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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Rice husk based power generation project by MECBL at Raigarh
Version: 01
Date: 19th June 2007

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

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Purpose

The purpose of the proposed project activity by Mahavir Energy & Coal Benification Ltd (MECBL) is to generate electricity using rice husk as fuel. The rice husk shall be combusted for producing high pressure steam in the boiler which would be fed to a turbine generator to generate 12.0 MW power. Rice husk is available in abundance in Raigarh District and adjoining areas in Chhattisgarh. The generated electricity will be sold to Chhattisgarh State Electricity Board (CSEB). Power Purchase Agreement has been signed by project proponent with CSEB for supply of power to the grid.

MECBL will generate electricity using carbon neutral rice husk (biomass residue) as fuel to generate 55 TPH steam at 67 $kg/cm^2_{(a)}$ and 495ºC which is used to drive a 12.0 MW condensing turbo-generator in order to generate power. This power will be exported to the regional electricity grid which is dominated by fossil fuel based power plants. Hence the proposed project activity displaces the electricity from grid distribution system that would have otherwise been supplied by fossil fuel fired power generating units in its absence thereby leading to reduction of greenhouse gas emissions.

Biomass Availability

The total food grain production in Chattisgarh has increased many folds during last few years A biomass assessment study has been conducted to assess the biomass availability within 75 km radius from the proposed project site at Village Bhangari, Gharghoda block, Raigarh District, Chattisgarh.The total crop production in the study area is 1876043 MT. Out of which 1770797 Metric Tonne (MT) (94.39%) is Paddy, 9755MT (0.52%) is Wheat and rest is Jawar, Bajra and other coarse grains. Production of 1 ton of rice require approximately 1.5 ton of paddy and total quantity of rice husk is approximately 20 percent of paddy. Total available rice husk considering above percentage rice husk is 375.208 thousand MTPA. The rice husk for the project activity shall be brought from locally available dealers and from mills within the Gharghoda block of Raigarh district, where the biomass is calculated to be available in surplus. The rice husk requirement at the project activity would be approximately 103624 MT per annum considering per day demand of 334 MT and working days as 310 in a year.

Project Activity's contribution to Sustainable Development

The contributions of the project activity towards sustainable development are as follows:

Social well being – The project activity will result in generation of employment, both during the time of construction of the project activity and the operational phase wherein people, would be employed for running the power production facility once it gets commissioned. The project activity will also generate employment opportunities for transporters who will be engaged in transporting rice husk from nearby collection centers to the project site.

Economic well being – The project activity would require rice husk which would be procured from the nearby areas. This would lead to additional income generation for the local farmers who would be able to sell the rice husk for effective utilization in the project activity.

Environmental well being – The project activity will result in reduction in GHG emissions by replacing the fossil fuel based power generation system in the state grid with rice husk based electricity generation system.

Technological well being – The technology stated for use in the project activity represents environmentally friendly technology for the application. The equipments, for the project activity, will be supplied by well established equipment manufacturers in the Indian market.

Thus it is ensured that the project activity contributes positively towards 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)	Party involved wishes to be considered as project participant (Yes/No)
Government of India (host)	Mahavir Energy & Coal Benefication Ltd	No

A.4. Technical description of the project activity:

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

The Project activity is located at Gharghoda, Chatttisgarh

A.4.1.1. Host Party(ies):

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India

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

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Chhattisgarh

A.4.1.3. City/Town/Community etc:

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Village Bhengari, District Raigarh

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

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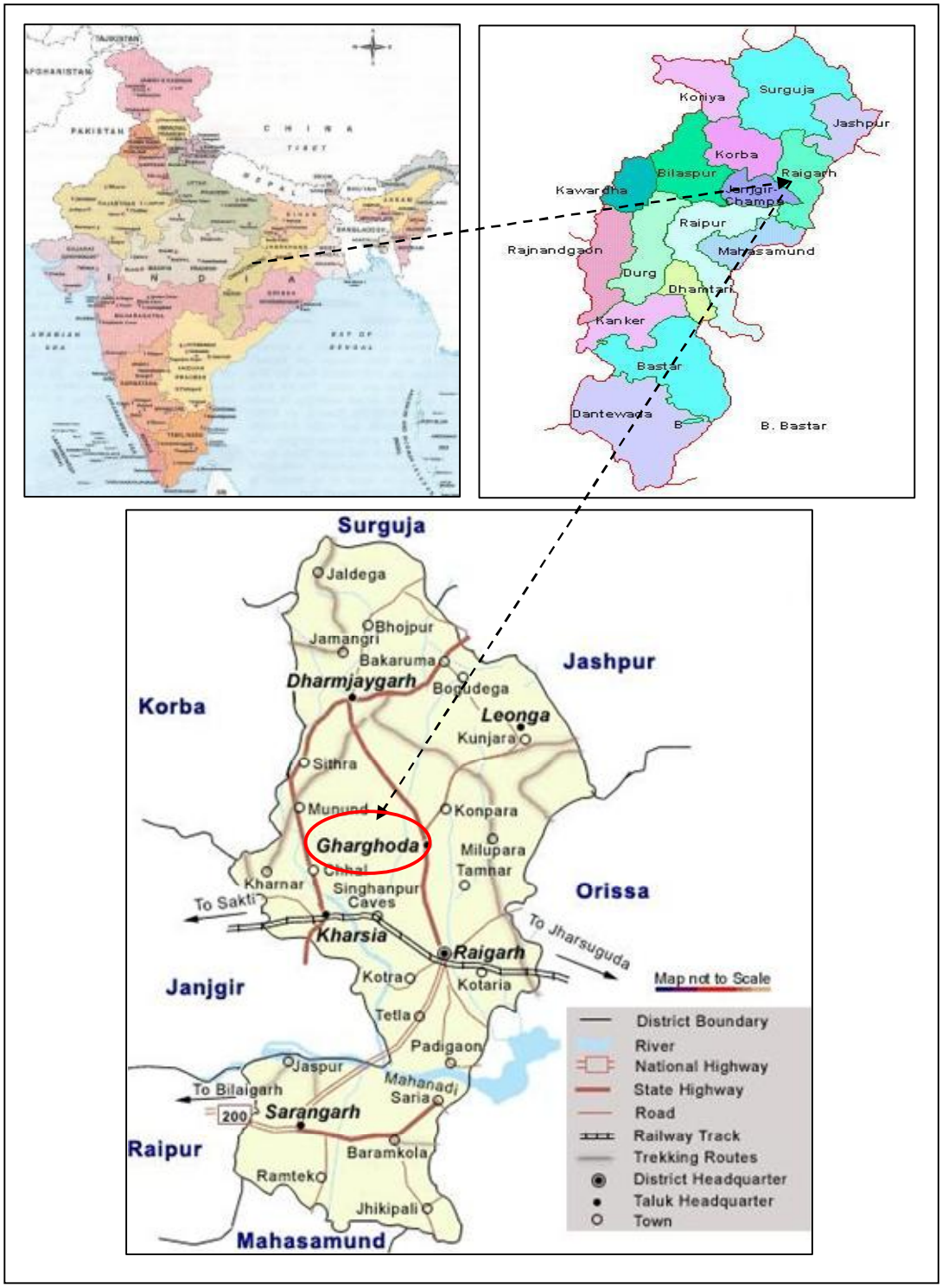
The project activity is located at Bhengari village in Navapara PO, Gharghoda Block, Raigarh district, Chhattisgarh, India. The geographical coordinates of the project activity is given below:

Longitude	83.42 °E
Latitude	22.23° N

The nearest railway station is at Kharsia.The following map shows the geographical location of the project activity.



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

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Type: I: Renewable energy projects
Category: I.D - Renewable electricity generation for a Grid (version 11, EB 31)

Technology of project activity

The power plant utilizes rice husk as fuel to generate steam. The steam drives the 12.0 MW condensing turbo-generator to generate power. Apart from these two main components, the power generation plant constitutes of fuel handling system, ash handling system and water system. The technical description of these systems is discussed below:

Boiler

The steam generating system for the power plant consists of one rice husk fired Atmospheric Fluidised Bed Boiler (AFBC) boiler with the steam generation capacity of 55.0 TPH with steam outlet parameters of 67 $kg/cm^2_{(g)}$ 495 ^0C. The boiler will be natural circulation and balanced draft type. The boiler will consist of air preheater, economizer, evaporators, superheaters, fuel firing equipment, integral piping and flue gas duct with expansion joints.

Steam Turbine

The entire steam generated in the boiler is fed to the 12.0 MW condensing turbo-generator with the following operational parameters:

Type:	Single cylinder, condensing type
Power:	12.0 MW at 11 kV, 50 Hz at 0.8 PF
Pressure, kg/cm^2 (a):	64
Temperature, °C:	490 ± 5

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

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Years	Estimation of annual emission reductions in tonnes of CO_2e
2008-2009	69,938
2009-2010	69,938
2010-2011	69,938
2011-2012	69,938
2012-2013	69,938
2013-2014	69,938
2014-2015	69,938
2015-2016	69,938
2016-2017	69,938
2017-2018	69,938
Total estimated reductions (tonnes of CO_2e)	**699,380**
Total number of crediting years	**10 years**
Annual average of the estimated reductions over the crediting period (tonnes of CO_2e)	**69,938**

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

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No public funding as part of project financing from parties included in Annex I of the convention 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:

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According to Appendix C, paragraph 2 of Simplified Modalities & Procedures for small scale CDM project activities, a proposed small-scale project activity shall be deemed to be a de-bundled 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:

- By 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.

The project activity qualifies for the use of simplified modalities and procedures for small-scale CDM project activities as there is no registered small scale project or any submission of application to register another small scale activity by MECBL.

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 – Renewable electricity generation for a Grid (AMS I.D., version 11, EB 31)
Reference: Indicative simplified baseline and monitoring methodologies for small-scale CDM project activity categories.

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

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The project activity satisfies the applicability criteria of the project category in the ensuing manner:

1. *This category comprises renewable energy generation units, such as photovoltaics, hydro, tidal/wave, wind, geothermal and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit.*
   The project activity is a renewable (biomass) energy generation unit that supplies electricity to the Western Regional Grid which is primarily a fossil fuel based grid.
2. *If the unit added has both renewable and non-renewable component (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.*
   The project activity is a new 12.0 MW installation for power generation by a steam turbine system. Thus, the total output of the project activity would be well below the stipulated limit of 15.0 MW.
3. *Combined heat and power (co-generation) systems are not eligible under this category.*
   The project activity is not a combined heat and power generation unit but a power generating unit only.
4. *In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct[2] from the existing units.*
   The project activity does not involve any existing renewable power generation units and is a new power generation facility as stated above.
5. *Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category. To qualify as a small scale project, the total output of the modified or retrofitted unit shall not exceed the limit of 15 MW.*
   The Project activity does not seek to retrofit or modify an existing facility and is a new installation.

B.3. Description of the project boundary:

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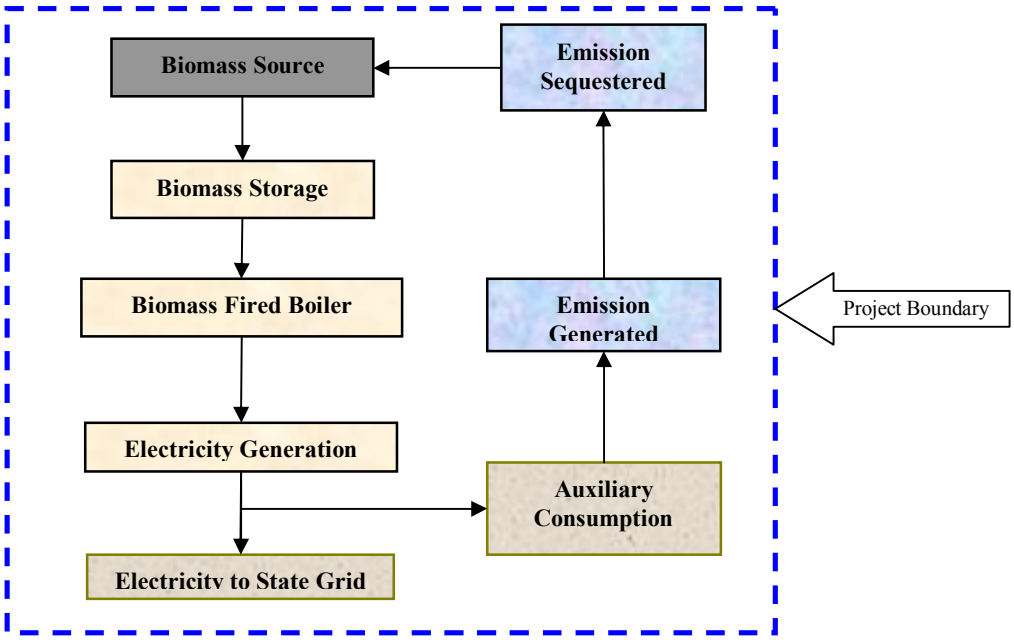
As per the paragraph 6 of AMS-I.D. Version 11, project boundary encompasses the physical and geographical site of the renewable generation source. The project boundary covers the biomass based

power plant, which starts from the biomass storage to the point of power supply to the CSEB grid. Thus, project boundary includes biomass storage, biomass fired boiler, electricity generation from the power production system, auxiliary consumption and electricity supplied to state grid. The project boundary is illustrated in the following diagram:



B.4. Description of baseline and its development:

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In the absence of project activity equivalent amount of electricity would have been generated in the fossil fuel based regional grid. Hence the baseline is equivalent electricity generation in the Western regional grid. There are five regions in India with respect to electrical transmission systems namely Northern Region, North Eastern Region, Eastern Region, Southern Region and Western Region. The project activity is located in Chhattisgarh state, which falls under western region. Hence, Western region grid is selected as grid boundary. The baseline emission factor has been taken from the CEA Carbon Dioxide Baseline database for Indian Power Sector, version 1.1[1].

Key variables used for determining the Baseline Emissions
EF_y - Baseline Emission factor of the Western Region Electricity Grid (tCO_2/GWh)
EG_y - Electricity Generation by the power plant (GWh)

[1] Please Refer Annex 3

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:

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The project activity meets the eligibility criteria to use simplified modalities and procedure for small-scale CDM project activities as set out in paragraph 6 (c) of decision 17/CP.7. As per the decision 17/cp.7 Para 43, a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.

Further referring to Appendix A to Annex B document of indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories, project participants shall provide a qualitative explanation to show that the project activity would not have occurred anyway, at least one of the listed elements should be identified in concrete terms to show that the activity is either beyond the regulatory and policy requirement or improves compliance to the requirement by removing barrier(s).

The implementation of the project activity by MECBL is not directly or indirectly mandated by any laws/ regulations of the respective state or the country.The project activity will encounter a number of barriers during its construction and operation phase. Various barriers existent in the path of the project activity are listed below:

Technological barrier:

The ash generated during rice husk burnings has low density and higher silica content. Due to low bulk density, ash adheres to the boiler tubes, thereby affecting the heat transfer and reducing the thermal efficiency. Due to higher silica content, equipments like boiler tubes, ID fan, top portion of the stack get eroded which leads to high maintenance cost, frequent breakdown and increased downtime of the project boiler. Hence, the operation & control of biomass fired boiler requires skilled boiler operators to run the system at its full potential and with minimal down time. For overcoming the problem of corrosion of equipments, an Electro Static Precipitator (ESP) will be installed, although the air pollution norms could have been met by installing Mechanical Dust Collectors (MDC), which is much cheaper. Further, wet rice husk cannot be used as a fuel in the FBC boilers as it results in the problem of clinker formation, therefore proper storage of rice husk is required.

Institutional and regulatory barriers:

The Chhatttisgarh Regulatory Commission has fixed uniform rate of wheeling charges of 2% in kind (3% as per Power Purchase and wheeling agreements entered into between the project proponent and Chhattisgarh State Electricity Board). The commission has decided to levy 6% of the energy input into the system towards transmission and wheeling charges irrespective of the distance between the point of injection of energy into the grid and the location of designated consumers. The request for 12 month banking facility proposed is also not allowed by the Commission. While determining the tariff, the Commission has adopted a normative figure of project cost as INR 39 Million/ MW which is lower than INR 40 Million/MW adopted by other state Regulatory Commissions and estimate of Central Electricity Authority (CEA). Commission has only allowed operation and maintenance (O&M) expenses at 4% of the project cost as against 7% recommended by the CEA. The depreciation of assets for power production as calculated for tariff determination has been considered at 7% by the commission as against bench mark of 7.84% proposed.

Commission has allowed the cost of rice husk at the rate of INR 800/MT as against actual price varying between INR 850 to 1000 per MT and increasing. The wastage of 3% in weight and non-combustible in the fuel has not been allowed. Power project have been allowed the use of 25% of coal as supplementary fuel to biomass fuel, but coal price has not been included in the working of fuel cost for tariff determination.

The commission has also prescribed that the tariff decided by the impugned order will not be applicable to those biomass power plants which consume coal more than 25% of the total fuel consumption.

Commission has provided an annual escalation in the cost of fuel at the rate of 5%. The biomass power producers request for a reasonable fuel cost adjustment (FCA) formula to be evolved along with a mechanism by which the actual fuel cost could be determined from time to time for adjustment in tariff has not been considered.

The Commission has decided that if a supplier delivers energy less than 70% or more than 105% of the scheduled energy (schedule to be given to distribution licensee at least 15 days prior to commencement of supply of energy) tariff for such power will be the variable cost plus 30 p/kWh.

The Commission did not agree to the request of the biomass power producers that the demand charges in case of Biomass projects supplying to the HT consumers (who are also the consumers of CSEB) should be pro-rata shared by the Biomass developers and CSEB. Biomass Power Developers' request that exchange of power between CSEB and Biomass projects may be billed monthly after netting the import and export of power. This request did not find any mention in the tariff order. The tariff order prescribed that in case of availment of start-up power by developers from the grid the demand charge on the contract demand applicable to HV 6 category of tariff would be reduced to 50% of the existing charge with no condition of minimum monthly guaranteed consumption.

Thus the project proponent initiative to undertake the proposed 12 MW biomass based power plant for supplying generated electricity to the stat grid faces all these aforesaid barriers. The carbon revenue from sale of CERs could alleviate the financial uncertainties and assure a secure revenue source to meet the required financial ratios to operate the project activity during the crediting period.

B.6. Emission reductions:

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B.6.1. Explanation of methodological choices:

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Project activity emissions

The GHG emission due to the combustion of biomass is neutralized by the sequestration done during the growth of the biomass, thereby making it a carbon neutral fuel. Further the rice husk contains negligible quantities of nitrogen and sulphur, the other green house gas from the combustion of rice husk can be considered as negligible. Therefore essentially there would not be any GHG emissions due to the project activity within the project boundary.

However, in case of emergencies, if any quantity of coal is used, then it will be monitored for estimation of associated CO_2 emissions.

Leakage

As mentioned in paragraph 12 of Type I Category D of indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories - version 11 – EB 31 is required only if the equipment of the project activity is transferred from another activity or the existing equipment is transferred to another activity.

As the equipment is not transferred from/to another activity in the present power generation plant the estimation of leakage is not applicable. However, the only source of considerable GHG emissions which are attributable to the project activity lying outside the project boundary will be the emissions arising during the transportation of rice husk. The same have been estimated in the following section.

Baseline emissions

Estimation of the emission factor

The Emission Factor the Western Regional Grid has been taken from the CEA CO_2 Baseline Database for Indian Power Sector, Version 1.1.

Calculation of Baseline Emissions

Formula used to determine the baseline emissions is as follows:

$$BE_y = EG_y \times EF_y$$

Where:

BE_y = Baseline Emissions in the year y (t CO_2 / year)

EG_y = Net Electricity generation by the project activity in the year y (GWh / year)

EF_y = Emission factor of the grid (t CO_2 / GWh)

Emission reduction

Following formula is used to determine emission reduction:

$$ER_y = BE_y - (PE_y + L_y)$$

Where:

ER_y = Emission reduction in the year y (t CO_2 / year)

PE_y = Project emissions in the year y (t CO_2 / year)

L_y = leakage emissions in the year y (t CO_2 / year)

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

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Data / Parameter:	**EF_y**
Data unit:	t/GWh
Description:	Emission factor of the western grid where the generated electricity from the project is fed.
Source of data used:	Carbon Dioxide Baseline database for Indian Power Sector, ver 1.1
Value applied:	894.58
Justification of the choice of data or description of measurement methods	The emission factor is the average value of Build and Combined Margin for all the electrical power generating units in the western grid.

and procedures actually applied :	
Any comment:	The data will be archived for 2 years beyond the crediting period.

B.6.3 Ex-ante calculation of emission reductions:

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Baseline Emissions:

BE_y	=	EG_y	*	EF_y
tCO2 / year		GWh / year		t CO_2 / GWh
69,938	=	**78.18**[2]	*	**894.58**

Project Emissions: There will be no project emissions as the project is using Carbon neutral fuel (Rice Husk).

Leakages: As per the Paragraph 16 of the methodology AMS I.C (Version 10), leakages is to be considered if the energy generating equipment is transferred from another activity or if the existing equipment is transferred to another activity. This does not apply to the project activity. However, the only source of considerable GHG emissions which are attributable to the project activity lying outside the project boundary will be the emissions arising during the transportation of rice husk. The same have been estimated below (taking very conservative estimates).

Emissions due to transportation of rice husk

As per paragraph 4 of "Attachment C to Appendix B - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories", for small-scale energy CDM project activities involving renewable biomass, sources causing emissions greater than 10% of the emission reductions are attributable to the project activity. Since the emissions due to the transportation of rice husk are only about 2% of the emission reductions by the project activity, they are not attributable to the project activity.

Description	Unit	Value
Total biomass required	Tonnes/year	126414
Biomass transported by truck	Tonnes/year	126414
Biomass load per truck	Tonnes	8
Total no. of trips		15802
Max. distance between project site and collection centres	Km	50
Consumption of diesel per trip (to and fro)(@4km/lit)	Litres	25
Total diesel consumption	Litres	395050

[2] Refer Annex 3

Density of Diesel	Tonnes/1000ltr	0.83
Mass of diesel used	Tonnes	327.892
Calorific value of diesel	TJ/tonne	0.0418
Emission factor for diesel	t CO_2/TJ	74.10
Net Emissions	**t CO_2 /year**	**1015**

This is not attributed to project activity as it is less than 10% of the project emissions reduction.

Emission reductions:

ER_y	=	BE_y	-	PE_y	-	Leakage
tCO2		tCO_2		tCO_2		tCO_2
69,938	=	**69938**	-	**0.0**	-	**0.0**

The project activity will therefore result in a total reduction of 699,380 t CO_2e over the crediting period.

B.6.3 Summary of the ex-ante estimation of emission reductions:

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Year	Project activity emissions (tCO_2e)	Baseline emissions (tCO_2e)	Leakage (tCO_2e)	Emission reductions (tCO_2e)
2007-08	0	69,938	0	69,938
2008-09	0	69,938	0	69,938
2009-10	0	69,938	0	69,938
2010-11	0	69,938	0	69,938
2011-12	0	69,938	0	69,938
2012-13	0	69,938	0	69,938
2013-14	0	69,938	0	69,938
2014-15	0	69,938	0	69,938
2015-16	0	69,938	0	69,938
2016-17	0	69,938	0	69,938
Total (tCO_2e)	**0**	**699,380**	**0**	**699,380**

A carbon intensive energy equivalent of **78.183** GWh for a period of 10 years would be replaced by clean power from the 12 MW rice husk based power generation plant thereby reducing **69,938** tonnes of CO_2 emissions.

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

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The project activity uses the approved monitoring methodology as follows:

Type I – Renewable energy projects

Category I.D – Grid connected renewable electricity generation
Reference: The monitoring methodology of the project activity is referred from 'Paragraph 13' of Type I - Category I.D - version 11 – EB 31' of indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories.

B.7.1 Data and parameters monitored:

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Data / Parameter:	**EG_{GEN}**
Data unit:	GWh/year
Description:	Gross electricity generated by the biomass power plant.
Source of data to be used:	Electronic Power and Energy meter, Daily log books
Value of data	86.87
Description of measurement methods and procedures to be applied:	Measured in plant premises and monitored and recorded every shift (8 hours). Along with the energy meter recording the kW, Ampere and power factor will also be monitored on an hourly basis. This will help in cross-checking the gross generated figure.
QA/QC procedures to be applied:	This data will be used for calculation of emission reductions by project activity. The gross generation figure can be cross checked by the voltage meter, ammeter and power factor meter readings which are recorded on an hourly basis. They will have class 1.0 accuracy conforming to IS 13779 standards. For digital read outs the error is computed in counts: Class 1.0 = ±1% of the full scale + 1 counts. Calibration of the meters from external certified agencies would be carried out annually.
Any comment:	The archived data will be kept for 2 years beyond the Crediting Period (CP)

Data / Parameter:	**EG_{Aux}**
Data unit:	GWh/year
Description:	Power consumed by the power plant and its auxiliaries
Source of data to be used:	Electronic meter, Daily log books
Value of data	8.687
Description of measurement methods and procedures to be applied:	Measured in plant premises and monitored and recorded continuously.
QA/QC procedures to be applied:	This data will be used for calculation of emission reductions by project activity. The auxiliary consumption figure can be cross checked by the voltage meter, ammeter and power factor meter readings which are recorded on an hourly basis. They will have class 1.0 accuracy conforming to IS 13779 standards. For digital read outs the error is computed in counts: Class 1.0 = ±1% of the full scale + 1 counts Calibration of the meters from external certified agencies would be

	carried out annually.
Any comment:	For the purpose of ex ante calculation of emission reductions, 15% auxiliary consumption has been assumed. The archived data will be kept for 2 years beyond the Crediting Period (CP).

Data / Parameter:	**$Q_{y,RH}$**
Data unit:	MT/year
Description:	The quantity of rice husk required to generate electricity
Source of data to be used:	Invoice reports
Value of data	126,414 MT/Yr
Description of measurement methods and procedures to be applied:	To be monitored at purchase, storage and usage
QA/QC procedures to be applied:	This data will be used as supporting information to calculate emission reductions by project activity.
Any comment:	Crediting Period (CP)+2 years

Data / Parameter:	**NCV_{RH}**
Data unit:	kcal/kg
Description:	The calorific value of rice husk used to generate electricity
Source of data to be used:	Test reports
Value of data	3200
Description of measurement methods and procedures to be applied:	Shall be obtained through sample testing
QA/QC procedures to be applied:	The calorific value of the rice husk is fairly constant and thus no QA/QC procedures are required.
Any comment:	Crediting Period (CP)+2 years

Data / Parameter:	**$Q_{y,coal}$**
Data unit:	MT/year
Description:	The quantity of coal that may be used in the power plant during the crediting period
Source of data to be used:	Log books
Value of data	This will be monitored ex-post.
Description of measurement methods and procedures to be applied:	Measured in plant premises Electronic weighing and record on paper, whenever it has been used
QA/QC procedures to be applied:	Weigh bridge will be calibrated at regular intervals.

Any comment:	The data will be archived for Crediting Period (CP)+2 years

Data / Parameter:	CC_{coal}
Data unit:	%
Description:	The carbon content of the type of coal that will be used.
Source of data to be used:	Sample testing
Value of data	--
Description of measurement methods and procedures to be applied:	Test certificates will be obtained from the supplier of the coal
QA/QC procedures to be applied:	--
Any comment:	The data will be archived for Crediting Period (CP)+2 years

B.7.2 Description of the monitoring plan:

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As per the paragraph 12 of Simplified Modalities and Procedures for Small Scale CDM Project activities, a proposed project activity shall,

(a) Meet the eligibility criteria for small-scale CDM project activities set out in paragraph 6 (c) of decision 17/CP.7;

(b) Conform to one of the project categories in appendix B to this annex;

(c) Not be a de-bundled component of a larger project activity, as determined through appendix C to this annex.

As explained earlier in A.4.2, the project activity meets the eligibility criteria for small-scale CDM project activities set out in paragraph 6 (c) of decision 17/CP.7, falls under small-scale CDM project of Type I. Category I.D and is not a de-bundled component of a larger project activity.

The monitoring plan has been drawn as per the guidance provided in paragraph 13 of 'Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories Type I - Category I.D - version 11 – EB 31'

Description of monitoring plan

There will be two separate energy meters to record the gross power produced and auxiliary power consumed in the project activity. The electrical energy monitoring would be required as the calculation of the emission reductions is based on the electricity displaced. As far as electricity is concerned, the monitoring and verification system would mainly comprise of these meters. All instruments will be calibrated at regular intervals so that the accuracy of measurement can be ensured at all the time. The rice husk input will also be monitored along with input quantity of coal when used. These monitoring and controls will be a part of the DCS/SCADA of the entire plant. All monitoring and control functions will be done as per the internally accepted standards of MECBL.

GHG Sources

Direct On-Site Emissions

Direct on-site emissions of the project activity are nil as the rice husk, the carbon neutral fuel is used in the project activity. Otherwise, the CO_2 emission due to the combustion of rice husk is the direct on-site emission, which is nullified by the photosynthesis process of paddy crops. Therefore, it "recycles" atmospheric carbon and does not add to the greenhouse effect.

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 activity. Since the quantum of emissions is below 2% of emission reductions by the project activity, hence 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 would be considered as indirect on site GHG source. By viewing the life of the rice husk based power generation plant, emissions from the above-mentioned source are too small and hence neglected. No other indirect on-site emissions are anticipated from the project activity.

Project Parameters affecting Emission Reduction
Fuel related parameters:

Quantity of rice husk used in the boiler as fuel
The quantity of rice husk entering the plant will be measured and records of the same will be maintained. The weighing system would be calibrated regularly to ensure the accuracy of the measurement. The data will be recorded for further verification with the amount of rice husk mentioned in invoices / receipts from fuel contractors.

Quality of rice husk used in the boiler
The main type of fuel proposed to be fired in the boiler is mainly rice husk. The properties of rice husk from ultimate analysis – calorific value, ash compositions etc. are already established and will be consistent in the region.

Operational Parameters of the rice husk based power generation unit

Total Electricity Generated
In the plant premises, the total electricity generated by the rice husk based power generation project is measured to the best accuracy and is monitored and recorded, on a continuous basis by the electronic energy meter. The integrated readings are logged on manual log book for every 8 hour shift.

Auxiliary Consumption
As the total quantum of electricity consumed by the auxiliaries would affect the total electricity supplied to the rice husk based power generation facility and therefore the amount of GHG reductions, the auxiliary electricity consumption is measured and recorded in the plant premises by the electronic energy meter. The integrated readings are recorded on manual log book for every 8 hour shift.

Power exported to the CSEB

It is calculated based on deduction of auxiliary consumption from the total electricity generated at MECBL would ensure accuracy of the measurement system by adopting the following operational and management structure.
The shift in-charges are responsible for the eight-hourly data recording of the relevant parameters mentioned in the monitoring plan. The mechanical and electrical managers would ensure that the data is properly collected and stored electronically/paper. The monthly report would be prepared by Electrical-in-charge by aggregating the daily readings. Any discrepancy observed in the readings would be handled responsively. The electrical department would forward the monthly report to finance department for the cross-verification. After cross-verification, the finance department would submit the report to top management. The managers are qualified technical personnel with more than 5 years experience in relevant field. All the shift in-charges are trained and experienced diploma holders.

Verification
The performance of the rice husk based electrical power generation project leads to CO_2 emission reductions. In other words, the longer the power plant runs and supplies power to the state grid, more would be the emission reductions. The major activities to be verified are as under:

- Verification of various measurement and monitoring methods
- Verification of instrument calibration methods
- Verification of measurement accuracy

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

>>
The baseline for the proposed project activity has been estimated by using the methodology specified in the applicable project category for small-scale CDM project activities. The baseline is the product of annual electricity (in GWh) generated by the project activity and Western grid emission factor of 894.58 tCO_2/GWh detailed in Annex 3.

Date of completion of the baseline in *DD/MM/YYYY*
19/06/2007

Name of person/entity determining the baseline:
Mahavir Energy and Coal Benefication Limited
The entity is also a project participant listed in Annex 1 of this document.

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:

>>
27/09/2006

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

>>
25y-0m

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

>>
A fixed crediting period of 10 years has been opted for the proposed project activity.

C.2.1. Renewable crediting period

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

>>
Not Applicable

C.2.1.2. Length of the first crediting period:

>>
Not Applicable

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>
01/01/2008
The project participant hereby confirms that the crediting period will not commence prior to the date of registration.

C.2.2.2. Length:

>>
10y-0m

SECTION D. Environmental impacts

>>

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

>>

The project being a renewable energy biomass based power project it does not fall under the purview of The Environmental Impact Assessment (EIA) notification of the Ministry of Environment and Forest, Government of India. As per the Government of India revised notification 2006 no EIA is required for biomass based power generation projects which are listed in the predefined list of Ministry of Environment and Forest.

The design philosophy of this project activity is driven by the concept of providing low cost energy with acceptable impact on the environment. Since the project uses only biomass residue (a carbon neutral fuel) for steam and electricity generation, it does not lead to GHG emissions.

Air - An ESP would be provided in the project activity as the air pollution control equipment. The chimney height would be as per the requirement of the pollution control board to disperse the flue gases in the atmosphere at an appropriate height.

Water – The project activity would not cause any significant impact on the quality/quantity of water in the region.

Solid – The ash generated from the rice husk burning would be used for top soil improvement and land filling or otherwise would be properly disposed off.

Noise – The equipments would be designed to operate at permissible noise levels. Personal Protective Equipments (PPEs) such as ear plugs would be provided for people working in the power plant.

Also, consent from the SPCB as per the Air and water act has been received.

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:

>>

The environmental impacts are not considered to be significant by the project participant or the host party.

SECTION E. Stakeholders' comments

>>

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

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The local stakeholders are those who face the immediate effect due to the project activities which involves effect on the local environment, social life and economics.

The stakeholders identified for the project activity are:

- Local villagers and representative of village governing bodies
- Employees of MECBL
- Equipment suppliers
- State pollution control board

The comments from local stakeholders were invited through a public hearing meeting.

E.2. Summary of the comments received:

>>

The local residents appreciated that the project activity would generate source of employment and revenue for them during the, construction and operation phase of the project and procurement of raw material for the project activity, respectively. The equipment suppliers and State Pollution Control Board have also appreciated the new project activity. The local stakeholders have given their no objection certificate to MECBL.

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

>>

No concerns were raised during the consultation with the stakeholders. Further, the web posting of the PDD would suffice for public viewing and comments.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Mahavir Energy and Coal Benefication Ltd
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Represented by:	
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Salutation:	Mr
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First Name:	Vinod
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Direct tel:	-
Personal E-Mail:	mahavirglobalcoal@yahoo.co.in, mecbl@yahoo.co.in

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding as part of project financing from Parties included in Annex 1 to the convention is involved in the project activity.

Annex 3

BASELINE INFORMATION

For the project activity the baseline scenario was determined as equivalent electricity generation from the grid

A) Choice of the grid that will be affected by the project activity

The electricity system in India is divided into five regions – Northern, Eastern, Western, Southern and North-Eastern Electricity Boards. Eastern Region grid is chosen as the grid system for the project activity, since the project activity is coming up in Chattisgarh which falls in the Western Region grid.

The Emission factor for the Western region grid has been taken to be **894.58 t CO_2e/GWh** as given in the Carbon Dioxide Baseline database for Indian Power Sector, version 1.1, given by CEA[3] which is a statutory body under the Ministry of Power. The data base currently covers the five fiscal years 2000-01 to 2004-05.

The Emission factor as per the database has been calculated in line with the approved methodology ACM0002, version 06[4]

Calculation of the Net Electricity Generated

Plant Capacity	kW	12000
Plant Load Factor	%	85
Auxiliary consumption	%	10
Number of days of operation in a year		310
Number of hours of operation in a day		24
Number of hours of operation per year		7446
Total electricity generated	GWh/year	86.87
Power supplied to the grid	GWh/year	78.18

[3] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

[4] CO_2 Baseline Databse for Indian Power Sector, User Guide, Version 1.1, pg 11

Annex 4

MONITORING INFORMATION

The monitoring plan has already been described in section B.7.2.

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