, 10.5 Kg/cm^2, 165^{0}Ceach), which were fed with rice husk only.

Project activity scenario

Salient features

- Installation of a 2.5 MW biomass based cogeneration project at KRPPL
- Installation of a 5.0 MW biomass based cogeneration project at GDPL

The project activities are functional at the respective project proponent sites.

The project activities are biomass (carbon neutral fuel) based cogeneration plants, which generate electricity in addition to steam to meet captive electricity and steam requirement. The project activities displace an equivalent amount of electricity the KRPPL and GDPL plants would have generated through fossil fuels. KRPPL's project activity would also displace the equivalent coal that was being used at KRPPL for steam generation. Diesel generator sets and boilers will remain as standby at each site. The process steam parameters shall remain unchanged in pre and post project scenario.

Availability of biomass

2.5 MW biomass based cogeneration project at KRPPL

Shahjahanpur area is the main rice belt of the state. There are around 40 rice mills in the vicinity of the paper mill. Surrounding districts like Sitapur and Lakhimpur also have high productivity of rice and approximately 65 rice mills are located in surrounding districts of Shahjahanpur. Rice husk is sourced from these rice mills in trucks or trolleys. Rice husk is available in plenty and after various end uses there is a net surplus. The Primary fuel of the project activity is rice husk and only in cases of exigencies coal may be used. If any coal will be used it will be monitored and taken into account.

5.0 MW biomass based cogeneration project at GDPL

There are around 43 rice mills in the vicinity of the paper mill. Rice husk is sourced from these rice mills in trucks or trolleys. Rice husk is available in plenty and after various end uses there is a net surplus. The Primary fuel of the project activity is rice husk and only in cases of exigencies coal may be used. If any coal will be used it will be monitored and taken into account.

Contribution of Project activity in Sustainable development:

The Government of India requires that attention should be paid to three elements: social, economic and environmental well being.

Social well being:

The project activities have helped landless labourers in the area by giving them employment. They are involved in loading the tractors which collect the fuel and deliver it to the plant.

Economic well being:

The project activities have resulted in increased overall efficiency by combined thermal and power generation. The project activities will also provide additional revenue for the farmers who use their tractors to transport the biomass. In other words, the project activities are generating commercial value to crop residues enabling the farmers to get better price out of their produce and thus augmenting their income.

Environmental well being:

The project activities will help to reduce air pollution caused by Diesel Generators. The project would have net positive impact on the environment.

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)
Ministry of Environment and Forest (MoEF), Government of India (host)	1. KR Pulp & Papers Ltd.(KRPPL), 2. Garg Duplex & Papers P Ltd. (GDPL)	No

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

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

A.4.1.1. Host Party(ies):

2.5 MW biomass based cogeneration project at KRPPL

India

5.0 MW biomass based cogeneration project at GDPL

India

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

2.5 MW biomass based cogeneration project at KRPPL

Uttar Pradesh

5.0 MW biomass based cogeneration project at GDPL

Uttar Pradesh

A.4.1.3. City/Town/Community etc:

2.5 MW biomass based cogeneration project at KRPPL

District Shahjahanpur

5.0 MW biomass based cogeneration project at GDPL

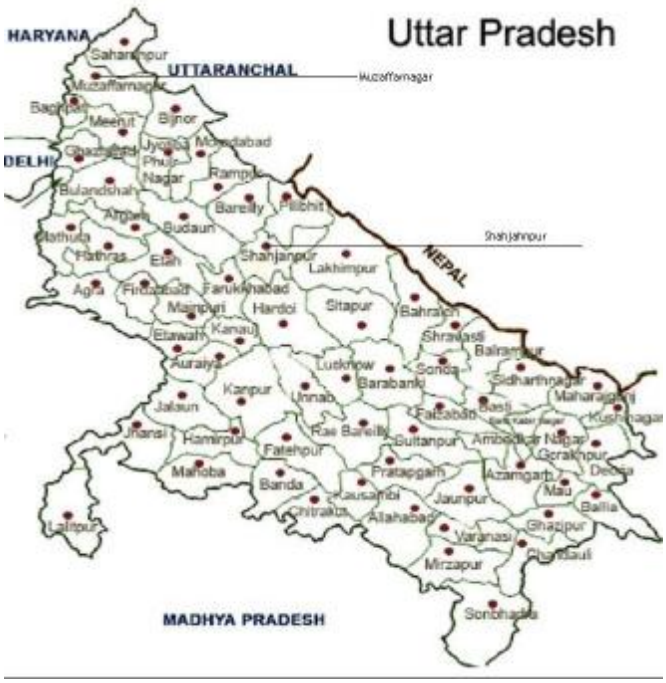
District Muzaffarnagar

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

2.5 MW biomass based cogeneration project at KRPPL- it is located at Rampur village, Shahjahanpur district, Uttar Pradesh. It is well connected by road and rail. The geographical coordinates of plant are $27^0$53' N Longitude and $79^0$55' E Latitude.

5.0 MW biomass based cogeneration project at GDPL it is located at Muzaffarnagar district, Uttar Pradesh. It is well connected by road and rail.. The geographical coordinates of plant are $29^0$28' N Longitude and $77^0$42' E Latitude.

Physical location is depicted in the following map(s):



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

Type I: Renewable Energy Project

Category-C: Thermal energy for the user

1. 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 cogenerating systems that produce heat and electricity for use on-site are included in this category.

Both KRPPL and GDPL project activities are biomass based cogeneration systems that produce heat and electricity for use on-site. Both project activities displace fossil fuel.

2. Where generation capacity is specified by the manufacturer, it shall be less than 15MW.

The combined capacity of both the project activities in 7.5 (MW) only, which is less than 15 MW.

3. For co-generation systems and/or co-fired systems to qualify under this category, the energy output shall not exceed 45 $MW_{thermal}$. E.g., for a biomass based co-generating system the capacity for all the boilers affected by the project activity combined shall not exceed 45 $MW_{thermal}$. In the case of the cofired system the installed

capacity (specified for fossil fuel use) for each boiler affected by the project activity combined shall not exceed 45 $MW_{thermal}$.

Both KRPPL and GDPL project activities are co-generation systems. The thermal capacity of the boilers for:

2.5 MW biomass based cogeneration project at KRPPL is 15.0 $MW_{thermal}$ and

5.0 MW biomass based cogeneration project at GDPL is 23.0 $MW_{thermal}$

Hence combined thermal capacity of boilers for both the project activities is 38.0 $MW_{thermal}$ only, which is less than 45 $MW_{thermal}$.

4. Project activities adding renewable energy capacity should consider the following cases:

1) Adding new units;

2) Replacing old units for more efficient units.

To qualify as a small scale CDM project activity, the aggregate installed capacity after adding the new units (case 1) or of the more efficient units (case 2) should be lower than 45 $MW_{thermal}$

KRPPL and GDPL project activities are replacing old units with more efficient units and as shown above, the combined capacity of both project activities is less than 45 $MW_{thermal}$.

Technology of project activities

The project activities are 2.5 MW and a 5.0 MW capacity co-generation power plant at KRPPL and GDPL respectively for captive use based on renewable energy biomass (rice husk) with a high-pressure boiler and a steam turbine configuration.

Boiler	KRPPL	GDPL
Type	Atmospheric Fluidized Bed Combustion (AFBC)	Atmospheric Fluidized Bed Combustion (AFBC)
Pressure	45 kg / cm2	65 kg / cm^2
Capacity	23.5 TPH	35 TPH
Temperature	430 C	485 C
Fuel	Rice Husk	Rice Husk
Efficiency	82%	82%
TURBINE		
Type	Multistage, Extraction Cum condensing, Horizontal, Impulse	2.5 x 1Extraction Cum condensing, 2.5 x 1 Backpressure type
Capacity	2.5 MW	2.5 x 2 = 5 MW
Inlet Steam Pressure	45 kg / cm2	65 kg / cm^2
Temperature	430 C	485 C

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:

Both KRPPL and GDPL project activities displace fossil based energy generation, by carbon neutral fuel (biomass) based co-generation thus avoiding GHG emissions. KRPPL and GDPL have taken the voluntary

initiative to implement these project activities in order to reduce the GHG emissions. There will be GHG emission reduction of around **530,000** tonnes of CO_2e over a 10 year crediting period.

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

Years	Annual Estimation of emission reduction in tonnes of CO_2e	
	KRPPL	**GDPL**
2007-2008	22088	30912
2008-2009	22088	30912
2009-2010	22088	30912
2010-2011	22088	30912
2011-2012	22088	30912
2012-2013	22088	30912
2013-2014	22088	30912
2014-2015	22088	30912
2015-2016	22088	30912
2016-2017	22088	30912
Total estimated reductions (tonnes of CO_2e)	**220880**	**309120**
Total number of crediting years	**10 years**	**10 years**
Annual Average over the crediting period of estimated reduction (tonnes of CO_2e)	**22088**	**30912**

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

No public funding as part of project financing from parties included in Annex I of the convention is involved in KRPPL and GDPL project activities.

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

The small-scale project activities are not a debundled component of a large project activity since there is no registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- by the same project participants;
- in the same project category or technology; and

- whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

SECTION B. Application of a baseline methodology:

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

Type I: Renewable Energy Project

Category-C: Thermal energy for the user

The reference has been taken from the indicative simplified baseline and monitoring methodologies for small-scale CDM project activity categories – I.C. (Version 8)

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

As already mentioned in A4.2, both KRPPL and GDPL project activities come under the Type I; Category C – 'Thermal energy for the user' since they are biomass based cogeneration systems that produce heat and electricity for use on-site and they displace fossil fuels.

Baseline for projects under Category I.C has been given in paragraphs 6 and 7.

1. 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.
2. Further for renewable energy technologies that displace electricity, the simplified baseline is the electricity consumption times the relevant emission factor calculated as described in category I.D, paragraphs 6 and 7.

Since the KRPPL project activity displaces both coal based thermal energy and DG based electrical energy, the baseline would be as per paragraph 6 and 7.

The baseline for GDPL project activity would be as per paragraph 7 since it only displaces DG based electrical energy.

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:

2.5 MW biomass based cogeneration project at KRPPL

The project activity is associated with the following barriers to its implementation and it was felt that the benefits due to sale of carbon credits would help KRPPL to overcome these barriers.

Barrier due to Prevailing Practice:

The common practice in the region for procuring power is either through the state grid or by producing in captive Diesel Generating sets. Efficient technology of Cogeneration has not yet practiced in the paper

sector in this region of India. The following table shows the status of power generation in the state of Uttar Pradesh.

Mode of Power Supply	Number of Plants
Power through state grid	45
Power through captive DGs	30
Power through coal based Co-generations	3
Power through Bio mass based Cogeneration	2
CDM Consideration for putting Cogeneration systems	2
Total	80

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There are around 80 paper units in the state of Uttar Pradesh out of which only two units [1]have biomass based cogeneration units. These two units have also considered CDM revenues for putting up cogeneration units.

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Other Barrier

Financial resources

KRPPL had to face a lot of difficulty in obtaining the financial closure of the project activity.

One of the major criteria's to access financing is that prospective financiers look for reliable, creditworthy, and firm sources of revenue for the project. Being a small market player, KRPPL did not have an easy access to the project finance. The loan application by project proponent was rejected by bank, which resulted in significant delay in achieving the financial closure. The project proponent finally managed to secure loan against high collateral. The project activity is not based on conventional thermal power technology with proper fuel linkage, where the cost of fuel does not increase unexpectedly. In biomass power projects the prices of biomass are always uncertain, which immediately raises the level of perceived risk by prospective financers. Also the domestic financial market in Uttar Pradesh has been characterized by high interest rates. The sale of carbon credits generated by project activity was considered before the financer decided to invest in the project activity. The prospect of registering the project activity as a CDM activity has thus helped to establish the project sustainability, it also helped to reduce the project financing risk of the financers and helped the project developer to proceed further.

Capacity to absorb new technologies

Rice husk ash contains high percentage of silica which leads to rapid erosion of the equipments. Due to high silica content and the pointed nature of the rice husk (biomass) particle, the equipment like ID fan, cone portion of air pre-heater and top portion of the stack would be eroded and lead to high maintenance

[1] Shree Bhawani Paper Mills; http://cdm.unfccc.int/Projects/DB/TUEV-SUED1135237103.39/view.html
Yash Papers Limited ; http://cdm.unfccc.int/Projects/DB/SGS-UKL1166797710.38/view.html

cost, frequent breakdown and increased downtime. The equipment supplier had agreed that erosion problem is higher in rice husk based cogeneration compared with coal based system. Due to this risk, KRPPL had disinclination to absorb this new technology, however they had taken the initiation to implement the project activity considering carbon benefits.

5.0 MW biomass based cogeneration project at GDPL

The project activity is associated with the following barriers to its implementation and it was felt that the benefits due to sale of carbon credits would help GDPL to overcome these barriers.

Barrier due to Prevailing Practice:

The common practice in the region for procuring power is either through the state grid or by producing in captive Diesel Generating sets. Efficient technology of Cogeneration has not yet practiced in the paper sector in this region of India. The following table shows the status of power generation in the state of Uttar Pradesh.

Mode of Power Supply	Number of Plants
Power through state grid	45
Power through captive DGs	30
Power through coal based Co-generations	3
Power through Bio mass based Cogeneration	2
Total	80

There are around 80 paper units in the state of Uttar Pradesh out of which only two units [2]have biomass based cogeneration units. These two units have also considered CDM revenues for putting up cogeneration units.

Other Barrier

Financial resources

GDPL had to face a lot of difficulty in obtaining the financial closure of the project activity.

One of the major criteria's to access financing is that prospective financiers look for reliable, creditworthy, and firm sources of revenue for the project. Being a small market player, GDPL did not have an easy access to the project finance. The loan application by project proponent was rejected by bank, which resulted in significant delay in achieving the financial closure. The project proponent finally managed to secure loan against high collateral. The project activity is not based on conventional thermal power technology with proper fuel linkage, where the cost of fuel does not increase unexpectedly. In biomass power projects the prices of biomass are always uncertain, which immediately raises the level of perceived

[2] Shree Bhawani Paper Mills

risk by prospective financers. Also the domestic financial market in Uttar Pradesh has been characterized by high interest rates. The sale of carbon credits generated by project activity was considered before the financer decided to invest in the project activity. The prospect of registering the project activity as a CDM activity has thus helped to establish the project sustainability, it also helped to reduce the project financing risk of the financers and helped the project developer to proceed further.

Capacity to absorb new technologies

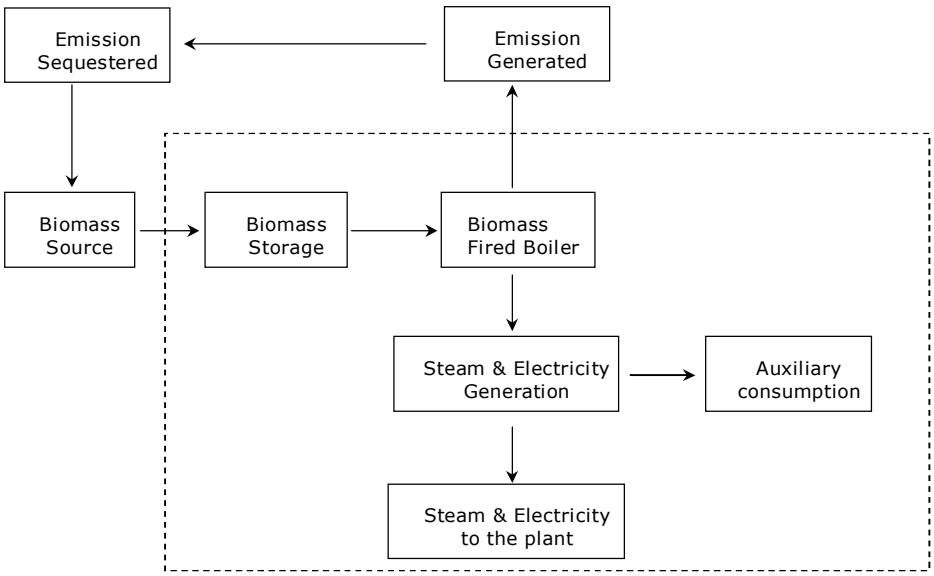
Rice husk ash contains high percentage of silica which leads to rapid erosion of the equipments. Due to high silica content and the pointed nature of the rice husk (biomass) particle, the equipment like ID fan, cone portion of air pre-heater and top portion of the stack would be eroded and lead to high maintenance cost, frequent breakdown and increased downtime. The equipment supplier had agreed that erosion problem is higher in rice husk based cogeneration compared with coal based system. Due to this risk, GDPL had disinclination to absorb this new technology, however they had taken the initiation to implement the project activity considering carbon benefits.

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:

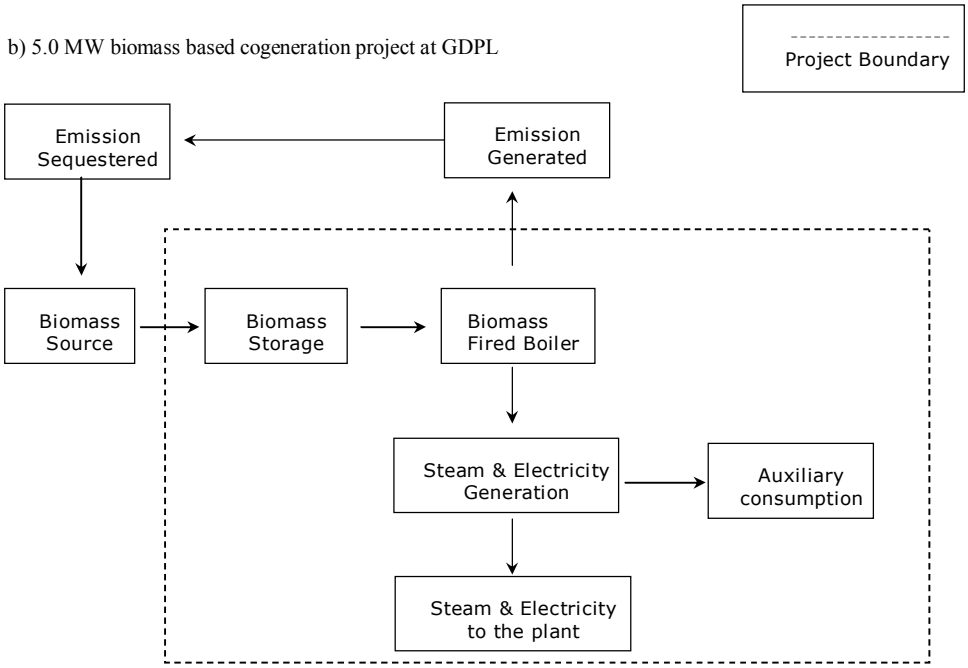
As per the guidelines, mentioned in paragraph 5 of Type I.C, project boundary is delineated by the physical and geographical site of the renewable generation source.

For the the KRPPL and GDPL project activities the project boundary is from the point of fuel storage to the point of energy supply to the paper mill where the project proponent has full control. Thus, project boundary covers fuel storage, boiler, steam turbine generator and other auxiliaries. Project boundaries of both the project activities are mutually exclusive and have been illustrated in the following diagrams:

a) 2.5 MW biomass based cogeneration project at KRPPL



b) 5.0 MW biomass based cogeneration project at GDPL



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

The baseline for the KRPPL and GDPL project activities has been arrived by using the methodology specified in paragraph 6 and 7 of category I.C.

The baseline for the coal based thermal energy displaced by KRPPL project 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 coal. Emission co-efficient for coal is based on national data available through NATCOM[3] and is taken as 95.8 ton CO_2/TJ.

The baseline for the diesel based electrical energy displaced by KRPPL and GDPL project activities would be electricity generation times the emission factor for diesel generator as given in table I.D.1 of category I.D. Emission factor for diesel generators has been taken as 0.8 kg CO_2/kWh.

Date of completion of the baseline: 14/10/2006

Name of person/entity determining the baseline: KR Pulp & Papers Ltd. and Garg Duplex & Papers P Ltd. KRPPL and GDPL are project participants as listed in Annex 1 of this document.

[3] National Communication of India to UNFCCC (http://www.natcomindia.org/pdfs/chapter2.pdf)

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

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

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

2.5 MW biomass based cogeneration project at KRPPL

15/03/2005

5.0 MW biomass based cogeneration project at GDPL

02/12/2004

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

25y-0m

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

Project activities would use fixed 10 year crediting period

C.2.1. Renewable crediting period:

>> NA

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

>> NA

C.2.1.2. Length of the first crediting period:

>> NA

C.2.2. Fixed crediting period:

>>

C.2.2.1. Starting date:

20/02/2007

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:

Title: Monitoring Methodology for the category I.C – Thermal energy for the user

Reference: 'Paragraph 9' as provided in Type I.C. (Version 8) of Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-Scale CDM Project Activity Categories.

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

As mentioned in the paragraph 12 of Simplified Modalities and Procedures for Small Scale CDM Project Activities, the Project participants may use the simplified baseline and monitoring methodologies, if they meet the applicability criteria of Small scale CDM project activity. As discussed earlier in A4.2, the project activities are small-scale CDM project of Type I. Category C, the monitoring plan has been developed as per the guidance provided in paragraph 9 of Type I.C.

The GDPL project activity displaces electrical energy from DG sets and KRPPL project activity displaces both thermal energy from coal and biomass fired boiler and electrical energy from DG sets, therefore the aforementioned monitoring methodology will be applicable to these project activities.

Description of monitoring plan

For KRPPL and GDPL project activities, gross power produced and auxiliary power consumed would be monitored separately by energy meters. For the KRPPL project activity the steam supplied to the paper mill by the cogeneration plant would also be monitored to calculate the emission reductions due to thermal energy displacement.

GHG Sources

Direct On-Site Emissions

Direct on-site emissions of the project activities are nil as the rice husk is a carbon neutral fuel.

Direct Off-Site Emissions

The transportation of rice husk causes emission of GHG. These emissions would be regarded as direct off-site emissions due to the project activities. Since similar quantum of emissions would have occurred in the

baseline also, due to the transport of diesel for the DG sets and the net direct off-site emissions could be regarded as negligible.

Indirect On-Site Emissions

The emission due to energy consumption during the construction of the project activities would be considered as indirect on site GHG source. By viewing the life of the cogeneration plants, emissions from the above-mentioned source are too small and hence neglected. No other indirect on-site emissions are anticipated from the project activities.

D.3 Data to be monitored:

a) KRPPL project activity

ID No.	Data variable	Data unit	Source of data	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic / paper)	For how long is archived data to be kept?	Comment
1	Total Electricity Generated	kWh	Log books	M	Every day	Total	Electronic	Crediting Period (CP)+2 years	-
2	Steam supplied to pulp and paper mill	Tons	Log books	M	Every day	Total	Electronic	CP + 2 Years	Used for baseline emission calculations.
3	Auxiliary consumption	kWh	Log books	M	Every day	Total	Electronic	CP+2 years	-
4	Power supplied to pulp and paper mill	kWh	Log books	C	Every day	Total	Electronic	CP+2 years	Used for baseline emission calculations.
5	Rice Husk quantity	Ton	Stock register	M	Every day	Total	Electronic	CP+2 years	-
6	Coal quantity	Ton	Stock register	M	Every day	Total	Electronic	CP+2 years	Quantity of coal would be used for project emissions calculations.
7	Rice husk calorific value	TJ/ton	Test Reports	M	Annually	Sample Testing	Electronic	CP+2 years	-
8	Coal calorific value	TJ/ton	Test Reports	M	Batch wise	Sample Testing	Electronic	CP+2 years	Calorific value of coal would be used for project emissions calculations.

b) GDPL project activity

ID No.	Data variable	Data unit	Source of data	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic / paper)	For how long is archived data to be kept?	Comment
1	Total Electricity Generated	kWh	Log books	M	Every day	Total	Electronic	Crediting Period (CP)+2 years	-
2	Auxiliary consumption	kWh	Log books	M	Every day	Total	Electronic	CP+2 years	-
3	Power supplied to pulp and paper mill	kWh	Log books	C	Every day	Total	Electronic	CP+2 years	Used for baseline emission calculations.
4	Rice Husk quantity	Ton	Stock register	M	Every day	Total	Electronic	CP+2 years	-
5	Coal quantity	Ton	Stock register	M	Every day	Total	Electronic	CP+2 years	Quantity of coal would be used for project emissions calculations.
6	Rice husk calorific value	TJ/ton	Test Reports	M	Annually	Sample Testing	Electronic	CP+2 years	-
7	Coal calorific value	TJ/ton	Test Reports	M	Batch wise	Sample Testing	Electronic	CP+2 years	Calorific value of coal would be used for project emissions calculations.

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

Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored. The details are as follows:

Data	Uncertainty level of data (High/Medium/Low)	Are QA/QC procedures planned for these data?
D.3. (a) 1	Low	Yes
D.3. (a) 2	Low	Yes
D.3. (a) 3	Low	Yes
D.3. (a) 4	Low	Yes
D.3. (a) 5	Low	Yes
D.3. (a) 6	Low	Yes
D.3. (a) 7	Low	Yes
D.3. (a) 8	Low	Yes
D.3. (b)1	Low	Yes
D.3. (b) 2	Low	Yes
D.3. (b) 3	Low	Yes
D.3. (b) 4	Low	Yes
D.3. (b) 5	Low	Yes
D.3. (b) 6	Low	Yes
D.3. (b) 7	Low	Yes

Project Parameters affecting Emission Reduction

Fuel related parameters:

Quantity of biomass used in the boiler as fuel

Biomass quantity entering the plant would be measured and records of the same will be maintained. The calibration check of weighing system would be done by independent agency annually to ensure the accuracy of the measurement. The data will be verified with the amount of biomass mentioned in invoices / receipts from fuel contractors.

Quality of biomass used in the boiler

The calorific value of biomass would be determined from ultimate analysis carried out every year.

Quantity of coal in the boiler as fuel

In case of exigencies, coal may be used and quantity of coal entering the plant would be measured and recorded. The calibration check of weighing system would be done by independent agency annually to

ensure the accuracy of the measurement. The data will be further verified with the amount of coal mentioned in invoices / receipts from fuel contractors.

Quality of coal used in the boiler

The calorific value of coal would be measured for every batch received.

Operational Parameters of the power generating Unit

Total Electricity Generated

The total electricity generated by the cogeneration plant at KRPPL would be measured by electronic energy meter of accuracy class 0.5 with maximum uncertainty of ± 0.5 %. The total electricity generated by the cogeneration plant at GDPL would be measured by electronic energy meter of accuracy class 1.0 with maximum uncertainty of ± 1.0 %. It will be recorded, on daily basis. Energy meters would be checked for calibration annually by external agencies.

Auxiliary Consumption

The auxiliary electricity consumption of the co-generation plants at KRPPL and GDPL would be measured by the electronic energy meters of accuracy class 1 with maximum uncertainty of ± 1 %. These energy meters would be checked for calibration annually by external agencies.

Power exported to the manufacturing facility

It will be calculated by deducting the auxiliary consumption from the total electricity generated for both KRPPL and GDPL project activities.

Steam supplied to Process

Steam quantity supplied to pulp and paper mill from cogeneration plant at KRPPL is measured by steam flow meter. This meter would be checked for calibration annually by external agencies.

In case the energy meters for total energy generation and auxiliary consumption go out of order, the data would be estimated based on running hours and running load (kW) of the equipments till the meters are repaired. Steps would be taken to repair the energy meters quickly.

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:

Operational and Management structure at KRPPL would be as follows:

Shift operator would be assigned with the responsibility recording of parameters as per the monitoring plan. Shift-in-charge would verify the data recorded at end of every shift. Section in-charge would verify data on daily basis and prepare the daily report. This daily report is discussed with General Manager (GM), Technical. In case of any irregularity observed, necessary action would be taken immediately. Finally the daily report is archived electronically in the office of GM, Technical.

Operational and Management structure at GDPL would be as follows:

Shift operator would be assigned with the responsibility recording of parameters as per the monitoring plan. Section in-charge would verify data on daily basis and prepare the daily report. This daily report is discussed with Director. In case of any irregularity observed, necessary action would be taken immediately. Finally the daily report is archived electronically in the office of section in-charge.

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

KR Pulp & Papers Ltd. and Garg Duplex & Papers P Ltd. have determined the monitoring plan and they are project participants as listed in Annex 1 of this document.

SECTION E.: Estimation of GHG emissions by sources:

E.1. Formulae used:

>>

E.1.1 Selected formulae as provided in appendix B:

No formulae for GHG emission reduction is specified for Category I.C.

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

>>

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:

The biomass is basically a carbon neutral fuel as the GHG emission due to the combustion of biomass is neutralized by the photosynthesis process carried out by growing plants. And also the content of nitrogen in the biomass is negligible. Hence other green house gas from the combustion of biomass can be considered as negligible. Therefore essentially there would not be any GHG emissions due to the KRPPL and GDPL project activities.

However in case of emergency if any quantity of coal is used by KRPPL or GDPL then the CO_2 emissions due to it would be calculated in the following manner:

Project Emission $PE_y = Q_{coal,y}$ x NCV x EF_{CO2} x OXID

Where:

$Q_{coal,y}$ – Quantity of coal used (ton)

NCV - the net calorific value of coal (TJ/ton)

EF_{CO2} - the CO_2 emission factor of coal (ton CO_2/TJ)

OXID - the oxidation factor of the coal

Quantity and calorific value of coal would be based on monitored data.

EF_{CO2} - 95.8 ton CO_2/TJ (as per NATCOM Report - Chapter 2 - Page 37)
(http://www.natcomindia.org/pdfs/chapter2.pdf)

OXID – 0.98 (as per IPCC)

The quantity of CO_2 emitted due to the combustion of coal would be deducted from the baseline emissions.

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

As mentioned in paragraph 8 of Type I.C, the leakage estimation is only required if the equipment of the project activity is transferred from another activity or the existing equipment is transferred to another activity. As the equipments are not transferred from/to another activity in the KRPPL and GDPL cogeneration projects, the estimation of leakage is not applicable.

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

Thus the emissions due to the KRPPL and GDPL project activities would be there only due to combustion of coal in case of exigencies and would be estimated as per the formula mentioned in E.1.2.1.

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:

Baseline emissions for electrical energy displaced by KRPPL and GDPL project activities:

$BE_{electrical,y} = EG_y \times EF_{DG}$

Where:

$BE_{electrical,y}$ –baseline emissions due to displacement of electricity during the year y (ton of CO_2)

EG_y - net quantity of electricity supplied to pulp and paper mill by the project activity during the year 'y' (kWh)

EF_{DG} - CO_2 baseline emission factor for the electricity displaced due to the project activity (tons CO_2/MWh).

EG_y would be based on monitored data. However for estimation of emission reductions it has been calculated as follows:

2.5 MW biomass based cogeneration project at KRPPL

EG_y = 19,320 MWh (Assuming auxiliary consumption of 8 % and 350 days of operation)

EF_{DG} = 0.8 tons CO_2/MWh (as given in table I.D.1 of category I.D)

$BE_{electrical,y}$ = 19320 x 0.8

= **15,456 ton CO_2**

5.0 MW biomass based cogeneration project at GDPL

EG_y = 38,640 MWh (Assuming auxiliary consumption of 8 % and 350 days of operation)

EF_{DG} = 0.8 tons CO_2/MWh (as given in table I.D.1 of category I.D)

$BE_{electrical,y}$ = 38640 x 0.8

= **30,912 ton CO_2**

Baseline emissions for thermal energy displaced by KRPPL project activity:

$BE_{thermal,y} = Q_{steam,y}$ x EF_{steam}

Where:

$BE_{thermal,y}$ –baseline emissions due to displacement of thermal energy during the year y (ton of CO_2)

$Q_{steam,y}$ - quantity of steam supplied to pulp and paper mill by the project activity during the year 'y' (ton)

EF_{steam} - CO_2 baseline emission factor for the thermal energy displaced due to the project activity (tons CO_2/ton of steam).

$Q_{steam,y}$ would be based on monitored data. However, for estimation purpose the steam quantity has been taken as same that for year 2004-05

EF_{steam} has been based on 3 year historic data.

Coal consumption and steam production used for baseline emissions:

Year	Coal consumption (tons/year)	Steam production (tons/year)
2002-03	2840.5	81112.8
2003-04	3193.5	115462.8
2004-05	3637.0	120424.9
Average	3223.6	105666.8

NCV - the net calorific value of coal is taken as 0.01923 TJ/ton as per NATCOM Report - Chapter 2 - Page 37

EF_{CO2} - the CO_2 emission factor of coal is taken as 95.8 ton CO_2/TJ as per NATCOM Report - Chapter 2 - Page 37

OXID - the oxidation factor of the coal is taken as 0.98 as per IPCC

$$EF_{steam} = \frac{3223.6 \times 0.01923 \times 95.8 \times 0.98}{105666.8}$$

EF_{steam} = 0.055 tons CO_2/ton of steam

$BE_{thermal,y}$ = 120424.9 x 0.055

= **6632 ton CO_2**

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:

Since project emissions are anticipated to be zero for both KRPPL and GDPL project activities, the emission reductions would be equal to baseline emissions for both the project activities.

2.5 MW biomass based cogeneration project at KRPPL

$BE_y = BE_{electrical,y} + BE_{thermal,y}$

$= 15456 + 6632$

$= 22088$ ton of CO_2

5.0 MW biomass based cogeneration project at GDPL

$BE_y = BE_{electrical,y}$

$= 30912$ ton of CO_2

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

S No.	Operating Years	Baseline Emissions (Tons of CO_2)	Project Emissions (Tons of CO_2)	Emission Reductions, (Tons of CO_2)	Baseline Emissions (Tons of CO_2)	Project Emissions (Tons of CO_2)	Emission Reductions, (Tons of CO_2)
		KRPPL			GDPL		
1.	2007-2008	22088	0	22088	30912	0	30912
2.	2008-2009	22088	0	22088	30912	0	30912
3.	2009-2010	22088	0	22088	30912	0	30912
4.	2010-2011	22088	0	22088	30912	0	30912
5.	2011-2012	22088	0	22088	30912	0	30912
6.	2012-2013	22088	0	22088	30912	0	30912
7.	2013-2014	22088	0	22088	30912	0	30912
8.	2014-2015	22088	0	22088	30912	0	30912
9.	2015-2016	22088	0	22088	30912	0	30912
10.	2016-2017	22088	0	22088	30912	0	30912
Total		220880	0	220880	309120	0	309120

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 KRPPL and GDPL project activities do not fall under the purview of Environment Impact Assessment notification[4] S.O. 60 (E) of the Ministry of Environment and Forest, Government of India. However, 'Consent to Establish' the KRPPL and GDPL project activities has been obtained from the Uttar Pradesh State Pollution Control Board (UPPCB).

Although the project activities would not cause significant negative impact over the environment, the following measures were considered during the design stage in the purview of environment.

Particulate matter

In order to minimize the dust emission from plant to a level of less than pollution control regulations, wet scrubbers have been installed for both the project activities.

Dry fly ash

The ash is being used to improve the top soil condition and also used for land filling of low lying areas.

Noise Pollution

The rotating equipments in the power plants are supplied with silencers wherever required to keep the noise level within limits.

[4] Reference : http://envfor.nic.in/legis/eia/so-60(e).html

SECTION G. Stakeholders' comments:

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

The stakeholders identified for the project activities are as under:

- Local Area – People
- Uttar Pradesh Pollution Control Board (UPPCB).
- Bank and FI's

These stakeholders are involved in the project activity at various stages. At the appropriate stage of the project development, KRPPL and GDPL consulted stakeholders to get the comments.

The KRPPL and GDPL organized stakeholder consultation meetings with the local community and the elected body of representatives administering the respective local area with the objective to inform them on the environmental and social impacts of the project activity and discuss their concerns regarding the project activity. On the day of meeting, project participants' representatives presented the salient features of the project activity to the stakeholders and requested their suggestions / objects. The opinions expressed by them have been recorded.

G.2. Summary of the comments received:

The local people at respective project sites have appreciated the project activities as they have resulted in generation of additional employment..

No Objection Certificate for KRPPL project activity has been received from the UPPCB vide their letter no. F27058/C-5/NOC-76/2000/4 dated 05.02.04.

No Objection Certificate for GDPL project activity has been received from UPPCB vide their letter no F04384/C-3/NOC/97/8/06.

The funding for the project activity has been received from public sector banks and financial institutions.

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

In view of various direct and indirect benefits (social, economical, and environmental) no concerns were raised during the consultation with stakeholders.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding as part of project financing from parties included in Annex I of the convention is involved in KRPPL and GDPL project activities.

Appendix A

Abbreviations

AFBC	Atmosphere fluidized bed combustion
CO_2	Carbon dioxide
^0C	Degree Centigrade
DG	Diesel Generator
GHG	Green House Gases
GDPL	Garg Duplex & Paper Mills (P) Ltd
INR	Indian National Rupee
IPCC	Inter Governmental Panel on Climate Change
kg	Kilogram
KRPPL	KR Pulp & Papers Ltd.
kVA	Kilo Volt Ampere
kW	Kilowatt
kWh	Kilowatt-hour
MW	Mega Watt
PDD	Project design document
TPH	Tonnes per hour
UNFCCC	United Nations Framework Convention on Climatic change

Appendix B

REFERENCES

- Kyoto Protocol to the United Nations Framework Convention on Climate Change
- Website of United Nations Framework Convention on Climate Change (UNFCCC), http://unfccc.int
- UNFCCC document: Clean Development Mechanism, Simplified Project Design Document For Small Scale Project Activities (SSC-PDD), Version 02
- UNFCCC document: Simplified modalities and procedures for small–scale clean development mechanism project activities
- UNFCCC document: Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories
- UNFCCC document: Determining the occurrence of debundling
- Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual
- http://www.natcomindia.org/natcomreport.htm