VERIFICATION / CERTIFICATION REPORT

"POYANG KAIDI BIOMASS POWER PROJECT" IN CHINA

(UNFCCC Registration Ref. No. 3056)

Monitoring Period:
6 January 2011 to 31 December 2011

REPORT NO. 2012-9492
REVISION NO. 01

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VERIFICATION / CERTIFICATION REPORT

Date of first issue: 8 November 2012	Project No.: PRJC-314596-2011-CCS-CHN
Approved by: Michael Lehmann	Organisational unit: DNV KEMA Energy & Sustainability Accredited Climate Change Services
Client: Wuhan Kaidi Holding Investment Co., Ltd	Client ref.: Mr. Xue Fei

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Summary:

DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions reported for the project activity "Poyang Kaidi Biomass Power Project" in China (UNFCCC Registration Ref. No. 3056) for the period 6 January 2011 to 31 December 2011.

In our opinion, the GHG emission reductions reported for the project in the monitoring report (version 2.0) of 23 August 2012 are fairly stated.

The GHG emission reductions were calculated correctly on the basis of the approved monitoring methodology ACM0006 (version 9) and the monitoring plan contained in the revised Project Design Document of 22 August 2012.

DNV Climate Change Services AS is able to certify that the emission reductions from the project activity "Poyang Kaidi Biomass Power Project" in China during the period 6 January 2011 to 31 December 2011 amount to 81 786 tonnes of CO_2 equivalent.

Report No.: 2012-9492	S E	
Report title: "Poyang Kaidi Biomass Power Project" in China	**Indexing terms** Key words Climate Change Kyoto Protocol Validation Clean Development Mechanism	Service Area Verification Market Sector Process Industry
Work carried out by: Liu Jinwei, Lin Wu	☒ No distribution without permission from the client or responsible organisational unit ☐ free distribution within DNV after 3 years ☐ Strictly confidential ☐ Unrestricted distribution	
Work verified by: Simon Wong Yon-Sing		
Date of this revision: 8 November 2012 / Rev. No.: 01 / Number of pages: 46		

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Abbreviations

CAR	Corrective Action Request
CCPG	Central China Power Grid
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MR	Monitoring Report
PDD	Project Design Document
PPA	Power Purchase Agreement
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Clean Development Mechanism Validation and Verification Standard

1 INTRODUCTION

Wuhan Kaidi Holding Investment Co., Ltd has commissioned DNV Climate Change Services AS (DNV) to carry out the verification and certification of the emission reductions reported for the CDM project activity 3056 "Poyang Kaidi Biomass Power Project" in China (the project) for the period 6 January 2011 to 31 December 2011. Wuhan Kaidi Holding Investment Co., Ltd was authorised by the project participant Poyang Kaidi Biomass Power Project to contract DNV for the verification /4/. This report contains the findings from the verification and a certification statement for the certified emission reductions.

1.1 Objective

Verification is the periodic independent review and *ex post* determination by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity during a defined monitoring period.

Certification is the written assurance by a DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify the emission reductions reported for the "Poyang Kaidi Biomass Power Project" for the period 6 January 2011 to 31 December 2011.

1.2 Scope

The scope of the verification is to verify that:

- The project activity has been implemented and operated in accordance with the registered PDD or any approved revised PDD;
- The monitoring plan complies with the monitoring methodology and the actual monitoring complies with the monitoring plan, including compliance with any guidance provided by the Board regarding deviations from the provisions of a registered plan and/or methodology;
- The data and calculation of GHG emission reductions have been assessed to correctly support the emission reductions being claimed.

The verification shall ensure that reported emission reductions are complete and accurate in order to be certified.

1.3 Description of the project activity

Project Parties:	China (host Party), United Kingdom of Great Britain and Northern Ireland and Switzerland (Annex I parties)
Title of project activity:	Poyang Kaidi Biomass Power Project
UNFCCC registration No:	3056
Baseline and Monitoring methodology	ACM0006 (version 9) and ACM0002 (version 10)

Project Participants:	Camco International Limited and Camco Carbon Limited from United Kingdom of Great Britain and Northern Ireland; Camco International Limited from Switzerland; Poyang Kaidi Green Energy Development Co., Ltd from China.
Location of the project activity:	Poyang Lake Grain Machining Industrial Base, Poyang Industrial Park, Jiangxi Province, P.R. China
Project's crediting period:	6 January 2011 to 5 January 2018
Period verified in this verification:	6 January 2011 to 31 December 2011

1.4 Methodology for determining emission reductions

The emission reductions are determined in accordance with the formulae given in the baseline and monitoring methodology ACM0006 (version 9) /43/ and the revised PDD /3/.

The project reduces CO_2 emissions and CH_4 emissions through substitution of power and heat generation with fossil fuels by energy generation with biomass residues. The emission reduction ER_y by the project during a given year y is the difference between the emission reductions through substitution of electricity generation with fossil fuels ($ER_{electricity,y}$), the emission reductions through substitution of heat generation with fossil fuels ($ER_{heat,y}$), project emissions (PE_y), emissions due to leakage (L_y) where this emission source is included in the project boundary and relevant, and baseline emissions due to the natural decay or burning of anthropogenic sources of biomass residues($BE_{biomass,y}$):

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

1.4.1 Baseline emissions

(1) Emission reduction due to the displacement of electricity ($ER_{electricity,y}$)

$ER_{electricity,y}$ is calculated by multiplying the net quantity of electricity generated in the project plant (EG_y) with the CO_2 emission factor for the electricity displaced due to the project ($EF_{electricity,y}$):

$$ER_{electricity,y} = EG_y \times EF_{electricity,y}$$

$EF_{electricity,y}$ is the emission factor of the grid, which was calculated ex-ante in the revised PDD /3/ and will not be updated during the first crediting period. EG_y is the net quantity of increased electricity generation as a result of the project (incremental to baseline generation). Since the baseline scenario 2 was applied for the project activity in the revised PDD, EG_y corresponding to the net quantity of electricity generation in the project plant (EG_y=$EG_{project\ plant,y}$).

(2) Emission reductions due to displacement of heat ($ER_{heat,y}$)

As per revised PDD /3/, the project will not claim GHG emission reductions from displacing heat that would otherwise be produced within Poyang Industrial Park.

Hence $ER_{heat,y}$=0.

(3) Baseline emissions due to natural decay or burning of anthropogenic sources of biomass residues during the year y ($BE_{biomass,y}$)

As per revised PDD /3/, the baseline scenario is B1 and B3 (uncontrolled burning or aerobic decay of the biomass residues), therefore the emissions from avoided disposal of the biomass to be used by the project activity in year y can be calculated as shown below. This assumes that for both B1 and B3, that the biomass residues would be burned in an uncontrolled manner.

$$BE_{biomass,y} = GWP_{CH4} \times \sum_{k} BF_{PJ,k,y} \times NCV_k \times EF_{burning,CH4,k,y}$$

GWP_{CH4} is Global Warming Potential of methane valid for the commitment period;

$BF_{PJ,k,y}$ is 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 or litter), for this project; $BF_{PJ,k,y} = BF_{k,y.}$

NCV_k is net calorific value of the biomass residue type k.

$EF_{burning,CH4,k,y}$ is CH4 emission factor for uncontrolled burning of the biomass residue type k during the year y.

1.4.2 Project emissions

The project emissions include emissions from transportation of biomass residues to the project site (PET_y), emissions from consumption of fossil fuel due to the project activity ($PEFF_y$), emissions from consumption of electricity at the project site due to the project activity ($PE_{EC,y}$) and CH_4 emissions from the combustion of biomass residues($PE_{biomass,CH4,y}$):

$$PE_y = PET_y + PEFF_y + PE_{EC,y} + GWP_{CH4} \times PE_{Biomass,CH4,y}$$

(1) Project emissions from transportation of biomass residues to the project site (PET_y)

The emissions from the transport of biomass residues to the project site were calculated from the number of truck trips (N_y), average round trip distance (from and to) between the biomass residue fuel supply sites and the project site (AVD_y), average CO_2 emission factor from fuel used for transportation ($EF_{km,CO2,y}$).

$$PET_y = N_y \times AVD_y \times EF_{km,CO2,y}$$

(2) Project emissions from on-site consumption of fossil fuel by the project ($PEFF_y$)

According to the revised PDD /3/, the emissions from fossil fuel consumed in the project plant will use the quantity of fossil fuel ($FC_{i,j,y}$) as well as its emission factor ($NCV_{i,y} \times EF_{CO2,i,y}$) according to the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" version 02 /44/. The quantity of fossil fuel ($FC_{i,j,y}$) includes the consumption of fossil fuels combusted in the biomass residue fired power plant ($FF_{projectplant,i,y}$) and fossil fuels combusted at the project site for other purposes that are attributable to the project activity ($FF_{projectsite,i,y}$).

$$PEFF_y = PE_{FC,j,y} = \sum_{i} FC_{i,j,y} \times COEF_{i,y} = \sum_{i} (FF_{projectplant,i,y} \times FF_{projectsite,i,y}) \times COEF_{i,y}$$

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

(3) Project emissions from consumption of electricity ($PE_{EC,y}$)

The emissions ($PE_{EC,y}$) due to on-site consumption of electricity are calculated based on the quantify of electricity consumed ($EC_{PJ,j,y}$), emission factor for electricity generation ($FE_{EL,j,y}$) and a factor to account for transmission losses ($TDL_{j,y}$) according to the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" version 01 /45/.

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

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

The methane emissions ($PE_{Biomass,CH4,y}$) from biomass residues combustion are calculated based on the quantity of biomass residue type k combusted in the project plant during the year y, net calorific value of the biomass residue type k and CH_4 emission factor for the combustion of biomass residues in the project plant:

$$PE_{Biomass,CH4,y} = EF_{CH4,BF} \times \sum_{k} BF_{k,y} \times NCV_{k}$$

1.4.3 Leakage

According to ACM0006 (version 9) /43/, the probable source identified for leakage is that the project diverts biomass from other users and thereby increases fossil fuel use. Approach L2 was selected to demonstrate that the annual biomass requirement of the project activity is at least 25% larger than the biomass utilized in the region.

As stated in the revised PDD /3/, the leakage from the project activity is zero, as the surplus of biomass residues is far greater than the quantity of residues used by the project activity.

2 METHODOLOGY

DNV has assessed and determined that the implementation and operation of the project activity, and the steps taken to report emission reductions comply with the CDM criteria and relevant guidance provided by the Board.

The assessment involved a desk review of relevant documentation as well as an on-site visit(s).

Verification team

				Type of involvement					
Role	***Last Name***	***First Name***	***Country***	Desk review	Site visit	Reporting	Supervision of work	Technical review	TA 1.1 competence
Team leader (Verifier)	Liu	Jinwei	China	✓	✓	✓	✓		✓
Verifier	Lin	Wu	China	✓		✓			
Technical reviewer	Wong	Simon Yon-Sing	Malaysia					✓	✓

Duration of verification

Monitoring report publication:	10 July 2012
Desk review:	11 July 2012 to 30 July 2012

On-site assessment: 31 July 2012

Reporting, calculation checks and QA/QC: 1 August 2012 to 8 November 2012

2.1 Desk review

In addition to the monitoring report /1/ (version 1.0 dated 6 July 2012 and version 2.0 dated 23 August 2012), DNV reviewed:

- The registered PDD for the project activity (version 04 dated 31 March 2010) /30/, the validation report for the registered PDD /32/ and the revised PDD (version 05 dated 22 August 2012) /3/, including the monitoring plan, and the corresponding validation opinion /31/;
- Baseline and monitoring methodology ACM0006, version 9 /43/;
- Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board /40/ /41/ /42/ /46/; and
- Other information and references relevant to the project activity /2/-/26/ /28/.

During the desk review, DNV has applied standard auditing techniques to assess the quality of information provided. The following activities were performed:

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures; and
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

2.2 On-site assessment

On 31 July 2012, DNV performed on-site assessments. During the on-site assessment DNV carried out:

- An assessment of the implementation and operation of the registered project activity is as per the revised PDD version 05 dated 22 August 2012 /3/;
- A review of information flows for generating, aggregating and reporting the monitoring parameters;
- Interviews with relevant personnel /47/ to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the revised PDD /3/;
- A cross check between information provided in the monitoring report and logbooks, inventories, purchase records or similar data sources;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of monitoring plan.

The data presented in the monitoring report were assessed by review of the detailed project documentation and production records, as well as by interviews with personnel from Poyang Kaidi Green Energy Development Co., Ltd, and observation of collection of measurements,

observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. This has enabled the verification team to assess the accuracy and completeness of reported monitoring results, to verify the correct application of the approved monitoring methodology and the determination of the emission reductions.

In addition all parameters required by the monitoring methodology ACM0006 (version 9) /43/, and the management system were assessed during the site visit.

2.3 Closing out of verification findings

The objective of this phase of the verification was to resolve any issues which needed to be clarified prior to DNV's conclusion that i) the project activity has been implemented and operated in accordance with the revised PDD /3/, ii) the monitoring plan complies with the monitoring methodology and the actual monitoring complies with the monitoring plan and iii) the data and calculation of GHG emission reductions are correct.

A corrective action request (CAR) is issued, where:

i. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
ii. Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
iii. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
iv. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

A clarification request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period.

The verification identified two CARs and eight CLs, but no FAR was raised. The CARs and CLs were satisfactorily addressed by the project participants by among other revising the monitoring (please refer to Appendix A for further details). In addition to the changes made to the monitoring report as a result of the verification findings, the following changes to the monitoring report (version 2.0 dated 23 August 2012) were made compared to the initial version of the monitoring report received for verification (version 1.0 dated 6 July 2012):

- The average round trip distance (from and to) between the biomass fuel supply sites and the project plant was revised from 120 km to 200 km for conservativeness.

3 VERIFICATION FINDINGS

This section summarises the findings from the verification of the emission reductions reported for the "Poyang Kaidi Biomass Power Project" for the period 6 January 2011 to 31 December 2011.

3.1 Remaining issues, CARs, FARs from previous validation / verification

This is the first verification of the proposed project. DNV confirms that there are no remaining issues identified in the validation report /32/.

3.2 Post registration changes

The post registration changes described in Appendix B were identified by DNV during this verification. These post registration changes were assessed by DNV.

For post registration changes not requiring prior approval by the CDM EB in accordance with Appendix 1 to the CDM Project Standard /41/, the assessment of the changes (in the form of a duly completed "Post-registration changes request form" (F-CDM-PRC) and DNV's assessment opinion on the changes /31/) is submitted together with the revised PDD (version 05 of 22 August 2012) /3/ for acceptance by the CDM EB as part of the request for issuance for this monitoring period.

The assessment of compliance with the project description and the monitoring plan contained in the PDD, as described in the following sections, is based on the revised PDD (version 05 of 22 August 2012) /3/.

3.3 Project implementation

The project is a Greenfield biomass utilization project located in the middle of Poyang Lake Grain Machining Industrial Base, Poyang Industrial Park, Jiangxi Province, P.R. China. The electricity generated by the project is delivered to the Central China Power Grid (CCPG) /6/.

The two units of the project were put into operation separately. The unit 1# of the project started to operate on 3 January 2010 and the unit 2# of the project started to operate on 5 November 2011, which was confirmed by the Certificate on connection to the grid issued by the Northeast of Jiangxi Province Power Supply Company (on behalf of CCPG) /5/.

All facilities and equipment as described in the PDD /3/ have been installed. The details of the boiler, turbine and generator with respect to their number, type and model of the machines have been verified /7/ /8/ /9/ during the on-site visit. DNV verified that the cogeneration plant included the installation of two sets of 65 t/h circulating fluid bed (CFB) boilers with medium temperature and sub-high pressure, two sets of 12 MW condensing and extraction steam turbines, and two sets of 15 MW associated generators, and confirmed to be as per the PDD /3/.

As stated in the PDD /3/, the heat generated will be supplied to the plants in Poyang Industrial Park to meet the process heat demand and replace heat generated by the small coal-fired boilers within the independent industries. There was no heat generated during this monitoring period because the heat pipeline was not laid down yet which was confirmed during the site visit. As stated in the PDD /3/, the generator is sized at 15 MW and not 12 MW to allow for possible peak generation and to avoid damage to the generation unit by sudden load change in

abnormal situations. It also stated in the PDD /3/ that under conditions where there is no steam extraction the steam turbines can theoretically generate at 2*15 MW and the project activity still is additional due to the financial unattractiveness because the efficiency of the plant for power only is higher than the plant operating in cogeneration mode. Since the emission reductions from the displacement of heat has not been considered in the emission reduction calculation in the revised PDD /3/, DNV confirmed that the project implementation without heat supply in this monitoring period does not have negative effect on the emission reductions claimed in this monitoring period.

The biomass residues consumed by the project activity are directly sourced from agriculture and forestry residues. The collected biomass residues were transported by vehicles to biomass residue sheds at the project site before being burnt in the boiler for electricity and heat generation /23/. In the registered PDD (version 04 dated 31 March 2010) /30/, regarding the biomass residue utilized, it was stated that "rice husk, cotton straw, rice straw, bean straw peanut straw, gingili straw and oil seed rape straw". By checking the daily operating log books /24/, DNV was able to confirm the biomass residues utilized for the project were rice husk, bamboo crumbs, wood scraps, branches, barks and stumps during this monitoring period. As of this, a post registration change has been requested. The post registration change on correcting the type of biomass residues applied in this verification activity has been assessed by DNV /31/; the correction has been reflected in the revised PDD version 05 dated 22 August 2012 /3/.

The control system at the power plant is automated and assures continuous operation, including monitoring of malfunction of equipment. By checking the daily operation and maintenance records, 1# steam turbine generator and 2# steam turbine generator were each shutdown 6 times for maintenance. The downtime records have been verified on site /24/. No retrofit/modification of project was found during the site visit.

On-site training for the CDM related procedures including monitoring, recording and reporting was verified to be in place /11/ and their implementation was confirmed by interviewing with the key operators and observing the operation /47/.

The verification team confirmed through visual inspection and document review that all physical features of the proposed CDM project activity including data collection systems and storage systems have been implemented in accordance with the revised PDD (version 05 of 22 August 2012) /3/. DNV confirmed during the on-site visit that the CDM project is completely operational.

3.4 Information (data and variables) provided in the monitoring report that is different from that stated in the registered PDD

The emissions reductions in this monitoring period are 81 786 tCO_2e in the period from 6 January 2011 to 31 December 2011 (i.e. 360 days). The annually expected emission reductions according to the revised PDD (version 05 of 22 August 2012) /3/ is 116 628 tCO_2e, which corresponds to the emission reductions of 115 030 tCO_2e on the monitoring period (i.e. 360 days). Hence the reported emission reductions are lower than the expected.

By comparing the actual project emissions and baseline emissions assessed in section 3.7 against the expected values in the revised PDD as below:

Item	Actual value in this monitoring period	Estimated value in the revised PDD (convert to the value based on this monitoring period)
Baseline emissions (tCO_2e)	90 134.75	128 921
Displacement of electricity (tCO_2e)	84 839.61	121 672
Natural decay of anthropogenic sources of biomass residue (tCO_2e)	5 295.14	7 250
Project emissions (tCO_2e)	8 348.67	13 891

The unit 2# of the project started to operate on 5 November 2011 which is only approximately two months prior to the end of this monitoring period /5/. Hence the electricity generation of unit 2# of the project in this monitoring period was much less than the value estimated based on the annual operation hours of 6 000 hours (which is equal to operation hours of 5 918 hours in this monitoring period) in the revised PDD /3/. DNV was able to confirm that the lower emission reductions were mainly due to the lower electricity generation and lesser biomass residues consumption.

Hence, DNV was able to confirm that the emission reductions claimed during this monitoring period 6 January 2011 to 31 December 2011 are reasonable.

3.5 Compliance of monitoring plan with monitoring methodology

DNV is able to confirm that the monitoring plan contained in the revised PDD (version 05 of 22 August 2012) /3/ is in accordance with the approved methodology applied by the project activity, i.e. ACM0006 (version 9) /43/.

3.6 Compliance of monitoring with the monitoring plan

The monitoring has been carried out in accordance with the monitoring plan contained in the revised PDD version 05 dated 22 August 2012 /3/.

The below section describe for each parameter, which is to be measured according to the monitoring plan, how DNV has verified that i) the actual monitoring complies with the monitoring plan and that ii) data have been assessed to correctly support the emission reductions being claimed.

3.6.1 Factors and datum determined ex-ante

All reported factors determined *ex-ante* by the monitoring methodology ACM0006 version 9 /43/ and indicated in the revised PDD (version 05 dated 22 August 2012) /3/ were also assessed as following:

1. Baseline emission factor of CCPG ($EF_{grid,y}$);

   As per the revised PDD /3/, the *ex-ante* determined emission factor of 0.9735 tCO_2/MWh for the CCPG is applied during the first crediting period.

2. Global warming potential for CH_4 (GWP_{CH4})

   The IPCC default value of 21 tCO_2/tCH_4 will be applied for the first commitment period and will be updated according to any future COP/MOP decisions /33/.

3. Average technical transmission and distribution losses for providing electricity to source j in year y ($TDL_{j,y}$)

   According to "Tool to calculate baseline, project and/or leakage emissions from electricity consumption", the default value (20%) can be adopted for project emission calculation /45/.

4. CH_4 emission factor for controlled burning of the biomass residue in the project plant ($EF_{CH4,BF}$)

   As per the revised PDD /3/, the IPCC default value of 30 kg CH_4/TJ is estimated ex-ante and applied during this credit period. When the default CH_4 emission factor of 30 kg/TJ is used, the uncertainty is estimated to be 300%, resulting in a conservativeness factor of 1.37. Thus, in this case a CH_4 emission factor of 41.1 kg/TJ shall be used.

5. CH_4 emission factor for uncontrolled burning of the biomass residue (NCV_k*$EF_{burning,CH4,k,y}$)

   As per the revised PDD /3/, the default CH_4 emission factor of 0.0027 t CH_4 per ton of biomass is used, the uncertainty can be deemed to be greater than 100%, resulting in a conservativeness factor of 0.73. Thus, in this case a CH_4 emission factor of 0.001971 tCH_4/tonne shall be used.

3.6.2 Factors and data monitored or calculated ex-post

According to the monitoring plan of the revised PDD /3/, the following 14 parameters shall be monitored:

1. Quantity of each biomass residue type k combusted in the project plant in year y ($BF_{k,y}$)
2. Moisture content of the biomass residues
3. Net calorific value of each biomass residue of type k (NCV_k)
4. Average round trip distance (from and to) between the biomass fuel supply sites and the project plant during the year y (AVD_y)
5. Number of truck trips for the transportation of biomass (N_y)
6. Average CO_2 Emission Factor for transportation of biomass with trucks during year y ($EF_{km,CO2}$)
7. CO_2 emission factor for fossil fuel type i (diesel) ($EF_{CO2,i,y}$)
8. Net calorific value of fossil fuel type i (diesel) (NCV_i)
9. Quantity of fossil fuel type i (diesel) combusted in the project plant during year y ($FF_{project\ plant,i,\ y}$)
10. 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 ($FF_{project\ site,i,\ y}$)
11. 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 ($EC_{PJ,\ y}$)
12. Net quantity of increased electricity generated in the project plant during the year y ($EG_{project\ plant,y}$)
13. Quantity of each biomass residues type k that are utilized in the defined geographical region
14. Quantity of each biomass residues type k that are available in the region

The following tables are for the parameters which are measured following the monitoring plan / methodology.

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	$BF_{k,y}$ Quantity of each biomass residue type k combusted in the project plant in year y
Measuring frequency:	Continuously
Reporting frequency:	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	The revised PDD /3/ requires continuous measurement. However the PDD does not state the reporting frequency.
Type of monitoring equipment:	Belt Weigher 1# Type: ICS-ST4-1000 SN: 0811109 Accuracy: 0.5 (The maximum permissible error is 0.5%) Belt Weigher 2# Type: ICS-ST4-1000 SN: 0811112 Accuracy: 0.5 (The maximum permissible error is 0.5%)
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	As per revised PDD /3/, the accuracy of belt weigher will not be lower than 1%. The accuracy of belt weigher used in the project is level 0.5 (which is equal to 0.5%) which is higher than the requirement of the revised PDD /3/.
Calibration frequency /interval:	Annually
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	The revised PDD specifies the calibration frequency of belt weigher is once a year and will undergo calibration/maintenance subject to appropriate industrial standards /3/. Hence the actual calibration interval is in line with the monitoring plan in the revised PDD /3/ and national verification regulation for belt

	weigher (JJG 195-2002) /38/.
Company performing the calibration:	Southern national measurement and test centre of Hubei measurement and test technique institute, which has been accredited by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China /22/.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes. The calibration confirmed the proper functioning of the belt weigher during the monitoring period.
Is(are) calibration(s) valid for the whole reporting period?	Yes. The calibration (certificate No.: JL110329091701) for belt weigher 1# (SN: 0811109) was performed on 4 January 2011 and valid up to 3 January 2012 /13/. The calibration (certificate No.: JL110325083501) for belt weigher 2# (SN: 0811112) was performed on 4 January 2011 and valid up to 3 January 2012 /13/. Hence the certificates covered the whole reporting period 6 January 2011 to 31 December 2011.
If applicable, has the reported data been cross-checked with other available data?	Yes. The values are cross-checked with annual energy balance which was based on purchased quantities and stock changes /2/.
How were the values in the monitoring report verified?	The reported data were verified with the log sheets /24/. No error was found.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensure the correct transfer of data and reporting of emission reductions and QA/QC processes are in place.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	Moisture content of the biomass residues

Measuring frequency:	Daily
Reporting frequency:	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. As per revised PDD /3/, continuously sampled at fixed time period and analysed daily and the mean value will be calculated at least annually. Actually monthly mean value was calculated for emission calculations in this monitoring period. The actual measuring and reporting frequency is in accordance with the monitoring plan and monitoring methodology.
Type of monitoring equipment:	Balance 1# Type: YB2001 SN: 0193 Accuracy: 0.1g Dry cabinet 1# Type: GZXGF-9123A-GBS SN: 2011133 Accuracy: 0.1 ℃ Dry cabinet 2# Type: 101-1B SN: 081211 Accuracy: 0.1 ℃
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not specified in the registered PDD; however with an accuracy of 0.1g and 0.1 ℃ /14/ of reading, the monitoring equipment represents good monitoring practice according to the *Determination of total moisture in coal*, GB/T 211—2007 /39/. As DNV could not identify national standard for the determination of total moisture in biomass, the national standard for the determination of total moisture in coal was followed. Considering the similar physical character of biomass and coal, DNV consider it's reasonable to follow this national standard.
Calibration frequency /interval:	Annually
Is the calibration interval in line with the monitoring plan? If the monitoring plan	The revised PDD specifies the calibration

does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	frequency is once a year /3/. Hence the actual calibration interval is in line with the monitoring plan in the revised PDD /3/.
Company performing the calibration:	Southern national measurement and test centre of Hubei measurement and test technique institute, which has been accredited by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China /22/.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes. The calibration confirmed the proper functioning of the balance and dry cabinets during the monitoring period.
Is(are) calibration(s) valid for the whole reporting period?	Yes. The calibration (certificate No.: JL110329091701) for balance 1# (SN: 0193) was performed on 4 January 2011 and valid up to 3 January 2012 /14/. The calibration (certificate No.: JL110328151901) for dry cabinet 1# (SN: 2011133) was performed on 4 January 2011 and valid up to 3 January 2012 /14/. The calibration (certificate No.: JL110328151301) for dry cabinet 2# (SN: 081211) was performed on 4 January 2011 and valid up to 3 January 2012 /14/. Hence the certificates covered the whole reporting period 6 January 2011 to 31 December 2011.
If applicable, has the reported data been cross-checked with other available data?	Not applicable.
How were the values in the monitoring report verified?	The reported data were verified with the log sheets /24/. No error was found.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensure the correct transfer of data and reporting of emission reductions and QA/QC processes are in place.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to	Not applicable

the CDM Project Standard?	

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	Net calorific value of each biomass residue of type k (NCV_k)
Measuring frequency:	Twice per year, every six months, taking three samples for each measurement. The samples are tested by a reputed laboratory and according to relevant international standards /15/.
Reporting frequency:	Twice per year (every six months)
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	The revised PDD specifies three samples shall be taken for measurement at least every six months /3/, but not specify the reporting frequency. The actual measuring frequency is in accordance with the monitoring plan and monitoring methodology /3/.
Type of monitoring equipment:	Measurements were carried out at reputed laboratories and according to relevant national standard (GB/T 211—2007) /39/. The Net calorific value of each biomass residue was measured by Luoyang Coal inspection technique center on 3 January 2011 and 2 July 2011 during this monitoring period /15/.
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not Applicable
Calibration frequency /interval:	Not Applicable
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not Applicable
Company performing the calibration:	Luoyang Coal inspection technique center has been accredited by Henan Bureau of Quality and Technical Supervision /21/.

Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	The Certificate of metrological authorization issued by Henan Bureau of Quality and Technical Supervision /21/ confirms the qualification of Luoyang Coal inspection technique center to perform the measurement of the net calorific value of biomass residues during this monitoring period /21/.
Is(are) calibration(s) valid for the whole reporting period?	Not Applicable
If applicable, has the reported data been cross-checked with other available data?	As per revised PDD /3/, the consistency of the measurements will be checked by comparing the measurement results with measurements from previous years, relevant data sources. Since this is the first verification, the measurement results were compared to the default NCV values of IPCC 2006 /33/ and found to be within the range (7.90TJ/t~31.0TJ/t) of NCV for wood/wood waste and the range (5.90TJ/t~23.0TJ/t) of NCV for other primary solid biomass with lower and upper limits of the 95% confidence intervals.
How were the values in the monitoring report verified?	Not applicable.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Not Applicable
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	Average round trip distance (from and to) between the biomass fuel supply sites and the project plant during the year y (AVD_y)
Measuring frequency:	Continuously measuring. Each time every truck which transports biomass residue to the plant is counted and recorded in the log books.

Reporting frequency:	Recorded in the log books and aggregated monthly. 200 km was used as the average round trip distance instead of monitored data for conservativeness because the farthest biomass fuel supply site could not be verified during the site visit as per the revised PDD /3/.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	As per the revised PDD, the data shall be continuously measured and recorded in the log books /3/. The actual measuring and reporting frequency is in accordance with the monitoring plan and monitoring methodology /3/.
Type of monitoring equipment:	Not Applicable
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not Applicable
Calibration frequency /interval:	Not Applicable
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not Applicable
Company performing the calibration:	Not Applicable
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not Applicable
Is(are) calibration(s) valid for the whole reporting period?	Not Applicable
If applicable, has the reported data been cross-checked with other available data?	As per revised PDD /3/, 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). 200 km was used as the average round trip distance instead of monitored data for conservativeness because the farthest biomass fuel supply site could not be verified during the

	site visit which is in line with the revised PDD /3/.
How were the values in the monitoring report verified?	200 km was used as the average round trip distance instead of monitored data for conservativeness because the farthest biomass fuel supply site could not be verified during the site visit which is in line with the revised PDD /3/.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensure the correct transfer of data and reporting of emission reductions and QA/QC processes are in place.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	Number of truck trips for the transportation of biomass (N_y)
Measuring frequency:	Continuously measuring. Each time every truck which transports biomass residue to the plant is counted and recorded in the log books.
Reporting frequency:	Recorded in the log books and aggregated monthly.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	As per the revised PDD, each time of transportation of the biomass residues to the project site shall be counted and recorded in the log books /3/. The actual measuring and reporting frequency is in accordance with the monitoring plan and monitoring methodology.
Type of monitoring equipment:	Not Applicable.
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national	Not Applicable.

standards, or as per the manufacturer's specification?	
Calibration frequency /interval:	Not Applicable.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not Applicable.
Company performing the calibration:	Not Applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not Applicable.
Is(are) calibration(s) valid for the whole reporting period?	Not Applicable.
If applicable, has the reported data been cross-checked with other available data?	As per revised PDD /3/, the consistency of the number of truck trips will be checked with the quantity of biomass combusted by the relation with previous years. It's not applicable because this is the first verification.
How were the values in the monitoring report verified?	The data was recorded in the log books /24/ and aggregated monthly /25/. The verification team has assessed all daily log sheets and the monthly reports and found them to be correct.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensure the correct transfer of data and reporting of emission reductions and QA/QC processes are in place.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	Average CO_2 emission factor for transportation of biomass with trucks during year y ($EF_{km,CO2}$)
Measuring frequency:	Default value from revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (Energy) /33/

Reporting frequency:	Not Applicable.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Not Applicable.
Type of monitoring equipment:	Not Applicable.
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not Applicable.
Calibration frequency /interval:	Not Applicable.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not Applicable.
Company performing the calibration:	Not Applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not Applicable.
Is(are) calibration(s) valid for the whole reporting period?	Not Applicable.
If applicable, has the reported data been cross-checked with other available data?	Not Applicable.
How were the values in the monitoring report verified?	As per revised PDD /3/, the appropriateness of the data shall be reviewed annually. DNV has checked the updated IPCC 2006 /33/ and was able to confirm no change for this value.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Not Applicable.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	CO_2 emission factor for fossil fuel type i (diesel) ($EF_{CO2,i,y}$)
Measuring frequency:	The upper limit of default value of the uncertainty at a 95% confidence interval from 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Energy) /33/
Reporting frequency:	Not Applicable.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Not Applicable.
Type of monitoring equipment:	Not Applicable.
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not Applicable.
Calibration frequency /interval:	Not Applicable.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not Applicable.
Company performing the calibration:	Not Applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not Applicable.
Is(are) calibration(s) valid for the whole reporting period?	Not Applicable.
If applicable, has the reported data been cross-checked with other available data?	Not Applicable.
How were the values in the monitoring report verified?	As per revised PDD /3/, the appropriateness of the data shall be reviewed annually. The data was derived from IPCC 2006 which is latest available version /33/ for this monitoring period.

Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Not Applicable.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	Net Calorific Value of fossil fuel type i (diesel) (NCV_i)
Measuring frequency:	Default value from China Energy Statistical Yearbook 2011/34/
Reporting frequency:	Not Applicable.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Not Applicable.
Type of monitoring equipment:	Not Applicable.
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not Applicable.
Calibration frequency /interval:	Not Applicable.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not Applicable.
Company performing the calibration:	Not Applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not Applicable.
Is(are) calibration(s) valid for the whole reporting period?	Not Applicable.

If applicable, has the reported data been cross-checked with other available data?	Not Applicable.
How were the values in the monitoring report verified?	Not applicable.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	As per revised PDD /3/, the appropriateness of the data shall be reviewed annually. The data was derived from China Energy Statistical Yearbook 2011, which is latest available version /34/ for this monitoring period.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	Quantity of fossil fuel type I (diesel) combusted in the project plant during year y ($FF_{project\ plant,i,y}$)
Measuring frequency:	Continuously
Reporting frequency:	Read the fuel consumption data after boiler start-up every time and record accordingly.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The revised PDD specified the consumption of diesel will be continuously measured and recorded by the project participant /3/. The measuring and reporting frequency is in accordance with the monitoring plan and monitoring methodology.
Type of monitoring equipment:	Flow meter 1# Type: LWY-10C SN: 08020 Accuracy: 1.0% Flow meter 2# Type: LWY-10C SN: 07115 Accuracy: 1.0%

	Flow meter 3# Type: LWY-10C SN: L1019012 Accuracy: 1.0% Flow meter 4# Type: LWY-10C SN: L1019030 Accuracy: 1.0% The flow meter 1# and 2# are equipped to Unit 1 while 3# and 4# are equipped to Unit 2.
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	As per revised PDD /3/, the accuracy of the flow meters will not be lower than 1%. The accuracy of flow meters used in the project is 1.0% which is in line with the revised PDD /3/.
Calibration frequency /interval:	Annually
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	The revised PDD specify the calibration frequency of flow meter is once a year and will undergo calibration/maintenance subject to appropriate industrial standards /3/. The actual calibration interval for flow meter 1# and flow meter 2# is in line with the monitoring plan in the revised PDD /3/ and national verification regulation for turbine flow meter (JJG 1037-2008) /37/. However, the flow meter 3# and flow meter 4# were not calibrated for this monitoring period.
Company performing the calibration:	Southern national measurement and test centre of Hubei measurement and test technique institute, which has been accredited by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China /22/, for flow meter 1# and flow meter 2#. The flow meter 3# and flow meter 4# were not calibrated for this monitoring period.

Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	The calibration confirmed the proper functioning of the flow meter 1# and flow meter 2# during the monitoring period. The flow meter 3# and flow meter 4# were not calibrated for this monitoring period.
Is(are) calibration(s) valid for the whole reporting period?	The calibration (certificate No.: *JL110329134201*) for flow meter 1# (SN: *08020*) was performed on 3 January 2011 and valid up to 2 January 2012 /16/. The calibration (certificate No.: *JL110329134802*) for flow meter 2# (SN: *07115*) was performed on 3 January 2011 and valid up to 2 January 2012 /16/. Hence the certificates of the flow meter 1# and flow meter 2# covered the whole reporting period 6 January 2011 to 31 December 2011. The flow meter 3# and flow meter 4# were not calibrated for this monitoring period. The certificate of calibration (certificate No.: JL2012030088080) for flow meter 3# (SN: L1019012) was calibrated on 3 January 2012 and valid up to 2 January 2013 /16/ which is after this monitoring period. The certificate of calibration (certificate No.: JL2012030088070) for flow meter 4# (SN: L1019030) was calibrated on 3 January 2012 and valid up to 2 January 2013 /16/ which is after this monitoring period.
If applicable, has the reported data been cross-checked with other available data?	The reported data has been cross-checked with the annual energy balance /2/ and purchase invoice of diesel /26/.
How were the values in the monitoring report verified?	The flow meter 3# and flow meter 4# are installed to monitor the diesel consumption caused by boiler 2#'s start up and were not calibrated during this monitoring period. The first calibration for these two flow meters was performed on 3 January 2012 which is after this monitoring period. However according to the calibration for these two flow meters by the manufacturer before these two flow meters left the factory /29/, the accuracy of these two flow meters are 1.0% and guaranteed by the manufacturer for the period from 30 September 2011 to 29 September 2012.

	The error identified in the delayed calibration test /16/ (i.e. 4.31% and 3.23% for flow meters 3# and 4# respectively) are beyond the maximum permissible error of the measuring equipment (1%), the diesel consumption were adjusted in a conservative manner as the higher error of 4.31% has been added to the value of diesel consumption by boiler 2# for the whole monitoring period which verified to be in accordance with the Guidelines for assessing compliance with the calibration frequency requirements version 01 /46/. The fuel consumption data was recorded in the log books /24/ after boiler start-up every time and aggregated monthly /25/. The verification team has assessed all daily log books /24/ and the monthly reports /25/ and found them to be correct.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensure the correct transfer of data and reporting of emission reductions and QA/QC processes are in place.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	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 ($FF_{project\ site,i,y}$)
Measuring frequency:	Continuously
Reporting frequency:	Each time of consumption of fossil fuel in the project is recorded on the log books /24/.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. As per revised PDD /3/, continuous measurement is required. However the revised PDD did not specify the reporting frequency

	/3/.
Type of monitoring equipment:	The consumption of diesel is monitored using diesel purchase and consumption log book.
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not Applicable.
Calibration frequency /interval:	Not Applicable.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not Applicable.
Company performing the calibration:	Not Applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not Applicable.
Is(are) calibration(s) valid for the whole reporting period?	Not Applicable.
If applicable, has the reported data been cross-checked with other available data?	The reported data has been cross-checked with the annual energy balance /2/ and purchase invoice of diesel /26/. As the storage of diesel wasn't measured, the total amount of purchase invoice for $FF_{project\ plant,i,y}$ and $FF_{project\ site,i,y}$ subtracting the amount of $FF_{project\ plant,i,y}$ will be used as $FF_{project\ site,i,y}$. DNV considers this is conservative and reasonable.
How were the values in the monitoring report verified?	The fuel consumption data was recorded in the log books /24/ after every time of consumption and aggregated monthly /25/. The verification team has assessed all daily log books /24/ and the monthly reports /25/ and found them to be correct.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensure the correct transfer of data and reporting of emission reductions and QA/QC processes are in place.
In case project participants have temporarily not monitored the parameter,	Not applicable

has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	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 ($EC_{PJ, y}$)
Measuring frequency:	Continuously
Reporting frequency:	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The revised PDD /3/ requires continuous measurement and aggregated at least annually.
Type of monitoring equipment:	Power meter 1# Type: DSSD1008 SN: 0807105 Accuracy: 0.5S Power meter 2# Type: DS862 SN: 10073628 Accuracy: 2.0
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	As per the revised PDD /3/, the accuracy of power meters shall be 0.5. The accuracy of power meter 1# is 0.5S which is higher than the accuracy of 0.5 /36/. The accuracy of power meter 2# is 2.0 which is lower than the accuracy of 0.5.
Calibration frequency /interval:	Annually
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Yes. The revised PDD /3/ specified the calibration frequency is once a year.

Company performing the calibration:	Poyang Electricity Measuring Testing Center, which has been accredited by Jiangxi Quality Technology Supervision Bureau /20/.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes. The calibration confirmed the proper functioning of the power meter 1# and power meter 2# during the monitoring period.
Is(are) calibration(s) valid for the whole reporting period?	Yes. The calibration (certificate No.: dianeng2011010402) for power meter 1# (SN: 0807105) was performed on 4 January 2011 (valid up to 3 January 2012) /17/ The calibration (certificate No.: dianneng2011010401) for power meter 2# (SN: 10073628) was performed on 4 January 2011 and valid up to 3 January 2012 /17/. Hence the certificates covered the whole reporting period 6 January 2011 to 31 December 2011.
If applicable, has the reported data been cross-checked with other available data?	As per the revised PDD /3/, the reported data shall be cross-checked with the invoices for purchased electricity if available. However there is no separate invoice for on-site electricity consumption. Hence the reported data cannot be cross-checked with the invoices.
How were the values in the monitoring report verified?	Due to the missing of monitoring data, , the on-site electricity consumption was calculated conservatively as the weight of biomass residue smashed (tons) and the electricity consumption factor (kWh/ton) for mechanical pre-treatment of biomass residue as per the revised PDD /3/. According to the interview with the project owner /47/, the biomass residue will be smashed just before sending to the boiler for combustion because the storage of smashed biomass residues is more difficult than raw biomass residues. Hence DNV considers it's suitable to take the value of $BF_{k,y}$ (Quantity of each biomass residue type k combusted in the project plant in year y) as the weight of biomass residue smashed for the calculation of $EC_{PJ,\,y}$. The on-site electricity consumption is consumed by two on-site crushers. The model types of them are BX2113 and Vermeer HG 365E and the electricity consumption factor of

	them are calculated to be 8.333 kWh/t and 6.8044 kWh/t respectively according to their technical specification /28/. The larger value of 8.333 kWh/t was used for the calculation for conservativeness. All the biomass residues consumed by the project are considered to be smashed for conservativeness and the data needed for the calculation was recorded in the log books /24/ and aggregated monthly /25/. The verification team has assessed all daily log books /24/ and the monthly reports /25/ and found them to be correct.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensure the correct transfer of data and reporting of emission reductions and QA/QC processes are in place.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	As stated in the registered PDD version 04 dated 31 March 2010, if the monitoring data is missing, or it is not feasible to install a dedicated meter to monitor this indicator, $EC_{PJ,y}$ will be calculated conservatively as the weight of straws smashed (tons) and the electricity consumption factor (kWh/ton). Hence although the monitoring data is missing for this monitoring period, DNV considered the calculation method for $EC_{PJ,\ y}$ was in line the registered PDD which was approved by the CDM EB.

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	Net quantity of increased electricity generated in the project plant during the year y ($EG_{project\ plant,y}$)
Measuring frequency:	Continuously
Reporting frequency:	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The revised PDD /3/ requires continuous measurement and does not specify the reporting frequency.
Type of monitoring equipment:	Gate meter

	Type: ZMQ202C.4 SN: 94826500 Accuracy: 0.2S Backup meter Type: ZMQ202C.4 SN: 94826502 Accuracy: 0.2S 10kV meter Type: DSSD135 SN: 807341 Accuracy: 0.5
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	As per revised PDD /3/, the accuracy of meters shall be 0.5. The accuracy of gate meter and backup meter is higher than 0.5, and the accuracy of 10 kV meter is 0.5 which is in line with the monitoring plan in the revised PDD /3/.
Calibration frequency /interval:	Annually
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	The revised PDD /3/ specified the calibration frequency is once a year.
Company performing the calibration:	Jiangxi Electric Power Research Institute and Jiangxi Gan Northeast Power Company Electric Measurement Center, which both has been accredited by Jiangxi Quality Technology Supervision Bureau /20/.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes. The calibration confirmed the proper functioning of the gate meter, backup meter and 10 kV meter during the monitoring period.
Is(are) calibration(s) valid for the whole reporting period?	Yes. The calibration (certificate No.: diannengXG101208) for gate meter (SN: 94826500) and backup meter (SN: 94826502) were performed by Jiangxi Electric Power Research Institute on 25 December 2010 and

	valid up to 24 December 2011 /18/. The calibration (certificate No.: diannengXX111201) for gate meter (SN: 94826500) and backup meter (SN: 94826502) were performed by Jiangxi Gan Northeast Power Company Electric Measurement Center on 24 December 2011 and valid up to 23 December 2012 /19/. The calibration (certificate No.: dianengXX101201) for 10 kV meter (SN: 807341) was performed by Jiangxi Gan Northeast Power Company Electric Measurement Center on 24 December 2010 and valid up to 23 December 2011 /19/. The calibration (certificate No.: dianengXX111204) for 10 kV meter (SN: 807341)was performed by Jiangxi Gan Northeast Power Company Electric Measurement Center on 24 December 2011 and valid up to 23 December 2012 /19/. Hence the certificates covered the whole reporting period 6 January 2011 to 31 December 2011.
If applicable, has the reported data been cross-checked with other available data?	As per revised PDD /3/, the consistency of the data will be 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. The consistency with the quantity of fuel fired was cross-checked in the annual energy balance /2/ and found to be reasonable as below: There is no heat was generated during this monitoring period because the heat pipeline was not laid down yet which was confirmed during the site visit. Hence the project was operated under pure condensing condition during this monitoring period. Based on the relevant design information from the suppliers and equipment purchase agreement of boiler, generator and turbine, the design efficiencies for these three equipment are 86%, 97 % and 32% (this is under pure condensing condition for steam turbine) respectively, which leads to an overall

	efficiency of 26.29% in theory for the set of boiler-turbine-generator. Taking account of the auxiliary power consumption and energy losses of the electric equipment, DNV considered the efficiency of 20.63% achieved in this monitoring period is reasonable compared to the theoretical efficiency of 26.29%. The reported data was cross-checked with the statement of the electricity transactions of Poyang Kaidi Biomass Power Project during 6 January 2011 to 31 December 2011 issued by Northeast of Jiangxi Province Power Supply Company (on behalf of CCPG) on 20 January 2012 /27/.
How were the values in the monitoring report verified?	The value was recorded in the log books /24/ and aggregated monthly /25/. The verification team has assessed all daily log books /24/ and the monthly reports /25/ and found them to be correct.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensure the correct transfer of data and reporting of emission reductions and QA/QC processes are in place.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	Quantity of each biomass residues type k that are utilized in the defined geographical region
Measuring frequency:	Not Applicable
Reporting frequency:	Not Applicable
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Not Applicable

Type of monitoring equipment:	As per revised PDD /3/, this value shall be derived from Surveys or Statistics
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not Applicable.
Calibration frequency /interval:	Not Applicable.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not Applicable.
Company performing the calibration:	Not Applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not Applicable.
Is(are) calibration(s) valid for the whole reporting period?	Not Applicable.
If applicable, has the reported data been cross-checked with other available data?	Not Applicable.
How were the values in the monitoring report verified?	This parameter is reviewed annually according to the project data and official data. The value used in the project is derived from Biomass availability report for Poyang Kaidi Biomass Power Project dated in February 2012 /12/ which can reflect the current status of the biomass resources in Poyang.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Not applicable
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	Quantity of each biomass residues type k that are available in the region
Measuring frequency:	Not Applicable
Reporting frequency:	Not Applicable
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Not Applicable
Type of monitoring equipment:	As per revised PDD /3/, this value shall be derived from Surveys or Statistics
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not Applicable
Calibration frequency /interval:	Not Applicable.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not Applicable.
Company performing the calibration:	Not Applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not Applicable.
Is(are) calibration(s) valid for the whole reporting period?	Not Applicable.
If applicable, has the reported data been cross-checked with other available data?	Not Applicable.
How were the values in the monitoring report verified?	This parameter is reviewed annually according to the project data and official data. The value used in the project is derived from Biomass availability report for Poyang Kaidi Biomass Power Project dated in February 2012 /12/ which can reflect the current status of the biomass resources in Poyang.
Does the data management ensure correct transfer of data and reporting of emission	Not applicable

reductions and are necessary QA/QC processes in place?	
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable

3.6.3 Energy balance

According to the methodology ACM0006 (version 9) /43/, the energy balance for the power plant is required to cross check the biomass and auxiliary fuels consumption. DNV has checked the energy balance calculation spreadsheet and confirmed the integrated electricity generation efficiency to be 20.63% /2/. Based on the relevant design information from the suppliers and equipment purchase agreement of boiler, generator and turbine /7/ /8/ /9/, the design efficiencies for these three equipment are 86%, 97% and 32%, respectively (this is under pure condensing condition for steam turbine), which leads to an overall efficiency of 27% in theory for the set of boiler-turbine-generator. Considering the inexperienced operation from the project staff and unstable facility performance (1# steam turbine generator and 2# steam turbine generator were shutdown 6 times each for maintenance) /24/, DNV considers that the efficiency observed in this monitoring period for the project activity is reasonable.

Therefore, it is concluded that the monitoring system is appropriate and complete.

3.7 Assessment of data and calculation of emission reductions

The emission reductions are determined in accordance with the formulae given in the baseline and monitoring methodology ACM0006, version 9 /43/ for scenario 2. DNV confirms that appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been applied for this project activity.

3.7.1 Baseline emissions

(1) Emission reductions ($ER_{electricity,y}$) due to displacement of electricity

The emission reductions ($ER_{electricity,y}$) due to displacement of electricity is the product of the ex-ante calculated grid emission factor ($EF_{electricity,y}$, in tCO_2/MWh) times the net electricity generation as a result of the project activity (EG_y in MWh), which will otherwise be supplied by the Central China Power Grid without the project activity:

$$ER_{electricity,y} = EG_y \times EF_{electricity,y}$$

The emission factor of the Central China Power Grid is determined *ex-ante* as 0.9735 tCO_2/MWh for the first crediting period. The net electricity delivered to the grid is 87 149.06 MWh /2/, which results in the baseline emission reductions 84 839.61 tCO_2e in this monitoring period.

(2) Emission reductions or increases due to displace of heat ($ER_{heat,y}$)

According to revised PDD, the project will not claim GHG emission reductions from displacing heat. Hence, $ER_{heat,y} = 0$

(3) Emission reductions ($BE_{biomass,y}$) due to natural decay or uncontrolled burning of anthropogenic sources of biomass residue

The emission reductions ($BR_{biomass,y}$) due to natural decay or uncontrolled burning of anthropogenic sources of biomass residue during the year y is calculated as the product of the amount of biomass residues (dry basis) used ($BE_{biomass,CH4,y}$) multiplies the biomass net calorific value, methane emission factor and the global warning potential of methane:

$$BE_{biomass,y} = GWP_{CH4} \times \sum_{k} BF_{PJ,k,y} \times NCV_k \times EF_{burning,CH4,k,y}$$

According to the revised PDD and the methodology, the quantity of biomass residue is adjusted for the moisture content in order to determine the quantity of dry biomass. Hence, $BF_{PJ,k,y} = BF_{k,y}$, namely the quantity of biomass residues of type k combusted in the project plant during the year y (tonnes of dry matter). According to the revised PDD, 0.001971 tCH_4/t is used as the product of NCV_k and $EF_{burning,CH4,k,y}$. The incremental quantity of biomass residues used as a result of the project activity is 127 929.82 tonnes (dry matter), which results in the baseline emission reductions 5 295.14 tCO_2e in this monitoring period.

Therefore, the total baseline emissions occurred in this monitoring period are 90 134.75 tCO_2e.

3.7.2 Project emissions

The project emissions include emissions from transportation of biomass residues to the project site (PET_y), emissions from on-site consumption of fossil fuel by the project ($PEFF_y$), emissions from consumption of electricity ($PE_{EC,y}$), and methane emissions from combustion of biomass residues ($PE_{biomass,CH4,y}$):

$$PE_y = PET_y + PEFF_y + PE_{EC,y} + GWP_{CH4} \times PE_{biomas,CH4,y}$$

(1) Project emissions from transportation of biomass residues (PET_y)

The emissions from the transport of biomass residues to the project site were calculated from the number of truck trips (N_y), average round trip distance (from and to) between the biomass residue fuel supply sites and the project site (AVD_y), average transportation from collection site to power plant and the CO_2 emission factor from fuel used for transportation ($EF_{km,CO2,y}$).

$$PET_y = N_y \times AVD_y \times EF_{km,CO2,y}$$

The IPCC default value of 0.001097 tCO_2/km was applied for the average CO_2 emission factor ($EF_{km,CO2,y}$) of the diesel trucks. The round trip distance between the farthest biomass supply site and the project site of 200 km was used as the average round trip distance (from and to) between biomass residue supply sites and the project site for conservativeness. The numbers of truck trips for the transportation of biomass residues was accounted as 25 040 and total round trip distance (from and to) between biomass residue supply sites and the project site was 500 800 km in this monitoring period. Hence, the project emissions were calculated as 5 493.78 tCO_2e.

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

The emission from on-site consumption of fossil fuels is calculated using the "*Tool to calculate project or leakage CO2 emissions from fossil fuel combustion*" version 02 /44/:

$$PEFF_y = PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$$
$$= \sum_i (FF_{projectplant,i,y} + FF_{projectsite,i,y}) \times COEF_{i,y}$$
$$COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}$$

The consumption of diesel was monitored in volume and converted to the mass using the standard density of diesel (0.85 kg/liter) as per the revised PDD version 05 dated 22 August 2012 /3/.The quantity of fossil fuel type i combusted in the biomass residue fired power plant during the year y ($FF_{projectplant,i,y}$) (16 166.41 litres) and 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* ($FF_{projectsite,i,y}$) (147 718 litres) are both considered in the calculation. The IPCC default values at the upper limit of the uncertainty at a 95% confidence interval 74 800 $kgCO_2e/TJ$ was applied for the CO_2 emission factor of the diesel in the calculation of project emissions for fossil fuel consumption /33/, and the net calorific value of diesel refers to latest reliable national data of China Energy Statistical Yearbook as 0.042652 TJ/t /34/. Hence, the project emissions were calculated as 444.42 tCO_2e.

(3) Project emissions from consumption of electricity ($PE_{EC,y}$)

The emissions ($PE_{EC,y}$) due to on-site consumption of electricity are calculated based on the quantify of electricity consumed, emission factor for electricity generation and a factor to account for transmission losses according to the "*Tool to calculate baseline, project and/or leakage emissions from electricity consumption*" version 01 /45/:

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

Since the electricity consumption is purchased from the grid only, the Scenario A mentioned is applicable to the proposed project /3/. The power grid emission factor 0.9735 tCO_2/MWh is applied, and 20% was chosen as the default value of *TDL* in line with the "*Tool to calculate baseline, project and/or leakage emissions from electricity consumption*" version 01 /45/. The quantity of electricity consumption was conservatively accounted as 937.96 MWh which resulted in the project emissions as 1 095.72 tCO_2e.

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

The methane emissions from combustion of biomass residues in the project ($PE_{biomass,CH4,y}$) is determined as below:

$$PE_{biomasss,CH4,y} = EF_{CH4,BF} \times \sum_k BF_{k,y} \times NCV_k$$

According to the methodology ACM0006 (version 9) /43/, when the IPCC default methane emission factor of 30 $kgCH_4/TJ$ for combustion of biomass residues is applied, the uncertainty of the methane emission factor is estimated to be 300%, resulting in a conservativeness factor of 1.37. Thus, the methane emission factor of 41.1 $kgCH_4/TJ$ ($EF_{CH4,BF}$) is used in the emission reduction calculation. The quantity ($BF_{k,y}$) and NCV (NCV_k) for each type of biomass residues combusted in the project were applied. The project emissions due to methane emissions from combustion of biomass residues were calculated to be 62.61 tCH_4 which is equivalent to 1 314.81 tCO_2e.

Therefore, the total project emissions occurred in this monitoring period are calculated and verified as 8 348.68 tCO_2e /2/.

3.7.3 Leakage

DNV confirms that the quantity of available biomass residue in the region is at least 25% larger than the quantity of biomass that is utilized, including the project plant. Hence, the leakage for the project activity is considered as zero.

The detailed data is indicated as below:

Table 1 Biomass residues resources within area covering a radius of 60 km around the project site

Biomass Type	Rice husk	Bamboo crumbs	Wood scraps	Branches	Barks	Stumps
Total biomass generation in the region(10^3t)	300.0	60.0	500.0			
Biomass loss (10^3t)	30.0	6.0	50.0			
Available Biomass in the region (10^3t)	270.0	54.0	450.0			
Biomass utilised out of the project (10^3t)	54.0	8.1	90.0			
Biomass utilised by the project in this monitoring period (10^3t)	37.1	26.4	112.6			
Biomass utilised by the project (10^3t) (convert to full year)	37.615	26.767	114.614			
Total biomass utilised, including the project (10^3t)	91.615	34.867	204.164			
Available Biomass/Total biomass utilised	294.71%	154.88%	220.41%			
Available Biomass/Total biomass utilised -100%	194.71%	54.88%	120.41%			
Abundant surplus? (More than 25%)	Yes	Yes	Yes			

The data in the above table is derived from the Biomass availability report for Poyang Kaidi Biomass Power Project issued by Wuhan Kaidi Electric Power Engineering Co., Ltd in February 2012 which was authorized by NDRC of China as consultant for new energy projects in China /12/.

3.7.4 Emission reductions

As stated in Section 1.4 above, the emission reductions (ER_y) by the project activity is the difference between the baseline emissions through the displacement of electricity ($ER_{electricity,y}$) and baseline emissions due to natural decay or uncontrolled burning of biomass residues ($BE_{biomass,y}$), project emissions (PE_y) and emissions (L_y) due to leakage:

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

From Section 3.7.1 to 3.7.3, the following information has been achieved:

$ER_{electricity,y}$ = 84 839.61 tCO_2e

$BE_{biomass,y}$ =5 295.14 tCO_2e

PE_y = 8 348.68 tCO_2e

L_y = 0 tCO_2e

Hence, the emission reductions (ER_y) by the project activity during this monitoring period are calculated to be 81 786 tCO_2e.

The emission reduction calculations have been based on actual monitored data of the plant, from 6 January 2011 to 31 December 2011 which have been verified by DNV. Emission reduction calculations were presented in a spreadsheet /2/ and DNV has assessed the calculations to be accurate.

The emissions reductions in this monitoring period are 81 786 tCO_2e in the period from 6 January 2011 to 31 December 2011 (i.e. 360 days), the annually expected emission reductions according to the revised PDD (05 of 22 August 2012) is 116 628 tCO_2e, which corresponds to the emission reductions of 115 030 tCO_2e (i.e. 360 days). Hence the reported emission reductions are 26.9% lower than the expected. The detail assessment on the low emission reductions in this monitoring period has been addressed in section 3.4. DNV was able to confirm that the emission reductions claimed during this monitoring period 6 January 2011 to 31 December 2011 was reasonable.

3.8 Quality of evidence to determine emission reductions

All necessary documentations are collected, referenced and aggregated, which is easily accessible in hard-copy or electronic format. Measurements are performed by calibrated equipment, and the key data can also be cross-checked via other sources, such as records, receipts and inventory data. No assumptions are used that have any material influence on reported emission reductions.

DNV concludes that during this monitoring period, the evidences for determination of emission reductions are sufficient and reasonable, and the calculation of emission reductions is reliable.

3.9 Management system and quality assurance

Poyang Kaidi Green Energy Development Co., Ltd is responsible for operation and routine maintenance of power plant under the CDM activity. The quality assurance and quality control procedures have been addressed in the CDM Management and Monitoring Manual /10/, including the organization structure with the responsibilities, personnel competencies, monitoring procedures and monitoring management. By interview with the staff and check records during on-site visit, it can be confirmed that the monitoring management system is implemented following the CDM Management and Monitoring Manual /10/.

All monitoring devices have been calibrated and maintained periodically to ensure the accuracy of measurement. All data have been archived electronically and/or in hard copy, and will be kept for more than two years since the end of the crediting period.

4 CERTIFICATION STATEMENT

DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions that have been reported for the CDM project activity 3056"Poyang Kaidi Biomass Power Project" in China for the period 6 January 2011 to 31 December 2011.

The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

It is DNV's responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity. DNV does not express any opinion on the selected baseline scenario or on the validated and revised PDD.

DNV conducted the verification on the basis of the baseline and monitoring methodology ACM0006 (version 9), the monitoring plan contained in the PDD (version 05 of 22 August 2012) and the monitoring report (version 2.0) dated 23 August 2012. The verification included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

DNV's verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. DNV planned and performed the verification by obtaining evidence and other information and explanations that DNV considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the project activity for the period 6 January 2011 to 31 December 2011 are fairly stated in the monitoring report (version 2.0) dated 23 August 2012.

The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0006 (version 9) and the monitoring plan contained in the PDD (version 05 of 22 August 2012).

DNV Climate Change Services AS is able to certify that the emission reductions from the CDM project activity 3056 "Poyang Kaidi Biomass Power Project" in China during the period 6 January 2011 to 31 December 2011 amount to 81 786 tonnes of CO_2 equivalent.

Beijing and Oslo, 8 November 2012

Liu Jinwei
Verifier
DNV Beijing, China

Michael Lehmann
Director of Services and Technologies
DNV Climate Change Services AS

5 REFERENCES

5.1.1 Documentation provided by the project participants

/1/ Wuhan Kaidi Holding Investment Co., Ltd: *CDM monitoring report for project activity 3056 "Poyang Kaidi* Biomass Power Project*" for the monitoring period 6 January 2011 to 31 December 2011*, Version 1.0 dated 6 July 2012 and version 2.0 dated 23 August 2012

/2/ Wuhan Kaidi Holding Investment Co., Ltd: *ER calculation spreadsheet*, version 1.0 dated 6 July 2012 and 2.0 dated 23 August 2012

/3/ Wuhan Kaidi Holding Investment Co., Ltd: *Revised PDD of Poyang Kaidi Biomass Power Project*, version 05 dated 22 August 2012

/4/ Poyang Kaidi Green Energy Development Co., Ltd: A letter of Authority on the CDM related issues was signed on 16 April 2011.

The letter grants the authority to Wuhan Kaidi Holding Investment Co., Ltd to undertake all actions necessary to represent and bind Poyang Kaidi Green Energy Development Co., Ltd to perform verification related works including choosing DOE and signing contract of verification commission.

/5/ Northeast of Jiangxi Province Power Supply Company (on behalf of CCPG):

Certificate on connection to the grid of power unit 1# issued on 8 January 2010 (the certificate indicates that the power unit 1 was connected to the grid successfully on 19 December 2009);

Certificate on connection to the grid of power unit 2# issued on 10 November 2011. (the certificate indicates that the power unit 2 was connected to the grid successfully on 23 October 2011)

/6/ Northeast of Jiangxi Province Power Supply Company (on behalf of CCPG) and Poyang Kaidi Green Energy Development Co., Ltd: *Power Purchase Agreement (PPA) of Poyang Kaidi Biomass Power Project* dated 30 August 2010 (the two parties of the agreement agreed on the valid period from 1 January 2010 to 31 December 2010 and the valid period will be prolonged automatically if no objection was raised);

Power Purchase Agreement (PPA) of Poyang Kaidi Biomass Power Project dated 1 November 2011 (The two parties of the agreement agreed on the valid period from 1 November 2011 to 31 December 2011 and the valid period will be prolonged automatically if no objection was raised.)

/7/ Wuhan Kaidi Electric Power Engineering Co., Ltd (the EPC contractor of Poyang Kaidi Green Energy Development Co., Ltd) and Jiangxi Jianglian Energy and Environmental Protection Co., Ltd: *Technical specification of boiler*, dated September 2007.

/8/ Wuhan Kaidi Electric Power Engineering Co., Ltd (the EPC contractor of Poyang Kaidi Green Energy Development Co., Ltd) and Nanjing Turbine & Electric Machinery (Group) Co., Ltd.: *Technical specification of turbine*, dated September 2007.

/9/ Wuhan Kaidi Electric Power Engineering Co., Ltd (the EPC contractor of Poyang Kaidi

Green Energy Development Co., Ltd) and Nanjing Turbine & Electric Machinery (Group) Co., Ltd.: *Technical specification of generator*, dated September 2007.

/10/ Wuhan Kaidi Holding Investment Co., Ltd (The parent company of Poyang Kaidi Green Energy Development Co., Ltd): CDM monitoring and operating manual, dated November 2010.

/11/ Poyang Kaidi Green Energy Development Co., Ltd: Training record of CDM activity dated 18 January 2011, 22 April 2011, 15 July 2011 and 26 October 2011.

/12/ Wuhan Kaidi Electric Power Engineering Co., Ltd: Biomass availability report for Poyang Kaidi Biomass Power Project dated in February 2012.

/13/ Southern national measurement and test centre of Hubei measurement and test technique institute:

Certificate of Calibration (Certificate No.: JL110329091701) for belt weigher 1# (SN: 0811109), calibration performed on 4 January 2011 (calibration valid from 4 January 2011 to 3 January 2012).

Certificate of Calibration (Certificate No.: JL110325083501) for belt weigher 2# (SN: 0811112), calibration performed on 4 January 2011 (calibration valid from 4 January 2011 to 3 January 2012).

/14/ Southern national measurement and test centre of Hubei measurement and test technique institute:

Certificate of Calibration (Certificate No.: JL110329091701) for balance 1# (SN: 0193), calibration performed on 4 January 2011 (calibration valid from 4 January 2011 to 3 January 2012).

Certificate of Calibration (Certificate No.: JL110328151901) for dry cabinet 1# (SN: 2011133), calibration performed on 4 January 2011 (calibration valid from 4 January 2011 to 3 January 2012).

Certificate of Calibration (Certificate No.: JL110328151301) for dry cabinet 2# (SN: 081211), calibration performed on 4 January 2011 (calibration valid from 4 January 2011 to 3 January 2012).

/15/ Luoyang Coal inspection technique center: Testing report for the net calorific value of biomass residues dated 3 January 2011 and 2 July 2011.

/16/ Southern national measurement and test centre of Hubei measurement and test technique institute:

Certificate of Calibration (Certificate No.: JL110329134201) for flow meter 1# (SN: 08020), calibration performed on 3 January 2011 (calibration valid from 3 January 2011 to 2 January 2012).

Certificate of Calibration (Certificate No.: JL110329134802) for flow meter 2# (SN: 07115), calibration performed on 3 January 2011 (calibration valid from 3 January 2011 to 2 January 2012).

Certificate of Calibration (Certificate No.: JL2012030088080) for flow meter 3# (SN: L1019012), calibration performed on 3 January 2012 (calibration valid from 3 January 2012 to 2 January 2013).

Certificate of Calibration (Certificate No.: JL2012030088070) for flow meter 4# (SN:

L1019030), calibration performed on 3 January 2012 (calibration valid from 3 January 2011 to 2 January 2013).

/17/ Poyang Electricity Measuring Testing Center:

Certificate of Calibration (Certificate No.:dianeng2011010402) for power meter 1# (SN: 0807105), calibration performed on 4 January 2011 (calibration valid from 4 January 2011 to 3 January 2012)

Certificate of Calibration (Certificate No.: dianneng2011010401) for power meter 2# (SN: 10073628), calibration performed on 4 January 2011 (calibration valid from 4 January 2011 to 3 January 2012).

/18/ Jiangxi Electric Power Research Institute:

Certificate of Calibration (Certificate No.: diannengXG101208) for gate meter (SN: 94826500) and backup meter (SN: 94826502), calibration performed on 25 December 2010 (calibration valid from 25 December 2010 to 24 December 2011).

/19/ Jiangxi Gan Northeast Power Company Electric Measurement Center:

Certificate of Calibration (Certificate No.: diannengXX111201) for gate meter (SN: 94826500) and backup meter (SN: 94826502), calibration performed on 24 December 2011 (calibration valid from 24 December 2011 to 23 December 2012).

Certificate of Calibration (Certificate No.:dianengXX101201) for power meter 10kV meter (SN: 807341), calibration performed on 24 December 2010 (calibration valid from 24 December 2010 to 23 December 2011).

Certificate of Calibration (Certificate No.:dianengXX111204) for power meter 10kV meter (SN: 807341), calibration performed on 24 December 2011 (calibration valid from 24 December 2011 to 23 December 2012).

/20/ Jiangxi Quality Technology Supervision Bureau:

Certificate of metrological authorization on Jiangxi Electric Power Research Institute issued on 31 March 2009 and valid up to 30 March 2012.

Certificate of metrological authorization on Jiangxi Gan Northeast Power Company Electric Measurement Center issued on 31 December 2010 and valid up to 30 December 2013.

Certificate of metrological authorization on Poyang Electricity Measuring Testing Center issued on 2 September 2008 and valid up to1 September 2011.

/21/ Henan Quality Technology Supervision Bureau: Certificate of metrological authorization on Luoyang Coal inspection technique center issued on 11 August 2008 and valid up to 10 August 2011.

/22/ General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China: Certificate of Metrological Authorization to Southern national measurement and test centre of Hubei measurement and test technique institute issued on 1 December 2007 and valid up to 30 November 2012.

/23/ Poyang Kaidi Green Energy Development Co., Ltd: Original records for the biomass residues which are transported to the project site for 6 January 2011 to 31 December 2011 (the records indicates the type, quantity and source of the biomass residues).

/24/ Poyang Kaidi Green Energy Development Co., Ltd: Log books recorded by operators

for 6 January 2011 to 31 December 2011.

/25/ Poyang Kaidi Green Energy Development Co., Ltd: Monthly report of Poyang Kaidi Biomass Power Project for 6 January 2011 to 31 December 2011. (The parameters monitored are aggregated into the monthly report)

/26/ Poyang Lutian gas station: Purchase invoices of diesel from 6 January 2011 to 31 December 2011.

/27/ Northeast of Jiangxi Province Power Supply Company (on behalf of CCPG): *statement of the electricity transactions of Poyang Kaidi Biomass Power Project during 6 January 2011 to 31 December 2011 dated 20 January 2012*.

/28/ Poyang Kaidi Green Energy Development Co., Ltd: Technical specification for the crusher BX2113 and the crusher Vermeer HG 365E.

/29/ Huayi Aofeng Automatic Equipment Co., Ltd.: Certificate of calibration for flow meter 3# (SN: L1019012) and flow meter 4# (SN: L1019030) dated on 30 September 2011 and valid until 29 September 2012. (The calibration was performed by the manufacturer of the flow meters before the flow meter leave the factory)

5.1.2 Other project documents or documents used by DNV to verify the information provided by the project participants

/30/ Camco International Limited: *Registration CDM-PDD for project activity "*Poyang Kaidi Biomass Power Project, version 04 of 31 March 2010

/31/ DNV: *validation opinion for post registration changes of project activity "Poyang Kaidi Biomass Power Project*, dated 8 November 2012.

/32/ TÜV Rheinland Group: *Validation Report for project activity "Poyang Kaidi Biomass Power Project"*, version 03, dated 25 October 2010

/33/ IPCC: 1996 IPCC Guidelines for National Greenhouse Gas Inventories (Energy);

IPCC: 2006 IPCC guidelines for national greenhouse gas inventories reference manual, 2006.

/34/ Department of Industry and Transport Statistics of National Bureau of Statistics and Energy Bureau of NDRC of China: *China Energy Statistical Yearbook 2011*.

/35/ State Bureau of Machine Building Industry: *Model numbering method for utility boiler*, JB/T 1617-1999, issued on 6 August 1999 and be valid from 1 January 2000.

/36/ General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China: *GB/T 17883-1999 "Alternating current static watt-hour meter for active energy (class 0.2S and 0.5S)"*, issued on 10 September 1999 and valid from 1 March 2000.

/37/ General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China: *Verification Regulation for Turbine Flowmeter*, JJG 1037-2008, issued on 25 March 2008 and valid from 25 June 2008. (all flow meters used in the project are turbine flow meters)

/38/ General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China: *Verification Regulation for Continuous Totalizing*

Automatic Weighing Instruments (Belt Weigher), JJG 195-2002, issued on 4 November 2002 and valid from 4 May 2003.

/39/ General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China: *Determination of total moisture in coal*, GB/T 211—2007, issued on 1 November 2007 and valid from 1 June 2008.

5.1.3 Methodologies, tools and other guidance by the CDM Executive Board

/40/ CDM Executive Board: *Clean Development Mechanism Validation and Verification Standard*, version 02.0.

/41/ CDM Executive Board: *Clean Development Mechanism Project Standard*, version 01.0.

/42/ CDM Executive Board: *Clean Development Mechanism Project Cycle Procedure*, version 02.0.

/43/ CDM Executive Board: *Consolidated methodology for electricity generation from biomass residues*, ACM0006 version 9.

CDM Executive Board: *Consolidated methodology for grid-connected electricity generation from renewable sources*, ACM0002 version 10.

/44/ CDM Executive Board: *Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion*, version 02.

/45/ CDM Executive Board: *Tool to calculate baseline, project and/or leakage emissions from electricity consumption*, version 01.

/46/ CDM Executive Board: *Guidelines for assessing compliance with the calibration frequency requirements*, version 01.

5.1.4 Persons interviewed during the verification

/47/ Poyang Kaidi Green Energy Development Co., Ltd:

Mr. Zhang Yongting, General Manager;

Mr. Xiao Lianfa, Production Manager;

Mr. Lv Zhiping, Maintenance Manager;

Mr. He Li, CDM Project Manager;

Ms Huang Ying, CDM Project Manager.

/48/ Camco:

Zhang Yong, Principle Technical Manager

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APPENDIX A

CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS

Corrective action requests

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 1	In the section D2 of MR, the frequency of measuring, reading and reporting for monitoring parameters ($BF_{k,y}$, moisture content of the biomass residues, $FF_{project\ plant,i,y,}$ $EC_{PJ,y}$, $EG_{project\ plant,y}$) shall be addressed to reflect the actual monitoring practice.	The frequency of measuring, reading and reporting for monitoring parameters ($BF_{k,y}$, moisture content of the biomass residues, $FF_{project\ plant,i,y,}$ $EC_{PJ,y}$, $EG_{project\ plant,y}$) have been updated, for details please see the section D2 of revised MR version 2.0.	The frequency of measuring, reading and reporting for monitoring parameters ($BF_{k,y}$, moisture content of the biomass residues, $FF_{project\ plant,i,y,}$ $EC_{PJ,y}$, $EG_{project\ plant,y}$) have been updated in MR version 2.0 and were verified to meet the corresponding requirement in the revised PDD /3/ and the methodology. Hence the CAR 1 is closed.
CAR 2	The following time gap of calibrations of the monitoring instruments were found during verification: (1) The calibrations of flow meter 3# and flow meter 4# were conducted on 3 January 2012 in MR, which did not cover the monitoring period from 6 January 2011 to 31 December 2011; (2) The calibration of gate meter and backup meter were conducted on 25 December 2010 and valid up to 24 December 2011, which did not cover the monitoring period from 6 January 2011 to 31 December 2011; (3) The calibration of 10 kV meter was conducted on 24 December 2010 and valid up to 23 December 2011, which did not cover the monitoring period from 6 January 2011 to 31 December 2011.	(1).The flow meters 3# and 4# were installed to monitor the consumption of fossil fuel caused by start-up of 2# boiler. The 2# boiler was put to use since 6 October 2011, so the calibrations of flow meter 3# and flow meter 4# were delayed by almost 3 months. The accuracy of the flow meters 3# and 4# are 4.31% and 3.23%, and the bigger error of them (4.31%) is chosen for conservativeness. As the error is beyond the maximum permissible error of the flow meter, according to "Guideline for assessing compliance with the calibration frequency requirements", the value of the consumption of fossil fuel caused by start-up of 2# boiler during the monitoring period should be multiplied by 104.31%. $FF_{project\ plant,i,y}$ of 2# boiler in October, November and December are 6 623.53 L, 1 776.47 L and 647.06 L respectively, and in the revised MR2.0 and ER spreadsheet version 2.0 they are multiplied by 104.31% (6 909.00 L, 1	1) The flow meter 3# and flow meter 4# are installed to monitor the diesel consumption caused by boiler 2#'s start up and were not calibrated during this monitoring period. The certificate of calibration (certificate No.: JL2012030088080) for flow meter 3# (SN: L1019012) was calibrated on 3 January 2012 and valid up to 2 January 2013 /16/. The certificate of calibration (certificate No.: JL2012030088070) for dry flow meter 4# (SN: L1019030) was calibrated on 3 January 2012 and valid up to 2 January 2013 /16/. Since the error identified in the delayed calibration test /16/ (i.e. 4.31% and 3.23% for flow meters 3# and 4# respectively) are beyond the maximum permissible error of the measuring equipment (1%), the diesel consumption were adjusted in a conservative manner as the higher error of 4.31% has been added to the value of diesel consumption by boiler 2# which is in accordance with the

<table>
<tr><th>CAR ID</th><th>Corrective action request</th><th>Response by Project Participants</th><th>DNV's assessment of response by Project Participants</th></tr>
<tr><td></td><td></td><td>853.04 L and 674.95 L respectively).

(2). The calibration of gate meter and backup meter were conducted on 24 December 2011 for the second time, and valid up to 23 December 2012.

(3). The calibration of 10 kV meter was conducted on 24 December 2011 for the second time, and valid up to 23 December 2012.

<table>
<tr><td>Meters</td><td>Gate meter</td><td>Backup meter</td><td>10 kV meter</td></tr>
<tr><td>Calibration frequency</td><td>Annually</td><td>Annually</td><td>Annually</td></tr>
<tr><td>Calibrated on</td><td>25/12/2010
24/12/2011</td><td>25/12/2010
24/12/2011</td><td>24/12/2010
24/12/2011</td></tr>
<tr><td>Valid date to</td><td>23/12/2012</td><td>23/12/2012</td><td>23/12/2012</td></tr>
</table>
</td><td>Guidelines for assessing compliance with the calibration frequency requirements version 01 /46/.

2) The certificates of calibration for gate meter and backup meter and are provided and were verified to cover the whole monitoring period.

3) The certificates of calibration for 10 kV meters are provided and were verified to cover the whole monitoring period.

Hence the CAR 2 is closed.</td></tr>
</table>

Clarification requests

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 1	After checking the documents about grid-connecting issued by the power company,	Taking into account of short operation period of unit 2, most of the emission reductions were	The actual operation hours of 1# steam turbine generator is 7 140 hours which is 19% higher

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
	DNV can confirm that the 2# unit was connected to the grid on 5 November 2011, which is only 56 days prior to the end of this monitoring period. As per MR for GSP, the actual emission reductions for this monitoring period are 84 692 tCO_2e which is lower than the net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD of 115 514 tCO_2e. The estimation of emission reductions in the registered PDD was based on the total installed capacity of two units. Taking into account of short operation period of unit 2#, clarification is sought on the actual operation of the project during this monitoring period.	caused by the operation of the 1# generator. According to the statistics from the monitoring records, the total of the down time of 1# generator is about 1 500 hours, and the actual operation hours is 7 140 hours which is longer than the estimated operation hours (6 000) in the registered PDD. What's more, there is no heat generation during this monitoring period due to delayed construction of heat network. As a result, the project is forced to operate under pure condensing scenario (with no steam extraction). As described in the PDD, the power capacity of the project with no steam extraction is 15MW*2=30MW. So the power capacity of the 1# generator can reach 15 MW, which is larger than 12 MW estimated under co-generation scenario. From the reasons presented above, longer operation hours and larger power capacity result in more net electricity generation and emission reductions.And what is very important is because 2# generator was put into use late in 2011, the quantity of the storage of biomass residues was rather large during current monitoring period. The 1# generator had to operate longer and with a higher power capacity sometimes in order to consume more biomass residues. In spite of those above, during current	than the estimated annual operation hours of 6 000 in the revised PDD. There is no heat was generated during this monitoring period because the heat pipeline was not laid down yet which was confirmed during the site visit. Hence the project was operated under pure condensing condition. As per the Technical specification of turbine /9/ and interview with the technical stuff of the project during the site visit /47/, the output capacity of turbine can reach 15 MW. Although the 2# unit was connected to the grid on 5 November 2011, which is only 56 days prior to the end of this monitoring period, taking into account of longer operation hours of unit 1# and higher output capacity of steam turbines of both two units under pure condensing condition, DNV considered the electricity generation achieved in this monitoring period is reasonable. The electricity generation achieved in this monitoring period has been also crosschecked with statement of the electricity transactions of Poyang Kaidi Biomass Power Project for the monitoring period issued by Northeast of Jiangxi Province Power Supply Company /27/. Hence the CL 1 is closed.

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
		monitoring period, the net electricity generation is 87 384.47 MWh, which is lower than the ex-ante estimated quantity 126 720 MWh. And the actual emission reductions for this monitoring period is 81 786 tCO_2e which is lower than the estimated emission reductions (115 030 tCO_2e) in the registered PDD too. And these have no impact on the project's additionality.	
CL 2	As per annual energy balance in MR, the total efficiency of the plant during this monitoring period is 20.63% which is much lower than the designed total efficiency of the plant of approximately 42% in the registered PDD. Clarification is sought on such difference.	The total efficiency of it was designed to be approximately 42% under co-generation scenario. During the whole monitoring period (from 6 January 2011 to 31 December 2011), the plant didn't supply any heat due to the delay of the construction of heating network. The total efficiency of the plant during the monitoring period can't reach 42% under pure condensing scenario (with no steam extraction). Based on the relevant design information from the suppliers and equipment purchase agreement of boiler, generator and turbine, the design efficiencies for these three equipment are 86%, 97 % and 32% (this is under pure condensing condition for steam turbine) respectively, which leads to an overall efficiency of 26.29% in theory for the set of boiler-turbine-generator. Considering the auxiliary power consumption and energy losses of the electric equipment, the efficiency 20.63% observed in this monitoring period for the project activity is reasonable.	There is no heat was generated during this monitoring period because the heat pipeline was not laid down yet which was confirmed during the site visit. Hence the project was operated under pure condensing condition. Taking account of the efficiency of boiler, turbine and generator used by the project /7/ /8/ /9/, the auxiliary power consumption and energy losses of the electric equipment, DNV considered the efficiency of 20.63% achieved in this monitoring period is reasonable. Hence the CL2 is closed.

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 3	By checking the daily operating log and interview with project operator, DNV found that the biomass residues combusted by the project during this monitoring period include rice husk, bamboo crumbs, wood scraps, braches barks and stumps which is inconsistent with the biomass residues type including rice husk, cotton straw, rice straw, bean straw, peanut straw, gingili straw and oil seed rape straws mentioned in the registered PDD. The clarification is sought on such inconsistency.	After the project was put into operation, the project owner deeply found that the production of local straws (cotton straw, rice straw, bean straw, peanut straw, gingili straw and oil seed rape straws mentioned in the registered PDD) was seasonal, dispersive and unabiding, and the collection and transportation of the straws were much more difficult and costlier than expected. As a result, the biomass fuel supply of the plant was severely affected. Meanwhile, a lot of forestry residues (bamboo crumbs, wood scraps, braches, barks and stumps) were produced in Poyang County where the project located, which was not predicted before. And the boilers of the power plant can consume the forestry residues effectively like the straws because of the similar chemical constituents of them. The abundant and sustainable supply of the forestry residues can guarantee the continuous operation of power plant. Additional types of biomass residues including bamboo crumbs, wood scraps, braches, barks and stumps were utilized since the end of 2010. The PDD has been revised regarding the change of biomass types, and the validation opinion by DOE indicated that the change has no impact for the additionality, the applicability and the application of the applied methodology. The request of changes regarding biomass residues and revised PDD (version 5) will be submitted to EB with the	A revised PDD is requested according to the project design change. The biomass residue utilized has been updated in the revised PDD. The assessment of the changes is submitted together with the revised PDD (version 05 of 22 August 2012 /3/) for acceptance by the CDM EB as part of the request for issuance for this monitoring period. DNV was able to confirm that the biomass changes for the project would not impact the additionality of project activity negatively, would not change the scale of CDM project activity, and would not change the applicability of ACM0006 (version 9). Since the quantity and nature of each biomass residue used in the calculation of emission reductions in the registered PDD are changed due to the change of biomass residue types, the annual estimated emission reductions have been updated to reflect to the actual project implementation and operation. Hence CL 3 is closed.

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
		revised MR.	
CL 4	Through on-site inspection, DNV found the following inconsistencies: • The generators' manufacturer is Nanjing Turbine & Electric Machinery (Group) Co., Ltd. in the nameplate, which is inconsistent with the manufacturer's name (Nanjing Steam Turbine (Group) Co.,) in the PDD; • The turbines' model is C12-4.90/0.981-12 in the nameplate, which is inconsistent with the model (C12-4.90/0.981-12/435℃) in the PDD and the model (C12-4.90/0.981-12/435) in MR; • The boilers' model is KG65-450/5.29-FSWZ1 in the nameplate, which is inconsistent with the model (KG65-450/5.29-FSWZ-I) in the PDD and MR. The clarification is sought on the above inconsistencies.	The generator' manufacturer is Nanjing Turbine & Electric Machinery (Group) Co., Ltd. And the old name "Nanjing Steam Turbine (Group) Co., Ltd" was used before. There was a typo without "Ltd" in the manufacturer's name (Nanjing Steam Turbine (Group) Co.,) in the registered PDD. The turbines' model (C12-4.90/0.981-12/435℃) in PDD was according to the Technical Agreement of turbines at equipment purchase stage, and "435℃" indicates the main steam temperature is 435℃. The turbines' nameplate shows the model is "C12-4.90/0.981-12" without "435℃". Omitting the main steam temperature is the common practice of domestic turbine manufacturers in printing nameplates. According to the "Model numbering method for utility boiler (JB/T 1617-1999)", the third part of the boiler's name refers to fuel code and the design serial number. "FSWZ" means the fuel is biomass, with "SWZ" being the first letter of Chinese Pinyin "Sheng Wu Zhi"; "I" indicates it is the first design. The dash is meant to separate the fuel code and the design stage and was neglected in the PDD. Therefore, the implementation of project is in compliance with the registered PDD. To	The generator manufacturer is Nanjing Turbine & Electric Machinery (Group) Co., Ltd. which was verified with the nameplate and the technical specification of generator /9/. The generator manufacturer has been revised to Nanjing Steam Turbine (Group) Co., Ltd in the revised PDD version 05 /3/ which was verified to be consistent with the nameplate and MR. According to the technical specification of turbine /8/ and the nameplate verified during the site visit, the main steam temperature of the turbines used in the project is 435℃. Hence DNV considered the clarification on the model of turbines is reasonable and acceptable. According to Model numbering method for utility boiler JB/T 1617-1999 /35/, the last number of the type number indicates the design version. Hence DNV considered both 1 and "-I" are indicating it's the first design version. The boiler type in the revised PDD 05 has been revised to KG65-450/5.29-FSWZ1 which is consistent with the nameplate of the boilers and the MR. Hence the CL4 is closed.

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
		be consistent, the PDD is revised to correct the mistakes.	
CL 5	As per the registered PDD, the standard density of diesel (0.85 kg/litre) was used to calculate the mass of diesel used in the project activity. However, the volume quantity of diesel was measured for the project start-up and combusted in the project plant for other purpose that is attributable to the project activity. Hence, the calculating process of mass quantity of diesel consumed in the project activity shall be addressed in the ER spreadsheet.	The volume quantity of diesel was measured for the project start-up and combusted in the project plant for other purpose that is attributable to the project activity has been added in the revised ER spreadsheet. The standard density of diesel (0.85 kg/litre) was used to calculate the mass of diesel.	The diesel consumption of diesel was measured in volume and was converted to the mass of the diesel using the standard density of diesel (0.85 kg/liter) in the revised ER spreadsheet which was verified to be correct by DNV. Hence the CL 5 is closed.
CL 6	As per registered PDD, the accuracy of the meters used to monitor on-site electricity consumption will not be lower than 0.5%. However during the on-site visit, DNV found two meters (SN 0807105 and 10073628) were installed to monitor the on-site electricity consumption and the accuracy of meter (SN 10073628) is 2.0 which did not meet the requirement of accuracy in the registered PDD. Furthermore, as part of internal electricity consumption, there is not separate invoice for such on-site electricity consumption as cross-check according to the registered PDD. The clarification is sought for the inconsistency above.	The meter with the accuracy 2.0% was installed to monitor the on-site electricity consumption ($EC_{PJ2,y}$). But the monitoring data $EC_{PJ2,y}$ is missing, and according to the registered PDD it should be calculated conservatively as the weight of biomass reisdue smashed in tons and the electricity consumption factor (kWh/ton). As described in the PDD, $EC_{PJ,y}$ can be conservatively calculated as the weight of straws smashed in tons and the electricity consumption factor. There are two machines installed on-site with the type BX2113 and Vermeer HG365E. The electricity consumption factor of BX2113 is 250kW/(30t/h)=8.333kWh/t, and the largest conservatively electricity	Due to the missing of monitoring data, the On-site electricity consumption was calculated conservatively as the weight of biomass residue smashed in tons and the electricity consumption factor (kWh/ton) as per the revised PDD /3/. The on-site electricity consumption is raised by two on-site crushers. The model types of them are BX2113 and Vermeer HG 365E and the electricity consumption factor of them are calculated to be 8.333 kWh/t and 6.8044 kWh/t respectively according to their technical specification /28/. The larger value of 8.333 kWh/t was used for the calculation for conservativeness. All the biomass residues consumed by the project are considered to be smashed for conservativeness and the data needed for the calculation was recorded in the log books /24/

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
		consumption factor of Vermeer HG365E is 224.546kW/(33t/h)=6.8044kWh/t. For the sake of conservative, all of the wood scraps, braches, barks and stumps consumed during the monitoring period are considered to be smashed. The quantity is 112 555.13 t totally, so the ECPJ, y can be calculated conservatively when using the largest electricity factor 8.333kWh/t: $EC_{PJ, y}$ =8.333kWh/t*112 555.13t/1000 =937.96MWh.	and aggregated monthly /25/. Therefore the measurement of two meters (SN 0807105 and 10073628) are not adopted and the separated invoices for such on-site electricity are not needed for cross-checking the measurement of the meters. DNV considered the conservative calculation for on-site electricity consumption was in line with the revised PDD /3/. Hence the CL 6 is closed.
CL 7	As per the registered PDD, the $FF_{project\ plant,i,y}$, $FF_{project\ site,i,y}$ shall be cross-checked with purchase receipts and the $EC_{PJ,y}$, $EG_{project\ plant,y}$ shall be cross-checked with receipts from electricity sales and purchase invoices. Clarification is sought on the progress of cross-checking for these parameters.	(1). During the whole monitoring period (from 6 January 2011 to 31 December 2011), the $FF_{project\ plant,i,y}$ and $FF_{project\ site,i,y}$ are 13.74 t and 120.05 t respectively. And the total quantity of the fossil fuel bought-in is 139.30 t according to the purchase receipts of the whole monitoring period. The purchase quantity (139.30 t) is a little larger than the sum of $FF_{project\ plant,i,y}$ and $FF_{project\ site,i,y}$(133.79 t) , and this is because of fuel storage. When the fossil fuel is bought in, some of the fossil fuel is used immediately, and the rest is stored up for the next time. As the storage of fossil fuel wasn't measured, $FF_{project\ plant,i,y}$ and $FF_{project\ site,i,y}$ can't be cross-checked with purchase receipts exactly. For the sake of conservative, all of the fossil fuel purchased is considered to be used up without fuel storage. In this case, the $FF_{project\ site,i,y}$ can be calculated	The total amount of purchase invoices for diesel for this monitoring period is 139.30 t which includes the amount of diesel $FF_{project\ plant,i,y}$ used for the start-up of the boilers and the amount of diesel $FF_{project\ site,i,y}$ for other purposes that are attributable to the project. As the storage of the diesel wasn't measured, the total amount of purchase invoice for $FF_{project\ plant,i,y}$ and $FF_{project\ site,i,y}$ subtracting the amount of $FF_{project\ plant,i,y}$ will be used as $FF_{project\ site,i,y}$. DNV considered this is conservative and reasonable. The reported data for $EG_{project\ plant,y}$ was cross-checked with the statement of the electricity transactions of Poyang Kaidi Biomass Power Project during 6 January 2011 to 31 December 2011 issued by Northeast of Jiangxi Province Power Supply Company (on behalf of CCPG) on 20 January 2012 /27/ and verified to be reliable by DNV.

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
		conservatively as follow: $FF_{project\ site,i,y}$ =Fuel purchase- $FF_{project\ plant,i,y}$ =139.30 t-13.74 t=125.56 t In the revised MR, $FF_{project\ plant,i,y}$ is 13.74 t (16 166.41 L) which is proved to be reliable, and $FF_{project\ site,i,y}$ is 125.56 t（14 7718 L） which is increased by 6482L than it was before. (2). For this project, the date of electricity transaction is in the middle of every month(not a fixed date), while the values of the electricity are calculated monthly from the first day to the last day of every month in the MR. So the $EC_{PJ,y}$, $EG_{project\ plant,y}$ can't be cross-checked exactly with the receipts from electricity sales and purchase invoices monthly. According to an official letter written by the electric power settlement department (Northeast of Jiangxi Province Power Supply Company), the total electricity import and export through the 110KV line are 101.12MWh and 87384.47MWh, and the total electricity imported through the 10KV backup line is 134.28MWh during the whole monitoring period (from 6 January 2011 to 31 December 2011), which is just the data used in the MR The letter has been sent to the DOE for cross-check.	Hence the CL 7 is closed.
CL 8	As per the MR, the serial numbers of two belt weigher are 081109 and 081112, respectively.	It's a mistake made during drafting the MR. The serial numbers of two belt weigher are	The serial numbers of belt weigher have been revised in the MR version 2.0 and were

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
	However the serial numbers on the nameplate of corresponding belt weigher are 0811109 and 0811112. Clarification is sought on the inconsistency of the serial number and corresponding calibration certificates.	0811109 and 0811112 respectively in fact, and the correction has been conducted in the revised MR version 2.0. And the calibration certificates have been sent to the DOE for cross-check.	verified to be consistent with the nameplates. The certificates of calibration for the belt weigher have been provided by PP and were verified to cover the whole monitoring period. Hence the CL 8 is closed.

Forward action requests from previous verification

FAR ID	Forward action request	Summary of how FAR has been addressed in this reporting period	Assessment of how FAR has been addressed
FAR 1	N/A		

Forward action requests from this verification

FAR ID	Forward action request	Response by Project Participants
FAR 1	N/A	

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APPENDIX B

POST REGISTRATION CHANGES

Type of post registration change	**Description of post registration change***	**Is prior approval by CDM EB required**?**	**In case prior approval by CDM EB is required, when was post registration change approved?**
Corrections	1. The manufacturer of steam turbine is changed in the PDD from NanJing Steam Turbine (Group) Co., Ltd to Nanjing Turbine & Electric Machinery (Group) Co., Ltd. The manufacturer of generator is changed in the PDD from NanJing Steam Turbine (Group) Co., to Nanjing Turbine & Electric Machinery (Group) Co., Ltd. The manufacturer of generator in the PDD shall be NanJing Steam Turbine (Group) Co., Ltd too. There is a missing of Ltd in the name of manufacturer in the PDD. 2. The model type of boiler is changed from KG65-450/5.29-FSWZ-I to KG65-450/5.29-FSWZ1. 3. Both weight meters and belt weighers are specified to monitor the Quantity of each biomass residue type combusted in the project plant in year y ($BF_{k,y}$) in the registered PDD. The PDD has been revised to ensure consistency in stating the monitoring equipment, which will only be the belt weigher. 4. The registered PDD stated the energy balance used for crosscheck of the quantity of biomass combusted in the project plant will be prepared annually in section B.7.1 "Data and parameters monitored". However the registered PDD also stated that the energy balance will be prepared monthly in section B.7.2 "Description of the monitoring plan". Section B.7.2 was thus corrected to be consistent with the frequency of the energy balance stated in section B.7.1. An annual energy balance was verified to be in line with the requirements of ACM0006 (version 09).	☐ Yes ☒ No	*Not applicable*
Temporary deviations from the registered monitoring plan and/or monitoring methodology	*Not applicable*	☐ Yes ☐ No	*Not applicable*

Type of post registration change	**Description of post registration change***	**Is prior approval by CDM EB required**?**	**In case prior approval by CDM EB is required, when was post registration change approved?**
Permanent changes from the registered monitoring plan or applied methodology	*Not applicable*	☐ Yes ☐ No	*Not applicable*
Changes to the project design of a registered project activity	In the registration PDD version 04 dated 31 March 2010 /30/, regarding the biomass residue utilized, it was stated that "rice husk, cotton straw, rice straw, bean straw peanut straw, gingili straw and oil seed rape straw". By checking the daily operating log books /24/, DNV was able to confirm the main biomass residues utilized for the project were rice husk, bamboo crumbs, wood scraps, branches, barks and stumps during this monitoring period. In addition, to revising the PDD with regard to the changes in the type of the biomass residue, the PDD was also revised in section A.3 to reflect that Camco International Limited was authorized by Switzerland to participate in this project. The request to also add Switzerland as Party involved in the project has been accepted by the UNFCCC on 18 April 2011.	☐ Yes ☒ No	*Not applicable*

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APPENDIX C

CURRICULA VITAE OF THE VERIFICATION TEAM MEMBERS

Lin Wu

Lin Wu *holds a Master Degree in Chemical Engineering & Process, a Bachelor Degree in Chemical Engineering & Process and a Bachelor Degree in Computer Science & Technology, having an overall experience of around 8 years. Prior to joining DNV, he has around four years experiences in chemical industry covering design of chemical process and system, piping design, commissioning and project management on site. His experience also covers the fields of desulfurization of flue gas in power plant industry.*

He has experience of around 4 years in validation and verification of CDM/JI projects and other 3rd party validation/verification services.

His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in "Energy Generation from Renewable Energy Sources" and "Chemical Processes Industries".

Lin Jinwei

Liu Jinwei *holds a Master Degree in Thermal-Physics. Prior to joining DNV, he has 3 years of experience in thermal power industry.*

He has experience of more than 1 year in validation and verification of CDM projects in DNV. His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in "Energy Generation from Renewable Energy Sources" and "Thermal energy generation from fossil fuels and biomass including thermal electricity from solar".

Simon Wong Yon Sing

Simon Wong Yon Sing *holds a Bachelor's Degree in Chemical Engineering with Environmental Engineering, with a year experience in the field of design and operation/maintenance of wastewater treatment as part of working in wastewater design & equipment supply services.*

His experience in designing and maintaining the wastewater treatment systems covers the fields of various manufacturing and chemical industries in Malaysia.

He has experience of more than 5 years in validation and verification of numerous CDM projects in DNV, both in Malaysia and abroad. His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in "Energy Generation from Renewable Energy Sources", "Waste Handling and Disposal" and "Animal Waste Management System".

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