

MONITORING REPORT FORM (CDM-MR) *
Version 01 - in effect as of: 28/09/2010

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* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

MONITORING REPORT**Version number: 2.0****Date: 31/03/2012****Jianli Kaidi Biomass Power Project****Reference number: 3044****The 1st monitoring period: 12/08/2010-31/03/2011****SECTION A. General description of the project activity****A.1. Brief description of the project activity:**

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Jianli Kaidi Biomass Power Project (hereafter referred to as the project) is a biomass utilization project developed by Jianli Kaidi Green Energy Development Co., Ltd. (hereafter referred to as the Project Owner) and is located in Chengdong Industrial Park, Jianli County, Hubei Province, P.R. China. The project is designed to produce 126,720MWh of electricity per year from burning biomass residues, displacing electricity generated by Central China Power Grid (CCPG), which is dominated by fossil fuel-fired power plants, and thus reducing greenhouse gas (CO₂) emissions.

The project processes and burns biomass residue, of which rice husk, cotton straw, branches, barks, stumps and wood chips are the main biomass fuel. 2 sets of 65t/h Circulating Fluidized Bed (CFB) boiler and 2 sets of 12MW steam turbines generator units are installed. Therefore, the total installed capacity of the Project is 24MW and the project is estimated to achieve 116,650 tonnes of CO₂e emissions reduction annually.

The project began to construct on 14/04/2008, and was put into operation since 19/12/2009. The project has been registered as a CDM project on 12/08/2010 (The version of registered PDD is version 5).

During current monitoring period (12/08/2010-31/03/2011), the project has achieved emission reductions of 58,410 tonnes CO₂e.

A.2. 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)
Peoples' Republic of China (host)	Jianli Kaidi Green Energy Development Co., Ltd	No
United Kingdom of Great Britain and Northern Ireland	Camco International Limited	No
United Kingdom of Great Britain and Northern Ireland	Camco Carbon Limited	No
Switzerland	Camco International Limited	No

() In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.*

A.3. Location of the project activity:

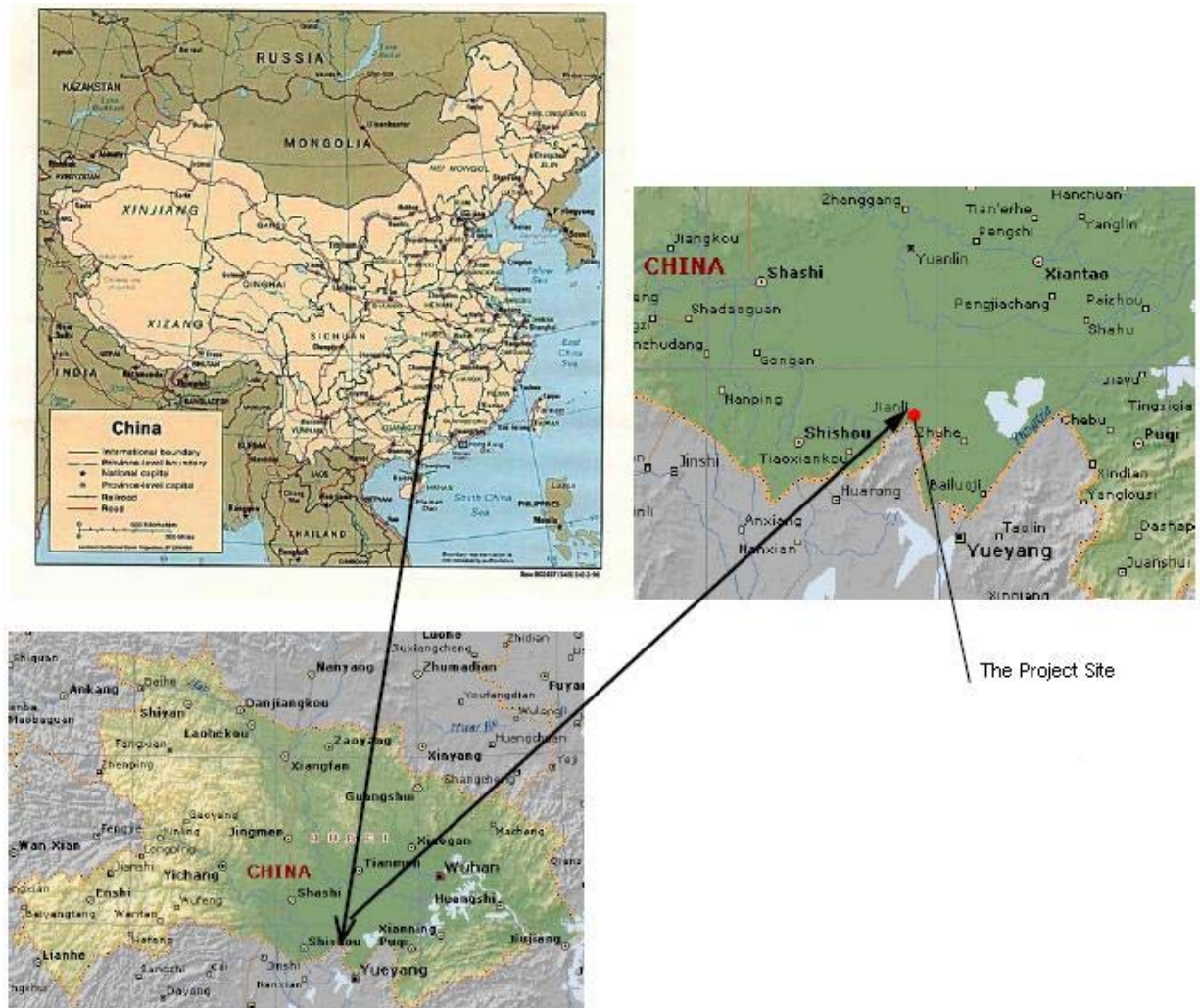
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The project activity is located in the Chengdong Industrial Park, Jianli County, Hubei Province, P.R. China.

The centre of plant has geographical coordinates of 112° 54' 18" east longitude 29° 49' 30" north latitude.

Please refer to the following drawing for the geographic location of the project activity.

Figure 1: Map showing the location of the project site



A.4. Technical description of the project

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The technology employed by the project is advanced domestic technology. The project installed two sets of 65t/h circulating fluid bed (CFB) boilers with medium temperature and sub-high pressure. At the same time, two 12MW steam turbines and two associated generators are applied in the project. The steam turbine employed is medium temperature and sub-high pressure extraction condensing steam turbine. The total installed capacity of the project is 24MW.

The key technical specifications of the boiler, turbine and generator are listed in the table below.

BOILER	
Manufacturer	Jiangxi Jianglian Energy and Environmental Protection Co., Ltd
Model	KG65-450/5.29-FSWZ- I
Type	Medium temperature and sub-high pressure Circulating Fluidized Bed
Maximum evaporation volume	65t/h
Rated steam pressure	5.29MPa
Rated steam temperature	450℃
Feed water temperature	153.2℃
Feed water pressure	5.72MPa
Efficiency	≥86 %
Quantity	2
STEAM TURBINE	
Manufacturer	NanJing Steam Turbine(Group) Co., Ltd
Model	C12-4.90/0.981-12/435℃
Type	Medium temperature and sub-high pressure extraction condensing steam turbine
Rated power	12MW
Main steam pressure	4.9MPa
Main steam temperature	435℃
Rate extraction steam volume	15t/h
Maximum Extraction steam volume when Rate electricity capacity is 6.59MW	45t/h
Quantity	2
GENERATOR	
Manufacturer	NanJing Steam Turbine(Group) Co.,
Model	QFJ-15-2
Rated power	15MW ¹
Rated voltage	10.5KV
Power factor	0.8
Efficiency	≥97%
Rated rotating speed	3000r/min
Rated frequency	50Hz
Quantity	2

The biomass residues are weighed by the weighbridge before being fed into the fuel entering system to the boiler for combustion or into the storehouse in the plant for future usage. The steam entered into the turbine is used for power generation.

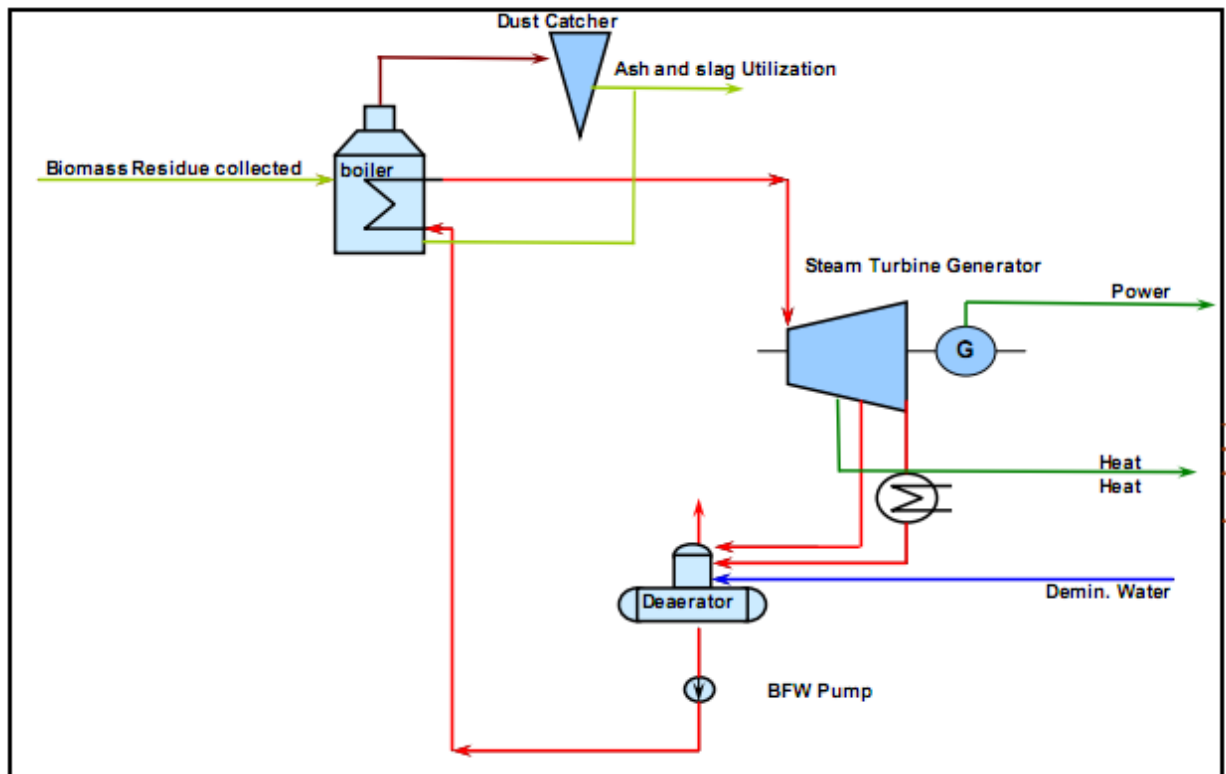
The boiler smoke is treated by a high efficiency bag filter and then carried to the ash storeroom. The annual ash generated from the power plant is very limited which is stored or given to the local farmers for free.

The turbine and generator system used in the project is supplied by Chinese domestic suppliers as well as the other auxiliary equipments installed in the power plant.

A flow diagram showing the power plant operation is provided as below.

¹ The generator is sized at 15MW and not 12MW to allow for possible peak generation and to avoid damage to the generation unit bu sudden load change in abnormal situations.

Figure 2: Flow Diagram of the plant



A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

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1. ACM0006 (Version 06.2) – “Consolidated methodology electricity generation from biomass residues”
2. “Combined tool to identify the baseline scenario and demonstrate additionality”. (Version 02.2)
3. ACM0002 (Version 08) – “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”
4. “Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion” (Version 02)
5. “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” (Version 01)
6. “Tool to calculate the emission factor for an electricity system” (Version 01.1)

For more information regarding the methodology, please refer to the link:

<http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>

A.6. Registration date of the project activity:

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12 Aug 10

A.7. Crediting period of the project activity and related information (start date and choice of crediting period):

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Crediting period: 12 Aug 10 – 11 Aug 17 (Renewable)

The start date of the crediting period is 12 Aug 10.

A.8. Name of responsible person(s)/entity(ies):
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SECTION B.Implementation of the project activity

B.1. Implementation status of the project activity

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The project consists of one site, which began to construct on 14/04/2008, and was put into operation since 19/12/2009. Please refer to the following table for details.

Activity	Date	
	1# Generator	2# Generator
Start of construction	14/04/2008	
Commissioning of core equipment	07/12/2009	06/02/2010
Operation of core equipment	19/12/2009	10/02/2010

During current period, 1# steam turbine generator and 2# steam turbine generator were respectively shutdown 17 times and 10 times for maintenance.

No events or situations, which may impact the applicability of the methodology, occurred during the current monitoring period.

B.2. Revision of the monitoring plan

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N/A

B.3. Request for deviation applied to this monitoring period

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N/A

B.4. Notification or request of approval of changes

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The request of approval of changes regarding the biomass residue was submitted to the EB, and was approved on 28 Feb 2012.

For more information regarding this, please refer to the link:

<http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1256015812.95/history95/history>

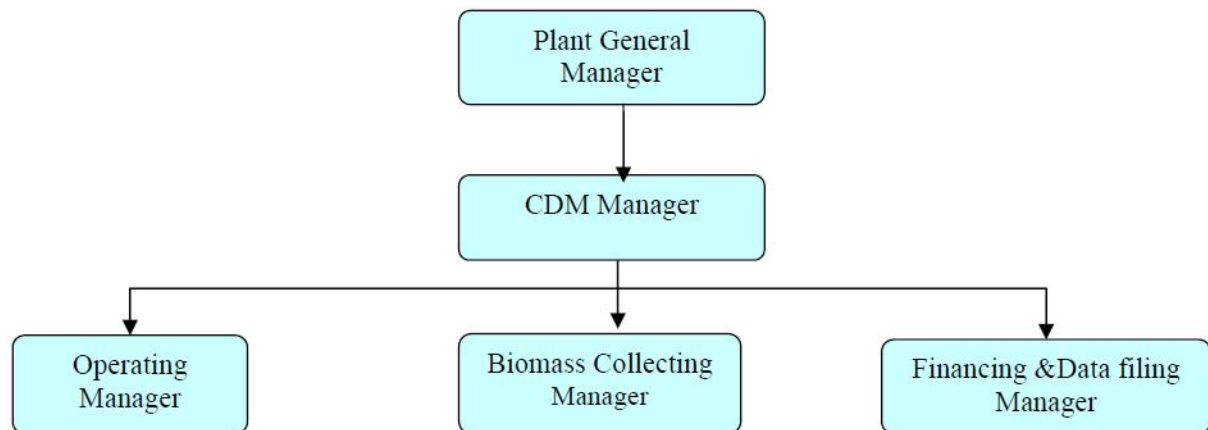
SECTION C. Description of the monitoring system

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1. The organizational structure, roles and responsibilities of personnel:

In order to ensure monitoring of the project is in accordance with the monitoring plan and methodology, a specific CDM office had been established before the registration of the project. Figure 3 shows the organizational structure of the CDM office.

Figure 3 Organizational structure of the CDM office



The responsibilities of the sections are briefly described as following:

The plant manager is in charge of approving the monitoring report, appointing the CDM manager and the relevant monitoring team members and responsible for the monitoring outcome.

The CDM manager is responsible for liaisoning with DOE and the buyers, organizing the relevant training, reviewing all the documents related with the monitoring of the project, correcting any errors in time and acting as the quality supervisor of the monitoring process.

The Operating Manger is responsible for the monitoring associated with operation of the plant, the net electricity generation, the start-up diesel consumption and the dry biomass combusted. In addition, the Operating Manager supervises meter maintenance and manages the calibration process.

The Biomass Collecting Manager is responsible for the monitoring associated with biomass collection, the transportation emission, the mechanical biomass pretreatment emissions and assisting the annual leakage analysis.

The Financing & Data filing Manager prepares the available original invoices or receipts associated with the whole monitoring process. Besides, the Financing & Data filing Manager collects the relevant data from the Operating Manger and the Biomass Collecting Manager, summarize the data, file the data and submit reports to the CDM manager in time.

The monitoring report is generated based on the monthly reports before each verification. The monitoring report is reviewed by the office manager before submitted to DOE.

2. Monitoring system:

2.1 Net electricity generation

There is a gate way meter and a back up meter installed on the project site monitoring the electricity supplied to the grid and purchased from the grid. They are double-way meters, and the accuracy of them is 0.2s.

In addition, a 10kv backup power meter is installed on the project site monitoring the electricity purchased from the grid. The accuracy is 0.5s.

The net electricity equals to electricity supplied to the grid minus electricity purchased from the grid minus electricity purchased from the 10kv backup power.

The data of electricity supplied to the grid and purchased from the grid is measured and crosschecked by the invoices and the power transaction note if available.

2.2 Biomass residues consumption

The amount of biomass residues combusted in the boiler is monitored by the belt weigher. The moisture of the biomass residues combusted also is monitored by sampling continuously at fixed time period and analyzed daily in the laboratory of the plant. The accuracy of the belt weighers is 0.5.

2.3 Fossil Fuel Consumption in the power plant

For fossil fuel used for starting up, flow meters are equipped in the supply and return pipe to monitor the quantity of diesel consumption. The accuracy of the flow meters is 1.0.

If there is any fossil fuel used for the shredders, forklifts or any other machines for the mechanical biomass pre-treatment in the project site (including the biomass collection sites) is monitored by the diesel purchase and consumption log book.

The purchase receipt is used for cross-check. If there is any data missing or significant error exists, the entire quantity of fossil fuel purchased in a particular monitoring period would be considered as combusted in the power plant for conservativeness.

2.4 Transportation of Biomass residues

The project developer of the project structures a recording and monitoring system within the biomass residues supply and management system covering all the biomass collection sites established by the project. Each time each truck transporting the biomass into the project site is counted and recorded in the log book. The transportation distance to the collection sites is recorded by company staffs at the sites and the data is recorded in the log books. The data on distance of fuel supply site from the plant can be verified by cross checking data records on the distances available with information from other sources (e.g. maps).

If data is missing for a particular round trip, the following backup data apply in their order:

- The round trip distance between the farthest biomass fuel supply site and the project plant is used.
- If the farthest biomass fuel supply site could not be verified, 200km would be used for conservativeness

2.5 Electricity consumed on site

When the biomass residue is mechanically pre-treated, the project needs a certain amount of electricity from grid. This amount is metered or calculated conservatively.

If the monitoring data is missing, or it is not feasible to install a dedicated meter to monitor this indicator, it is calculated conservatively as the weight of straws smashed in tons and the electricity consumption factor (kWh/ton). The electricity factor can be calculated as follows:

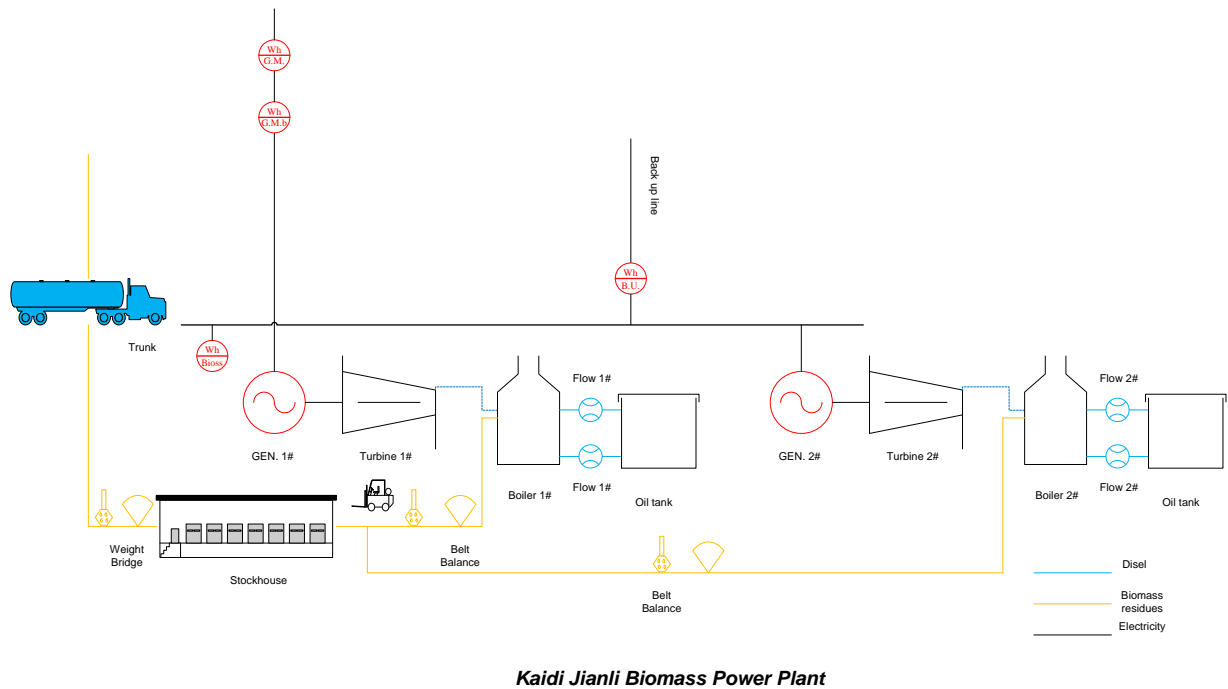
- 1) Collecting all the nameplates power (in kW) and capacity (t/h) of every straw crackers
- 2) Calculating the electricity factor corresponding to each cracker in kWh/t
- 3) Using the largest number as a conservative electricity factor for the calculation

2.6 Leakage

The project consumption and availabilities in the defined geographical area of each type of biomass residue not only the biomass types mentioned above but also other biomass residues utilized in the project is monitored to check the leakage effect brought by the operation of the project. This is obtained from surveys or statistics from local agricultural bureau or other official public resource. If they are not available, the project owner will ask specialized institute or consulting company to do biomass availability research.

The following figure shows the monitoring system of the project.

Figure 4: The monitoring system and power system connection



3. Data collection procedures

The meters or monitoring equipment installed in the monitoring system are calibrated by a certified Party in accordance with the manufacturer's recommendations and National Regulations for ensuring reliability of the system. Calibrations shall be evidenced with certificates of calibration for the relevant meter(s) issued by a qualified body. A calibration and error log are maintained to provide transparency and sound management.

All the electronic and paper documents relevant to CDM must be archived for more than two years since the end of the crediting period.

4. Emergency procedures for the monitoring system

4.1 Training

Members of staff who are involved in the CDM project have been given training on the CDM and reporting requirements, prior to registration of the project. New members of staff joining the CDM project team will also be given training in relation to their responsibilities. Full training procedures and a training plan have been detailed in the CDM Manual.

4.2 Record Keeping and Internal Reporting Procedure

The data associated with the emission reduction will be kept for at least 2 years after the end of the crediting period or the last issuance of CERs, whichever occurs later.

4.3 Error Handling Procedure

In the event that a meter has lost calibration over the allowable error limit then this shall be corrected at the earliest opportunity and re-calibrated and the data recorded from this meter since the last successful calibration shall be ignored.

The check of the CDM Project manager and then the third party verifier prior to issuance of the CERs is considered adequate for errors in the calculations. Where errors in the calculations are discovered by either of these Parties, the monitoring report shall be modified and the corrected version shall be resubmitted to the verifier.

4.4 External Reporting Procedure

After signing by the CDM Project manager, the report is sent to the third party verifier who is contracted to verify the emissions reductions during the crediting period of the project.

4.5 Procedure for corrective actions arising

The CDM manager is responsible for identifying corrective actions arising from the above procedures and for liaising with the purchaser, the third party verifiers and other stakeholders to take necessary steps to implement the corrective actions.

4.6 Emergency procedures

In the unlikely event of an emergency, set procedures will be followed. Details of the procedures to be followed are described in the relevant Operation Manuals. The key points include:

- The Distributed Control System (DCS) will automatically shut off the boilers upon detecting an emergency.
- The operators can also remotely shut off the boilers if they find an emergency situation has occurred.

SECTION D.Data and parameters

1. Parameters

D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

Data / Parameter:	EF_v
Data unit:	t CO ₂ e/MWh
Description:	Baseline emission factor of Central China Power Grid
Source of data used:	The registered PDD Version 5
Value(s) :	0.9735
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Additional comment:	

Data / Parameter:	GWP_{CH4}
Data unit:	t CO ₂ e/t CH ₄
Description:	Global warming potential for CH ₄
Source of data used:	The registered PDD Version 5
Value(s) :	21
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Additional comment:	

Data / Parameter:	TDL_{i,v}
Data unit:	%
Description:	Average technical transmission and distribution losses for providing electricity to source j in year y.
Source of data used:	The registered PDD Version 5
Value(s) :	20
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission calculation
Additional comment:	

Data / Parameter:	EF_{CH4,BF}
Data unit:	kg CH ₄ /TJ
Description:	CH ₄ emission factor for controlled burning of the biomass residue in the project plant
Source of data used:	The registered PDD Version 5
Value(s) :	41.1
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission calculation
Additional comment:	

Data / Parameter:	NCV_k*EF_{burning,CH4,k,v}
Data unit:	t CH ₄ /ton

Description:	CH ₄ emission factor for controlled burning of the biomass residue in the project plant
Source of data used:	The registered PDD Version 5
Value(s) :	0.001971
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission calculation
Additional comment:	

D.2. Data and parameters monitored				
Data / Parameter:	$BF_{k,y}$			
Data unit:	Tons of dry matter			
Description:	Quantity of each biomass residue type k combusted in the project plant in year, y.			
Measured /Calculated /Default:	Measured			
Source of data:	On-site measurements			
Value(s) of monitored parameter:	Type	Units	Data	
	Rice husk	tonne	81117.81	
	Cotton straws	tonne	10782.86	
	Branches	tonne	2004.67	
	Barks	tonne	4477.37	
	Stumps	tonne	241.30	
	Wood chips	tonne	3400.39	
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline and project emissions			
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Meter name	Belt balance 1#	Belt balance 2#	
	Type/Model	ICS-ST4-1000	ICS-ST4-1000	
	Accuracy	0.5	0.5	
	SN	811110	811109	
	Last calibration date	26-Jun-10	26-Jun-10	
	Valid period	25-Jun-11	25-Jun-11	
	Calibration Frequency	Once per year	Once per year	
Measuring/ Reading/ Recording frequency:	Continuously measurement and monthly recording; 100% of data are monitored and electronically archived.			
Calculation method (if applicable):	Use weigh meters, adjust for the moisture content in order to determine the quantity of dry biomass			
QA/QC procedures applied:	The meter undergoes calibration/maintenance subject to appropriate industrial standards. Direct measurements at the plant site are crosschecked with an annual energy balance that is based on purchased quantities and stock changes.			

Data / Parameter:	<i>Moisture content of the biomass residues</i>
Data unit:	% water content
Description:	Moisture content of the biomass residues

Measured /Calculated /Default:	Measured		
Source of data:	Measured by balance and dry cabinet		
Value(s) of monitored parameter:	Please refer to the spread sheet		
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline and project emissions		
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Meter name	Balance 1#	
	Type/Model	YB2001	
	Accuracy	0.1g	
	SN	196	
	Last calibration date	26-Jun-10	
	Valid Period	25-Jun-11	
	Calibration frequency	Once per year	
	Meter name	Dry cabinet 1#	Dry cabinet 2#
	Type/Model	101-1B	101-1A
	Accuracy	0.1 °C	0.1 °C
	SN	81213	171
	Last calibration date	27-Jun-10	27-Jun-10
	Valid Period	26-Jun-11	26-Jun-11
	Calibration frequency	Once per year	Once per year
Measuring/ Reading/ Recording frequency:	Daily measurement and monthly recording; 100% of data are monitored and electronically archived.		
Calculation method (if applicable):	--		
QA/QC procedures applied:	The monitoring procedures in the laboratory of the plant is done according to authoritative instructions or guidance		

Data / Parameter:	NCV_k					
Data unit:	GJ/ton of dry matter					
Description:	Net calorific value of each biomass residue of type k					
Measured /Calculated /Default:	Measured					
Source of data:	Report from a reputed laboratory and according to relevant international standards.					
Value(s) of monitored parameter:	Type	Units	NCV	Test Date	NCV	Test Date
	Rice husk	MJ/Kg	12.13	22/07/2010	13.56	21/01/2011
	Cotton straws	MJ/Kg	13.36	30/07/2010	13.47	21/01/2011
	Branches	MJ/Kg	13.38	20/10/2010	12.66	21/01/2011
	Barks	MJ/Kg	13.94	20/10/2010	13.98	21/01/2011
	Stumps	MJ/Kg	10.88	20/10/2010	10.90	21/01/2011
	Wood chips	MJ/Kg	11.53	20/10/2010	11.49	21/01/2011
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions & project emission					
Monitoring equipment (type, accuracy class, serial	N/A					

number, calibration frequency, date of last calibration, validity)	
Measuring/ Reading/ Recording frequency:	At least every six months, taking three samples for each measurement.
Calculation method (if applicable):	--
QA/QC procedures applied:	The consistency of the measurements is checked by comparing the measurement results with measurements from previous years, relevant data sources. If the measurement results differ significantly from previous measurements or other relevant data sources, Additional measurements are conducted.

Data / Parameter:	AVD_y
Data unit:	km
Description:	Average round trip distance (from and to) between the biomass fuel supply sites and the project plant during the year y
Measured /Calculated /Default:	Measured
Source of data:	On site records maintained in the log books
Value(s) of monitored parameter:	86.2
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Each time every truck which transports biomass residue to the plant is counted and recorded in the log books. Monitoring and recording frequency: Continuously.
Calculation method (if applicable):	Aggregate monthly and take average
QA/QC procedures applied:	The data on distance of fuel supply site from the plant can be verified by cross checking data records on the distances available with information from other sources (e.g. maps). If data is missing for a particular round trip, the following backup data apply in their order: <ul style="list-style-type: none"> ➤ The round trip distance between the farthest biomass fuel supply site and the project plant will be used. ➤ If the farthest biomass fuel supply site could not be verified, 200km would be used for conservativeness.

Data / Parameter:	N_y
Data unit:	--
Description:	Number of truck trips for the transportation of biomass
Measured /Calculated /Default:	Measured
Source of data:	On site records maintained in the log books
Value(s) of monitored parameter:	13,505
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions

Leakage emission calculations)	
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Each time every truck which transports biomass residue to the plant is counted and recorded in the log books. Monitoring and recording frequency: Continuously.
Calculation method (if applicable):	--
QA/QC procedures applied:	The consistency of the number of truck trips is checked with the quantity of biomass combusted by the relation with previous years

Data / Parameter:	EF_{km,CO_2}
Data unit:	tCO ₂ e/km
Description:	Average CO ₂ Emission Factor for transportation of biomass with trucks during year y
Measured /Calculated /Default:	Default
Source of data:	IPCC default value
Value(s) of monitored parameter:	0.001097 Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Choose emission factors applicable for the truck types used from the literature in a conservative manner. The appropriateness of the data is reviewed annually
Calculation method (if applicable):	--
QA/QC procedures applied:	--

Data / Parameter:	$EF_{CO_2,I,y}$
Data unit:	kg CO ₂ e/TJ
Description:	CO ₂ emission factor for fossil fuel type i (diesel)
Measured /Calculated /Default:	Default
Source of data:	As local or national data are not available, the source is IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories, which is a conservative estimate.
Value(s) of monitored parameter:	74,800 The upper limit of IPCC 2006 default value , diesel emission factor
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission

Leakage emission calculations)	
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	N/A
Calculation method (if applicable):	--
QA/QC procedures applied:	The plant is designed to use diesel at this stage. Should any other fossil fuel be used during operation, the same monitoring procedures apply.

Data / Parameter:	NCV_i
Data unit:	TJ/tonne
Description:	Net Calorific Value(NCV_i) of fossil fuel type i(diesel)
Measured /Calculated /Default:	Default
Source of data:	Reliable National Data
Value(s) of monitored parameter:	0.042652 China Energy Statistical Yearbook 2010,Diesel NCV
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	The appropriateness of the data is reviewed annually
Calculation method (if applicable):	--
QA/QC procedures applied:	The plant is designed to use diesel at this stage. Should any other fossil fuel be used during operation, the same monitoring procedures apply.

Data / Parameter:	$FF_{project\ plant\ i,y}$
Data unit:	tonne
Description:	Quantity of fossil fuel type i(diesel) combusted in the project plant during year y
Measured /Calculated /Default:	Measured
Source of data:	Flow meters
Value(s) of monitored parameter:	46.74
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission

Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)			
	Meter name	Flow meter 1#	Flow meter 1#
	Type/Model	LWY-10C	LWY-10C
	Accuracy	1.0	1.0
	SN	8059	8084
	Last calibration date	26-Jun-10	26-Jun-10
	valid Period	25-Jun-11	25-Jun-11
	Calibration frequency	Once per year	Once per year
	Meter name	Flow meter 2#	Flow meter 2#
	Type/Model	LWY-10C	LWY-10C
	Accuracy	1.0	1.0
	SN	8085	10620
	Last calibration date	26-Jun-10	30-Jun-10
	valid Period	25-Jun-11	29-Jun-11
	Calibration frequency	Once per year	Once per year
Measuring/ Reading/ Recording frequency:	Continuously measurement and monthly recording; 100% of data is monitored and electronically archived.		
Calculation method (if applicable):	--		
QA/QC procedures applied:	The meters undergo calibration/maintenance subject to appropriate industrial standards. The measurements is cross-checked by the purchased quantities and stock changes if available.		

Data / Parameter:	$FF_{project\ site, i, y}$
Data unit:	tonne
Description:	Quantity of fossil fuel type i combusted in the project site(including the collection sites) for other purposes that are attributable to the project activity during year y
Measured /Calculated /Default:	Measured
Source of data:	On site consumption records maintained in the log books
Value(s) of monitored parameter:	64.06
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Continuously measurement and monthly recording; 100% of data is monitored and electronically archived.
Calculation method (if applicable):	The consumption of diesel is monitored using diesel purchase and consumption log book.
QA/QC procedures applied:	The data is cross checked by the purchase receipts.

Data / Parameter:	$EC_{PJ, y}$
Data unit:	MWh
Description:	On-site electricity consumption(including the electricity consumption for the mechanical treatment of the biomass in the biomass collection

	sites and the project site) attributable to the project activity during the year y														
Measured /Calculated /Default:	Measured														
Source of data:	On-site measurements by meter or calculated conservatively as the weight of straws smashed in tons and the electricity consumption factor (kWh/ton)														
Value(s) of monitored parameter:	177.72														
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission														
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	<table border="1"> <tr> <td>Meter name</td><td>Meter for biomass</td></tr> <tr> <td>Type/Model</td><td>DSSD1008</td></tr> <tr> <td>Accuracy</td><td>0.5s</td></tr> <tr> <td>SN</td><td>30100516</td></tr> <tr> <td>Last calibration date</td><td>11-Oct-10</td></tr> <tr> <td>Valid Period</td><td>10-Oct-11</td></tr> <tr> <td>Calibration frequency</td><td>Once per year</td></tr> </table>	Meter name	Meter for biomass	Type/Model	DSSD1008	Accuracy	0.5s	SN	30100516	Last calibration date	11-Oct-10	Valid Period	10-Oct-11	Calibration frequency	Once per year
Meter name	Meter for biomass														
Type/Model	DSSD1008														
Accuracy	0.5s														
SN	30100516														
Last calibration date	11-Oct-10														
Valid Period	10-Oct-11														
Calibration frequency	Once per year														
Measuring/ Reading/ Recording frequency:	Continuously measurement and monthly recording; 100% of data is monitored and electronically archived.														
Calculation method (if applicable):	<p>When the biomass residue is mechanically pretreated, the project needs a certain amount of electricity from grid. This amount is metered by a meter, the accuracy of which is 0.5s.</p> <p>If the monitoring data is missing, or it is not feasible to install a dedicated meter to monitor this indicator, it will be calculated conservatively as the weight of straws smashed in tons and the electricity consumption factor (kWh/ton). The electricity factor can be calculated as follows:</p> <ol style="list-style-type: none"> 1) Collecting all the nameplates power (in kW) and capacity(t/h) of every straw crackers 2) Calculating the electricity factor corresponding to each cracker in kWh/t 3) Using the largest number as a conservative electricity factor for the calculation 														
QA/QC procedures applied:	Cross-check measurement results with invoices for purchased electricity if available														

Data / Parameter:	<i>EG_{project plant,y}</i>
Data unit:	MWh
Description:	Net quantity of increased electricity generated in the project plant during the year y
Measured /Calculated /Default:	Measured
Source of data:	On-site measurements
Value(s) of monitored parameter:	58,711.31
Indicate what the data are used for (Baseline/ Project/ Leakage emission)	Baseline emission

calculations)				
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Meter name	Gate meter	Backup Meter	10KV Meter
	Type/Model	MK6E	MK6E	DSSD5
	Accuracy	0.2s	0.2s	0.5s
	SN	206652850	206652837	53648
	Date	22-Jul-10	22-Jul-10	23-Jul-10
	Valid Period	21-Jul-11	21-Jul-11	22-Jul-11
	Frequency	Once per year		
Measuring/ Reading/ Recording frequency:	Continuously measurement and monthly recording; 100% of data is monitored and electronically archived.			
Calculation method (if applicable):	Electricity supplied to the grid and purchased from the grid is monitored by a double way meter and the data is cross-checked by the invoices and the power transaction note. The meters are 0.2s double-way meters.			
	Electricity imported from a 10kv backup power is monitored by meter and the amount of electricity imported through this line is checked by the invoice. The accuracy of the meter is 0.5s.			
	The net electricity equals to electricity supplied to the grid minus electricity purchased from the grid minus electricity purchased from the 10kv backup power.			
QA/QC procedures applied:	The consistency of the data is cross-checked with receipts from electricity sales and invoices, if available; and the quantity of fuels fired to see whether the electricity generation divided by the quantity of fuels fired results in a reasonable efficiency.			

Data / Parameter:	-
Data unit:	tonnes
Description:	Quantity of each biomass residues type k that are utilized in the defined geographical region
Measured /Calculated /Default:	Measured
Source of data:	Surveys or Statistics
Value(s) of monitored parameter:	Please refer to Section E.3
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Leakage
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	N/A
QA/QC procedures applied:	This parameter is reviewed annually according to the project data and official data.

Data / Parameter:	-
Data unit:	tonnes
Description:	Quantity of each biomass residues type k that are available in the region
Measured /Calculated /Default:	Measured
Source of data:	Surveys or Statistics
Value(s) of monitored parameter:	Please refer to Section E.3
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Leakage
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	N/A
QA/QC procedures applied:	This parameter is reviewed annually according to the project data and official data.

2. Data monitored

The monitored parameters are given in the following table 1.

Table 1: Monitored Parameters

Parameter		Rice husk			Branches		
		BF _{k,y}	Moisture	NCV	BF _{k,y}	Moisture	NCV
from	to	tonne	%	GJ/ton	Tonne	%	GJ/ton
		A	B	C	D	E	F
12/08/2010	31/08/2010	11,851.86	13.37	12.13	0.00	0.00	0.00
01/09/2010	30/09/2010	12,919.16	13.07	12.13	0.00	0.00	0.00
01/10/2010	31/10/2010	9,158.30	16.41	12.13	0.00	0.00	0.00
01/11/2010	30/11/2010	11,621.82	15.97	12.13	0.00	0.00	0.00
01/12/2010	31/12/2010	8,458.89	15.80	12.13	757.22	22.82	13.36
01/01/2011	31/01/2011	11,957.13	13.84	13.56	3,615.56	22.12	13.47
01/02/2011	28/02/2011	10,958.77	13.92	13.56	3,926.44	23.92	13.47
01/03/2011	31/03/2011	17,696.07	13.31	13.56	5,731.40	23.31	13.47
Total		94,622.00	-	-	14,030.62	-	-

Parameter		Branches			Barks		
		BF _{k,y}	Moisture	NCV	BF _{k,y}	Moisture	NCV
from	to	tonne	%	GJ/ton	Tonne	%	GJ/ton
		G	H	I	J	K	L
12/08/2010	31/08/2010	0.00	0.00	0.00	0.00	0.00	0.00
01/09/2010	30/09/2010	0.00	0.00	0.00	0.00	0.00	0.00
01/10/2010	31/10/2010	0.00	0.00	0.00	328.76	15.42	13.94
01/11/2010	30/11/2010	174.23	26.61	13.38	1,189.08	17.01	13.94
01/12/2010	31/12/2010	56.16	28.69	13.38	462.07	16.70	13.94
01/01/2011	31/01/2011	424.55	25.85	12.66	871.88	17.82	13.98
01/02/2011	28/02/2011	541.64	24.48	12.66	1,371.39	18.07	13.98
01/03/2011	31/03/2011	1,591.91	30.09	12.66	1,179.79	16.30	13.98
Total		2,788.49	-	-	5,402.97	-	-

Parameter		Branches			Barks		
		BF _{k,y}	Moisture	NCV	BF _{k,y}	Moisture	NCV
from	to	tonne	%	GJ/ton	Tonne	%	GJ/ton
		M	N	O	P	Q	R
12/08/2010	31/08/2010	0.00	0.00	0.00	0.00	0.00	0.00
01/09/2010	30/09/2010	0.00	0.00	0.00	0.00	0.00	0.00
01/10/2010	31/10/2010	0.00	0.00	0.00	207.82	29.31	11.53
01/11/2010	30/11/2010	40.05	28.91	10.88	1,002.28	28.01	11.53
01/12/2010	31/12/2010	27.04	28.93	10.88	480.82	30.83	11.53
01/01/2011	31/01/2011	24.15	28.28	10.90	963.49	30.29	11.49
01/02/2011	28/02/2011	75.30	27.21	10.90	974.24	31.31	11.49
01/03/2011	31/03/2011	174.29	30.30	10.90	1,241.70	30.86	11.49
Total		340.83	-	-	4,870.35	-	-

Parameter		VD _y	N _y	FF _{project plant,i,y}	FF _{project site,i,y}	EG _{project expored,y}
from	to	km	-	Tonnes	Tonnes	MWh
		S	T	U	V	W
12/08/2010	31/08/2010	59,762	818	11.25	3.73	5,503.58
01/09/2010	30/09/2010	91,960	1,126	3.64	6.25	6,334.48
01/10/2010	31/10/2010	120,042	1,407	4.78	4.69	5,422.76
01/11/2010	30/11/2010	111,248	1,309	5.38	5.65	6,824.31
01/12/2010	31/12/2010	139,658	1,561	6.65	5.51	5,143.49
01/01/2011	31/01/2011	233,982	2,577	6.75	10.46	8,411.58
01/02/2011	28/02/2011	173,398	1,977	3.10	11.53	7,662.72
01/03/2011	31/03/2011	233,804	2,730	5.19	16.24	13,894.02
Total		1,163,854	13,505	46.74	64.06	59,196.93

Parameter		EG _{project impored,y}	EG _{project backup,y}	EC _{Pj,y}
from	to	MWh	MWh	MWh
		X	Y	Z
12/08/2010	31/08/2010	21.15	0.00	0.00
01/09/2010	30/09/2010	7.31	0.08	0.00
01/10/2010	31/10/2010	23.54	120.52	3.65
01/11/2010	30/11/2010	19.44	153.60	16.37
01/12/2010	31/12/2010	32.87	73.80	11.65
01/01/2011	31/01/2011	12.08	0.00	37.84
01/02/2011	28/02/2011	0.44	0.28	44.37
01/03/2011	31/03/2011	20.53	0.00	63.84
Total		137.35	348.28	177.72

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

>>

Baseline emissions are calculated as:

- a) Emission reduction due to displacement of electricity

$$ER_{electricity,y} = EG_y \times EF_{electricity,y} \quad (1)$$

Where:

$ER_{electricity,y}$	Emission reductions due to displacement of electricity during the year y (tCO ₂ /yr)
EG_y	Net quantity of increased electricity generation as a result of the project activity (incremental to baseline generation) during the year y (MWh)
$EF_{electricity,y}$	CO ₂ emission factor for the electricity displaced due to the project activity during the year y (tCO ₂ /MWh), which is 0.9735 tCO ₂ e/MWh (See registered PDD Version 5 available online at http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1256015812.95/view)

During the current monitoring period, the net electricity supplied to the grid is:

$$EG_y = 59,196.93 \text{ MWh} - 137.35 \text{ MWh} - 348.28 \text{ MWh} = 58,711.31 \text{ MWh}$$

Therefore,

$$ER_{electricity,y} = 58,711.31 \text{ MWh} \times 0.9735 \text{ tCO}_2\text{e} / \text{MWh} = 57,155.46 \text{ tCO}_2\text{e}$$

- b) Emission reductions or increases due to displacement of heat

Since there is no steam is supplied to user, so the $ER_{heat,y} = 0$

- c) Baseline emissions due to natural decay or uncontrolled burning of anthropogenic sources of biomass residues

$$BE_{biomass,y} = GWP_{CH_4} \cdot \sum_k BF_{PJ,k,y} \cdot NCV_k \cdot EF_{burning,CH_4,k,y} \quad (2)$$

Where:

$BE_{biomass,y}$	Baseline emissions due to natural decay or burning of anthropogenic sources of biomass residues during the year y (tCO ₂ e/yr)
GWP_{CH_4}	Global Warming Potential of methane valid for the commitment period (tCO ₂ e/tCH ₄)
$BF_{PJ,k,y}$	Incremental quantity of biomass residue type k used as a result of the project activity in the project plant during the year y (tons of dry matter)
NCV_k	Net calorific value of the biomass residue type k (GJ/ton of dry matter)
$EF_{burning,CH_4,k,y}$	CH ₄ emission factor for uncontrolled burning of the biomass residue type k during the year y (tCH ₄ /GJ)
k	Types of biomass residues for which the identified baseline scenario is B1 or B3 and for which leakage effects could be ruled out with one of the approaches L1, L2 or L3 described in the leakage section

$$BE_{biomass,y} = 2 \text{ tCO}_2\text{e} / \text{CH}_4 \times 102,024.40 \text{ t} \times 0.001971 \text{ tCH}_4 / \text{t} = 4,222.89 \text{ tCO}_2\text{e}$$

E.2. Project emissions calculation

>>

According to methodology ACM0006 version 6.2, the emissions of the project within the project boundary include:

- CO₂ emissions from transportation of biomass residues to the project site (PET_y),
- CO₂ emissions from on-site consumption of fossil fuels due to the project activity (PEFF_y),
- CO₂ emissions from consumption of electricity (PE_{EC,y}),
- Where this emission source is included in the project boundary and relevant: CH₄ emissions from the combustion of biomass residues (PE_{Biomass,CH₄,y}),
- Where waste water from the treatment of biomass residues degrades under anaerobic conditions: CH₄ emissions from waste water.

Project emissions are calculated as follows:

$$PE_y = PET_y + PEFF_y + PE_{EC,y} + GWP_{CH_4} \cdot (PE_{biomass,CH_4,y} + PE_{WW,CH_4,y}) \quad (3)$$

Where:

PET _y	CO ₂ emissions during the year y due to transport of the biomass residues to the project plant (tCO ₂ /yr)
PEFF _y	CO ₂ emissions during the year y due to fossil fuels co-fired by the generation facility or other fossil fuel consumption at the project site that is attributable to the project activity (tCO ₂ /yr)
PE _{EC,y}	CO ₂ emissions during the year y due to electricity consumption at the project site that is attributable to the project activity (tCO ₂ /yr)
GWP _{CH₄}	Global Warming Potential for methane valid for the relevant commitment period
PE _{Biomass,CH₄,y}	CH ₄ emissions from the combustion of biomass residues during the year y (tCH ₄ /yr)
PE _{WW,CH₄,y}	CH ₄ emissions from waste water generated from the treatment of biomass residues in year y (tCH ₄ /yr), for this project, there is no waste water generated from the treatment of biomass, so the PE _{WW,CH₄,y} =0 tCO ₂ e

- a) Carbon dioxide emissions from combustion of fossil fuels for transportation of biomass residues to the project plant (PET_y)

$$PET_y = N_y \cdot AVD_y \cdot EF_{km,CO_2,y}$$

Where:

PET _y	CO ₂ emissions during the year y due to transport of the biomass residues to the project plant (tCO ₂ /yr)
N _y	Number of truck trips during the year y
AVD _y	Average round trip distance (from and to) between the biomass residue fuel supply sites and the site of the project plant during the year y (km)
EF _{km,CO₂,y}	Average CO ₂ emission factor for the trucks measured during the year y (tCO ₂ /km)

Therefore,

$$PET_y = 13,505 \times \frac{1,163,854km}{13,505} \times 0.001097tCO_2e/km = 1,276.75tCO_2$$

- b) Carbon dioxide emissions from on-site consumption of fossil fuels (PEFF_y)

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

Where:

$PE_{FC,j,y}$	Are the CO ₂ emissions from fossil fuel combustion in process j during the year y (tCO ₂ /yr);
$FC_{i,j,y}$	Is the quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr);
$COEF_{i,y}$	Is the CO ₂ emission coefficient of fuel type i in year y (tCO ₂ /mass or volume unit)
i	Are the fuel types combusted in process j during the year y

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}$$

Where:

$COEF_{i,y}$	Is the CO ₂ emission coefficient of fuel type i in year y (tCO ₂ /mass or volume unit)
$NCV_{i,y}$	Is the weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)
$EF_{CO2,i,y}$	Is the weighted average CO ₂ emission factor of fuel type i in year y (tCO ₂ /GJ)
i	Are the fuel types combusted in process j during the year y

Therefore,

$$PEFF_y = \sum_i FC_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,y}$$

$$= (46.74t + 64.06t) \times 0.042652TJ / t \times 74,800kgCO_2e / TJ / 1 \times 10^3 = 353.49tCO_2e$$

c) CO₂ emissions from electricity consumption ($PE_{EC,y}$)

$$PE_{EC,y} = \sum_i EC_{PJ,j,y} \times EF_{EL,j,y} \times (1 + TDL_{j,y})$$

Where:

$EC_{PJ,j,y}$	Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr)
$EF_{EL,j,y}$	Emission factor for electricity generation for source j in year y (tCO ₂ /MWh)
$TDL_{j,y}$	Average technical transmission and distribution losses for providing electricity to source j in year y

Therefore,

$$PE_{EC,y} = 177.72MWh \times 0.9735tCO_2e / MWh \times (1 + 20\%) = 207.61tCO_2e$$

d) Methane emissions from combustion of biomass residues ($PE_{Biomass,CH4,y}$)

$$PE_{biomass,CH4,y} = EF_{CH4,BF} \cdot \sum_k BF_{k,y} \cdot NCV_k$$

Where:

$BF_{k,y}$	Quantity of biomass residue type k combusted in the project plant during the year y (tons of dry matter)
NCV_k	Net calorific value of the biomass residue type k (GJ/ton of dry matter)
$EF_{CH4,BF}$	CH ₄ emission factor for the combustion of biomass residues in the project plant (tCH ₄ /GJ), according to ACM0006, Version 6.2, the $EF_{CH4,BF}=41.1 \text{ kg CH}_4/TJ$

Therefore,

$$PE_{biomass,CH4,y} = 41.1kgCH_4 / TJ \cdot (46,041.52t \times 12.13GJ / t + 35,076.30t \times 13.56GJ / t$$

$$+ 584.42t \times 13.36GJ / t + 10,198.44t \times 13.47GJ / t + 167.92t \times 13.38GJ / t + 1,836.75t \times 12.66GJ / t$$

$$+ 1,649.79t \times 13.94GJ / t + 2,827.58t \times 13.98GJ / t + 47.69t \times 10.88GJ / t + 193.61t \times 10.90GJ / t$$

$$+ 1,201.03t \times 11.53GJ / t + 2,199.36t \times 11.49GJ / t) / 1 \times 10^6 = 53.80tCH_4$$

According the data calculated above,

$$PE_y = 1,276.75tCO_2e + 353.49tCO_2e + 207.61tCO_2e + 21tCO_2e / tCH_4 \times (53.80 + 0)tCH_4$$

$$= 2,967.72tCO_2e$$

E.3. Leakage calculation

>>

According to methodology ACM0006 version 6.2, the main potential source of leakage for this project activity is an increase in emissions from fossil fuel combustion or other sources due to diversion of biomass residues from other uses to the project plant as a result of the project activity. Changes in carbon stocks in the LULUCF sector are expected to be insignificant since this methodology is limited to biomass residues.

A statistic is issued by a reputed institute on the biomass availability, and the data are as followed:

Table 2: Demonstration of abundant surplus of biomass availability

Demonstration of abundant surplus of biomass availability						
Biomass Type	Rice husks	Cotton straws	Stumps	Branches	Barks	Wood chips
Total biomass generation in the region(kt)	236.3	102.1	150.0	410.0		
Biomass loss(kt)	23.6	15.3	15.0	41.0		
Available Biomass in the region(kt)	212.7	86.8	135.0	369.0		
Biomass utilised out of the project(kt)	42.5	13.0	27.0	73.8		
Biomass utilised by the project (kt)	94.622	14.031	0.341	2.789	5.403	4.871
Total biomass utilised, including the project(kt)	137.156	27.049	27.341	86.863		
Available Biomass/Total biomass utilised	155%	321%	494%	425%		
Available Biomass/Total biomass utilised -100%	55%	221%	394%	325%		
Abundant surplus? (more than 25%)	Yes	Yes	Yes	Yes		

From the data in the above table, that the leakage of the project within the project boundary is zero, i.e. $LE_y = 0 tCO_2e$.

E.4. Emission reductions calculation / table

>>

The emission reductions achieved is calculated by the following formulae:

$$ER_y = ER_{heat,y} + ER_{electricity,y} + BE_{biomass,y} - PE_y - L_y$$

$$= 0tCO_2e + 57,155.46tCO_2e + 4,222.89tCO_2e - 2,967.72tCO_2e - 0tCO_2e = 58,410tCO_2e$$

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

>>

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period (Extended to a whole year)
------	---	--

Emission reductions (tCO ₂ e)	116,650	91,895 ²
---	---------	---------------------

E.6. Remarks on difference from estimated value in the PDD

>>

From the data shown in the above table, the actual emission reduction achieved during current monitoring period is lower than the ex-ante estimation in registered CDM-PDD.

² $91,895tCO_2e = \frac{58,410tCO_2e}{232days} \times 365days$

Annex 1: The energy balance calculation for the verification period

The total inputs of biomass residues combusted and useful output of electricity from the project are presented below. From this data the conversion efficiency of the project in this period is calculated as 16.33%.

Table 3. The energy input and electricity generation in the project activity in this period

	BF _{k,y} (ton) (dry base)	NCV _k (TJ/t) ³	Energy(TJ)
Rice husk	81117.81	0.01267	1027.458
Cotton straws	10782.86	0.01344	144.949
Branches	2004.67	0.01295	25.956
Barks	4477.37	0.01396	62.504
Stumps	241.30	0.01089	2.628
Wood chips	3400.39	0.01151	39.139
Fossil Fuel ⁴	46.74	0.04265	1.994
Total			1304.628
electricity exported (TJ)			213.109
efficiency			16.33%

Energy Balance:

$E_{total} = E_{biomass} + E_{fossil\ fuel} = 1,304.628\ TJ$

Electricity exported= 59,196.93 MWh=213.109 TJ

Efficiency= Electricity exported/ E_{total} =16.33%

³ The average NCV is used here. For more information, please refer to the emission reduction calculation sheet.

⁴ The consumption of fossil fuel is caused by boiler start-up only.

History of the document

Version	Date	Nature of revision
01	EB 54, Annex 34 28 May 2010	Initial adoption.
Decision Class: Regulatory Document Type: Guideline, Form Business Function: Issuance		