



Monitoring report form for CDM project activity
(Version 09.0)

MONITORING REPORT

Title of the project activity	Biomass generation project, in Sheyang county, Jiangsu province, P.R. China		
UNFCCC reference number of the project activity	1366		
Version number of the PDD applicable to this monitoring report	V4.0		
Version number of this monitoring report	01		
Completion date of this monitoring report	02/07/2022		
Monitoring period number	3 rd Monitoring Period		
Duration of this monitoring period	01/01/2013–31/03/2015 (first and last days included)		
Monitoring report number for this monitoring period	Not applicable		
Project participants	National Bio Energy Company Limited (Project Owner) Climate Change Capital Carbon Fund II s.à r.l. (withdrawn) Climate Change Capital Carbon Managed Account Limited. (withdrawn) China Carbon N.V. (as the new CER buyer)		
Host Party	P.R. China		
Applied methodologies and standardized baselines	The approved consolidated baseline and monitoring methodology ACM0006 “Consolidated methodology for grid-connected electricity generation from biomass residues Version 04”. No standardized baselines applied.		
Sectoral scopes	Sectoral scope(s): 1 : Energy industries (renewable-/non-renewable sources)		
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013 until 31 December 2020	Amount achieved from 1 January 2021
	Not applicable	308,901 tCO ₂ e	Not applicable
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	334,055 tCO ₂ e		

SECTION A. Description of project activity

A.1. General description of project activity

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The project is a newly-built generation project with local surplus biomass residues (wood residues/cotton straw/cole straw/maize straw/rice straw/reed/wheat straw) as fuel, which is located in Sheyang County, Jiangsu province. The install capacity of this project is 30MW¹ with 130 t/h boiler.

The annual biomass residues consumption are about 170,194.67 tons/25,175.05 tons/1.01 tons/19,386.04 tons /27,212.57 tons/16,392.39 tons/10,497.07 tons for wood residues/cotton straw/cole straw/maize straw/rice straw/reed/wheat straw separately (in wet basis), which are re-calculated in accepted revised PDD. And it is expected to deliver annually 188,488.80 MWh electricity to East China Power Grid (ECPG) of China.

The GHG emission reductions are from two components. Firstly, the project activity substituted electricity generation of ECPG dominated by fossil fuel power plants. Secondly, the project activity used biomass residues in high efficiency, which reduces CH₄ emissions because the biomass is dumped or left to decay or burned in an uncontrolled manner in the absence of the project. The estimated annual GHG emission reductions are 148,695 tCO₂e.

The construction of the power plant started on 08/09/2006² and the power generation unit was commissioned successfully on 03 Sep 2007.

Total emission reductions achieved in this monitoring period is 308,901 tCO₂e.

Further information on this project can be found in accepted revised PDD and associated documents, which are available on the UNFCCC website:

<https://cdm.unfccc.int/Projects/DB/TUEV-SUED1190986543.01/view?cp=1>

Project owner has performed 41 days in total of maintenance during this monitoring period, beyond that, the power generation and monitoring equipments were running in normal conditions. The data records and management system were in place.

A.2. Location of project activity

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The project activity is located at West Economic Development Zone of Sheyang County, Yancheng city, Jiangsu Province, P. R. China, and its geographic coordinate is: North Latitude 33°46'03" and East Longitude 120°10'57".

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
P.R. China (Host)	National Bio Energy Company Limited (Project Owner)	No
United Kingdom of Great Britain and Northern Ireland	Climate Change Capital Carbon Fund II s.à r.l. (withdrawn)	No
United Kingdom of Great Britain and Northern Ireland	Climate Change Capital Carbon Managed Account Limited. (withdrawn)	No

¹ Due to debugging failure in May of 2007, PO replaced the 25MW power generation unit (PGU) to be a new unit of capacity 30MW and re-installed in July.2007.

² Construction permission dated on 08.Sep.2006.

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Switzerland	Climate Change Capital Carbon Managed Account Limited(withdrawn)	No
Germany	China Carbon N.V. (as the new CER buyer)	No

A.4. References to applied methodologies and standardized baselines

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Version 04 of ACM0006: "Consolidated baseline methodology for grid-connected electricity generation from biomass residues".

Referred as the methodology, version 06 of ACM0002: Consolidated baseline methodology for grid connected electricity generation from renewable source and Version 03 of "Tool for the Demonstration and Assessment of Additionality".

More information about the methodology can be found on the website:

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

A.5. Crediting period type and duration

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The renewable crediting period (7yrs×3) is adopted.

The duration of the first crediting period is 01/04/2008-31/03/2015.

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

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The project activity is to collect and utilize biomass residues (wood residues, cotton straw, cole straw, maize straw, rice straw, reed, wheat straw) to generate electricity, The project is not a power/heat cogeneration project.

The project made good use of biomass residues as fuels and installed a 130 t/h water-cooling liberated boiler with high temperature and high pressure made in China authorized by Denmark BWE Company, one 30MW steam turbine and one suited generator have been applied in the project

The transportation for biomass residue collection generate CO₂ emissions, the normal operation of the Project plant also consume diesel fuel that also brings CO₂ emissions, biomass combustion in the Power Plant generate CH₄ emissions, and electricity consumption by the project activity also bring CO₂ emissions.

Table B.1 list the key specifications of the main equipments, and Figure B.1 shows the technical connection diagram of the Project.

Table B.1 Key technical specifications of BWE boiler

BWE boiler made by Jinan Boiler Group Co., Ltd.:

Parameters Name	Unit	Value
Type of Boiler	/	YG-130/9.2-T
boiler maximum continuous rating	t/h	130
Superheated Steam pressure	Mpa	9.2
Superheated Steam temperature	°C	540

Turbine made by Wuhan Steam Turbine Group Corporation:

Parameters Name	Unit	Data
Model	/	N30-8.83-2
Rated Output	MW	30
Rated Rotation Speed	r/min	3000

Rated Flow of main steam	t/h	120.5
Rated Pressure of main steam	Mpa	8.83
Rated Temperature of main steam	°C	535

Generator made by Wuhan Steam Turbine Group Corporation:

Parameters Name	Unit	Data
Model	/	QF-30-2
Rated Output	MW	30
Rated Voltage	kV	6.3
Rated Electric Current	A	3437
Rated Rotation Speed	r/min	3000
Efficiency	%	≥97.4%

The total installed capacity of the project is 30MW and the estimated net generation of electricity in accepted revised PDD is 188,488.80MWh per year.

The electricity output was transmitted through a 6.3kV/110kV transformer at the site connected to Jiangsu Provincial Power Grid that is an integral part of East China Power Grid (ECPG).

See detailed technical process in diagram below:

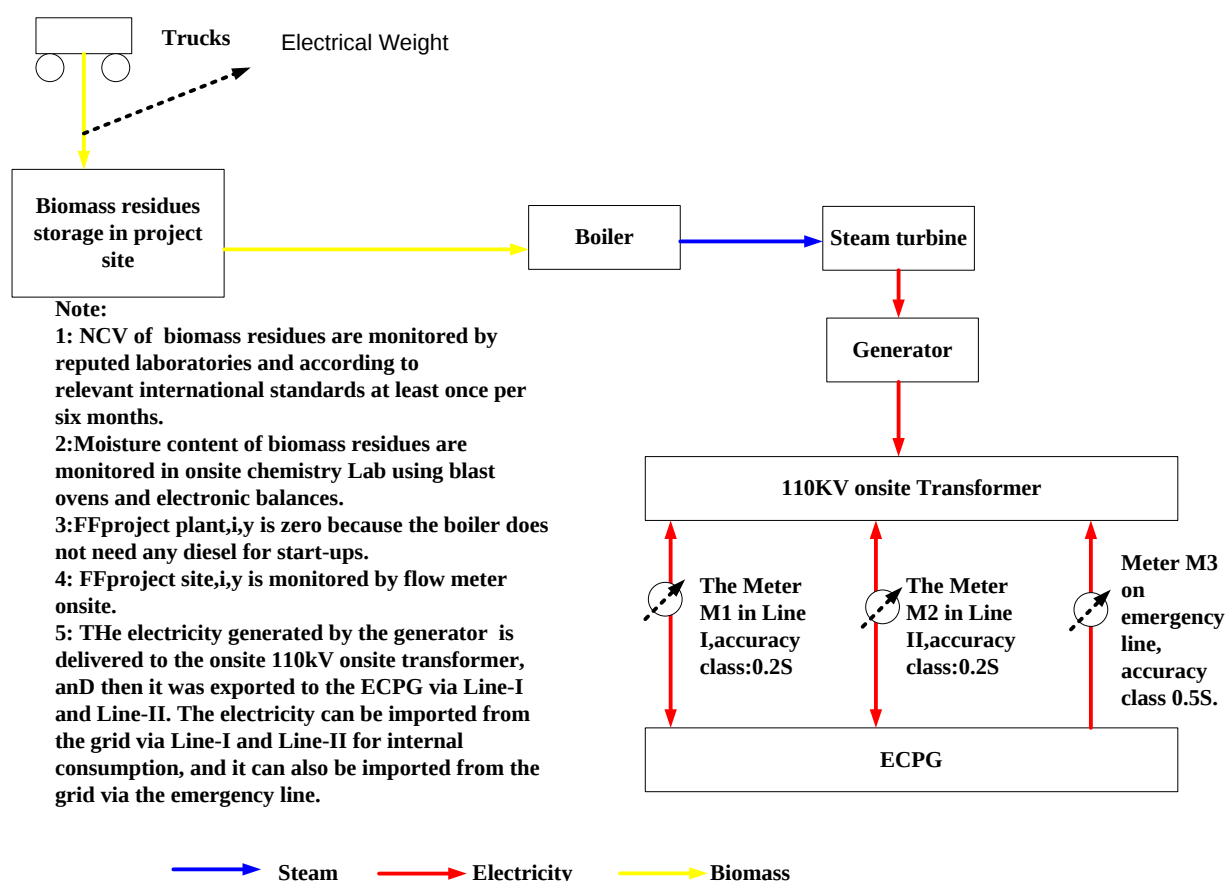


Figure B.1 Connection Diagram of the Project

The project was put into trial operation in May of 2007, but the debugging is failing due to purchased 25 MW power generation unit, so, PO and Wuhan Steam Turbine Group Corporation agreed to replace the 25MW PGU to be a new unit of capacity 30MW and re-installed in July.2007.

The construction of the power plant started on 08 Sep 2006 and the power generation unit was commissioned successfully on 03 Sep 2007.

Project owner has performed 41 days in total of maintenance during this monitoring period. Beyond that, the power generation and monitoring equipments were running in normal conditions. The data records and management system were in place.

There was no special event or situation may impact the applicability of the methodology occurred over this monitoring period.

B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

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There is no temporary deviation from registered monitoring plan or applied methodology or applied standardized baseline in this monitoring period.

B.2.2. Corrections

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There is no correction during this monitoring period.

B.2.3. Changes to the start date of the crediting period

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There are no changes to the start date of the crediting period.

B.2.4. Inclusion of monitoring plan

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Not applicable.

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

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There is a revision to the monitoring plan of the project approved by EB on 22 Apr 2009 and second Monitoring Plan revision joined in accepted revised PDD, which is strictly used by the project owner to monitor all parameters required by the accepted revised PDD version 4.0 dated 23/03/2012, and got approval on 17 May 2012.

B.2.6. Changes to project design

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Because the installed capacity was changed from 25MW to be 30MW, higher operation hours and changed biomass residues types, a notification of changes from project activity as described in the registered PDD was submitted to EB in the revised PDD version 4.0 dated 23/03/2012 and got approval on 17 May 2012.

B.2.7. Changes specific to afforestation or reforestation project activity

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Not applicable.

SECTION C. Description of monitoring system

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Organizational Structure

National Bio Energy Co., Ltd. will conduct monitoring procedures according to the monitoring methodology chosen for this project activity. This monitoring methodology will enable the recording of emission reductions and leakage effects in an accurate and conservative manner.

National Sheyang Bio Energy Co., Ltd., who is the subsidiary of National Bio Energy Co., Ltd., appoints on-site personnel (at the project activity site), who will be in charge of gathering and recording all the required information described in the monitoring plan. Such duties will be included into the routine work of the operators to ensure continuity and high-quality standards. The information will be partially processed and stored there, and will be sent periodically (monthly) to National Bio Energy Co., Ltd. headquarter in Beijing for final processing (table formats, reports, etc.).

The responsibilities for carrying out these tasks are broadly elaborated in Figure C.1 below:

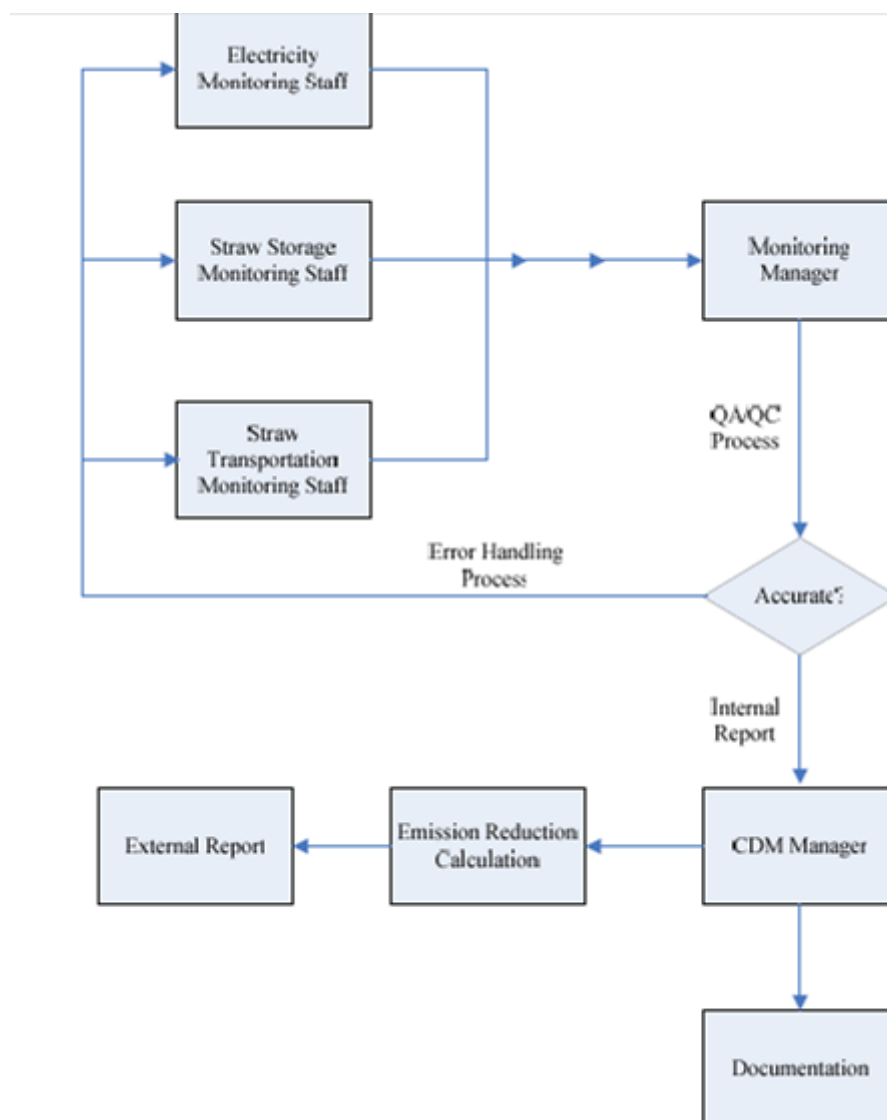


Figure C.1 Organizational Structure

Roles and responsibilities of personnel

The staff from onsite conduct the monitoring procedures and work based on the revised monitoring plan (approved by EB) described.

The monitoring data such as all kinds of tables for different monitoring parameters, reports were processed and stored first in the plant office by operating manager and biomass purchase department manager, and the emissions reductions would be calculated and checked by Mr Chong Renjie, and then the results were sent periodically to Mr Shao Shangqing, CDM project director for quality assurance.

The personal responsibilities of the project are:

Operating manager of the plant: Overall management of power plant operation and in charge of collecting monitoring data as requested by the monitoring plan.

Biomass purchase department manager: Biomass collection and summarizing the data collected at the collection stations in terms of types, amount, and transportation record, etc of straws. Ensuring the biomass at the sites was not stored over half year.

Mr Wu Rong, Mr Su Hua, Mr Guo Weibin, and Miss Chen Yingying: Check the monitoring data and ERY calculation.

Data collection procedures

- **Monitoring locations**

The monitoring locations are shown in below:

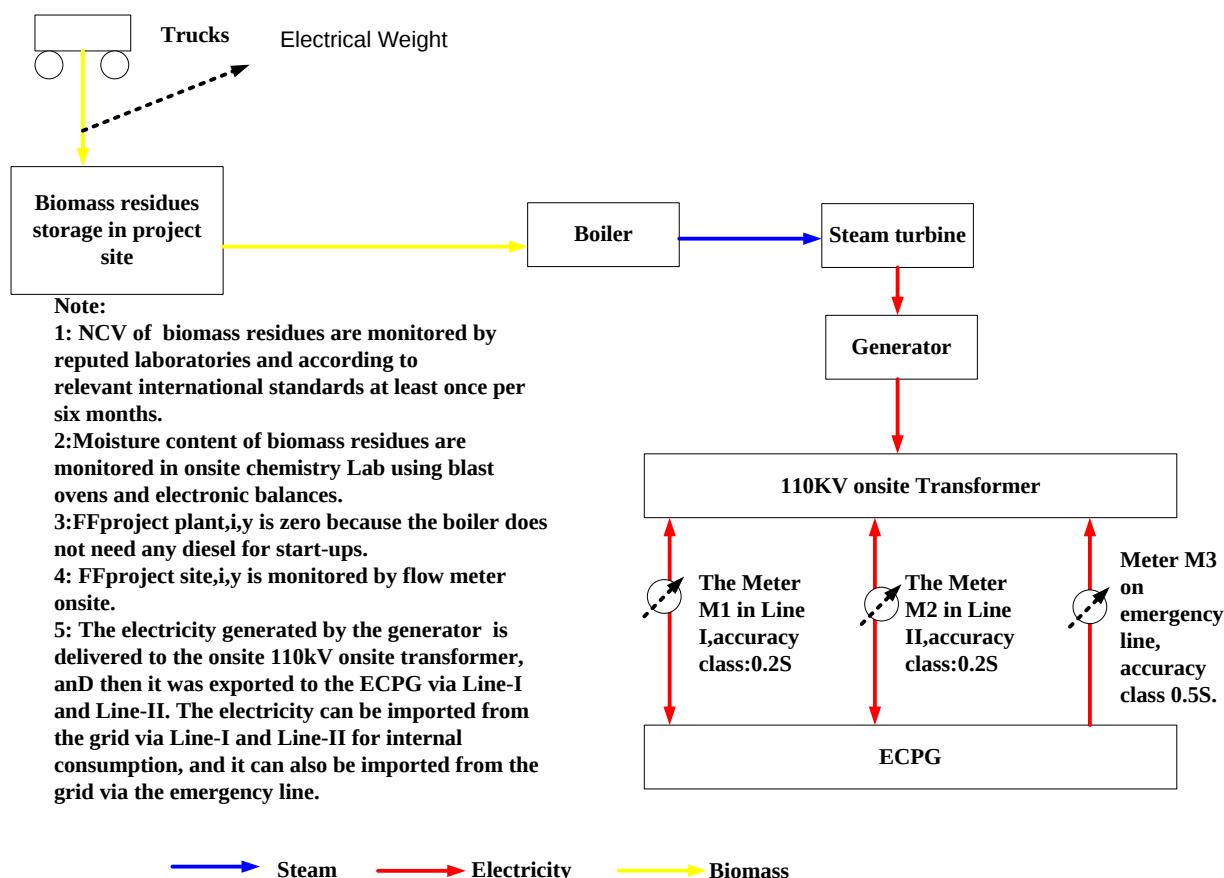


Figure C.2 Monitoring locations

The electricity delivered to the grid by the Project was monitored by three electricity meters:

- The meter (M1) was installed at the output of the onsite 110kV substation in Line-I, and can monitor the electricity exported to the grid and electricity imported from the grid via Line-I.
- The meter (M2) was installed at the output of the onsite 110kV substation in Line-II, and can monitor the electricity exported to the grid and electricity imported from the grid via Line-II.
- The meter (M3) was installed at the input of the Project in emergency line, and can monitor the electricity imported to the grid via emergency line.

Both M1&M2 are bidirectional electricity meters with accuracy 0.2S, the accuracy of M3 is 0.5S.

The data of M1&M2&M3 are monitored continuously and recorded monthly and cross checked by sales receipts, the calibration of meters is conducted annually.

The quantity of each type of biomass residues combusted in the Project are monitored by two weight meters (Electrical Weight) installed at the weight house and recorded by the project owner and aggregated into the monthly report. The weight meters are calibrated annually. The project owner conducted an energy balance analysis that is based on purchased quantities and stock changes to crosscheck the amount of biomass residues consumed by the project. The transportation distance are also monitored and recorded.

The moisture content is monitored for each batch of biomass of homogeneous quality by blast ovens and electronic balances and the monitoring result is recorded. It's calibrated annually.

The NCV of each type of biomass residues is measured by reputed laboratories according to relevant national standards at least once half a year.

The biomass residues resource is sourced from survey conducted by local government annually.

For the project, the boiler does not need any diesel for start-ups. But a small quantity of diesel is used in-plant. The diesel consumption is continuously measured by volume meter (flow meter) and recorded in a log book and the measurements with an annual energy balance that is based on purchased quantities and stock changes is crosschecked..

The electricity meters, weight meters, flow meters, blast ovens and electronic balances of the project are calibrated by qualified third parties. The accuracy level of all the monitoring equipments are in line with relevant national standards.

All the data collected as part of monitoring will be archived and kept at least for two years after the end of the last crediting period.

In case of any malfunction or emergency, a conservative approach will be used to calculate the emission reductions.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data / Parameter	GWP _{CH4}
Unit	tCO ₂ e/ tCH ₄
Description	Global warming potential for CH ₄
Source of data	IPCC 2006 default value
Value(s) applied	25
Choice of data or Measurement methods and procedures	25 for the second commitment period and will be updated according to any future COP/MOP decisions.
Purpose of data	The data is used for baseline and project emissions calculation.
Additional comment	-

Data/Parameter	EF _y
Unit	tCO ₂ e/MWh
Description	CO ₂ Emission Factor of ECPG
Source of data	Chinese DNA
Value(s) applied	0.864
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	The data is used for baseline and emissions calculation.
Additional comments	-

D.2. Data and parameters monitored

Data / Parameter:	EG _y
Unit:	MWh
Description:	Annual electricity delivered to the grid by the project
Measured/ Calculated / Default:	Measured
Source of data:	Electricity meters (M1&M2&M3) reading at connection point between the power plant and ECPG.
Value(s) of monitored parameter:	421,038.575

Monitoring equipment:	The electricity delivered to the grid by the Project was monitored by three electricity meters and calibration of the meters is conducted annually. <table border="1"> <thead> <tr> <th>Type</th><th>Electricity meter(M1)</th><th>Electricity meter(M2)</th><th>Electricity meter(M3)</th></tr> </thead> <tbody> <tr> <td>Model</td><td>DTZ545</td><td>DTZ545</td><td>DSZ178</td></tr> <tr> <td>Serial number</td><td>1524777672</td><td>1524777638</td><td>1541833884</td></tr> <tr> <td>Accuracy class</td><td>0.2S</td><td>0.2S</td><td>0.5S</td></tr> <tr> <td>Date of calibration</td><td>10/11/2012 09/11/2013 08/11/2014</td><td>10/11/2012 09/11/2013 08/11/2014</td><td>10/11/2012 09/11/2013 08/11/2014</td></tr> <tr> <td>Valid to</td><td>08/11/2015</td><td>08/11/2015</td><td>08/11/2015</td></tr> </tbody> </table>	Type	Electricity meter(M1)	Electricity meter(M2)	Electricity meter(M3)	Model	DTZ545	DTZ545	DSZ178	Serial number	1524777672	1524777638	1541833884	Accuracy class	0.2S	0.2S	0.5S	Date of calibration	10/11/2012 09/11/2013 08/11/2014	10/11/2012 09/11/2013 08/11/2014	10/11/2012 09/11/2013 08/11/2014	Valid to	08/11/2015	08/11/2015	08/11/2015
Type	Electricity meter(M1)	Electricity meter(M2)	Electricity meter(M3)																						
Model	DTZ545	DTZ545	DSZ178																						
Serial number	1524777672	1524777638	1541833884																						
Accuracy class	0.2S	0.2S	0.5S																						
Date of calibration	10/11/2012 09/11/2013 08/11/2014	10/11/2012 09/11/2013 08/11/2014	10/11/2012 09/11/2013 08/11/2014																						
Valid to	08/11/2015	08/11/2015	08/11/2015																						
Measuring/ Reading/ Recording frequency:	EG _y is continuously measured and monthly recorded.																								
Calculation method (if applicable):	EG_y=A-A'-B, where: A is the electricity delivered to the grid by the unit of the project. A' is the electricity consumed by the units from the grid. B is measured by an electricity meter connected with an emergence line to measure the electricity consumed by the projects in case of emergence.																								
QA/QC procedures:	The meters are calibrated annually. The data is monitored through the electricity meters, and rechecked by comparing with the electricity sales receipt from power corporation monthly.																								
Purpose of data:	The data is used for baseline emissions calculation.																								
Additional comment:	-																								

Data / Parameter:	BF _{k,y}
Unit:	Tonnes
Description:	Quantity of biomass fuel type k combusted in the project plant during the year y (dry base) (k=wood residues/cotton straw/cole straw/maize straw/rice straw/reed/wheat straw)
Measured/ Calculated / Default:	Measured
Source of data:	On site measured by Electrical Weights.
Value(s) of monitored parameter:	288,581.19 tonnes (dry basis) for wood residues, 47,295.26 tonnes (dry basis) for cotton straw, 1.41 tonnes (dry basis) for cole straw, 32,296.14 tonnes (dry basis) for maize straw, 66,263.08 tonnes (dry basis) for rice straw, 31,072.26 tonnes (dry basis) for reed, 21,168.79 tonnes (dry basis) for wheat straw.

Monitoring equipment:	Weight meters (Electrical Weights) are used for measurement. They are calibrated annually.																		
	<table border="1"> <tr> <td>Type</td><td>Electrical Weight</td><td>Electrical Weight</td></tr> <tr> <td>Model</td><td>SCS-30</td><td>SCS-80</td></tr> <tr> <td>Serial number</td><td>20070109</td><td>20080102</td></tr> <tr> <td>Accuracy class</td><td>Class III</td><td>Class III</td></tr> <tr> <td>Date of calibration</td><td>17/05/2012 16/05/2013 15/05/2014</td><td>17/05/2012 16/05/2013 15/05/2014</td></tr> <tr> <td>Valid to</td><td>14/05/2015</td><td>14/05/2015</td></tr> </table>	Type	Electrical Weight	Electrical Weight	Model	SCS-30	SCS-80	Serial number	20070109	20080102	Accuracy class	Class III	Class III	Date of calibration	17/05/2012 16/05/2013 15/05/2014	17/05/2012 16/05/2013 15/05/2014	Valid to	14/05/2015	14/05/2015
Type	Electrical Weight	Electrical Weight																	
Model	SCS-30	SCS-80																	
Serial number	20070109	20080102																	
Accuracy class	Class III	Class III																	
Date of calibration	17/05/2012 16/05/2013 15/05/2014	17/05/2012 16/05/2013 15/05/2014																	
Valid to	14/05/2015	14/05/2015																	
Measuring/ Reading/ Recording frequency:	Measuring continuously, and aggregated into Monthly Reading Report.																		
Calculation method (if applicable):	- Not applicable																		
QA/QC procedures:	BF _{k,y} has been crosschecked with an annual energy balance that is based on purchase receipt and stock change record for QA/QC.																		
Purpose of data:	The data is used for Baseline emission and Project emission calculations.																		
Additional comment:	-																		

Data / Parameter:	Moisture content of the biomass residues
Unit:	% Water content
Description:	Moisture content of each biomass residue type k .(k= wood residues/cotton straw /cole straw/maize straw/rice straw/reed/wheat straw)
Measured/ Calculated / Default:	Measured
Source of data:	The biomass was measured continuously and the moisture content of them was monitored by blast ovens and electronic balances in the chemical laboratory of the power plant when they are transported to the plant and then inspected their values with national standard GB/T211-2007 applied, which were put down on the quality inspection report. Moisture content of biomass residues of every truck arrived in the power plant has been monitored, three samples were analyzed at the same time and reported. And then the monthly weighted average value of biomass is worked out.
Value(s) of monitored parameter:	Weighted average value in this monitoring period: wood residues: 31.76% cotton straw: 29.49% cole straw: 25.38% maize straw: 29.83% rice straw: 23.46% reed: 25.61% wheat straw:20.20% Please see the column of moisture content for each kind of biomass in emission reduction spread sheet for details.

Monitoring equipment:	Blast ovens and electronic balances are used for measurement of content of the biomass residues on site. They are calibrated annually.				
	Type	Blast oven	Blast oven	Electronic balance (analytical)	Electronic balance
	Model	101-2A	101-2A	FA2104N	BS-3000A
	Serial number	93	25	53041	4060157
	Accuracy class	+/- 1°C	+/- 1°C	0.1mg	0.1g
	Date of calibration	17/05/2012 16/05/2013 15/05/2014	17/05/2012 16/05/2013 15/05/2014	17/05/2012 16/05/2013 15/05/2014	17/05/2012 16/05/2013 15/05/2014
	Valid to	14/05/2015	14/05/2015	14/05/2015	14/05/2015
Measuring/ Reading/ Recording frequency:	Measured when every truck arrived, and monthly weighted average value has been applied in the ER calculation.				
Calculation method (if applicable):	--Not applicable				
QA/QC procedures:	- Not applicable				
Purpose of data:	The data is used for Baseline emission and Project emission calculations				
Additional comment:	-				

Data / Parameter:	Density _d
Unit:	t/L
Description:	Density of diesel used for biomass residues transportation
Measured/ Calculated / Default:	Default
Source of data:	National standard GB/T19147-2016
Value(s) of monitored parameter:	0.00085
Monitoring equipment:	-Not applicable
Measuring/ Reading/ Recording frequency:	Will be updated with the latest version of GB/T19147.
Calculation method (if applicable):	-Not applicable
QA/QC procedures:	-Not applicable
Purpose of data:	The data is used for Project emission calculations
Additional comment:	-

Data / Parameter:	$FF_{\text{project plant, d,y}}$
Unit:	Tons
Description:	Quantity of diesel combusted in the straw-fired boiler during the year y
Measured/ Calculated / Default:	Measured
Source of data:	Fuel department of the power plant

Value(s) of monitored parameter:	The boiler does not need any diesel for start-ups, so no monitoring equipment has been settled to monitor $FF_{\text{project plant,d,,y}}$ in the initial design stage. $FF_{\text{project plant,d,,y}}$ is 0. Therefore it is not monitored.
Monitoring equipment:	--Not applicable
Measuring/ Reading/ Recording frequency:	-Not applicable
Calculation method (if applicable):	-Not applicable
QA/QC procedures:	-Not applicable
Purpose of data:	The data is used for project emissions calculation.
Additional comment:	-

Data / Parameter:	FF _{project site, diesel,y}																				
Unit:	Ton																				
Description:	Quantity of diesel combusted in the straw forklift during the year y																				
Measured/ Calculated / Default:	Measured																				
Source of data:	Fuel department of the power plant																				
Value(s) of monitored parameter:	476.201																				
Monitoring equipment:	Flow meters are used for measurement. It is calibrated annually. <table><tr><td>Type</td><td>Flow meter</td><td>Flow meter</td></tr><tr><td>Model</td><td>LC-11</td><td>LC11-AD DN40</td></tr><tr><td>Serial number</td><td>072</td><td>089</td></tr><tr><td>Accuracy class</td><td>0.5%</td><td>0.5%</td></tr><tr><td>Date of calibration</td><td>17/05/2012 16/05/2013 15/05/2014</td><td>17/05/2012 16/05/2013 15/05/2014</td></tr><tr><td>Valid to</td><td>14/05/2015</td><td>14/05/2015</td></tr></table>			Type	Flow meter	Flow meter	Model	LC-11	LC11-AD DN40	Serial number	072	089	Accuracy class	0.5%	0.5%	Date of calibration	17/05/2012 16/05/2013 15/05/2014	17/05/2012 16/05/2013 15/05/2014	Valid to	14/05/2015	14/05/2015
Type	Flow meter	Flow meter																			
Model	LC-11	LC11-AD DN40																			
Serial number	072	089																			
Accuracy class	0.5%	0.5%																			
Date of calibration	17/05/2012 16/05/2013 15/05/2014	17/05/2012 16/05/2013 15/05/2014																			
Valid to	14/05/2015	14/05/2015																			
Measuring/ Reading/ Recording frequency:	Measuring and recording for every refuelling process																				
Calculation method (if applicable):	Use flow meter and the volume will be converted into weight using a conservative 0.85 ton/m ³ specific gravity value for conservation ³																				
QA/QC procedures:	Project Owner had crosschecked the measurements by an annual energy balance that is based on purchased quantities and stock changes and with available purchase invoices, and found that the measurements are accurate. And, higher value of “plant daily logs” and “calculated value from diesel purchasing invoice and stock change” is adopted for conservation.																				
Purpose of data:	The data is used for project emissions calculation.																				
Additional comment:	-																				

³ The national standard "Automobile Diesel Fuel GB 19147-2009/2013/2016" published the maximum specific gravity value of diesel to be 0.85 ton/m^3 .

Data / Parameter:	EC _{PJ,y}
Unit:	MWh
Description:	On-site electricity consumption attributable to the project activity
Measured/ Calculated / Default:	Measured
Source of data:	Electricity meter reading
Value(s) of monitored parameter:	0 Electricity consumption by straw crackers have already been deducted in EGy (Annual electricity delivered to the grid by the proposed project), and there is no straw crackers in the two biomass collection stations. Furthermore, Linhai biomass collection station has been disused since 31/08/2010, Yangma biomass collection station has been disused since 16/06/2010. And there is no new biomass collection station(s) are to be constructed and put into use.
Monitoring equipment:	-Not applicable
Measuring/ Reading/ Recording frequency:	Continuously
Calculation method (if applicable):	-Not applicable
QA/QC procedures:	-Not applicable
Purpose of data:	The data is used for project emissions calculation.
Additional comment:	-

Data / Parameter:	AVD _y
Unit:	km
Description:	Average round trip distance between biomass fuel supply sites and the project site
Measured/ Calculated / Default:	Measured
Source of data:	Fuel department of the power plant
Value(s) of monitored parameter:	100
Monitoring equipment:	The project owner named each site and measured the distances of different collection sites on map. The staffs find which collection site it is from and put down the name of collection site when each truck arrives. And then distance of biomass can be identified and is put down in the data collection system. There is no instrument for AVD_y
Measuring/ Reading/ Recording frequency:	Recording distance when every truck arrived at project site.
Calculation method (if applicable):	The maximum value 100km is used for conservation.
QA/QC procedures:	PO has checked consistency of distance records provided by the truckers by comparing recorded distances with maps for QA/QC.

Purpose of data:	The data is used for project emissions calculation.
Additional comment:	-

Data / Parameter:	Ny
Unit:	-
Description:	Number of truck trips for the transportation of biomass measured.
Measured/ Calculated / Default:	Measured
Source of data:	Fuel department of the power plant
Value(s) of monitored parameter:	690,887
Monitoring equipment:	-Not applicable
Measuring/ Reading/ Recording frequency:	Whenever the truck arrives in the power plant, the staff puts down the number. Furthermore, project owner decide to adopt the value calculated using average truck load 1 ton in accepted PDD, this is conservative.
Calculation method (if applicable):	-Not applicable
QA/QC procedures:	-Not applicable
Purpose of data:	The data is used for project emissions calculation.
Additional comment:	-

Data / Parameter:	$BF_{k, \text{available}}$
Unit:	tons
Description:	Quantity of available biomass residues of type k in the region
Measured/ Calculated / Default:	Calculated
Source of data:	Statistics from local governments
Value(s) of monitored parameter:	This is obtained from official data. Please refer to table E.8 below for more details.
Monitoring equipment:	-Not applicable
Measuring/ Reading/ Recording frequency:	Data was obtained from statistic or survey conducted by local government annually.
Calculation method (if applicable):	--Not applicable
QA/QC procedures:	The Statistic Data of Biomass in the region was provided by local government which is official and authoritative, so there is no need for supplementary data sources and expert judgment.
Purpose of data:	Leakage emission calculations
Additional comment:	-

Data / Parameter:	$BF_{k, \text{used}}$
Unit:	tons
Description:	Quantity of biomass residues of type k that are utilized (e.g. for energy generation or as feedstock) in the defined geographical region.

Measured/ Calculated / Default:	Calculated
Source of data:	Statistics from local governments
Value(s) of monitored parameter:	This is obtained from official data. Please refer to table E.8 below for more details.
Monitoring equipment:	-Not applicable
Measuring/ Reading/ Recording frequency:	Data was obtained from statistic or survey conducted by local government annually.
Calculation method (if applicable):	--Not applicable
QA/QC procedures:	The Statistic Data of Biomass in the region was provided by local government which is official and authoritative, so there is no need for supplementary data sources and expert judgment.
Purpose of data:	Leakage emission calculations
Additional comment:	-

Data / Parameter:	EF _{CH₄,BF}
Unit:	tCH ₄ /TJ
Description:	CH ₄ emission factor for combustion of biomass in the project plant
Measured/ Calculated / Default:	Default
Source of data:	Version 04 of ACM0006
Value(s) of monitored parameter:	0.0411 According to the IPCC 2006 default value provided in table 3 of ACM0006, the CH ₄ emission factor of combustion of biomass in agriculture is 0.03 tCH ₄ /TJ. Considering a conservativeness factor of 1.37, the CH ₄ emission factor in this PDD is taken as 0.0411 tCH ₄ /TJ.
Monitoring equipment:	-Not applicable
Measuring/ Reading/ Recording frequency:	-Not applicable
Calculation method (if applicable):	-Not applicable
QA/QC procedures:	There is no new version of IPCC manual, so this parameter remains the same as stated in registered PDD and is thought to be suitable and accurate.
Purpose of data:	The data is used for project emissions calculation
Additional comment:	-

Data / Parameter:	EF _{km,CO₂,y}
Unit:	tCO ₂ /km
Description:	Average CO ₂ Emission Factor for transportation of biomass with trucks
Measured/ Calculated / Default:	Default
Source of data:	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual, Moderate Control index for US Heavy Duty Diesel Vehicles in Table 1-32, page 1.75.

Value(s) of monitored parameter:	0.001011
Monitoring equipment:	-Not applicable
Measuring/ Reading/ Recording frequency:	Shall be updated according to IPCC latest version. Minimal of two years after last issuance of CERs. There is no updated information in latest versions of IPCC.
Calculation method (if applicable):	-Not applicable
QA/QC procedures:	-Not applicable
Purpose of data:	The data is used for project emissions calculation.
Additional comment:	-

Data / Parameter:	NCV _d
Unit:	GJ/ton
Description:	Net calorie value of diesel used for on-site fuel use.
Measured/ Calculated / Default:	Default
Source of data:	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Value(s) of monitored parameter:	43.3 (for diesel)
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Any update of IPCC Guidelines in future will be followed.
Calculation method (if applicable):	- Not applicable
QA/QC procedures:	As an IPCC default value, the uncertainty is low.
Purpose of data:	The data is used for project emissions calculation.
Additional comment:	-

Data / Parameter:	EF _d
Unit:	tCO ₂ /TJ
Description:	Emission factor of diesel used for on-site fuel use.
Measured/ Calculated / Default:	Default
Source of data:	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories.
Value(s) of monitored parameter:	74.8
Monitoring equipment:	-Not applicable
Measuring/ Reading/ Recording frequency:	Any update of IPCC Guidelines in future will be followed.

Calculation method (if applicable):	-Not applicable
QA/QC procedures:	Uncertainty level of data is low
Purpose of data:	The data is used for project emissions calculation.
Additional comment:	-

Data / Parameter:	$EF_{\text{burning,CH}_4,k,y} \cdot NCV_k$
Unit:	tCH ₄ /ton biomass
Description:	CH ₄ emission factor for uncontrolled burning of the biomass residues
Measured/ Calculated / Default:	Default
Source of data:	2006 IPCC Guidelines, Volume 4, Table 2.5, default value for agricultural residues.
Value(s) of monitored parameter:	0.001971 (This value is fixed in the entire crediting period) According to the IPCC default value provided in table 5 of ACM0006, the CH ₄ emission factor of combustion of biomass in power plant is 0.0027 tCH ₄ /t. Considering a conservativeness factor of 0.73, the CH ₄ emission factor in this PDD is taken as 0.001971 tCH ₄ /TJ.
Monitoring equipment:	-Not applicable
Measuring/ Reading/ Recording frequency:	-Not applicable
Calculation method (if applicable):	-Not applicable
QA/QC procedures:	Value is from latest version of IPCC, so the uncertainty is low.
Purpose of data:	The data is used for baseline emissions calculation.
Additional comment:	-

Data / Parameter:	NCV_k
Unit:	TJ/ton
Description:	Net calorific value of biomass residue type k consumed by the project. (k=wood residues/cotton straw/cole straw/maize straw/rice straw/reed/wheat straw)
Measured/ Calculated / Default:	Measured
Source of data:	Test reports issued by reputed laboratories.
Value(s) of monitored parameter:	Please see the columns of NCV_k for each kind of biomass (wood residues, cotton straw, cole straw, maize straw, rice straw, reed, and wheat straw) in emission reduction spread sheet or table-Appendix 2 in MR for details.
Monitoring equipment:	Measurements are carried out at reputed laboratories on dry basis and according to relevant national standards.
Measuring/ Reading/ Recording frequency:	At least once half a year for different types of biomass residues.
Calculation method (if applicable):	Take three samples for each measurement. The average value is adopted for calculation.

QA/QC procedures:	Three samples (dry matter) should be analyzed at the same time by the test institution and reported. And the average of NCV of these samples should be used in the emission reduction calculation. The analysis will be made every six months. PO has checked consistency of measurements and local/national data with default values by the IPCC. There is little difference from IPCC default values ⁴ , so PO did not collect additional information.
Purpose of data:	The data is used for project emissions calculation.
Additional comment:	-

Data / Parameter:	EF _{CO₂,LE}
Unit:	tCO ₂ e/GJ
Description:	CO ₂ emission factor of the most carbon intensive fuel used in the country
Measured/ Calculated / Default:	Default
Source of data:	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: "workbook", Chapter 1, table 1-2.
Value(s) of monitored parameter:	0.092708 (coal) $25.8\text{tC/TJ} * 44/12\text{tCO}_2/\text{tC} * 0.001\text{TJ/GJ} * 0.98 = 0.092708 \text{ tCO}_2/\text{GJ}$ This data is fixed and will be update according to IPCC guidelines.
Monitoring equipment:	-Not applicable
Measuring/ Reading/ Recording frequency:	-Not applicable
Calculation method (if applicable):	-Not applicable
QA/QC procedures:	Uncertainty level of data is low.
Purpose of data:	Leakage emission calculations
Additional comment:	-

D.3. Implementation of sampling plan

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Not applicable.

SECTION E. Calculation of emission reductions or net anthropogenic removals ⁵

E.1. Calculation of baseline emissions or baseline net removals

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The GHG emission reductions of the project are from two major sources: CO₂ emission reductions through the substitution of electricity generation in ECPG, CH₄ emission reductions from a reduction of direct

⁴ In 2006 IPCC Guidelines for National Greenhouse Gas Inventories, table 1.2, Volume 2 Energy, chapter 1, Page 1.19, default value of NCV_{woods residues} is 15.6 GJ/tons on a dry-basis, default value of NCV_{others} is 11.6 GJ/tons on a dry-basis.

⁵ Please see ER calculation sheet for details.

dumping or uncontrolled burning of biomass.

According to the accepted revised PDD, the baseline emissions for year y can be calculated according to the following formula:

$$BE_y = ER_{\text{electricity},y} + BE_{\text{biomass},y} \quad (1)$$

Where:

$ER_{\text{electricity},y}$ are the emission reductions due to displacement of electricity during the year y in tons of CO₂,

$BE_{\text{biomass},y}$ are Baseline emissions due to natural decay or burning of anthropogenic sources of biomass residues during the year y (tCO₂e/yr)

BE_y : are baseline emissions of the project activity during the year y (tCO₂e/yr)

a) Emission reductions due to displacement of electricity ($ER_{\text{electricity},y}$)

The project owner used ACM0002 and ACM0006 in the accepted PDD to establish the emissions factor for the net electricity generated by the project. Following these methodologies, the emission reductions achieved by the project activity from electricity generation can be calculated by multiplying the net electricity supplied to the grid and the appropriate emissions factor of the grid.

The emission reductions from electricity $ER_{\text{electricity},y}$ by the project activity during a given year y is

$$ER_{\text{electricity},y} = EG_y * EF_{\text{electricity},y} \quad (2)$$

Where:

$ER_{\text{electricity},y}$ are the emission reductions due to displacement of electricity during the year y in tons of CO₂,

EG_y is the net quantity of increased electricity generation as a result of the project activity (incremental to baseline generation) during the year y in MWh,

$EF_{\text{electricity},y}$ is the CO₂ emission factor for the electricity displaced due to the project activity during the year y in tons of CO₂/ MWh, which has been determined ex-ante in the accepted revised PDD as 0.864.

Project net electricity generation is monitored through the use of onsite electricity meters. With the emissions factor fixed for the crediting period, net electricity generation calculated from total supply to the grid and total imports from the grid and the emergency line $ER_{\text{electricity},y}$ was calculated bellow.

All metering equipment is calibrated regularly in line with industry standards. In addition, total supply and total imports are checked against sales receipts.

Table E.1. Monitoring Result of E_{Gy} and $ER_{electricity,y}$ calculation

Period	Electricity exported to the grid		Electricity Imported from the grid		Electricity imported from emergency line		E _{Gy} =Electricity Exported-Electricity Imported from the grid-Electricity Imported from emergency line(conservative value)	E _{F^{electricity,y}} (tCO ₂ e/MWh)	E _{R^{electricity,y}} (tCO ₂ e)
	MRR	Sale receipts	MRR	Sale receipts	MRR	Sale receipts			
	A6'	A6''	B6'	B6''	C6'	C6''	D6=min (A6',A6'') - max(B6',B6'')- max(C6',C6'')	E6	F6=D6*E6
01/01/2013-31/01/2013	11,313.918	11,313.918	64.912	64.912	43.615	43.615	11,205.391	0.864	9,681.458
01/02/2013-28/02/2013	14,406.650	14,406.650	0.000	0.000	55.496	55.496	14,351.154	0.864	12,399.397
01/03/2013-31/03/2013	15,874.509	15,874.509	51.103	51.103	65.466	65.466	15,757.940	0.864	13,614.860
01/04/2013-30/04/2013	15,537.300	15,537.300	0.000	0.000	70.122	70.122	15,467.178	0.864	13,363.642
01/05/2013-31/05/2013	14,641.704	14,641.704	85.113	85.113	89.347	89.347	14,467.244	0.864	12,499.699
01/06/2013-30/06/2013	15,223.356	15,223.356	0.000	0.000	80.692	80.692	15,142.664	0.864	13,083.262
01/07/2013-31/07/2013	13,739.611	13,739.611	0.000	0.000	67.436	67.436	13,672.175	0.864	11,812.759
01/08/2013-31/08/2013	13,313.982	13,313.982	0.000	0.000	58.189	58.189	13,255.793	0.864	11,453.005
01/09/2013-30/09/2013	17,184.840	17,184.840	0.000	0.000	48.228	48.228	17,136.612	0.864	14,806.033
01/10/2013-31/10/2013	17,708.221	17,708.221	0.000	0.000	73.182	73.182	17,635.039	0.864	15,236.674
01/11/2013-30/11/2013	16,548.270	16,548.270	0.000	0.000	62.809	62.809	16,485.461	0.864	14,243.438
01/12/2013-31/12/2013	17,972.810	17,972.810	0.000	0.000	43.386	43.386	17,929.424	0.864	15,491.022
01/01/2014-31/01/2014	16,710.020	16,710.020	0.000	0.000	63.388	63.388	16,646.632	0.864	14,382.690
01/02/2014-28/02/2014	16,168.568	16,168.568	0.000	0.000	50.571	50.571	16,117.997	0.864	13,925.949
01/03/2014-31/03/2014	15,805.652	15,805.652	0.000	0.000	64.204	64.204	15,741.448	0.864	13,600.611
01/04/2014-30/04/2014	15,515.604	15,515.604	0.000	0.000	80.475	80.475	15,435.129	0.864	13,335.951
01/05/2014-31/05/2014	15,997.940	15,997.940	0.000	0.000	89.018	89.018	15,908.922	0.864	13,745.309
01/06/2014-30/06/2014	16,263.753	16,263.753	0.000	0.000	53.163	53.163	16,210.590	0.864	14,005.950
01/07/2014-31/07/2014	15,741.000	15,741.000	48.882	48.882	57.408	57.408	15,634.710	0.864	13,508.389
01/08/2014-31/08/2014	14,697.238	14,697.238	50.705	50.705	49.904	49.904	14,596.629	0.864	12,611.487
01/09/2014-30/09/2014	16,826.736	16,826.736	0.000	0.000	76.633	76.633	16,750.103	0.864	14,472.089

01/10/2014-31/10/2014	17,842.247	17,842.247	0.000	0.000	68.201	68.201	17,774.046	0.864	15,356.776
01/11/2014-30/11/2014	17,272.348	17,272.348	0.000	0.000	39.197	39.197	17,233.151	0.864	14,889.442
01/12/2014-31/12/2014	17,462.040	17,462.040	0.000	0.000	80.238	80.238	17,381.802	0.864	15,017.877
01/01/2015-31/01/2015	10,552.713	10,552.713	84.425	84.425	29.580	29.580	10,438.708	0.864	9,019.044
01/02/2015-28/02/2015	15,468.000	15,468.000	0.000	0.000	61.573	61.573	15,406.427	0.864	13,311.153
01/03/2015-31/03/2015	17,307.320	17,307.320	0.000	0.000	51.114	51.114	17,256.206	0.864	14,909.362
Total	423,096.350	423,096.350	385.140	385.140	1,672.635	1,672.635	421,038.575	/	363,777.329

b) Baseline emissions due to natural decay or uncontrolled burning of anthropogenic sources of biomass ($BE_{Biomass,y}$)

The project participants, using ACM0006 (Version 04), established in the PDD that methane emissions would occur in the baseline scenario, i.e. the biomass residue would have been burned in an uncontrolled manner or dumped and left to decay, generating significant methane emissions. Methane emissions from dumping biomass residues, and leaving them to decay, are higher than when they are burned in an uncontrolled manner. Therefore to be conservative, it is assumed, that all residues are burned.

Unused biomass burned in open-air is a conservative scenario, because the quantity of the GHG produced from natural decay of biomass is far more than that from biomass burning in open-air. Therefore, the emission from the unused biomass is calculated on the following equation:

$$BE_{Biomass,y} = GWP_{CH_4} * \sum_k BF_{PJ,k,y} * NCV_k * EF_{burning,CH_4,k,y} \quad (3)$$

Where:

$BE_{Biomass,y}$ is baseline emissions due to natural decay or burning of anthropogenic sources of biomass residue during the year y (tCO₂e/year) ,

GWP_{CH_4} is the Global Warming Potential for methane valid for the relevant commitment period(21tCO₂/tCH₄),

NCV_k is the net calorific value of the biomass residue type k in GJ/ton,

$BF_{PJ,k,y}$ is the incremental quantity of biomass residue type k used as a result of the project activity in the project plant during the year y (ton) .,

$EF_{burning,CH_4,k,y}$ is CH₄ emission factor for uncontrolled burning of the biomass residue type k during year y (tCH₄/GJ)

And $GWP_{CH_4} = 25$, and PPs used 0.0027 tCH₄/ton biomass for product of $EF_{burning,CH_4,k,y} * NCV_k$ for conservation and the corresponding conservativeness factor is 0.73.

Table E.2 Monitored $BF_{k,y}$ and calculation of $BE_{Biomass,y}$

Period	BF1(ton) (dry base)	BF2(ton) (dry base)	BF3(ton) (dry base)	BF4(ton) (dry base)	BF5(ton) (dry base)	BF6(ton) (dry base)	BF7(ton) (dry base)	NCVk *EF _{burning, CH₄,i} (tCH ₄ /ton)	Cons ervati ve factor	GWP _{CH₄} (tCO ₂ e/t CH ₄)	BE _{biomass,y} (tCO ₂ e)
	A7=A3	B7=C3	C7=E3	D7=G3	E7=I3	F7=K3	G7=M3	H7	I7	J7	K7=(A7+...+G7)*H7*I7*J7
01/01/2013-31/01/2013	8,010.35	1,324.01	0.00	1,140.65	2,073.74	991.87	464.33	0.0027	0.73	25	690.094
01/02/2013-28/02/2013	9,680.14	1,922.00	0.00	1,155.81	1,080.09	826.69	474.79	0.0027	0.73	25	746.000
01/03/2013-31/03/2013	11,106.67	1,497.75	0.00	1,200.58	2,905.44	1,215.55	865.08	0.0027	0.73	25	925.930
01/04/2013-30/04/2013	10,479.51	1,796.53	0.00	1,521.67	1,692.82	1,254.22	611.13	0.0027	0.73	25	855.212
01/05/2013-31/05/2013	11,032.15	1,490.61	0.35	895.81	2,264.11	879.48	936.34	0.0027	0.73	25	862.256
01/06/2013-30/06/2013	9,444.40	1,386.99	0.09	1,086.77	1,986.26	1,366.73	890.15	0.0027	0.73	25	796.352
01/07/2013-31/07/2013	8,848.27	1,234.29	0.11	1,112.84	2,558.72	1,114.03	802.78	0.0027	0.73	25	772.190
01/08/2013-31/08/2013	10,092.25	1,219.16	0.00	853.93	2,582.65	845.47	505.79	0.0027	0.73	25	793.290
01/09/2013-30/09/2013	11,873.15	1,579.89	0.00	1,574.96	1,491.50	1,453.72	899.39	0.0027	0.73	25	929.948
01/10/2013-31/10/2013	11,975.14	1,673.07	0.00	1,212.01	3,532.75	915.35	1,053.81	0.0027	0.73	25	1,003.344
01/11/2013-30/11/2013	11,800.70	2,034.36	0.00	1,449.42	3,354.46	1,026.98	634.26	0.0027	0.73	25	1,000.292
01/12/2013-31/12/2013	13,032.87	1,620.21	0.00	1,323.33	4,171.53	906.77	1,148.98	0.0027	0.73	25	1,094.087
01/01/2014-31/01/2014	11,275.37	1,981.70	0.00	981.76	1,307.04	1,499.33	847.05	0.0027	0.73	25	881.640
01/02/2014-28/02/2014	11,447.85	1,670.35	0.00	1,029.34	1,664.11	998.93	1,000.47	0.0027	0.73	25	877.640
01/03/2014-31/03/2014	10,683.09	1,192.17	0.00	962.51	3,168.60	820.46	562.36	0.0027	0.73	25	856.852
01/04/2014-30/04/2014	11,719.79	1,563.75	0.00	1,453.26	2,042.03	1,104.59	894.22	0.0027	0.73	25	925.268
01/05/2014-31/05/2014	11,444.80	1,869.23	0.69	1,335.73	2,811.91	934.39	585.40	0.0027	0.73	25	935.345
01/06/2014-30/06/2014	9,720.40	1,592.91	0.06	1,575.30	3,209.94	1,315.05	778.11	0.0027	0.73	25	896.399
01/07/2014-31/07/2014	10,794.04	2,202.86	0.12	1,276.84	3,005.64	831.29	805.98	0.0027	0.73	25	932.124
01/08/2014-31/08/2014	9,386.69	1,786.32	0.00	962.39	2,066.94	1,120.77	611.32	0.0027	0.73	25	785.169
01/09/2014-30/09/2014	10,869.64	2,052.57	0.00	1,040.58	2,437.48	1,459.56	672.39	0.0027	0.73	25	913.175
01/10/2014-31/10/2014	11,942.40	2,369.05	0.00	1,492.81	2,405.57	1,834.36	1,208.60	0.0027	0.73	25	1,047.231
01/11/2014-30/11/2014	12,932.58	2,499.29	0.00	1,082.66	2,128.83	1,203.21	939.73	0.0027	0.73	25	1,024.244
01/12/2014-31/12/2014	10,793.27	2,385.10	0.00	1,209.79	3,235.68	1,369.37	669.23	0.0027	0.73	25	968.866
01/01/2015-31/01/2015	6,442.18	1,506.28	0.00	789.40	2,037.73	656.76	673.24	0.0027	0.73	25	596.504

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01/02/2015-28/02/2015	10,297.22	1,895.99	0.00	967.93	2,323.60	1,426.16	1,004.60	0.0027	0.73	25	882.786
01/03/2015-31/03/2015	11,456.31	1,948.82	0.00	1,608.07	2,723.89	1,701.16	629.26	0.0027	0.73	25	988.827
Total	288,581.19	47,295.26	1.41	32,296.14	66,263.08	31,072.26	21,168.79	/	/	/	23,981.065

E.2. Calculation of project emissions or actual net removals

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Project emissions include CO₂ emission from transportation of biomass to the project site, CO₂ emissions from on-site consumption of fossil fuels due to the project activity, CO₂ emissions from on-site electricity consumption attributable to the project activity and CH₄ emissions from the combustion of biomass. GHG emissions from the project activity in year y are calculated on the following equation:

$$PE_y = PET_y + PEFF_y + PE_{EC,y} + GWP_{CH_4} * PE_{Biomass,CH_4,y} \quad (4)$$

Where:

PE_y are total project CO₂ emissions during the year y (tCO₂e/year) ,

PET_y are CO₂ emissions during the year y due to transportation of the biomass to the project (tCO₂e/year) ,

$PEFF_y$ are the CO₂ emissions during the year y due to fossil fuels co-fired by the generation facility or other fossil fuels consumption at the project site that is attributable to the project activity (tCO₂e/year) ,

$PE_{EC,y}$ are the CO₂ emissions during the year y due to electricity consumption at the project that is attributable to the project activity (tCO₂e/year) .

GWP_{CH_4} is the global warming potential for methane valid for the relevant commitment period,

$PE_{Biomass,CH_4,y}$ is the CH₄ emissions from the combustion of biomass during the year y (tCH₄/year).

a) Carbon dioxide emissions from combustion of fossil fuels for transportation of straws (PET_y)

Following ACM0006 in the PDD, the project owner established the formulae for calculating the emissions from the transport of biomass residues to the project plant. The emissions were calculated in the accepted revised PDD from the projected number of truck trips, average distance the biomass gets transported to the project plant, and the CO₂ emissions factor from fuel used for transportation. During operation, the number of truck trips were monitored so that the following formulae can be used:

$$PET_y = N_y \times AVD_y \times EF_{km,CO_2,y} \quad (5)$$

Where:

PET_y are CO₂ emissions during the year y due to transport of biomass residues to the project plant (tCO₂e/year) .

AVD_y is the 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).

$EF_{km,CO_2,y}$ is the average CO₂ emission factor for the trucks measured in t CO₂e/km.

N_y : is Number of truck trips during the year y

Table E.3 Monitored data for transport emissions and calculation of PET_y

Period	Ny'	Ny''(Calculated using average truck load 1 ton in accepted revised PDD)	Ny=max(Ny',Ny'')	AVDy (Max,km)	EF _{km,CO2} (tCO ₂ e/km)	PETy (tCO ₂ e)
	A1'	A1''	A1	B1	C1	D1=A1*B1*C1
01/01/2013-31/01/2013	3,534	19,038	19,038	100.00	0.001011	1,924.742
01/02/2013-28/02/2013	4,021	22,545	22,545		0.001011	2,279.300
01/03/2013-31/03/2013	3,573	25,614	25,614		0.001011	2,589.575
01/04/2013-30/04/2013	3,092	24,574	24,574		0.001011	2,484.431
01/05/2013-31/05/2013	4,165	23,871	23,871		0.001011	2,413.358
01/06/2013-30/06/2013	3,684	24,328	24,328		0.001011	2,459.561
01/07/2013-31/07/2013	3,334	22,178	22,178		0.001011	2,242.196
01/08/2013-31/08/2013	3,990	22,388	22,388		0.001011	2,263.427
01/09/2013-30/09/2013	2,942	27,550	27,550		0.001011	2,785.305
01/10/2013-31/10/2013	3,721	27,546	27,546		0.001011	2,784.901
01/11/2013-30/11/2013	3,725	27,641	27,641		0.001011	2,794.505
01/12/2013-31/12/2013	4,249	29,923	29,923		0.001011	3,025.215
01/01/2014-31/01/2014	3,041	26,651	26,651		0.001011	2,694.416
01/02/2014-28/02/2014	3,405	25,302	25,302		0.001011	2,558.032
01/03/2014-31/03/2014	2,326	25,079	25,079		0.001011	2,535.487
01/04/2014-30/04/2014	4,350	25,296	25,296		0.001011	2,557.426
01/05/2014-31/05/2014	2,341	26,162	26,162		0.001011	2,644.978
01/06/2014-30/06/2014	3,096	27,271	27,271		0.001011	2,757.098
01/07/2014-31/07/2014	4,223	26,685	26,685		0.001011	2,697.854
01/08/2014-31/08/2014	5,045	23,125	23,125		0.001011	2,337.938
01/09/2014-30/09/2014	3,841	26,910	26,910		0.001011	2,720.601
01/10/2014-31/10/2014	2,630	30,296	30,296		0.001011	3,062.926
01/11/2014-30/11/2014	3,762	29,528	29,528		0.001011	2,985.281
01/12/2014-31/12/2014	2,931	28,583	28,583		0.001011	2,889.741
01/01/2015-31/01/2015	4,446	17,294	17,294		0.001011	1,748.423
01/02/2015-28/02/2015	3,854	26,518	26,518		0.001011	2,680.970
01/03/2015-31/03/2015	3,278	28,991	28,991		0.001011	2,930.990
Total	96,599	690,887	690,887	/	/	69,848.676

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

The boiler does not need any diesel for start-ups, so no monitoring equipment has been settled to monitor $FF_{\text{project plant,d,y}}$ in the initial design stage. $FF_{\text{project plant,d,y}}$ is 0.

There quantity of diesel combusted in the straw forklifts both in project plant and two biomass collection stations. Following ACM0006 in the PDD, the project owner established the formula for calculating the emissions from fossil fuel use in the project plant, using the quantity of each fuel used and the appropriate emissions coefficient, as follows:

$$PEFF_y = \sum_i (FF_{\text{project, plant, i, y}} + FF_{\text{project, site, i, y}}) * NCV_i * EF_d \quad (6)$$

Where:

$PEFF_y$ are CO₂ emissions from on-site consumption of fossil fuels in the biomass power plant during the year y in tons of CO₂ equivalents,

$FF_{project, plant, i, y}$ is the quantity of fossil fuel type i combusted in the biomass residue fired power plant during the year y.

$FF_{project, site, i, y}$ is the quantity of fossil fuel type i combusted at the project site for other purposes that are attributable to the project activity during the year y,

NCV_i is the Net calorific value of diesel (GJ/ton), which is 42.652 GJ/ton for diesel,

EF_d is CO₂ emission factor for the diesel (tCO₂e/GJ)

Table E.4

Monitored data and calculation of emissions from on-site consumption of fossil fuels ($PEFF_y$)

Period	$FF_{project, site, diesel, y}$ (tons, from Plant Daily Logs)	$FF_{project, site, diesel, y}$ (tons, from diesel purchasing invoice and stock change)	Higher value between PDL and the diesel purchasing and stock change	NCV_{diesel} (TJ/ton)	EF_d (tCO ₂ /TJ)	$PEFF_y$ (tCO ₂ e)
	A2	B2	$C2 = \max(A2, B2)$	D2	E2	$F2 = C2 * D2 * E2$
01/01/2013-31/01/2013	10.803	10.90	10.900	0.0433	74.8	35.303
01/02/2013-28/02/2013	28.261	28.32	28.320	0.0433	74.8	91.724
01/03/2013-31/03/2013	19.602	19.50	19.602	0.0433	74.8	63.487
01/04/2013-30/04/2013	18.655	18.26	18.655	0.0433	74.8	60.421
01/05/2013-31/05/2013	19.404	19.70	19.700	0.0433	74.8	63.805
01/06/2013-30/06/2013	6.348	6.42	6.420	0.0433	74.8	20.793
01/07/2013-31/07/2013	17.837	17.70	17.837	0.0433	74.8	57.770
01/08/2013-31/08/2013	20.118	20.20	20.200	0.0433	74.8	65.425
01/09/2013-30/09/2013	25.149	25.22	25.220	0.0433	74.8	81.684
01/10/2013-31/10/2013	19.937	19.47	19.937	0.0433	74.8	64.574
01/11/2013-30/11/2013	17.473	18.32	18.320	0.0433	74.8	59.336
01/12/2013-31/12/2013	27.487	26.47	27.487	0.0433	74.8	89.026
01/01/2014-31/01/2014	12.445	12.74	12.740	0.0433	74.8	41.263
01/02/2014-28/02/2014	28.785	29.53	29.530	0.0433	74.8	95.643
01/03/2014-31/03/2014	18.275	17.47	18.275	0.0433	74.8	59.189
01/04/2014-30/04/2014	8.127	8.98	8.980	0.0433	74.8	29.085
01/05/2014-31/05/2014	10.756	10.06	10.756	0.0433	74.8	34.839
01/06/2014-30/06/2014	19.614	20.16	20.160	0.0433	74.8	65.295
01/07/2014-31/07/2014	18.799	18.57	18.799	0.0433	74.8	60.888
01/08/2014-31/08/2014	8.259	7.47	8.259	0.0433	74.8	26.748
01/09/2014-30/09/2014	10.847	12.04	12.040	0.0433	74.8	38.996
01/10/2014-31/10/2014	19.594	18.51	19.594	0.0433	74.8	63.462
01/11/2014-30/11/2014	19.150	19.50	19.500	0.0433	74.8	63.157
01/12/2014-31/12/2014	10.999	11.96	11.960	0.0433	74.8	38.737
01/01/2015-31/01/2015	19.953	19.59	19.953	0.0433	74.8	64.624
01/02/2015-28/02/2015	24.604	24.25	24.604	0.0433	74.8	79.687
01/03/2015-31/03/2015	8.454	7.48	8.454	0.0433	74.8	27.380
Total	469.734	468.79	476.201	/	/	1,542.339

Note: $FF_{\text{project plant,diesel,y}}$ is 0, so, only $FF_{\text{project site,diesel,y}}$ is used for $PE_{FF,y}$ calculation.

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

Following ACM0006 (Version 04) in the PDD, the project owner established the formula for calculating the emissions from electricity consumption, using the quantity of electricity purchased and the appropriate emissions coefficient, as follows:

$$PE_{EC,y} = EC_{PJ,y} * EF_{\text{grid,y}} \quad (7)$$

Where:

$PE_{EC,y}$ are CO₂ emissions from on-site electricity consumption attributable to the project activity (tCO₂e/year).

$EC_{PJ,y}$ is the on-site electricity attributable to the project activity during the year y (MWh),

$EF_{\text{grid,y}}$ is the CO₂ emission factor for grid electricity during the year y (tCO₂e/ MWh).

Table E.5 Monitored $EC_{PJ,y}$ and calculation of ($PE_{EC,y}$)

Period	$EC_{PJ,y}$ (MWh)	$EF_{\text{electricity,y}}$ (tCO ₂ e/MWh)	$PE_{EC,y}$ (tCO ₂ e)
	A4	B4	C4= A4*B4
01/01/2013-31/03/2015	0	0.864	0.000

Note: Linhai biomass collection station has been disused since 31/08/2010, Yangma biomass collection station has been disused since 16/06/2010.

And there is no new biomass collection station(s) are to be constructed and put into use. So, $EC_{PJ,y}$ is zero.

d) Methane emissions from combustion of straws ($PE_{\text{Biomass,CH}_4,y}$)

It was established in the PDD that the emissions can be calculated from the quantity of biomass that would not be used in absence of the project activity, with the net caloric value and the appropriate emissions factor, as follows:

$$PE_{\text{Biomass,CH}_4,y} = EF_{\text{CH}_4,BF} * \sum_k BF_{k,y} * NCV_k \quad (8)$$

Where:

$PE_{\text{Biomass,CH}_4,y}$ are the project emissions from combustion of straws (tCO₂e/year),

$BF_{k,y}$ is the quantity of straw type k used as fuel in the project plant during the year y in tons in dry matter (ton),

NCV_k is the net calorific value of the biomass residues type k in TJ per tons, and

$EF_{\text{CH}_4,BF}$ is the CH₄ emission factor for controlled burning of the straw in tCH₄/TJ.

According to the recording of the project owner, wood residues, cotton straw, cole straw, maize straw, rice straw, reed, wheat straw are used.

Methane emissions in both the baseline and project scenario are calculated from the amount of biomass residue burned in the project plant. Seven kinds of biomass are used. The quantities and energy content are monitored. With the $GWP_{\text{CH}_4}=25$, and the methane emissions factor for burning biomass in a controlled manner $EFC_{\text{H}_4,i} = 30 \text{ kgCH}_4/\text{TJ}$ with a conservativeness factor of 1.37.

Table E.6 Monitored data and calculation of $GWP_{CH_4} * PE_{Biomass, CH_4, y}$

Period	BF1(ton) (dry base)	NCV1 (TJ/ton) (dry base)	BF2(ton) (dry base)	NCV2 (TJ/ton) (dry base)	BF3(ton) (dry base)	NCV3(TJ/ton) (dry base)	BF4(ton) (dry base)	NCV4(TJ/ton) (dry base)	BF5(ton) (dry base)	NCV5(TJ/ton) (dry base)	BF6(ton) (dry base)	NCV6(TJ/ton) (dry base)	BF7(ton) (dry base)	NCV7(TJ/ton) (dry base)	EF _{CH₄, B_F} (KgCH ₄ /TJ)	Conser vative factor	GW P(tC O ₂ e/ CH ₄)	GWP _{CH₄} *P E _{Biomass, CH₄} y (tCO ₂ e)
	A3	B3	C3	D3	E3	F3	G3	H3	I3	J3	K3	L3	M3	N3	O3	P3	Q3	R3=(A3*B3+...+M3*N3)*O3*P3*Q3/1000
01/01/2013-31/01/2013	8,010.35	0.01420	1,324.01	0.01434	0.00	0.01490	1,140.65	0.01480	2,073.74	0.01319	991.87	0.01444	464.33	0.01347	30	1.37	25	202.977
01/02/2013-28/02/2013	9,680.14	0.01420	1,922.00	0.01434	0.00	0.01490	1,155.81	0.01480	1,080.09	0.01319	826.69	0.01444	474.79	0.01347	30	1.37	25	220.609
01/03/2013-31/03/2013	11,106.67	0.01420	1,497.75	0.01434	0.00	0.01490	1,200.58	0.01480	2,905.44	0.01319	1,215.55	0.01444	865.08	0.01347	30	1.37	25	271.762
01/04/2013-30/04/2013	10,479.51	0.01420	1,796.53	0.01434	0.00	0.01490	1,521.67	0.01480	1,692.82	0.01319	1,254.22	0.01444	611.13	0.01347	30	1.37	25	252.522
01/05/2013-31/05/2013	11,032.15	0.01420	1,490.61	0.01434	0.35	0.01490	895.81	0.01480	2,264.11	0.01319	879.48	0.01444	936.34	0.01347	30	1.37	25	253.249
01/06/2013-30/06/2013	9,444.40	0.01492	1,386.99	0.01359	0.09	0.01362	1,086.77	0.01579	1,986.26	0.01429	1,366.73	0.01393	890.15	0.01442	30	1.37	25	243.701
01/07/2013-31/07/2013	8,848.27	0.01492	1,234.29	0.01359	0.11	0.01362	1,112.84	0.01579	2,558.72	0.01429	1,114.03	0.01393	802.78	0.01442	30	1.37	25	236.347
01/08/2013-31/08/2013	10,092.25	0.01492	1,219.16	0.01359	0.00	0.01362	853.93	0.01579	2,582.65	0.01429	845.47	0.01393	505.79	0.01442	30	1.37	25	243.112
01/09/2013-30/09/2013	11,873.15	0.01492	1,579.89	0.01359	0.00	0.01362	1,574.96	0.01579	1,491.50	0.01429	1,453.72	0.01393	899.39	0.01442	30	1.37	25	285.665
01/10/2013-31/10/2013	11,975.14	0.01492	1,673.07	0.01359	0.00	0.01362	1,212.01	0.01579	3,532.75	0.01429	915.35	0.01393	1,053.81	0.01442	30	1.37	25	307.195
01/11/2013-30/11/2013	11,800.70	0.01492	2,034.36	0.01359	0.00	0.01362	1,449.42	0.01579	3,354.46	0.01429	1,026.98	0.01393	634.26	0.01442	30	1.37	25	306.182
01/12/2013-31/12/2013	13,032.87	0.01567	1,620.21	0.01595	0.00	0.01687	1,323.33	0.01496	4,171.53	0.01416	906.77	0.01453	1,148.98	0.01458	30	1.37	25	348.180
01/01/2014-31/01/2014	11,275.37	0.01567	1,981.70	0.01595	0.00	0.01687	981.76	0.01496	1,307.04	0.01416	1,499.33	0.01453	847.05	0.01458	30	1.37	25	283.203
01/02/2014-28/02/2014	11,447.85	0.01567	1,670.35	0.01595	0.00	0.01687	1,029.34	0.01496	1,664.11	0.01416	998.93	0.01453	1,000.47	0.01458	30	1.37	25	281.632
01/03/2014-31/03/2014	10,683.09	0.01567	1,192.17	0.01595	0.00	0.01687	962.51	0.01496	3,168.60	0.01416	820.46	0.01453	562.36	0.01458	30	1.37	25	273.116
01/04/2014-30/04/2014	11,719.79	0.01567	1,563.75	0.01595	0.00	0.01687	1,453.26	0.01496	2,042.03	0.01416	1,104.59	0.01453	894.22	0.01458	30	1.37	25	296.263
01/05/2014-31/05/2014	11,444.80	0.01567	1,869.23	0.01595	0.69	0.01687	1,335.73	0.01496	2,811.91	0.01416	934.39	0.01453	585.40	0.01458	30	1.37	25	299.081
01/06/2014-30/06/2014	9,720.40	0.01626	1,592.91	0.01403	0.06	0.01388	1,575.30	0.01542	3,209.94	0.01319	1,315.05	0.01388	778.11	0.01454	30	1.37	25	284.206
01/07/2014-31/07/2014	10,794.04	0.01626	2,202.86	0.01403	0.12	0.01388	1,276.84	0.01542	3,005.64	0.01319	831.29	0.01388	805.98	0.01454	30	1.37	25	296.957
01/08/2014-31/08/2014	9,386.69	0.01626	1,786.32	0.01403	0.00	0.01388	962.39	0.01542	2,066.94	0.01319	1,120.77	0.01388	611.32	0.01454	30	1.37	25	250.954

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01/09/2014-30/09/2014	10,869.64	0.01626	2,052.57	0.01403	0.00	0.01388	1,040.58	0.01542	2,437.48	0.01319	1,459.56	0.01388	672.39	0.01454	30	1.37	25	291.573
01/10/2014-31/10/2014	11,942.40	0.01626	2,369.05	0.01403	0.00	0.01388	1,492.81	0.01542	2,405.57	0.01319	1,834.36	0.01388	1,208.60	0.01454	30	1.37	25	334.147
01/11/2014-30/11/2014	12,932.58	0.01626	2,499.29	0.01403	0.00	0.01388	1,082.66	0.01542	2,128.83	0.01319	1,203.21	0.01388	939.73	0.01454	30	1.37	25	329.300
01/12/2014-31/12/2014	10,793.27	0.01599	2,385.10	0.01370	0.00	0.01399	1,209.79	0.01460	3,235.68	0.01367	1,369.37	0.01396	669.23	0.01209	30	1.37	25	302.457
01/01/2015-31/01/2015	6,442.18	0.01599	1,506.28	0.01370	0.00	0.01399	789.40	0.01460	2,037.73	0.01367	656.76	0.01396	673.24	0.01209	30	1.37	25	185.295
01/02/2015-28/02/2015	10,297.22	0.01599	1,895.99	0.01370	0.00	0.01399	967.93	0.01460	2,323.60	0.01367	1,426.16	0.01396	1,004.60	0.01209	30	1.37	25	275.964
01/03/2015-31/03/2015	11,456.31	0.01599	1,948.82	0.01370	0.00	0.01399	1,608.07	0.01460	2,723.89	0.01367	1,701.16	0.01396	629.26	0.01209	30	1.37	25	310.258
Total/weighted average Value	288,581.19	0.01542	47,295.26	0.01435	1.41	0.01556	32,296.14	0.01517	66,263.08	0.01374	31,072.26	0.01413	21,168.79	0.01401	/	/	/	7,465.908

Note: BF1=wood residues,BF2=cotton straw,BF3=cole straw,BF4=maize straw,BF5=rice straw,BF6=reed,BF7=wheat straw.

Table E.7 Project Emission (PE_y) calculation

Period	PETy (tCO ₂ e)	PEFFy (tCO ₂ e)	GWP _{CH₄} *PE _{biomass,CH₄,y} (tCO ₂ e)	PE _{EC,y} (tCO ₂ e)	PEy (tCO ₂ e)
	A5=D1	B5=F2	C5=R3	D5=C4	F5=A5+B5+C5+D5
01/01/2013-31/01/2013	1,924.742	35.303	202.977	0.000	2,163.022
01/02/2013-28/02/2013	2,279.300	91.724	220.609	0.000	2,591.633
01/03/2013-31/03/2013	2,589.575	63.487	271.762	0.000	2,924.824
01/04/2013-30/04/2013	2,484.431	60.421	252.522	0.000	2,797.374
01/05/2013-31/05/2013	2,413.358	63.805	253.249	0.000	2,730.412
01/06/2013-30/06/2013	2,459.561	20.793	243.701	0.000	2,724.056
01/07/2013-31/07/2013	2,242.196	57.770	236.347	0.000	2,536.313
01/08/2013-31/08/2013	2,263.427	65.425	243.112	0.000	2,571.963
01/09/2013-30/09/2013	2,785.305	81.684	285.665	0.000	3,152.654
01/10/2013-31/10/2013	2,784.901	64.574	307.195	0.000	3,156.670
01/11/2013-30/11/2013	2,794.505	59.336	306.182	0.000	3,160.022
01/12/2013-31/12/2013	3,025.215	89.026	348.180	0.000	3,462.421
01/01/2014-31/01/2014	2,694.416	41.263	283.203	0.000	3,018.882
01/02/2014-28/02/2014	2,558.032	95.643	281.632	0.000	2,935.307
01/03/2014-31/03/2014	2,535.487	59.189	273.116	0.000	2,867.791
01/04/2014-30/04/2014	2,557.426	29.085	296.263	0.000	2,882.774
01/05/2014-31/05/2014	2,644.978	34.839	299.081	0.000	2,978.898
01/06/2014-30/06/2014	2,757.098	65.295	284.206	0.000	3,106.600
01/07/2014-31/07/2014	2,697.854	60.888	296.957	0.000	3,055.699
01/08/2014-31/08/2014	2,337.938	26.748	250.954	0.000	2,615.640
01/09/2014-30/09/2014	2,720.601	38.996	291.573	0.000	3,051.170
01/10/2014-31/10/2014	3,062.926	63.462	334.147	0.000	3,460.534
01/11/2014-30/11/2014	2,985.281	63.157	329.300	0.000	3,377.738
01/12/2014-31/12/2014	2,889.741	38.737	302.457	0.000	3,230.935
01/01/2015-31/01/2015	1,748.423	64.624	185.295	0.000	1,998.342
01/02/2015-28/02/2015	2,680.970	79.687	275.964	0.000	3,036.620
01/03/2015-31/03/2015	2,930.990	27.380	310.258	0.000	3,268.629
Total	69,848.676	1,542.339	7,465.908	0.000	78,856.922

E.3. Calculation of leakage emissions

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As stated in the baseline and monitoring methodology of the project activity, leakage emissions should be calculated due to insufficient biomass supply. If the biomass supply is insufficient, biomass transportation from other consumers to the project site will cause additional fossil fuel consumption around the project site. The biomass in surplus will be monitored and recorded annually. On the condition that biomass supply proves sufficient, the emission leakage is zero. There are three options in the baseline methodology to demonstrate that the biomass used in the project power plant will not increase the fossil fuel consumption elsewhere. Among them, option 2 is: "Demonstrate that there is an abundant surplus of the biomass in the region of the project activity which is not utilized". For this purpose, the project owner has to demonstrate that the quantity of available biomass in the region is at least 25% larger than the quantity of biomass that is utilized (e.g. for energy generation or as feedstock), including the project plant. So the project owner has got biomass availability from local government during the monitoring period. The project owner established that the leakage from the project activity is zero, as the surplus of biomass residues is far greater (>25%) than the quantity of residues used in the project plant. Please refer to table E.8 for more information.

As for the project, the maximum radius for biomass collection is small than 50 km, which is between 20 km and 200km, and therefore the radius meets the requirements of the methodology. And the project owner has consigned the Statistic Bureau of Yancheng City, to do some survey about biomass. Please refer to table E.8 for more details.

Table E.8 Demonstration of abundant surplus of biomass availability

Unit: 10 ⁴ ton	Year 2013						
	BF1 wood residues	BF2 cotton straw	BF3 cole straw	BF4 maize straw	BF5 rice straw	BF6 reed	BF7 wheat straw
Available Biomass in the region	116.50	55.20	18.30	6.80	102.00	107.50	65.00
Biomass utilized out of the project	38.50	19.85	5.00	2.20	42.50	66.50	22.50
Biomass utilized by the project	18.207	2.676	0.00007	2.057	3.911	1.696	1.171
Total biomass utilized, including the project	56.707	22.526	5.000	4.257	46.411	68.196	23.671
Available Biomass/Total biomass utilized	205%	245%	366%	160%	220%	158%	275%
Available Biomass/Total biomass utilized -100%	105%	145%	266%	60%	120%	58%	175%
Abundant surplus? (More than 25%)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Unit: 10 ⁴ ton	Year 2014						
	BF1 wood residues	BF2 cotton straw	BF3 cole straw	BF4 maize straw	BF5 rice straw	BF6 reed	BF7 wheat straw
Available Biomass in the region	110.000	56.500	18.500	6.000	110.500	108.500	62.000
Biomass utilized out of the project	35.000	20.000	5.000	1.750	45.000	60.500	25.000
Biomass utilized by the project	19.750	3.288	0.00012	2.054	3.835	1.969	1.192
Total biomass utilized, including the project	54.750	23.288	5.000	3.804	48.835	62.469	26.192
Available Biomass/Total biomass utilized	201%	243%	370%	158%	226%	174%	237%
Available Biomass/Total biomass utilized -100%	101%	143%	270%	58%	126%	74%	137%
Abundant surplus? (More than 25%)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Unit: 10 ⁴ ton	Year 2015						
	BF1 wood residues	BF2 cotton straw	BF3 cole straw	BF4 maize straw	BF5 rice straw	BF6 reed	BF7 wheat straw
Available Biomass in the region	115.0	55.0	19.2	6.2	110.0	105.5	63.5
Biomass utilized out of the project	36.5	21.0	5.0	1.8	43.0	63.0	23.0
Biomass utilized by the project	17.576	3.012	0.00000	1.991	3.694	2.076	1.177

Total biomass utilized, including the project	54.076	24.012	5.000	3.791	46.694	65.076	24.177
Available Biomass/Total biomass utilized	213%	229%	384%	164%	236%	162%	263%
Available Biomass/Total biomass utilized -100%	113%	129%	284%	64%	136%	62%	163%
Abundant surplus? (More than 25%)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: 1: The data of available biomass and biomass utilized out of the project in the region are calculated from official data provided by Yancheng City government.

2: The data of biomass utilized by the project in period 01/01/2015-31/03/2015(90 days) is converted to be value of one year.

From Table E.8, it can be concluded that the available quantity of biomass in the region in year 2013-2017 is 25% larger than the quantity of biomass that is utilized, including the project.

Therefore, according to the accepted revised PDD:

$$L_y = 0\text{tCO}_2\text{e}$$

E.4. Calculation of emission reductions or net anthropogenic removals

	Baseline GHG emissions or baseline net GHG removals (t CO ₂ e)	Project GHG emissions or actual net GHG removals (t CO ₂ e)	Leakage GHG emissions (t CO ₂ e)	GHG emission reductions or net anthropogenic GHG removals (t CO ₂ e)			
				Before 01/01/2013	From 01/01/2013 until 31/12/2020	From 01/01/2021	Total amount
Total	387,758.394	78,856.922	0	Not applicable	308,901	Not applicable	308,901

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO ₂ e)	Amount estimated ex ante for this monitoring period in the PDD (t CO ₂ e)
308,901	334,055

E.5.1. Explanation of calculation of “amount estimated ex ante for this monitoring period in the PDD”

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According to the registered PDD, the designed annual emission reductions of the Project are 148,695 tCO₂e. Considering the duration of this monitoring period is 820 days, thus, the designed emission reductions in this monitoring period can be calculated as 148,695/365×820=334,055 tCO₂e.

E.6. Remarks on increase in achieved emission reductions

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The actual emission reductions achieved during this monitoring period are 308,901 tCO₂e, which is about 7.53%⁶ lower than the estimated value in the accepted revised PDD.

⁶ (308,901 tCO₂e-334,055 tCO₂e)/ 334,055 tCO₂e×100%= -7.53%, please see ER calculation sheet for details.

E.7. Remarks on scale of small-scale project activity

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Not applicable.

Appendix 1. The energy balance calculation for the verification period

The total inputs of all types of fuels 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 20.86%.

Table Appendix 1. The energy input and electricity output in the project activity in this period

	BFk (ton) (dry base)	NCVk ((TJ/ton)	Energy (TJ)
BF1	288,581.19	0.01542	4,451.30
BF2	47,295.26	0.01435	678.48
BF3	1.41	0.01556	0.02
BF4	32,296.14	0.01517	490.03
BF5	66,263.08	0.01374	910.73
BF6	31,072.26	0.01413	439.00
BF7	21,168.79	0.01401	296.54
Total			7,266.09
Net electricity exported (TJ)			1,515.74
Efficiency			20.86%

Energy Balance :

$$E_{\text{total}} = E_{\text{biomass1}} + E_{\text{biomass2}} + \dots + E_{\text{biomass7}} = 7,266.09 \text{ TJ}$$

$$\text{Net electricity exported} = 421,038.575 \text{ MWh} = 1,515.74 \text{ TJ}$$

$$\text{Efficiency} = \text{Net electricity exported} / E_{\text{total}} = 20.86\%$$

Table Appendix 2 NCV_k inspection results

Inspected values provided by reputed laboratories on dry basis(TJ/ton)							
Inspection date	NCVk (k=wood residues)	NCVk(k=cotton straw)	NCVk(k=cole straw)	NCVk(k=maize straw)	NCVk(k=rice straw)	NCVk (k=reed)	NCVk(k=wheat straw)
26/12/2012	0.01420	0.01434	0.01490	0.01480	0.01319	0.01444	0.01347
23/06/2013	0.01492	0.01359	0.01362	0.01579	0.01429	0.01393	0.01442
20/12/2013	0.01567	0.01595	0.01687	0.01496	0.01416	0.01453	0.01458
18/06/2014	0.01626	0.01403	0.01388	0.01542	0.01319	0.01388	0.01454
15/12/2014	0.01599	0.01370	0.01399	0.01460	0.01367	0.01396	0.01209

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
09.0	8 October 2021	Revision to: • Ensure consistency with version 03.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN).
08.0	6 April 2021	Revision to: • Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).
07.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; • Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; • Make editorial improvements.
06.0	7 June 2017	Revision to: • Ensure consistency with version 01.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
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