
VERIFICATION AND CERTIFICATION REPORT

EDF Trading Limited

**Shandong Gaotang 30MW Biomass
Power Generation Project**

(UNFCCC Ref. No.: 1375)

(MP2 from 26/03/2009 to 25/12/2012) (Both days inclusive)

SGS Climate Change Programme

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Date of Issue:		Project Number:	
08/07/2014		CDM.VER0966 MP2	
Project Title:			
Shandong Gaotang 30MW Biomass Power Generation Project			
Organisation:		Client:	
SGS United Kingdom Limited		EDF Trading Limited	
Publication of Monitoring Report:			
Monitoring Period:		26/03/2009 to 25/12/2012	
First Monitoring Report Version and Date:		Version 01 dated 20/01/2014	
Final Monitoring Report Version and Date:		Version 02 dated 11/03/2014	
Summary:			
<p>SGS United Kingdom Ltd has performed the second periodic verification of the CDM project "Shandong Gaotang 30MW Biomass Power Generation Project", bearing UNFCCC reference number 1375, with registration date of 20/03/2008 and first crediting period from 20/03/2008 to 19/03/2015. The verification includes confirming the implementation of the monitoring plan of the approved revised Project Design Document Version 07 dated 02/10/2011 (approved by CDM EB on 02/03/2012) and the application of the monitoring methodology as per ACM0006, Version 04. A site visit was conducted to verify the data submitted in the monitoring report. SGS confirms the following has been reviewed:</p> <ul style="list-style-type: none"> (a) The approved revised PDD, including the monitoring plan and the corresponding validation report; (b) Monitoring report, previous verification report, and the Emission Reduction Calculation Spreadsheet; (c) The applied monitoring methodology; (d) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board; (e) All information and references relevant to the project activity's resulting in emission reductions. <p>This registered biomass power generation project utilizes local surplus biomass residues (Cotton Straw, Wood Residues and Wheat Bran) for generating electricity. The total installed capacity is 30MW. It is estimated that the project can deliver 187,626 MWh/year of electricity to the North China Grid (NCG), which consume nearly 247,506 tons biomass residues (on wet base) per year. The monitoring plan of the project had been revised together with registered PDD and the resulting revised PDD was approved by the CDM EB on 02/03/2012.</p> <p>SGS confirms that the project is implemented in accordance with the validated and revised Project Design Document. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 528,473 tCO₂e emission reductions during period 26/03/2009 up to 25/12/2012.</p>			
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CDM Verification			
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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Request
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
EB	Executive Board
EF	Emission Factor
ETN	Electricity Transaction Note
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Period
MR	Monitoring Report
MRR	Monthly Reading Record
NA	Not applicable
NCG	North China Grid
NCV	Net Calorific Value
PDD	Project Design Document
PP	Project Participant
PPA	Power Purchase Agreement
P.R.China	People's Republic of China
RMP	Revision of Monitoring Plan
SGS	SGS United Kingdom Ltd
TA	Technical Area
UK	United Kingdom of Great Britain and Northern Ireland
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

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1. Introduction

1.1 Objective

SGS United Kingdom Ltd has been contracted by EDF Trading Limited (one of the project participants of the project) to perform an independent verification of its CDM project "Shandong Gaotang 30MW Biomass Power Generation Project". CDM projects must undergo periodic audits and verification of emission reductions as the basis for issuance of Certified Emission Reductions (CERs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The emissions report conforms with the requirements of the monitoring plan in the approved revised PDD and the approved methodology; and
- The data reported are complete and transparent.

1.2 Scope

The scope of the verification is the independent and objective review and ex post determination of the monitored reductions in GHG emission by the project activity. The verification is based on the validated and approved revised project design document and the monitoring report. The project is assessed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance.

SGS has, based on the recommendations in the Validation and Verification Standard, employed a risk-based approach in the verification, focusing on the identification of significant reporting risks and the reliability of project monitoring.

Due professional care has been exercised and ethical conduct has been followed by the assessment team during the verification process. The verification report is a fair presentation of the verification activity.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 Project Activity and Period Covered

This engagement covers emissions and emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the following project and period.

Title of Project Activity:	Shandong Gaotang 30MW Biomass Power Generation Project
UNFCCC Registration Number:	1375
Monitoring Period Covered in this Report:	26/03/2009 to 25/12/2012
Project Participants:	Host Country: National Bio Energy Co., Ltd. (P.R.China) Annex I Country: EDF Trading Limited, (United Kingdom of Great Britain and Northern Ireland)
Location of the Project Activity:	Gaotang County, Shandong Province, P.R.China

2. Methodology

2.1 General Approach

SGS performs the verification work using a Periodic Verification Checklist prepared following the VVS. The Periodic Verification Checklist describes the verification approach and the sampling plan.

The checklist gives the assessment team a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;
- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the monitoring report.

Using the Periodic Verification Checklist, SGS verified the implementation of the monitoring plan and the data presented in the Monitoring Report for the period in question. This involved a site visit and a desk review of the monitoring report. This verification report describes the findings of this assessment.

Only verification activities undertaken after the publication of the monitoring report on the UNFCCC CDM website were used as a basis for SGS to conclude our verification and submit a request for issuance of CERS to the Board.

2.2 Verification Team for this Assessment

A team of competency has been selected to perform the verification of the project.

Name	Role
Karen Tong	Team Leader/ Lead Assessor/Local Assessor
Sarah Chan	Assessor
Yi Liao	Technical Area expert (TA 1.1)

2.3 Means of Verification

2.3.1 Review of Documentation

The approved revised PDD, and the monitoring report submitted by the client and additional background documents related to the project performance were reviewed. A complete list of all documents reviewed is attached in section 8 of this report.

2.3.2 Site Visits

As part of the verification, the following on-site inspections have been performed by Karen Tong and Yi Liao.

Location: Gaotang County, Shandong Province, P.R.China	
Date: 20-21/02/2014	
Coverage:	Source of Information / Persons Interviewed
1. An interview with project participants, including reviewing the implementation statues of the project, key physical components of the project, monitoring plan and staff training records;	Ms. Julia Lee, EDF Trading Limited. Mr. Yuning Li, National Bio Energy Gaotang Co., Ltd.
2. Visual inspection on key physical components and spatial configuration of the operating and monitoring system of the entire project;	Mr. Zhang Tao, National Bio Energy Gaotang Co., Ltd.
3. A review of the Monitoring Report, meter reading records, sales receipts and wind turbine generation logbooks;	Mr. Li Fujing, National Bio Energy Gaotang Co., Ltd.
4. Collection of the calibration certificates of the metering system and the qualification for the calibrating entity;	Ms. Yu LU, National Bio Energy Gaotang Co., Ltd. Ms. Chen Hailing, National Bio Energy Gaotang Co., Ltd.
5. Inspection of the control room, instrument room, transformer substation;	Mr. Sun Peiyi, National Bio Energy Gaotang Co., Ltd.
6. Review of calculations and assumptions made in determining the GHG data and emission reductions;	Mr. Lin Zuqing, National Bio Energy Gaotang Co., Ltd.
7. Identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.	Mr. Lin Chunlei, National Bio Energy Gaotang Co., Ltd.

2.4 Reporting of Findings

As an outcome of the verification process, the team can raise different types of findings.

In general, where insufficient or inaccurate information is available and clarification or new information is required the team shall raise a Clarification Request (CL) specifying what additional information is required.

Where a non-conformance arises the team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

- I. Non-compliance 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 that will impact the quantity of emission reductions;
- IV. Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants

The verification process may be halted until this information has been made available to comply with the requirements of the CDM Executive Board. Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

A clarification request (CL) will be raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. All CARs and CLs raised during verification shall be resolved prior to submitting a request for issuance.

Corrective Action Requests and Clarification Requests are raised in the Periodic Verification Checklist. The Project Developer is given the opportunity to “close” outstanding CARs and respond to CLs.

Forward Action Requests (FARs) may be raised during verification for actions where the monitoring and reporting require attention and/or adjustment for the next verification period, which are for the benefit of future projects and future verification activities. These have no impact upon the completion of the verification activity.

All CARs, CLs and FARs for this verification period are included in this report.

2.5 Internal Quality Control

Following the completion of the assessment process and a recommendation by the Assessment Team, all documentation will be forwarded to a Technical Review Team. The task of the Technical Review Team is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

Technical Review Team

Name	Role
Linda Hu	Technical Reviewer
Jumson Fu	Technical Area expert (TA 1.1)

3. Verification Findings

3.1 Project Implementation

This is a registered biomass power generation project utilizing local surplus biomass residues (Cotton Straw, Wood residues and wheat bran) for generating electricity. The registered PDD of the project had been revised together with the monitoring plan in the PDD and the resulting revised PDD was approved by the CDM EB on 02/03/2012 (/2/).

The total installed capacity is 30 MW. It is estimated that the project can deliver 187,626 MWh/y of electricity to the North China Grid (NCG), which consumes nearly 247,506 tons biomass residues (on wet base) per year as per the approved revised PDD. Referring to the project information on the UNFCCC website, <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1191857086.36/view>, the project was registered on 20/03/2008 against ACM0006 Version 04 (/1/). The first crediting period is from 20/03/2008 to 19/03/2015 (renewable). This verification covers the second monitoring period from 26/03/2009 to 25/12/2012. The start date of this monitoring period is 26/03/2009, the day after the end date of the first monitoring period (20/03/2008 to 25/03/2009). The end date of this monitoring period is 25/12/2012, which is still within the first crediting period (/3/).

The following has been checked to verify the applicability of the methodology to the project activity.

1. It was confirmed that the predominant fuels used by the project are cotton stalk, wood residues, wheat bran, and no other type of biomass was used in the power plant, which were confirmed by reviewing the detailed biomass residues purchase records (/25/) and interviewing with the staff member of the project during the onsite visit.
2. The cotton stalk used by the project is by-products of agriculture crops, not from a production process. The wood residues are provided by local woodwork factories through wholesalers and retailers. Some of the Wheat bran was provided by Shandong Quanlin Paper factory. A statement issued by Shandong Quanlin Paper factory were provided and confirmed that all the wood residues and wheat bran supplied by them are biomass residues and do not result in any increase of processing capacity of raw input or in other substantial changes in the wood plate production process(/8/).
3. As confirmed during interviews with the staff of the project, it was claimed that the storage of biomass residues are less than one year.
4. The fossil fuel consumed by the project is used in mechanical treatment of the biomass residues for fuel combustion which was also confirmed by reviewing the fuel consumption record and interviewing with the staff working on the project site (/9/).

Based on the assessment work above, the assessment team confirmed that the applicability of the methodology was met by the project.

The construction of the project started since 01/04/2006. The project started trial operation on 29/01/2007 and the full commercial operation started in April 2008. Relevant project implementation records (/14/) have been provided by the PP and verified by the assessment team. Reported information related to installed technical equipments (i.e. Boiler, Turbine and Power generator) has been checked against the actual installed equipments. Information consistency has been confirmed by the assessment team (/11/).

By checking the line connection diagram of the electricity system of the project (/12/) and the Power Purchase Agreement (PPA, /13/), it is confirmed that the electricity generated by the power plant is delivered to North China Grid (NCG). Therefore, the project boundary is consistent with the approved revised PDD.

It was confirmed that there is no additional source of GHG emissions attributable to the project. No fossil fuels were observed to be used for power generation by the project during this monitoring period.

Project participants (PPs) have set up a CDM manual and other internal management procedures (/15/). During this monitoring period, the project has been well operated following the CDM manual and management procedure. The staff are well trained and qualified (/16/). During this monitoring period, monitoring equipments were replaced (/17//18/), as detailed in section 3.4.

Through document review and on-site visit, it has been confirmed by the assessment team that the project participants have operated the CDM project activity as per the approved revised PDD.

In accordance with the *Guidelines for Completing the Monitoring Report Form* (Annex 7, EB 75, /47/), the monitoring report contains a comparison of the actual emission reduction claimed for this monitoring period with the estimate in the approved revised PDD. The estimated emission reductions were calculated as 679,419 tCO₂e (679,419 tCO₂e=180,881 tCO₂e/365 days*1,371 days) for the period 26/03/2009 to 25/12/2012 (1,371 days) as per the estimation in the approved revised PDD. The actual emission reduction has been verified as 659,061 tCO₂e, which is 3% lower than the ex-ante estimate. Based on the information in the approved revised PDD, the assessment team confirmed that no significant increase in estimated emission reductions. Further, according to the requirement by EB 66th meeting (/19/), the annual amount of ERs to be issued to this project activity shall be capped at the average annual emissions reductions estimated in the original registered PDD, i.e. 140,695 tCO₂e. Thus, **528,473 tCO₂e** (528,473 tCO₂e =140,695 tCO₂e /365 days*1,371 days) were claimed for this monitoring period.

CAR #6 was raised for some typographical issues in the MR version 02 and ER spreadsheet version 03:

- Page 8 of the MR, the spelling of parameter EF_{gird} is incorrect.
- Pages 16 and 17 of the MR, under the header “measuring/reading/recording frequency”, the text are a different font/format from MR template text.
- Page 26 of the MR, the version of the methodology shall be added.
- The verification of the MR is against the revised PDD, thus, in the ER spreadsheet the “PDD” in cover page tab, cell B15 and ER calculation tab, Cell A422 shall be “revised” PDD.

Monitoring report version 02 dated 11/03/2014 and ER spreadsheet version 03 dated 11/04/2014 were revised by the client with the minor issues addressed. Considering these are minor issues, the version number of the MR and ER spreadsheet remains unchanged. It is accepted by the assessment team. CAR #6 was closed out.

3.2 Post registration changes

There was a post registration change to the project during the first monitoring period. The post registration change was approved by the CDM EB on 02/03/2012.

There is no post registration change to the project during this monitoring period.

3.2.1 Temporary deviations from registered monitoring plan or applied methodology

There is no temporary deviation from the approved revised monitoring plan or applied methodology to the project during this monitoring period.

3.2.2 Corrections

There is no correction to the project during this monitoring period.

3.2.3 Permanent changes from registered monitoring plan or applied methodology

There is no permanent change from the approved revised monitoring plan or applied methodology to the project during this monitoring period.

3.2.4 Changes to project design of registered project activity

There is no change to the project design of the registered project activity during this monitoring period.

3.2.5 Changes to start date of crediting period

The starting date of the crediting period of the project has not been changed since registration.

3.3 Remaining Issues, CAR's, FAR's from Previous Validation or Verification

This is the 2nd periodic verification for the project. There are no remaining issues from the validation stage and previous verification, which was confirmed by reviewing the validation report for registration, the validation opinion on the post change to the PDD, and the verification report for the first monitoring period (/5//6//7/).

3.4 Completeness and accuracy of Monitoring

3.4.1 Verification of monitoring of parameters

Monitoring of reductions in GHG emissions to result from the registered project have been implemented in accordance with the monitoring plan contained in the approved revised PDD. The monitoring mechanism, including the data collection system, is effective and reliable and verified to be in compliance with the applied methodology.

All baseline emission parameters, project emission parameters, and leakage parameters are verified to be monitored in compliance with the approved revised PDD. The monitoring of the parameters is detailed as follows.

3.4.1.1 *EG_y*: Net quantity of electricity delivered to grid in year y (Baseline Emission Parameter)

As per the approved revised monitoring plan, *EG_y* is continuously measured by meters with the accuracy of 0.2%. It was verified that there are three bidirectional meters involved in monitoring the parameter in this monitoring period. The information of the meters and their usage duration in the monitoring period (MP) are listed as follows.

The accuracy of the meters is verified to be consistency with the calibration reports.

SN	Type	Accuracy	Date of the replacement	Usage duration in the MP
200306083C0123	DTSD341	0.5	25/04/2009 00:00	26/03/2009-25/04/2009
95280	DTSD341	0.5s	13/01/2013 00:00	25/04/2009-13/01/2011
210299720	MK6E	0.2s	NA	13/01/2011-25/12/2012

It was found that before 13/01/2011 the accuracy of the main meter used to monitor *EG_y* was 0.5, which is not compliance with the requirement in the approved revised PDD. However, it was also clarified in the revised PDD, that this meter is owned and operated by the North-China Power Grid. The project owner has no right to settle or change the accuracy of the main meter. As per the revised PDD, the project owner will discount 0.5% of *EG_y* monitored by the electricity meter with accuracy 0.5 for conservativeness. This conservative approach was applied in the ER spreadsheet when determining the *EG_y* of the project before 13/01/2011 and was verified to be correct. The meters replacement records (/17/) were provided for verification during the site visit. It clearly stated in the meters replacement records that the meter replacement was carried by the Grid Company. The meter readings of the new and old meters before the replacement were clearly reported in the meters replacement records.

The bidirectional meters installed at the 220kV Huixin substation continuously measured the electricity delivered to the grid. Designated personnel from the grid company read the main meter (At 24:00) within the last ten day of a month and recorded the readings of the meters (/20/). Then, the grid company informed the project owner of the amount of electricity delivered to the grid using Electricity Transaction Notes (ETNs,/22/),



and the project owner checked with their own on site installed bidirectional meter reading records for obvious difference (/21/). The power plant issued the electricity sales invoices to the grid company. The data on the Monthly Reading Records (MRRs) were provided for verification. The ETNs issued by the grid company have been provided to and verified by assessment team against reported data for cross check. Data presented in the sales invoices have also been applied for cross check reference (/23/). After data comparison, conservative values between the measured results and sales receipts have been applied for final ER calculation. This is accepted by the assessment team since this is a conservative option. The calculation in the spreadsheet has been walked through and reported values in the final version of MR and ER calculation spreadsheet were verified to be correct (/3//4/).

After consideration of the discount 0.5% of EG_y before 13/01/2011, the final verified measured results for EG_y are 669,244.07MWh. The compliance of the monitoring of EG_y is verified and listed in the following table:

Monitoring Report, onsite checks Approved revised Monitoring Plan & Approved Methodology	Requirement in the applicable methodology and relevant EB Documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & applicable methodology.
Data/Parameter	EG _{project plant,y}	EG _y	EG _y	Compliance
Description	Net quantity of electricity generated in the project plant during the year y	Net quantity of electricity delivered to grid in year y	Net quantity of electricity delivered to grid in year y	Compliance
Measured/Calculated /Default	Measured	Measured	Measured	Compliance
Source of data	On-site measurements	Measured by meters with the accuracy of not less than 0.5	Monitored continuously by a bidirectional electricity meter installed at Huixin Substation	Compliance
Monitoring equipment	meter	Electricity meters	monitored continuously by a bidirectional electricity meter installed at Huixin Substation	Compliance
Measuring/Reading/ Recording frequency	Continuously	Continuous on-site measurements and monthly recording by the power distribution company.	Continuous on-site measurements and monthly recording by the power distribution company	Compliance
Calculation method (if applicable)	NA	NA	NA	NA
QA/QC procedures	The consistency of metered net electricity generation should be cross-checked with receipts from electricity sales (if available) and the quantity of fuels fired(e.g. check whether the electricity generation divided by the quantity of fuels fired results in a reasonable efficiency that is comparable to previous years).	The electricity meter will be operated by the power distribution company and calibrated periodically according to relevant national standards (for example: JJG596-1999).Data measured by meters will be cross checked by the electricity sales receipts. Furthermore, PPs decided to discount 0.5% of EG _y monitored by electricity meter with accuracy 0.5 for conservativeness.	The electricity meter is operated by the power distribution company and calibrated at least once a year by accredited entity. The monthly metered electricity records have been cross checked by electricity sales receipts. According to the approved PDD version7, PPs decided to discount 0.5% of EG _y monitored by electricity meter with accuracy 0.5 for conservation. In this monitoring period, the 0.5% discount was applied before 13/01/2011 00:00, as the main meter with accuracy of 0.2s was put into use since 13/01/2011 00:00.	Compliance

3.4.1.2 $EC_{PJ,y}$ On-site electricity consumption attributable to the project activity during the year y

As per the revised monitoring plan, on-site electricity consumption attributable to the project activity consists of two parts, one part is the electricity consumption at the project power plant, and the second part is the electricity consumption at the biomass collection stations. The first part of the $EC_{PJ,y}$ is measured by the same main meters of EGy installed at the substation of the grid company (220kV Huixin substation) and the accuracy of the meters are in compliance with the requirement in the approved revised PDD. The second part is the electricity consumption at the seven biomass collection stations. During this monitoring period, it was verified that the suppliers of the biomass residues sent the residues to the large biomass residues collection station at the project site directly. The other seven collection stations were not used in this monitoring period and there is no electricity consumed in these stations in this monitoring period.

In the monitoring report (MR) version 01, there is no monitoring information on the electricity consumed in the seven collection stations. The monitoring of $EC_{PJ,y}$ reported in the MR shall be corrected for sake of transparency. CAR #1 was raised.

In response to CAR #1, the monitoring report was revised. In the revised MR version 02 dated 11/03/2014, it was found that the information on the monitoring of the electricity consumed in the seven biomass residues collection stations has been added in monitoring report section C and section D.2. As per the revised PDD, the electricity consumed in the seven biomass residues collection station was measured by the meters installed at the collection stations with accuracy of 2.0 separately. By reviewing the calibration certificates of the meters (/36/), it can be confirmed that all the meters uses in the seven collection stations are calibrated as per relevant standards. There is statement issued by the local grid company confirming this (/23/). By reviewing the statement it was confirmed that there is no electricity consumption during this monitoring period.

Based on the verification work carried above, CAR #1 was closed out.

In sheet "EGy" of ER calculation spreadsheet, G59-G104, the formula used (MIN (data from meter reading, data from sale receipts)) is not correct. CAR #5 was raised for revision to the ER calculation spreadsheet in this regard. In response to this finding, The ER calculation spreadsheet was revised and updated to version 03, dated 11/04/2014. The Formulas were verified to be correct. CAR #5 was closed.

Monitoring process for electricity consumption at the project power plant is as same as EGy. ETNs and Electricity purchase invoices issued by the grid company (/22//23/) have been used for verification and cross check reference. After data comparison, conservative values have been applied for final ER calculation. This is accepted by the assessment team since this is a conservative option. The calculation in the spreadsheet has been walked through and reported values in the final versions of both the MR and the ER calculation spreadsheet were verified to be correct.

The compliance of the monitoring of $EC_{PJ,y}$ with the applied methodology and the revised PDD were verified and listed in the following table:

Monitoring Report, onsite checks	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Approved revised Monitoring Plan & Approved Methodology				
Data/Parameter	EC _{PJ,y}	EC _{PJ,y}	EC _{PJ,y}	Compliance
Description	On-site electricity consumption attributable to the project activity during the year y	On-site electricity consumption attributable to the project activity during the year y (including the electricity consumed for the preparation of the biomass residue in all collection stations)	On-site electricity consumption attributable to the project activity during the year y	Compliance
Measured/Calculated /Default	Measured	Measured	Measured	Compliance
Source of data	On-site measurements	The electricity consumed by the project plant is measured by the main meter installed at the power distribution company with accuracy of 0.5. The electricity consumed for the preparation of the biomass residue in all collection stations is measured by meters installed at the collection stations with accuracy of 2.0 separately.	Main meter reading at Huixin substation and meters in the seven collection stations.	Compliance
Monitoring equipment	Use electricity meters. The quantity shall be cross-checked with electricity purchase receipts	The main meter installed at the power distribution station and meters installed at the collection stations.	Main meter reading at Huixin substation and meters in the seven collection stations.	Compliance
Measuring/Reading/ Recording frequency	Continuously, aggregated at least annually	The electricity consumed by the project plant is continuously on-site measured and monthly recording by the power distribution company.	Continuous on-site measurements and monthly recording by the power distribution company	NA
Calculation method (if applicable)	NA	NA	NA	NA
QA/QC procedures	Cross-check measurement results with invoices for purchased electricity if available.	The electricity main meter will be operated by the power distribution company and calibrated periodically according to relevant national standards (for example: JJG596-1999). The electricity meters installed at the collection stations will be calibrated periodically according to relevant national standards (for example: JJG307-1988 or JJG307-2006). Data measured by meters will be cross checked by the electricity sales receipts.	The electricity meter installed at Huixin Substation is operated by the power distribution company and calibrated at least once a year by accredited entity. The monthly metered electricity records have been cross checked by electricity sales receipts. There is no electricity consumed in the seven collection stations, which was confirmed by reviewing the statement issued by the local grid company.	Compliance

3.4.1.3 $BF_{k,y}$: Quantity of biomass residue type k combusted in the project plant during the year y

According to the applied methodology and approved revised monitoring plan, quantity of biomass residue type k combusted in the project plant during the year y ($BF_{k,y}$) should be continuously measured by weight meters installed at the project site. Biomass purchases invoices (if available) should be applied as cross check reference to ensure the data quality. The measurement results should be cross-checked with the energy balance which is based on the purchased quantities and stock changes.

As verified during the site visit, three types of biomass residues including cotton straw (Biomass fuel (BF1), wood residues (BF2), and wheat bran (BF3) have been utilised by the project during this monitoring period. According to the inventory of biomass residues (/24/), all the biomass sources were stored in the storage room for no more than one year which was verified by the assessment team during the onsite visit by interviewing staff member of the project. $BF_{k,y}$ was measured by two electronic truck scales (Electric truck scale #1 and Electric truck scale #2) installed at the project site, owned and operated by the project owner. Grass-grasping vehicles were used to supply the biomass residues to the boiler. For each batch of biomass residues, designated operator recorded the biomass residue type and records the fully loaded vehicle (gross weight) and empty vehicle weight (tare weight) to get the quantity of biomass (Net weight) of this biomass residues type for each batch consumed. The weight values are recorded into daily and aggregated into monthly biomass residue consumption records (/24/). The two electronic truck scales (Electric truck scale #1 and Electric truck scale #2) are also used to monitor the daily biomass residues purchased and monthly summarized in monthly biomass residues purchased records (/25/) which have been used for cross checking the biomass residue consumed by the project. Consistency was observed. Furthermore, the assessment team has compared the biomass residue consumed and corresponding electricity generated, and the same trend were found.

The values in the monthly biomass residues consumption records were applied in calculation. The daily biomass residues consumption records were randomly checked for cross reference. All raw data was checked by the assessment team and the calculation process has also been verified.

In compliance with the approved revised monitoring plan, $BF_{k,y}$ was crosschecked with the annual energy balance that is based on purchased quantities and stock changes. Energy efficiency in this monitoring period is 27.16%. After consultation with the sectoral scope expert and comparing with publicly available information (article "Biomass Power Generation Technology, Issued by Shandong Electric Power Engineering Consulting Institute Corp. Ltd (/26/)); the assessment team noted that the average energy efficiency for the biomass power generation project is around 30%. Therefore, the assessment team confirmed that the energy efficiency measured for this project is reliable.

Monitoring Report, onsite checks	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Approved revised Monitoring Plan & Approved Methodology				
Data/Parameter	BF_{k,y}	BF_{k,y}	BF_{k,y}	Compliance
Description	Quantity of biomass residue type <i>k</i> combusted in the project plant during the year <i>y</i>	Quantity of biomass residue type <i>k</i> combusted in the project plant during the year <i>y</i>	Quantity of biomass residue type <i>k</i> combusted in the project plant during the year <i>y</i>	Compliance
Measured/Calculated /Default	Use weight or volume meters. Adjust for the moisture content in order to determine the quantity of dry biomass. The quantity shall be crosschecked with the quantity of electricity (and heat) generated and any fuel purchase receipts (if available)	On site measured by weight meters and adjust for the moisture content in order to determine the quantity of dry biomass. Meters at the weighing station will undergo maintenance subject to national standards (for example: JJG907-2003).	Measured by two Electric truck scale #1 and Electric truck scale #2	Compliance
Source of data	On-site measurements	Project Records from Project Procurement department of plant	Project records from project procurement department of plant	Compliance
Monitoring equipment	weight or volume meters	Weight meters	Electric truck scale	Compliance
Measuring/Reading/ Recording frequency	Continuously, prepare annually an energy balance	Crosscheck the measurements with an annual energy balance that is based on purchased quantities and stock changes.	Continuous on-site measurements and summarized into monthly summary	Compliance
Calculation method (if applicable)	NA	NA	NA	NA
QA/QC procedures	Crosscheck the measurements with an annual energy balance that is based on purchased quantities and stock changes	Any direct measurement with mass or volume meters at the plant site will be cross checked with the quantity of electricity generated and biomass fuel purchase receipts (if available), and prepare annually an energy balance sheet.	All purchase records, biomass available in the store and biomass quantity combusted for production are all available at the plant site. BF _{k,y} measurements had been crosscheck with an annual energy balance that is based on purchased quantities and stock change for QA/QC.	Compliance

According to ACM0006 version 04, Parameter $BF_{k,y}$ (Quantity of biomass residue type k combusted in the project during the year y in a volume or mass unit) needs to be adjusted to take into account the moisture content in order to determine the quantity of dry biomass.

3.4.1.4 Moisture content of the biomass residues

As per the approved revised PDD, the moisture content of the biomass residues will be measured in the power plant and calculated for the mean values at least annually. It was verified during the site visit that wholesalers and retailers from the surrounding areas of the project site send the biomass residues to the project site. The moisture content and NCV_k (Net Calorific Value) of Biomass Residue type K were selected and sampled by the staff of the project when the biomass residues were transported to the project site. The operator took at least three samples of each kind of biomass residues for each measurement. A set of moisture analyzer has been installed in the power plant (SN: 3506073, Type: SDTGA300, Accuracy: 0.01). The measurement results (/27/) were recorded in the daily lab analysis report, summarized in the monthly measure report, and is kept both electronically and in paper print.

The reported values of the moisture content of the biomass residues are the mean value of measured values for the corresponding kind of biomass residues during the corresponding month. Monthly reported spreadsheets have been applied to calculate the mean value of moisture content for each biomass residues.

In MR Version 01, Table E.2 the moisture of BF2 for period 25/11/2010-25/12/2010 and 26/12/2010-24/01/2011 are not consistent with the verified ones. CAR #4 was raised. In response to the finding, the values were revised to be consistent with verified ones. The values in the ER spreadsheet were checked and confirmed to be correct. Therefore, the first concern in the CAR #4 was closed.

All the raw data from analysis lab and the calculation process were random checked by SGS assessors to confirm the suitability of the value applied in the calculation of the emission reduction.



Monitoring Report, onsite checks Approved revised Monitoring Plan & Approved Methodology	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Data/Parameter	Moisture content of the biomass residues	Moisture content of the biomass residues	Moisture content of the biomass residues	Compliance
Description	Moisture content of each biomass residue type k	Moisture content of each biomass residue type k	Moisture content of each biomass residue type k	Compliance
Measured/Calculated /Default	On-site measurements	Continuously monitored by moisture analyzer. Moisture content of the biomass residues will be both measured in the power plant and calculated the mean values at least annually.	Continuous on-site measurements.	Compliance
Source of data	On-site measurements by moisture analyzer	On-site measurements by moisture analyzer	On-site measurements by moisture analyzer	Compliance
Monitoring equipment	moisture analyzer	moisture analyzer	moisture analyzer	Compliance
Measuring/Reading/ Recording frequency	Continuously, mean values calculated at least annually	Moisture content of the biomass residues will be both measured in the power plant and calculated the mean values at least annually.	Continuous on-site measurements and summarized in monthly measure report	Compliance
Calculation method (if applicable)	NA	NA	NA	NA
QA/QC procedures	NA	NA	NA	NA

3.4.1.5 NCV_k : Net Calorific Value of biomass residue type k consumed by the project

According to ACM0006 version 04, the parameter NCV_k (Net Calorific Value of Biomass Residue type k) needs to be measured at least every six months. As per the approved revised PDD, NCV_k should be measured and reported in the chemical laboratory at least every six months. For each test, at least three samples should be measured for each batch of biomass type.

As verified during the site visit, the same samples taken for the test of the Moisture content of the biomass residues were used for the NCV_k for the biomass residues. A set of calorimeter are installed at the analysis lab of the plant (SN: 1406128, Type: SDACM3000, Accuracy: Qualified). The operator takes at least three samples of each kind of biomass residues for each measurement. The measurement results were recorded in the daily lab analysis report and were summarized in the monthly report both electronically and in paper print (/27/).

The reported values of NCV_k (dry biomass) are the mean of measured values for the corresponding kind of biomass residues during the corresponding month.

In MR Version 01, Table E.6 the NCV of BF2 for period from 25/11/2010 to 25/12/2010, and NCV of BF1 for period from 23/02/2011 to 24/03/2011 are not consistent with the verified ones. CAR #4 was raised. In response to the finding, the values were revised to be consistent with verified ones as there was a typographical error made by the PP. The values in the ER spreadsheet was checked and confirmed to be correct. Therefore, the second concern in the CAR #4 was closed.

All the raw data from analysis lab and the calculation process were verified by SGS assessors during on site visit.

Monitoring Report, onsite checks Approved revised Monitoring Plan & Approved Methodology	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Data/Parameter	NCV _k	NCV _k	NCV _k	Compliance
Description	Net calorific value of biomass residue type <i>k</i>	Net calorific value of biomass residue type <i>k</i> consumed by the project	Net calorific value of biomass residue type <i>k</i> consumed by the project	Compliance
Measured/Calculated /Default	Measured	Measured	Measured and calculated	Compliance
Source of data	Measurements	Measured in project plant	Measured in project plant	Compliance
Monitoring equipment	Not mentioned	Not mentioned	NCV _k is on site measured by calorimeter.	Compliance
Measuring/Reading/ Recording frequency	Measurements shall be carried out at reputed laboratories and according to relevant international standards. Measure the NCV based on dry biomass. At least every six months, taking at least three samples for each measurement.	The net calorific value of biomass residues should be measured and reported in the chemical laboratory at least per six months. For each test, at least three samples should be measured for each batch of biomass type.	Monthly measuring and taking at least three samples for each measurement. Meanwhile, the results are read and recorded.	Compliance
Calculation method (if applicable)	NA	NA	Mean values calculated for each kind of biomass residues during corresponding month.	Compliance
QA/QC procedures	Check the consistency of the measurements by comparing the measurement results with measurements from previous years, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC. If the measurement results differ significantly from previous measurements or other relevant data sources, conduct additional measurements. Ensure that the NCV is determined on the basis of dry biomass.	Check consistency of data from the different resources. If the values differ significantly, the most conservative will be used.	PO has checked consistency of measurements with public available data, i.e. IPCC. There is no significant difference, so PO did not collect additional information.	Compliance

3.4.1.6 *AVD_y: Average return trip distance (from and to) between biomass fuel supply sites and the project site.*

According to the approved revised monitoring plan, this parameter is obtained from the records provided by the PP.

As verified, during this MP, only the large biomass residues collection station at the project site was in service. Every time biomass residues were transported into the project plant, the site operator manually input information on the source, type of the biomass residues, distance etc into daily purchase statistic records of the biomass residues (/25/). The reported value of AVD_y of every month was the average of all the distances recorded for all the suppliers in the month. Monthly data were summarized into the monthly summary on the number of truck trips and average distance. Distances in the electronic map of biomass residues collection sites (/28/) were used as cross references.

All the raw data of the biomass source, type, distance, biomass supplier etc in the purchase statistic records of the biomass residues are presented in an easy way to check. The calculation process presented in the monthly summary spreadsheet was walked through and found to be correct.

Monitoring Report, onsite checks Approved revised Monitoring Plan & Approved Methodology	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Data/Parameter	AVD _y	AVD _y	AVD _y	Compliance
Description	Average round trip distance (from and to) between biomass fuel supply sites and the project site	Average round trip distance (from and to) between biomass fuel supply sites and the project site	Average round trip distance (from and to) between biomass fuel supply sites and the project site	Compliance
Measured/Calculated /Default	Not mentioned	Not mentioned	Measured and calculated	Compliance
Source of data	Records by project participants on the origin of the biomass	Records by project participants	Records by project participants	Compliance
Monitoring equipment	NA	NA	NA	NA
Measuring/Reading/ Recording frequency	Continuously	Not mentioned	Recording distance when every truck arrived at project site.	Compliance
Calculation method (if applicable)	Not mentioned	Not mentioned	The average value is adopted for each corresponding month.	Compliance
QA/QC procedures	Check consistency of distance records provided by the truckers by comparing recorded distances with other information from other sources (e.g. maps).	Check consistency of distance records provided by the truckers by comparing recorded distances with other information from other sources (e.g. maps).	PO has checked consistency of distance records in which those distances are provided by the truckers by comparing recorded distances with maps for QA/QC.	Compliance

3.4.1.7 *N_y: Number of truck trips for the transportation of biomass*

According to the approved revised monitoring plan, this parameter is monitored by the operator of the dispatch centre for each truck when they arrive at the project plant.

The biomass source, type, distance, biomass supplier etc. in the purchase statistic records were recorded for each truck as they arrived at the power plant. The number of the record is actually the number of truck trips for the transportation of biomass (N_y) (/25/). Monthly total number of truck trips was summarized into monthly records on number of truck trips. The actual implementation status is in line with the revised monitoring plan.

Monthly summary records have been used for calculating N_y . Raw data have been checked and the calculation process was also verified. Reported data in the monitoring report and the ER calculation spreadsheet and confirmed to be correct.

Monitoring Report, onsite checks Approved revised Monitoring Plan & Approved Methodology	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Data/Parameter	N_y	N_y	N_y	Compliance
Description	Number of truck trips for the transportation of biomass.	Number of truck trips for the transportation of biomass.	Number of truck trips for the transportation of biomass.	Compliance
Measured/Calculated /Default	Not mentioned	Not mentioned	Measured	Compliance
Source of data	On-site measurements	On-site measurements	On-site measurements	Compliance
Monitoring equipment	NA	NA	NA	NA
Measuring/Reading/ Recording frequency	Continuously	Whenever the truck arrives in the power plant, the statistician puts down the number in the data collection system for calculating project emissions.	Recording distance when every truck arrived at project site.	Compliance
Calculation method (if applicable)	NA	NA	NA	NA
QA/QC procedures	Check consistency of the number of truck trips with the quantity of biomass combusted, e.g. by the relation with previous years.	Check consistency of the number of truck trips with the quantity of biomass combusted, e.g. by the relation with previous years.	PP has checked consistency of the number of truck trips with quantity of biomass purchased for QA/QC.	Compliance

3.4.1.8 *$FF_{project\ plant,i,y}$: Quantity of diesel combusted in the biomass residue fired power plant during the year y*

In the revised PDD, it was indicated that according to the actual design, the boiler does not need any diesel for start-ups, so no monitoring equipment has been installed to monitor $FF_{project\ plant,i,y}$. $FF_{project\ plant,i,y}$ is 0 and fixed during the whole project operation stage. This was checked by interviewing the staff of the project and confirmed by reviewing the operation manual of the boiler (/29/).

3.4.1.9 *$FF_{project\ site,i,y}$: Quantity of diesel combusted at the project site for other purposes that area attributable to the project activity.*

According to the revised monitoring plan, this parameter shall be directly measured and calculated by the procurement department of the power plant.

During the on-site visit, the assessment team identified that the fossil fuel combusted at the project site for other purposes that attributable to this project activity ($FF_{\text{project site},i,y}$) mainly relate to the onsite grass-grasping vehicles. $FF_{\text{project site},i,y}$ was measured before 01/07/2009 by the flow meter (SN:283992690, Type:CS2000-30CA, Accuracy: Qualified) which is owned and operated by Gaotang Petro Station. Since 01/07/2009, a fuelling station was started to be used by the project and the $FF_{\text{project site},i,y}$ has been measured by the flow meter (SN:0606082, Type:JDK50C111, Accuracy 0.3%) in the project site. It was verified that the volume quantity of diesel has been continuously monitored and recorded, then multiple by diesel density (/31/, this is a default parameter, detailed information is presented in section 3.4.1.10 of this report) to get the mass quantity of diesel for ER calculation. Measured records has been collected and summarized by the PP.

The monthly summary record for onsite diesel consumed (/9/) has been collected by the assessment team and cross checked against the purchased invoice (/10/) of diesel. Raw data have been checked and the calculation process was also verified to be correct.

Monitoring Report, onsite checks Approved revised Monitoring Plan & Approved Methodology	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Data/Parameter	$FF_{\text{project site},i,y}$	$FF_{\text{project site},i,y}$	$FF_{\text{project site},i,y}$	Compliance
Description	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	Quantity of diesel combusted at the project site for other purposes that are attributable to the project activity during the year y	Quantity of diesel combusted at the project site for other purposes that are attributable to the project activity during the year y	Compliance
Measured/Calculated /Default	Measured	Measured	Measured	Compliance
Source of data	On-site measurements	Direct measurement and calculation in the procurement department of plant	Direct measurement and calculation in the procurement department of plant	Compliance
Monitoring equipment	Use weight or volume meters	measured by flow meter(s) which operated and controlled by the diesel supplier	Measured by two flow meters.	Compliance
Measuring/Reading/ Recording frequency	Continuously	Continuously	Continuously	Compliance
Calculation method (if applicable)	NA	The volume quantity of diesel will be multiplied by density of diesel ρ_{diesel} to get the mass quantity of diesel.	$FF_{\text{project site},i,y} = \rho_{\text{diesel}} (\text{kg/liter}) * \text{volume flow (liter)} / 1000$	Compliance
QA/QC procedures	Cross-check the measurements with an annual energy balance that is based on purchased quantities and stock changes.	The consistency of metered diesel consumption should be crosschecked with purchase receipts.	The consistency of metered diesel consumption was crosschecked with purchase receipts.	Compliance

3.4.1.10 ρ_{diesel} :Density of diesel

As per the approved revised monitoring plan, this parameter will be used to calculate mass quantity of diesel

combusted at the project site ($FF_{\text{project site},i,y}$) for each monitoring period. Direct measured ρ_{diesel} data from diesel supplier side is unavailable. Therefore, PP chooses to use the default value from national standard i.e. Automobile Diesel Fuels (GB/T19147-2003, /31/).

As verified, there are new versions of GB/T19147-2003, including GB19147-2009 and GB19147-2013. In the MR Version 01, value of 0.85 kg/litre was applied. CL #2 was raised for clarification on the compliance with the revised PDD of the ρ_{diesel} in the monitoring period.

In response to the CL #2, the MR and ER spreadsheet were revised. The information in the three versions of Automobile Diesel Fuels was verified as follows:

Version No.	Effective date	Conservative value of diesel
GB/T19147-2003	01/10/2003	0.86 kg/litre
GB19147-2009	01/01/2010	0.85 kg/litre
GB19147-2013	07/02/2013	0.85 kg/litre

In compliance with the revised PDD, the default value of diesel density in GB/T19147-2003 of 0.86 kg/litre was applied for the period from 26/03/2009 to 25/01/2010 and 0.85 kg/litre is applied for the period from 26/01/2010 to 25/12/2012 and was accepted by the assessment team.

The links in the ER spreadsheet was checked and confirmed that corresponding updating in the calculation of the ER for this monitoring period resulting from CL #2 was correct. Therefore, CL #2 was closed out.

The compliance of the monitoring is verified as stated in the table below:

Monitoring Report, onsite checks Approved revised Monitoring Plan & Approved Methodology	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Data/Parameter	NA	ρ_{diesel}	ρ_{diesel}	Compliance
Description	NA	Density of diesel	Density of diesel	Compliance
Measured/Calculated /Default	NA	Default	Default	Compliance
Source of data	NA	Use accurate and reliable national data in the national standard "automobile diesel fuel GB/T19147-2003".	The national standard "automobile diesel fuel GB/T 19147-2003", "automobile diesel fuel GB 19147-2009" and "automobile diesel fuel GB 19147-2013"	Compliance
Monitoring equipment	NA	NA	NA	NA
Measuring/Reading/Recording frequency	NA	Reviewed for the appropriateness of the GB/T19147 annually.	Annually	Compliance
Calculation method (if applicable)	NA	NA	NA	NA
QA/QC procedures	NA	The available default value from GB/T19147-2003 is used, but will be reviewed for the appropriateness of the GB/T19147 annually.	Default value from national standards GB/T 19147-2003, GB19147-2009 and GB19147-2013 are used in corresponding years in this monitoring period, and have been reviewed annually.	Compliance

3.4.1.11 $EF_{km,CO_2,y}$: average CO₂ emission factor for transportation of biomass with trucks

As per the approved revised monitoring plan, it is impossible for the PP to conduct sample measurement and the reliable national default value is not available. So the default values from the IPCC manual (/33/) will be used.

As the PP could not get this data from the subcontractor of truck rental, the carbon emission factor for large heavy load transportation truck as 0.001011tCO₂/km (IPCC default value) has been adopted in the Monitoring Report.

The compliance of the monitoring is verified as stated in the table below:

Monitoring Report, onsite checks Approved revised Monitoring Plan & Approved Methodology	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Data/Parameter	$EF_{km,CO_2,y}$	$EF_{km,CO_2,y}$	$EF_{km,CO_2,y}$	Compliance
Description	Average CO ₂ emission factor for the trucks during the year y	Average CO ₂ emission factor for transportation of biomass with trucks	Average CO ₂ emission factor for transportation of biomass with trucks	Compliance
Measured/Calculated /Default	Measured/Default	Default	Default	Compliance
Source of data	Conduct sample measurements of the fuel type, fuel consumption and distance travelled for all truck types. Calculate CO ₂ emissions from fuel consumption by multiplying with appropriate net calorific values and CO ₂ emission factors. For net calorific values and CO ₂ emission factors, use reliable national default values or, if not available, (country-specific) IPCC default values. Alternatively, choose emission factors applicable for the truck types used from the literature in a conservative manner (i.e. the higher end within a plausible range).	It is impossible to conduct sample measurements of the fuel type fuel consumption and distance travelled for all truck types, and reliable national default values is not available, so PP selected to use IPCC 2006 default value from the Moderate Control index for the US heavy Duty Diesel Vehicle.	IPCC 2006 default value form Moderate Control index for the US heavy Duty Diesel Vehicle.	Compliance
Monitoring equipment	NA	NA	NA	NA
Measuring/Reading/ Recording frequency	At least annually	Not mentioned	Review annually	Compliance
Calculation method (if applicable)	NA	NA	NA	NA
QA/QC procedures	Cross-check measurement results with emission factors referred to in the literature.	IPCC value from the latest version published will be utilized.	The available IPCC default value is used, and has been reviewed for the appropriateness with the latest version of IPCC	Compliance

3.4.1.12 $EF_{CO_2,FF,i}$ CO2 Emission Factor for fossil fuel type i

As per the approved revised PDD, IPCC default value of 0.0741 tCO₂e/GJ has been adopted in the Monitoring Report and is verified to be same with the one from latest version of IPCC (IPCC 2006 default value (table 1.4, chapter1, volume2: energy,/46/).

Monitoring Report, onsite checks Approved revised Monitoring Plan & Approved Methodology	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Data/Parameter	$EF_{CO_2,FF,i}$	$EFCO_2,FF,,i$	$EF_{CO_2,FF,i}$	Compliance
Description	CO2 emission factor for fossil fuel type i	CO2 Emission Factor for fossil fuel type i	CO2 Emission Factor for fossil fuel type i	Compliance
Measured/Calculated /Default	Either conduct measurements or use accurate and reliable local or national data where available. Where such data is not available, use IPCC default emission factors.	Default	Default	Compliance
Source of data	Either conduct measurements or use accurate and reliable local or national data where available. Where such data is not available, use IPCC default emission factors (country-specific, if available) if they are deemed to reasonably represent local circumstances. Choose the value in a conservative manner and justify the choice.	IPCC default value(table 1.4, chapter 1, volume 2: energy)	IPCC 2006 default value (table 1.4, chapter1, volume2: energy)	Compliance
Monitoring equipment	Measurements shall be carried out at reputed laboratories and according to relevant international standards.	NA	NA	NA
Measuring/Reading/ Recording frequency	In case of measurements: At least every six months, taking at least three samples for each measurement. In case of other data sources: Review the appropriateness of the data annually.	The available default values are used, but will be reviewed for the appropriateness of the data annually with latest version of IPCC.	Review annually	Compliance
Calculation method (if applicable)	NA	NA	NA	NA
QA/QC procedures	Check consistency of measurements and local / national data with default values by the IPCC. If the values differ significantly from IPCC default values, possibly collect additional information or conduct measurements.	The available default values are used, but will be reviewed for the appropriateness of the data annually with latest version of IPCC.	The available IPCC default value are used, and is reviewed for the appropriateness of data annually with latest version of IPCC	Compliance

3.4.1.13 NCV_i : Net Calorific Value of fossil fuels combusted at the project site for other purposes that are attributable to the project activity during year y.

As per the approved revised PDD, the default value of Net Calorific Value of fossil fuels combusted at the project site for other purposes that are attributable to the project activity during the year y, as 42.652 GJ/ton (China Energy Statistical Yearbook, 2013, /34/) was adopted in the Monitoring Report. After cross-checking the data presented in the IPCC 2006(/33/), no significant difference were identified; the assessment team therefore considered that the applied NCV_i is acceptable.



Monitoring Report, onsite checks Approved revised Monitoring Plan & Approved Methodology	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Data/Parameter	NCV _i	NCV _i	NCV _i	Compliance
Description	Net calorific value of the fossil fuel type <i>i</i>	Net Calorific Value of fossil fuels combusted at the project site for other purposes that are attributable to the project activity during the year <i>y</i>	Net Calorific Value of fossil fuels combusted at the project site for other purposes that are attributable to the project activity during the year <i>y</i>	Compliance
Measured/Calculated /Default	Measured//Default	Default	Default	Compliance
Source of data	Either conduct measurements or use accurate and reliable local or national data where available. Where such data is not available, use IPCC default net calorific values (country-specific, if available) if they are deemed to reasonably represent local circumstances. Choose the values in a conservative manner and justify the choice.	China Energy Statistical Yearbook	China Energy Statistical Yearbook 2013	Compliance
Monitoring equipment	Measurements shall be carried out at reputed laboratories and according to relevant international standards.	NA	NA	NA
Measuring/Reading/ Recording frequency	In case of measurements: At least every six months, taking at least three samples for each measurement. In case of other data sources: Review the appropriateness of the data annually.	The Values for the fossil fuels are utilized from the China Energy Statistical Yearbook, which Shall be updated according to China Energy Statistical Yearbook new version annually.	Annually	Compliance
Calculation method (if applicable)	NA	NA	NA	NA
QA/QC procedures	Check consistency of measurements and local / national data with default values by the IPCC. If the values differ significantly from IPCC default values, possibly collect additional information or conduct measurements.	Check data from China Energy Statistical Yearbook with default values by the IPCC. If the values differ significantly from IPCC default values, possibly collect additional information or conduct measurements.	PO has checked the consistency of national data with default values by the IPCC, in table 1.2, Chapter 1, volum2 of IPCC 2006 manual, it stated that the Net Calorific Value of diesel is 0.043 TJ/tonne which differs little with China Energy Statistical Yearbook 2013. So, 42.652 GJ/tonne was thought to be suitable and accurate.	Compliance

3.4.1.14 $NCV_k * EF_{burning, CH_4, k, y}$: CH_4 emission factor for uncontrolled burning of the biomass residue type k during the year y

According to the applied methodology ACM0006 Version 04, the revised approved MP applies referenced default values. Recommended value in the applied methodology is 0.0027 t CH_4 per ton of biomass as default value for the product of NCV_k and $EF_{burning, CH_4, k, y}$. The uncertainty can be deemed to be greater than 100%, resulting in a conservativeness factor of 0.73. Therefore, the final emission factor 0.001971 t CH_4 /t biomass residues should be used.

Monitoring Report, onsite checks	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Approved revised Monitoring Plan & Approved Methodology				
Data/Parameter	NA	$NCV_k * EF_{burning, CH_4, k, y}$	$NCV_k * EF_{burning, CH_4, k, y}$	Compliance
Description	CH_4 emission factor for uncontrolled burning of the biomass residue type k during the year y	CH_4 emission factor for uncontrolled burning of the biomass residue type k during the year y	CH_4 emission factor for uncontrolled burning of the biomass residue type k during the year y	Compliance
Measured/Calculated /Default	Default	Default	Default	Compliance
Source of data	Not mentioned	In the baseline methodology, $NCV_k * EF_{burning, CH_4, k, y} = 0.001971$ t CH_4 /ton is applied.	IPCC 2006 default value 0.0027 t CH_4 /ton is used as $NCV_k * EF_{burning, CH_4, k, y}$, and the conservative factor of 0.73 is applied	Compliance
Monitoring equipment	NA	NA	NA	NA
Measuring/Reading/Recording frequency	NA	NA	NA	NA
Calculation method (if applicable)	NA	NA	NA	NA
QA/QC procedures	NA	NA	NA	NA

3.4.1.15 $EF_{CH_4,BF}$: CH_4 methane emission factor for the combustion of biomass residues in the project plant

As per the approved revised PDD and the IPCC default value provided in table 3 of ACM0006 version 04, the CH_4 emission factor of combustion of biomass in agriculture is 0.03 t CH_4 /TJ. Considering a conservativeness factor of 1.37, the CH_4 emission factor as 0.0000411 t CH_4 /GJ was adopted by the project.

Monitoring Report, onsite checks Approved revised Monitoring Plan & Approved Methodology	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Data/Parameter	$EF_{CH_4,BF}$	$EF_{CH_4,BF}$	$EF_{CH_4,BF}$	Compliance
Description	CH_4 emission factor for the combustion of biomass residues in the project plant	CH_4 emission factor for the combustion of biomass residues in the project plant	CH_4 emission factor for the combustion of biomass residues in the project plant	Compliance
Measured/Calculated /Default	Measured /Default	Default	Default	Compliance
Source of data	On-site measurements or default values, as provided in Table 3.	Default values, as provided in Table 3 of ACM0006 (Version 4) which sources from 2006 IPCC Guideline, Volume 2, Chapter 2, Tables 2.2 to 2.6.	Default values, as provided in Table 3 of ACM0006 (Version 4) which sources from 2006 IPCC Guideline, Volume 2, Chapter 2, Tables 2.2 to 2.6	Compliance
Monitoring equipment	The CH_4 emission factor may be determined based on a stack gas analysis using calibrated analyzers.	NA	NA	Default value is applied, thus NA
Measuring/Reading/ Recording frequency	At least quarterly, taking at least three samples per measurement	NA	NA	Default value is applied, thus NA
Calculation method (if applicable)	NA	NA	NA	NA
QA/QC procedures	Check the consistency of the measurements by comparing the measurement results with measurements from previous years, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC. If the measurement results differ significantly from previous measurements or other relevant data sources, conduct additional measurements.	Check this parameter using the latest version of IPCC value.	The available IPCC default value is used, and has been reviewed for the appropriateness with the latest version of IPCC	Compliance

3.4.1.16 Quantity of available biomass residues of type k in the region and Quantity of biomass residues of type k that are utilized (e.g. for energy generation or as feedstock) in the defined geographical region

According to the approved revised PDD and ACM0006 ver04, the project chooses approach L2 to assess leakage effects. During the monitoring period, the PP needs to demonstrate that the quantity of available biomass residue of biomass of type k in the region is at least 25% larger than quantity of biomass residues of type k that are utilized.

By reviewing the monthly and daily purchase statistic records of the biomass residues of the project, it was found that during the monitoring period, the biomass residues were collected from Gaotang County, Xiajin County, Guan County and Linqing County, Pingyuan County, Wucheng County, Yucheng County, Chiping County. The maximal radius for biomass collection was 50km, which is within the 20km to 200km radius required by ACM0006 version 04. The radius has been verified by the SGS assessors using an electronic map (/28/).

As per the approved revised monitoring plan, the quantity of available biomass residues of type k in the region is obtained from the official local data since national statistics are not available. There was a biomass residues statistic survey conducted for eight local authorities, by the Statistic Bureau of eight biomass collection sites (/30/); they are official and authoritative survey departments for local agricultural data. The amount of all types of available biomass residues in the region and other utilizations in the area (not including this project) were generated from public survey result. The related data from the statistic reports have been provided to and checked by the SGS assessors.

The reported values of quantity of available biomass residues of type k in the region in the MR have been verified to be in compliance with the information indicated in the statistic reports. As stated in the table E.7. of the MR it was confirmed that the quantity of available biomass residue of biomass of type k in the region is 25% larger than quantity of biomass residues of type k that are utilized. Therefore, SGS assessors were able to confirm that an abundant surplus of biomass in the region was demonstrated and the leakage of the project was zero during this monitoring period.

The compliance of the monitoring for the two parameters were verified as stated in the table below:



Monitoring Report, onsite checks Approved revised Monitoring Plan & Approved Methodology	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Data/Parameter	—	—	—	NA
Description	Quantity of available biomass residues of type k in the region	Quantity of available biomass residues of type k in the region	Quantity of available biomass residues of type k in the region	Compliance
Measured/Calculated /Default	Not mentioned	Not mentioned	Calculated	Compliance
Source of data	Surveys or statistics	Surveys or statistics from local agricultural bureau if national statistics is not available	Statistics from local governments	Compliance
Monitoring equipment	NA	NA	NA	NA
Measuring/Reading/ Recording frequency	Annually	Annually	Data was obtained from statistic or survey conducted by local government annually.	Compliance
Calculation method (if applicable)	Not mentioned	Not mentioned	It is equal to the sum of statistics of available biomass residues which is reported by regional Statistic Bureaus	Compliance
QA/QC procedures	NA	NA	Sum of biomass residues utilized out of this project and biomass residues utilized by this project	Compliance



Monitoring Report, onsite checks Approved revised Monitoring Plan & Approved Methodology	Requirement in the applicable methodology and relevant EB documents	Requirement in the approved revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & Methodological requirements.
Data/Parameter	–	–	–	NA
Description	Quantity of biomass residues of type k that are utilized (e.g. for energy generation or as feedstock) in the defined geographical region	Quantity of biomass residues of type k that are utilized (e.g. for energy generation or as feedstock) in the defined geographical region	Quantity of biomass residues of type k that are utilized (e.g. for energy generation or as feedstock) in the defined geographical region	Compliance
Measured/Calculated /Default	Not mentioned	Not mentioned	Calculated	Compliance
Source of data	Surveys or statistics	Surveys or statistics from local agricultural bureau if national statistics is not available	Statistics from local governments	Compliance
Monitoring equipment	NA	NA	NA	NA
Measuring/Reading/ Recording frequency	Annually	Annually	Data was obtained from statistic or survey conducted by local government annually.	Compliance
Calculation method (if applicable)	NA	NA	It is equal to the sum of statistics of available biomass residues which is reported by regional Statistic Bureaus	Compliance
QA/QC procedures	NA	NA	The statistic data of biomass in the region was provided by local government which is official and authoritative	Compliance

3.4.2 Verification of implementation of sampling plan

Not applicable

3.5 Accuracy of Equipment

A. Electricity Meters

In the original registered PDD, EG_y is continuously measured by meters with the accuracy of 0.2%. In the approved revised PDD, the PP clarified that the electricity meter is installed and controlled by the regional power distribution company (Liaocheng Power Supply Bureau) and the project owner had no right to set the accuracy level of monitoring device. The installation of an electricity meter with 0.5 accuracy level at the 30 MW power stations is in line with Chinese industrial standard DL/T 448-2000(/32/). The following solution has been applied by the PP: 0.5% of electricity delivery amount will be deducted from the total EG_y monitored by the electricity meter with accuracy of 0.5, for conservativeness; this is in line with the approved revised PDD. The assessment team considered this is a conservative solution for meter accurate level decrease.

According to the national standard JJG596-1999(/48/), meters installed by the regional power distribution company at Huixin substation has been calibrated annually by Liao Cheng Power Research Institute and The electric energy metering centre of Gaotang power supply company, which are accredited entities by Quality and Technical Supervision Bureau of Shandong. The calibration reports and the accreditation certificate of the calibrating entities have been verified (/35//36//37//38/).

$EC_{PJ,y}$ has been measured by the meters installed at the 220kV Huixin substation and the meters installed in the seven collection centers. The meters in the seven collection centers are all 2.0, which is in compliance with the revised PDD and DL/T 448-2000(/32/). The meters are calibrated by the electric energy metering centre of Gaotang power supply company.

All the calibration results showed that the meters are all eligible, with the period of validity covering this monitoring period under verification.

B. The electronic truck scale

Two installed electronic truck scales (Type: SCS-30t; S/N: 20061206 and 20070701 accuracy level: III) were checked visually on site by the verification team. The electronic truck scales have been calibrated twice a year as per Chinese national standard JJG 539-1997(/49/) by Quality and Technology Supervision Inspection Institute of Liaocheng city (/39/) which is accredited by Quality and Technology Supervision Bureau of Shandong Province (/40/). Calibration details valid for this monitoring period verified by the SGS assessors are listed in the table further below.

C. The Calorimeter

The calorimeter (S/N: 1406128; Accuracy level: Qualified) was checked by the assessment team. The calorimeter was calibrated by Quality and Technology Supervision Inspection Institute of Liaocheng city, which is authorised by Quality and Technology Supervision Bureau of Shandong Province. The calibration certificates of the calorimeter (/41/) and accreditation certificate of the calibrating entity (/42/) valid during this monitoring period have been verified by the SGS assessors. Calibration for calorimeter has been carried out once per year based on the national standard JJG672-2001(/50/). The calibration certificate indicated that the calorimeter was checked to be eligible.

D. The Moisture Analyzer

The moisture analyzer (S/N: 3506073; Accuracy level: 0.01) was checked by the assessment team. The calorimeter was calibrated by Quality and Technology Supervision Inspection Institute of Liaocheng city, which is authorised by Quality and Technology Supervision Bureau of Shandong Province. The calibration certificates of the moisture analyzer (/43/) and accreditation certificate of the calibrating entity (/42/) valid during this monitoring period have been verified by the SGS assessors. Calibration for moisture analyzer has been carried out once per year based on national standard JJG1036-2008(/51/). The calibration certificate indicated that the moisture analyzer was checked to be eligible.



E. The Flow Meter

Calibration records of the flow meters were checked by the assessment team. The flow meters were calibrated by Quality and Technology inspection institute of Gaotang city, which is authorised by Quality and Technology Supervision Bureau of Shandong Province. The calibration certificates of the flow meters (/44/) and accreditation certificate of the calibrating entity (/45/) valid during this monitoring period have been verified by the SGS assessors.

As per the Guidelines for Completing the Monitoring Form (version 04.0,/47/), the calibration frequency shall be reported in the monitoring report Section D.2. The calibration frequency of the meters used to measure the volume quantity of diesel consumed by the project was not included in the MR. CL #3 was raised.

As clarified by the client in response to CL #3, the calibration frequency of flow meter CS2000-30CA (serial no. 283992690) and flow meter JDK50C111 (serial no. 0606082) is once every two years and once per year respectively; this is consistent with the validity of the calibration certificates, as checked by the assessment team. In the revised MR version 02 dated 11/03/2014, the calibration frequency of the flow meters used during this monitoring period was reported in section D.2 and CL #3 was closed out.

The calibration certificate indicated that the flow meter was checked to be eligible.

The information on the monitoring equipments involved by the project is listed in the table below.



Monitoring equipment	Monitoring parameter	S/N	Type	Level	Calibration frequency requirement	Calibration date	Validity	Calibration Entity	Accreditation Certificate for the calibration entity Issuing authority Relevant
Electricity meter	EG _y and EC _{PJ,y}	200306083C0123	DTSD341	0.5	Once per year	13/03/2009	12/03/2010	Liao Cheng Power Research Institute Liao Cheng Power Research Institute	(Lu)Faji(2009)D016 Valid from 01/01/2009 to 31/12/2011
		95280	DTSD341	0.5s	Once per year	10/02/2009	09/02/2014		
		210299720	MK6E	0.2s	Once per year	09/05/2009 10/04/2010	09/04/2011	The electric energy metering centre of Gaotang power supply company	(Lu)Faji(2009)D095, Valid from 01/01/2009 to 31/12/2011; (Lu)Faji(2012)D095, Valid from 01/01/2012 to 31/12/2015
						06/01/2011 04/01/2012	03/01/2013		
Electricity meter	EC _{PJ,y}	220227	DT862	2.0	Once every five years	20/09/2006 15/09/2011	14/09/2016	The electric energy metering centre of Gaotang power supply company	(Lu)Faji(2009)D095, Valid from 01/01/2009 to 31/12/2011; (Lu)Faji(2012)D095, Valid from 01/01/2012 to 31/12/2015
		483577	DT862-4	2.0		25/11/2006 20/11/2011	19/11/2016		
		483477	DT862-4	2.0		05/11/2007 30/09/2012	29/09/2017		
		015882	DT862	2.0	Once every three years	30/09/2006 20/09/2009 13/09/2012	12/09/2015		
		220265	DT862	2.0		21/08/2006 19/08/2009 15/08/2012	14/08/2015		
		220220	DT862	2.0		08/10/2006 06/10/2009 30/09/2012	29/09/2015		
		0596049	DT862-4	2.0	Once every five years	05/12/2007 30/09/2012	29/09/2017		



Electric truck scale #1	BF _{k,y}	20061206	SCS-30	class III	Once every six months	22/03/2009 23/09/2009 ¹ 23/03/2010 01/09/2010 28/02/2011 31/05/2011 30/11/2011 28/05/2012 19/11/2012	NA	Quality and Technology inspection institute of Gaotang city	(Lu)Faji(2009)372502, Valid from 01/12/2009 to 30/11/2014
		20070701					18/05/2013		
Moisture analyzer	Moisture content of the biomass residues	3506073	SDTGA300	0.01	Once a year	07/02/2009 05/01/2010 04/01/2011 04/04/2011 30/03/2012	29/03/2013	Quality and Technology inspection institute of Liao Cheng city	(Lu)Faji(2008)37013, Valid from 01/07/2008 to 30/06/2013
Calorimeter	NCV _k	1406128	SDACM3000	Qualified	Once a year	09/01/2009 05/01/2010 04/01/2011 04/04/2011 30/03/2012	29/03/2013		
Flow meter	FF _{project site,i,y}	283992690	CS2000-30CA	Qualified	Once every two years	28/07/2007	27/07/2009	Quality and Technology inspection institute of Gaotang city	(Lu)Faji(2009)372502, Valid from 01/12/2009 to 30/11/2014
		0606082	JDK50C111	0.3%	Once a year	15/06/2009 05/06/2010 17/05/2011 15/05/2012	14/05/2013		

¹ According to the calibration report the validity period of this calibration is from 22/03/2009 to 23/09/2009

3.6 Summary of compliance with the calibration frequency requirements for measuring instruments.

The calibration of the following measuring equipment has an impact on the claimed emission reductions:

A. Electricity Meters

B. The electronic truck scale

C. The Calorimeter

D. The Moisture Analyzer

E. The Flow Meter

As verified in section 3.5 above, the meters have been calibrated according to the relevant standards. In compliance with the approved revised PDD, all monitoring instruments have been properly calibrated at the interval specified in the revised monitoring plan. Calibration reports and accreditation certificates for the calibration entities have been verified by the assessment team.

3.7 Accuracy of Emission Reduction Calculations

The calculation of emission reductions in the final MR and ER spreadsheet is found to be correct. CAR #4 was raised for the mistakes on the reported data in the MR and ER spreadsheet version 01. The response to CAR #4 was satisfactory and was closed (please refer to 3.4.1.4 and 3.4.1.5 of this report for the detailed information and section 9 of this report). The details of the reported and the verified values for all parameters are listed in section 4, 'Calculation of Emission Reductions'.

3.8 Quality of Evidence to Determine Emission Reductions

Critical parameters used for the determination of the Emission Reductions are discussed in section 3.4 above. All the data recorded is in compliance with the monitoring report.

3.9 Management and operational System and Quality Assurance

Management system and quality assurance procedures have been stipulated in the CDM Manual (/15/) and internal operation procedure and have been implemented. Emergency plan and staff training plan are in place, although no emergency situation happened during this monitoring period. The staffs are well trained and qualified (/16/). These have been verified during the on-site visit and the document review. Therefore, the assessment team confirms that the management system of the CDM project is in place; with the responsibilities properly identified and in place, and that QA/QC procedures well implemented.

In accordance with paragraphs 279 of the VVS Version 07.0 (/52/), the assessment team confirms that responsibilities and authorities for monitoring and reporting are in accordance with what is stated in the monitoring plan in the approved revised PDD.

3.10 Data from External Sources

3.10.1 GWP_{CH_4} : Global Warming Potential of CH_4

As per the approved revised PDD and ACM0006 version 04, IPCC default value of 21 tCO₂e/tCH₄ has been adopted in the Monitoring Report.

3.10.2 $EF_{electricity,y}$: CO₂ emission factor for the electricity displaced due to the project activity during the year y

According to the description about the calculation of the baseline emission factor in section B.6 of the approved revised PDD, the emission factor of the electricity displaced ($EF_{electricity,y}$) is determined ex-ante as 0.975 tCO₂e/MWh and fixed for the first crediting period.

The emission factor of the electricity displaced, 0.975 tCO₂e/MWh was correctly adopted in the Monitoring Report.

3.10.3 $EF_{grid,y}$: CO₂ emission factor for grid electricity during the year y

According to the description about the calculation of the project emission in section B.6 of the approved revised PDD, the emission factor of the CO₂ emission factor for grid electricity ($EF_{grid,y}$) is determined ex-ante as 0.975 tCO₂e/MWh and fixed for the first crediting period.

The emission factor of the grid electricity, 0.975tCO₂e/MWh was correctly adopted in the Monitoring Report.

3.10.4 $EF_{km,CO_2,y}$: average CO₂ emission factor for transportation of biomass with trucks

As per the approved revised monitoring plan, it is not possible for the PP to conduct sample measurement and the reliable national default value is not available. So the default values from the IPCC manual (/33/) will be used.

As the PP could not get this data from the subcontractor of truck rental, the carbon emission factor for large heavy load transportation truck as 0.001011 tCO₂/km (IPCC default value) has been adopted in the Monitoring Report. Detailed verification result can be found in section 3.4.1.11 of this report above.

3.10.5 ρ_{diesel} : Density of diesel

As per the revised monitoring plan, this parameter will be used to calculate mass quantity of diesel combusted at the project site ($FF_{project,site,i,y}$) for each monitoring period. Direct measured ρ_{diesel} data from diesel supplier side is unavailable. Therefore, the PP chooses to use the default value from national standard i.e. Automobile Diesel Fuels (GB/T19147-2003,GB19147-2009,GB19147-2013 /31/). Detailed verification result can be found in section 3.4.1.10 of this report above.

3.10.6 $EF_{CO_2,FF,i}$ CO₂ Emission Factor for fossil fuel type i

As per the approved revised PDD, IPCC default value of 0.0741 tCO₂e/GJ has been adopted in the Monitoring Report and is verified to be same with the one from latest version of IPCC(IPCC 2006 default value (table 1.4, chapter1, volume2: energy,/46/). Detailed verification result can be found in section 3.4.1.12 of this report above.

3.10.7 NCV_i : Net Calorific Value of fossil fuels combusted at the project site for other purposes that are attributable to the project activity during year y.

As per the approved revised PDD, the default value of Net Calorific Value of fossil fuels combusted at the project site for other purposes that are attributable to the project activity during the year y as 42.652 GJ/ton (China Energy Statistical Yearbook, 2013, /34/) was adopted in the Monitoring Report. After cross-checking the data presented in the IPCC 2006, /33/, no significant difference identified, the assessment team therefore considered that the applied NCV_i is acceptable. Detailed verification result can be found in section 3.4.1.13 of this report above.

3.10.8 $NCV_k * EF_{burning, CH_4, k, y}$: CH_4 emission factor for uncontrolled burning of the biomass residue type k during the year y

According to the applied methodology ACM0006 Version 04, the revised approved MP applied referenced default values. Recommended value in applied methodology is 0.0027 t CH_4 per ton of biomass as default value for the product of NCV_k and $EF_{burning, CH_4, k, y}$. The uncertainty can be deemed to be greater than 100%, resulting in a conservativeness factor of 0.73. Therefore, the final emission factor 0.001971 t CH_4 /t biomass residues should be used. Detailed verification result can be found in section 1.1.1.1 of this report above.

3.10.9 $EF_{CH_4, BF}$: CH_4 methane emission factor for the combustion of biomass residues in the project plant

As per the approved revised PDD and the IPCC default value provided in table 3 of ACM0006 version 04, the CH_4 emission factor of combustion of biomass in agriculture is 0.03 t CH_4 /TJ. Considering a conservativeness factor of 1.37, the CH_4 emission factor as 0.0000411 t CH_4 /GJ was adopted by the project. Detailed verification result can be found in section 3.4.1.15 of this report above.

3.10.10 Quantity of available biomass residues of type k in the region and Quantity of biomass residues of type k that are utilized (e.g. for energy generation or as feedstock) in the defined geographical region

According to the approved revised PDD and ACM0006 ver04, the project chooses approach L2 to assess leakage effects. It was demonstrated that the quantity of available biomass residue of biomass of type K in the region is at least 25% larger than quantity of biomass residues of type k that are utilized. The reported values of quantity of available biomass residues of type k in the region in the MR have been verified to be in compliance with the information indicated in the statistic reports. Detailed verification result can be found in section 1.1.1.1 of this report above.

4. Calculation of Emission Reductions

Parameter		Reported Value in MR version 01 dated 20/01/2014	Verified Value in MR version 02 dated 11/03/2014
$GWP_{CH_4}(tCO_2e/tCH_4)$		21	21
$EF_{electricity,y}(tCO_2e/MWh)$		0.975	0.975
$EF_{grid,y}(tCO_2e/MWh)$		0.975	0.975
$EG_y(MWh)$		669,244.07	669,244.07
$BF_{k,y}(\text{tonne})$	cotton straw	365,871.45	365,871
	wood residues	184,737.46	184,745
	wheat bran	18,079.32	18,079
N_y		98,824	98,824
$EF_{km,CO_2,y}(tCO_2/km)$		0.001011	0.001011
$FF_{project\ plant,i,y}(\text{tonne})$		0	0
$FF_{project\ site,i,y}(\text{tonne})$		490.99	491.80
$\rho_{diesel}(kg/liter)$		0.85	0.85 and 0.86
$EF_{CO_2,FF,i}(tCO_2/GJ)$		0.0741	0.0741
NCV_i		42.652	42.652
$NCV_k * EF_{burning,CH_4,k,y}(tCH_4/ton\ biomass\ residue)$		0.001971	0.001971
$EF_{CH_4,BF}(tCH_4/GJ)$		0.0000411	0.0000411
$EC_{PJ,y}(MWh)$		2,377.19	2,377.19

Based on the verified value, the emission reductions were calculated as follows:

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

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

$$ER_{electricity,y} = EG_y * EF_{electricity,y}$$

Where:

$ER_{electricity,y}$ are the emission reductions due to displacement of electricity during the year y (tCO_2e/yr).

EG_y is the net quantity of electricity delivered to grid in year y.

$EF_{electricity,y}$ is the CO_2 emission factor for the electricity displaced due to the project activity during the year y (tCO_2e/MWh), which is 0.975 tCO_2e/MWh .

$$\text{Thus, } ER_{electricity,y} = EG_y * EF_{electricity,y} = 669,244.07MWh * 0.975tCO_2e/MWh = 652,512.97tCO_2e$$

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

Emission reductions due to displacement of heat ($ER_{heat,y}$) is not considered for the project. Therefore,

$$ER_{heat,y} = 0\ tCO_2e$$

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

$$BE_{biomass,y} = GWP_{CH_4} * \sum_k BF_{PJ,k,y} * NCV_k * EF_{burning,CH_4,k,y}$$

Where:

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

GWP_{CH_4} is the Global Warming Potential for methane valid for the relevant commitment period which is determined in the PDD as 21 tCO₂e/tCH₄.

NCV_k is the net calorific value of the biomass residue type k in GJ per tons of dry matters.

$BF_{PJ,k,y}$ is the incremental quantity of biomass residue type k used as fuel in the project plant during the year y in tons.

$EF_{burning,CH_4,k,y}$ is the CH₄ emission factor for uncontrolled burning of the biomass residue type k in tCH₄/GJ.

According to the changed PDD, $NCV_k * EF_{burning,CH_4,k,y} = 0.001971$ tCH₄/ton.

$$\sum_k BF_{PJ,k,y} = BF_1 + BF_2 + BF_3^2 = 365,871t + 184,745t + 18,079t = 568,696 t$$

$$BE_{biomass,y} = GWP_{CH_4} * \sum_k BF_{PJ,k,y} * NCV_k * EF_{burning,CH_4,k,y}$$

$$= 21tCO_2e/tCH_4 * 568,696t * 0.001971tCH_4/ton = 23,538.88 tCO_2e$$

Please refer to Table E.2 in the MR version 02 for monthly monitoring data.

d) $PE_y = PET_y + PEFF_y + PE_{EC,y} + GWP_{CH_4} * PE_{biomass,CH_4,y}$

Where:

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

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

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

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

GWP_{CH_4} is the Global Warming Potential for methane valid for the relevant commitment period,

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

$$PE_y = PET_y + PEFF_y + PE_{EC,y} + GWP_{CH_4} * PE_{biomass,CH_4,y}$$

$$= 5,444.19tCO_2e + 1,554.35tCO_2e + 2,317.76tCO_2e + 365.43tCH_4 * 21 tCO_2e/tCH_4 = 16,990.27 tCO_2e$$

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

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

Where:

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

AVD_y is the average round trip distance (from and to) between the biomass residue fuel supply sites and the site of the project plant during the year y (km)

$EF_{km,CO_2,y}$ is the average CO₂ emission factor for the trucks measured during the year y (tCO₂e/km)

² BF₁=Cotton straw; BF₂=Wood residues; BF₃=Wheat bran

N_y is the number of truck trips during the year y

According to the data in Table E.3 in the MR version 02,

$$PET_y = N_y * AVD_y * EF_{km,CO_2,y} = 5,444.19tCO_2e$$

ii. Carbon dioxide emissions from fossil fuel consumption in the power plant ($PEFF_y$)

$$PEFF_y = \Sigma (FF_{project\ plant,i,y} + FF_{project\ site,i,y}) * NCV_i * EF_{co2,FF,i}$$

Where:

$PEFF_y$ are CO₂ emissions from on-site consumption of fossil fuels in the biomass power plant during the year y in tons of CO₂ equivalents (tCO₂/yr),

$FF_{project,plant,i,y}$ is the quantity of fossil fuel type i combusted in the project plant during the year y (ton/year), which is 0 in this project,

$FF_{project,site,i,y}$ is the quantity of fossil fuel type i combusted at the project site during the year y (ton/year),

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

$EF_{co2,FF,i}$ is CO₂ emission factor for the diesel (tCO₂/GJ), which is 0.0741 tCO₂/GJ.

There is no fossil fuel was combusted as auxiliary fuel for boiler start up, thus,

$$FF_{project\ plant,i,y} = 0tCO_2$$

$FF_{project,site,i,y} = 491.80t$, please refer to Table E.4 in the MR version 02 for monthly monitoring data.

$$\begin{aligned} \text{Therefore, } PEFF_y &= \Sigma (FF_{project\ plant,i,y} + FF_{project\ site,i,y}) * NCV_i * EF_{co2,FF,i} \\ &= (0t + 491.80t) * 42.652 \text{ GJ/ton} * 0.0741 \text{ tCO}_2/\text{GJ} = 1,554.35 \text{ tCO}_2e \end{aligned}$$

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

$$PE_{EC,y} = EC_{PJ,y} * EF_{grid,y}$$

Where:

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

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

$EF_{grid,y}$ is the CO₂ emission factor for grid electricity during the year y (tCO₂/MWh), which is 0.975 tCO₂/MWh.

Since the seven out site collection stations were not used in this monitoring period and there was no electricity consumed in these stations in this monitoring period. $EC_{PJ,y}$ = electricity consumption at the project site measured by main meter installed at Huixin Substation.

$EC_{PJ,y} = 2,377.19\text{MWh}$, please refer to Table E.5 in the MR version 02 for monthly monitoring data.

Therefore

$$PE_{EC,y} = EC_{PJ,y} * EF_{grid,y} = 2,377.19\text{MWh} * 0.975\text{tCO}_2e/\text{MWh} = 2,317.76\text{tCO}_2e$$

iv. Methane emissions from combustion of biomass residues ($PE_{\text{biomass,CH}_4,y}$)

$$PE_{\text{biomass,CH}_4,y} = EF_{\text{CH}_4,\text{BF}} * \sum_k BF_{k,y} * NCV_k$$

Where:

$PE_{\text{biomass,CH}_4,y}$ are the project emissions from biomass controlled burning (tCO₂e/year) ,
 $BF_{k,y}$ is the quantity of the biomass residues used as fuel in the project plant during the year y in tons
 NCV_k is the net calorific value of the biomass residues type k in GJ per ton, and
 $EF_{\text{CH}_4,\text{BF}}$ is the CH₄ emission factor for controlled burning of the biomass residues in tCH₄/TJ, which is 0.0000411 tCH₄/GJ.

$$PE_{\text{biomass,CH}_4,y} = EF_{\text{CH}_4,\text{BF}} * \sum_k BF_{k,y} * NCV_k = 365.43 \text{ tCH}_4,$$

e) Calculation of leakage

As verified, $L_y = 0 \text{ tCO}_2\text{e}$.

$$\begin{aligned} ER_y &= ER_{\text{electricity},y} + ER_{\text{heat},y} + BE_{\text{biomass},y} - PE_y - L_y \\ &= 652,512.97 \text{ tCO}_2\text{e} + 0 \text{ tCO}_2\text{e} + 23,538.88 \text{ tCO}_2\text{e} - 16,990.27 \text{ tCO}_2\text{e} - 0 \text{ tCO}_2\text{e} \\ &= 659,061 \text{ tCO}_2\text{e} \end{aligned}$$

Emission Reduction:

Period	Reported Value (as per the web hosted MR) tCO ₂ e	Verified Value tCO ₂ e	If Different, Summary of Issues That Caused the Difference
26/03/2009 to 25/12/2012	659,064.24	659,061	CL #2 and CAR #4 and CL #2 and CAR #4 were closed out.

According to the requirement by EB 66th meeting Para 77, the annual amount of ERs to be issued to this Project shall be capped at the average annual emissions reductions estimated in the original registered PDD, i.e. 140,695 tCO₂e per year. Therefore, the amount of emission reductions which could be claimed during this monitoring period should be **528,473 tCO₂e** (140,695 tCO₂e/365*1,371 days).



5. Recommendations for Changes in the Monitoring Plan

There is no recommendation for the changes in the Monitoring Plan during this (2nd) periodic verification.

6. Overview of Results

Assessment Against the Provisions of Decision 17/CP.7:

Is the project documentation in accordance with the requirements of the approved revised PDD and relevant provision of decision 17/CP.7, EB decisions and guidance and the COP/MOP?

Yes. The results of the compliance assessment are recorded in the verification checklist which is used as an internal report only.

Have on-site inspections been performed that may comprise, inter alia, a review of performance records, interviews with project participants and local stakeholders, collection of measurements, observations of established practices and testing of the accuracy of monitoring equipment?

Yes. Karen Tong (Lead Assessor and Local Assessor) and Yi Liao (Technical Expert) visited the site and undertook interviews, collected data, audited the implementation of procedures, checked calibration certificates and checked data, inter alia.

The results of the site visit are recorded in the verification checklist which is used as an internal report only.

The evidences have been checked and collected. The final monitoring report is attached with this verification report.

Has data from additional sources been used? If yes, please detail the source and significance.

Values for the following parameters are from external sources, The detailed source have been discussed in the section 3.10 of this report above. All the values are from reliable external source such as IPCC, China Energy yearbook etc.

- a) GWP_{CH_4} : Global Warming Potential of CH_4 . *The significance is high but the uncertainty is low.*
- b) $EF_{electricity,y}$: CO_2 emission factor for the electricity displaced due to the project activity during the year y . *The significance is high but the uncertainty is low.*
- c) $EF_{grid,y}$: CO_2 emission factor for grid electricity during the year y , *The significance is high but the uncertainty is low.*
- d) $EF_{km,CO_2,y}$: average CO_2 emission factor for transportation of biomass with trucks, *The significance and the uncertainty are low.*
- e) ρ_{diesel} : Density of diesel, *The significance and the uncertainty are low.*
- f) $EF_{CO_2,FF,i}$: CO_2 Emission Factor for fossil fuel type i , *The significance and the uncertainty are low.*
- g) NCV_i : Net Calorific Value of fossil fuels combusted at the project site for other purposes that are attributable to the project activity during year y , *The significance and the uncertainty are low.*
- h) $NCV_k * EF_{burning, CH_4,k,y}$: CH_4 emission factor for uncontrolled burning of the biomass residue type k during the year y , *The significance and the uncertainty are low.*
- i) $EF_{CH_4,BF}$: CH_4 methane emission factor for the combustion of biomass residues in the project plant, *The significance and the uncertainty are low.*
- j) Quantity of available biomass residues of type k in the region. *The significance and the uncertainty are low.*
- k) Quantity of biomass residues of type k that are utilized (e.g. for energy generation or as feedstock) in the defined geographical region. *The significance and the uncertainty are low.*

Please review the monitoring results and verify that the monitoring methodologies for the estimation of reductions in anthropogenic emissions by sources have been applied correctly and their documentation is complete and transparent.

Yes. The monitoring methodology has been correctly applied and the monitoring report and supporting references are complete and transparent.

Have any recommendations for changes to the monitoring methodology for any future crediting period been issued to the project participant?

No.

Determine the reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CDM project activity, based on the data and information using calculation procedures consistent with those contained in the approved revised project design document and the monitoring plan.

The data used in anthropogenic emission reduction calculation is consistent with those contained in the approved revised PDD and monitoring plan. The emission reduction was 679,419 tCO₂e for the period 26/03/2009 to 25/12/2012 as per the estimation made in the approved revised PDD. The actual emission reduction has been verified as 528,473 tCO₂e for the same period, taking into account the decision of EB 66th meeting para 77.

Identify and inform the project participants of any concerns related to the conformity of the actual project activity and its operation with the approved revised project design document. Project participants shall address the concerns and supply relevant additional information.

"No such non conformity of the actual project activity and its operation with the approved revised project design document has been observed."

Post monitoring report on UNFCCC website

Yes, the monitoring report is available at ref. 1375 on UNFCCC website

<http://cdm.unfccc.int/Projects/DB/TUEV-SUED1191857086.36/view>

7. Verification and Certification Statement

SGS United Kingdom Ltd has been contracted by EDF Trading Limited to perform the verification of the emission reductions reported for the CDM project Shandong Gaotang 30MW Biomass Power Generation Project (UNFCCC Reference Number:1375) in the period 26/03/2009 to 25/12/2012.

The verification is based on the validated and approved revised project design document and the monitoring report for this project. Verification is performed in accordance with section I of Decision 3/CMP.1, and relevant decisions of the CDM EB and CoP/MoP. The scope of this engagement covers the verification and certification of greenhouse gas emission reductions generated by the above project during the above mentioned period, as reported in Monitoring Report version 02 dated 11/03/2014

The management of EDF Trading Limited is responsible for the preparation, calculation and determination of GHG emission reductions from the project. The development and maintenance of records and reporting procedures are in accordance with the monitoring report.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 26/03/2009 to 25/12/2012 based on the reported emission reductions in the Monitoring Report version 02 dated 11/03/2014 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, SGS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

SGS confirms that the project is implemented as described in the validated and approved revised project design documents. Based on the information we have seen and evaluated, we confirm the following:

Project Title:	Shandong Gaotang 30MW Biomass Power Generation Project
UNFCCC Reference Number:	1375
Approved revised PDD Used for Verification:	Approved revised Project Design Document, version 07, dated 02/10/2011
Methodology Used for Verification:	ACM0006 version 04, Valid from 01/11/2006 to 17/05/2007
Applicable Period:	26/03/2009 to 25/12/2012
Total GHG Emission Reductions Verified:	528,473 tCO ₂ e

Signed on behalf of the Verification Body by Authorized Signatory

Signature: 

Name: Siddharth Yadav

Date: 10/07/2014

8. Document References

- /1/ Applied methodology ACM0006 version 04 valid from 01/11/2006 to 17/05/2007
- /2/ Approved revised Project Design Document, version 7, dated 02/10/2011
- /3/ Monitoring Report for this monitoring period

MR Version	Date of Revision	Main changes reason for Revision
Version 01	20/01/2014	Original version published on the UNFCCC website.
Version 02	11/03/2014	This version of MR is updated based on the new FOs raised by the assessment team CAR#1: section c and section D.2 CL #2, section D.2 parameter of p_{diesel} - CL #3: section D.2 of parameter $FF_{\text{project site, i, y}}$ CAR #4: Table E.2 and Table E.6.
Version 02	11/03/2014	MR is updated based on the new FO raised by the assessment team (CAR #6). a) Page 8, the spelling of parameter EF_{grid} is corrected; b) Pages 16 and 17, under the header “measuring/reading/recording frequency”, the font/format of the text are revised. c) Page 26, the version of the methodology is added. * Considering these are minor issues, the version number of the MR and ER spreadsheet remains unchanged.

- /4/ ER calculation spreadsheet for this monitoring period version 01 dated 20/01/2014, version 02 dated 11/03/2014 and version 03 dated 11/04/2014.
- /5/ Validation Report issued by TÜV SÜD, No 1041284 dated 20/03/2008
- /6/ Validation Opinion for the revised PDD, issued by SGS, dated 19/10/2012
- /7/ Verification reports for the first monitoring period, issued by SGS dated 13/09/2012.
- /8/ A statement on the supply of Wheat bran, issued by Shandong Quanlin Paper factory
- /9/ Monthly summary records of diesel combusted at the project site covering this monitoring period
- /10/ Diesel sales invoice covering this monitoring period.
- /11/ Pictures of the Nameplate of the Boiler, Turbine and Power generator installed by the Project.
- /12/ Line connection diagram of the electricity system of the Biomass power plant
- /13/ PPA signed between the project owner and the grid company
- /14/ Project Implementation Time Line and Records: Construction starting date, trial operation date and final commercial operation starting date.
- /15/ CDM Manual (Including Management Process, Data Collection Procedure, Roles and responsibility, Emergency Plan)
- /16/ Staff Training Records and Qualification Certificates
- /17/ Meters replacement records of the electricity meters, issued by the Local Grid company.
- /18/ Meters replacement records of the flow meter used to monitoring the diesel consumed by the Project.
- /19/ EB66 Meeting Report Paragraph 77.
- /20/ Monthly Electricity Meters Reading Records (The Main meter) of the electricity delivered and consumed by the Project to and from the Grid(MRRs).

- /21/ Monthly Electricity Meters Reading Records of the electricity delivered to the Grid monitored by the meter installed in the Project site.
- /22/ Electricity Transaction Notes for Electricity delivered to and consumed from the grid
- /23/ Electricity sales invoice for electricity delivered and consumed from the grid (including the statement issued by Local Grid company on the electricity consumed at the biomass collection stations)
- /24/ Monthly biomass residue consumption records of by the Project.
- /25/ Monthly and daily purchase records of the biomass residues of the project coving this monitoring period.
- /26/ Biomass Power Generation Technology, Prepared by Shandong Electric Power Engineering Consulting Institute Corp.Ltd, The People's Republic of China. 09/02/2007. Author: He Huang.
- /27/ Measured Moisture Content and NCV of Biomass Residues covering this monitoring period
- /28/ Electronic Map of the biomass residues collection sites
- /29/ Operation manual of the boiler.
- /30/ Survey result of available and utilised biomass in Gaotang City, Xiajin City, Guanxian City, and Linqing City, Pingyuan City, Wucheng City, Yucheng City, Chiping City issued on by Statistic Bureau of the eight cities. Covering this monitoring period.
- /31/ GB/T19147-2003, GB19147-2009, GB19147-2013 Automobile diesel fuels
- /32/ DL/T448-2000 Technical administrative code of electric energy metering
- /33/ 2006 IPCC Guidelines for National Greenhouse Gas Inventories
- /34/ China Energy Statistic Yearbook 2013, Compiled by Department of Energy Statistics, National Bureau of Statistics, People's Republic of China.
- /35/ Calibration certificates of electricity meter (main meter) covering this monitoring period.
- /36/ Calibration certificates of electricity meters (electricity meter installed in the biomass collection station) covering this monitoring period.
- /37/ Accreditation Certificate of Liao Cheng Power Research Institute, issued by Quality and Technology Supervision Bureau of Shandong Province
- /38/ Accreditation Certificate of Gaotang Power Supply Company issued by Quality and Technical Supervision Bureau of Shandong province
- /39/ Calibration certificates of electronic truck scales used by the project, issued by Quality and Technology Supervision Inspection Institute of Liaocheng city, with period of validity covering this monitoring period.
- /40/ Accreditation Certificate of by Quality and Technology Supervision Inspection Institute of Liaocheng city, issued by Quality and Technology Supervision Bureau of Shandong Province
- /41/ Calibration Certificate of the calorimeter, issued by Quality and Technology Supervision Inspection Institute of Liaocheng city, with period of validity covering this monitoring period.
- /42/ Accreditation Certificate of Quality and Technology Supervision Inspection Institute of Liaocheng city, issued by Quality and Technology Supervision Bureau of Shandong Province.
- /43/ Calibration Certificate of the moisture analyser, issued by Quality and Technology Supervision Inspection Institute of Liaocheng city, with period of validity covering this monitoring period.
- /44/ Calibration Certificate of the flow meter, issued by Quality and Technology Supervision Inspection Institute of Liaocheng city, with period of validity covering this monitoring period.
- /45/ Accreditation Certificate of Quality and Technology Supervision Inspection Institute of Gaotang city, issued by Quality and Technology Supervision Bureau of Shandong Province
- /46/ IPCC 2006 default value (volume2: energy)
- /47/ EB75 Annex 7 Guidelines for Completing the Monitoring Report Form Version 04.0 dated 4/10/2013
- /48/ JJG 596-1999 National Metrological Calibration regulation for Electrical Energy Meters with electronics
- /49/ JJG 539-1997 Verification regulation of digital indicating weighing instrument
- /50/ JJG672-2001 Verification Regulation of the Bomb Calorimeter.



- /51/ JJG1036-2008. Verification Regulation for Electronic Balance
- /52/ Clean Development Mechanism Validation and Verification Standard version 07.0 dated 01/06/2014
- /53/ Clean Development Mechanism Project Standard version 07.0 dated 01/06/2014

9. Findings Overview

	CARs	CLs	FARs
Total Number raised	4	2	0

Date:	06/03/2014		Raised by:	Karen Tong and Liao Yi	
Type:	CAR	Number:	#1	Reference:	Section 3.5
Lead Assessor Comment:			Date: 06/03/2014		
<p>As per the revised PDD, $EC_{PJ,y}$ includes two parts. One is the electricity consumed by the project plant, which is measured by the main meter installed at the power distribution company. The other part is the electricity consumed for the preparation of the biomass residue in the collection stations. During this monitoring period, it was verified that the suppliers of the biomass residues sent the residues to the large biomass residues collection station at the project site directly. The other seven collection stations were not used in this monitoring period and there is no electricity consumed in these stations in this monitoring period.</p> <p>In the monitoring report (MR) version 01, there is no monitoring information on the electricity consumed in the seven collection stations. Thus, the monitoring of $EC_{PJ,y}$ reported in the MR shall be corrected for sake of transparency.</p>					
Project Participant Response:			Date: 11/03/2014		
Monitoring information on the electricity consumed in the seven biomass residues collection stations has been added in monitoring report version 02, and calibration certificates have been provided for verification.					
Documentation Provided as Evidence by Project Participant:					
Monitoring report version 02, 11/03/2014.					
Calibration certificates of the electricity meters installed at seven biomass residues collection stations.					
Information Verified by Lead Assessor:					
Monitoring report version 02 dated 11/03/2014.					
Calibration certificates of the electricity meters installed at seven biomass residues collection stations provided by the client.					
Statement issued by the local grid company on the no electricity consumption during this monitoring period.					
Reasoning for not Acceptance or Acceptance and Close Out:					
<p>In the revised MR version 02 dated 11/03/2014, it was found that the information on the monitoring of the electricity consumed in the seven biomass residues collection stations has been added in monitoring report section C (page 6) and section D.2 (page 17-20). As per the revised PDD, the electricity consumed in the seven biomass residues collection station was measured by the meters installed at the collection stations with accuracy of 2.0 separately. By reviewing the calibration certificates of the meters, it can be confirmed that all the meters used in the seven collection stations are calibrated as per relevant standards.</p> <p>There is statement issued by the local grid company. By reviewing the statement it was confirmed that there is no electricity consumption during this monitoring period.</p> <p>Based on the verification work carried above, CAR #1 was closed out.</p>					
Acceptance and Close out by Lead Assessor: Karen Tong				Date: 30/03/2014	

Date:	06/03/2014		Raised by:	Karen Tong and Liao Yi													
Type:	CL	Number:	#2	Reference:	Section 3.7												
Lead Assessor Comment:				Date: 06/03/2014													
As per the revised PDD, p_{diesel} shall "use accurate and reliable national data in the national standard "automobile diesel fuel GB/T19147-2003". As verified, there new versions of GB/T19147 including GB19147-2009 and GB19147-2013. Please clarify the compliance with the revised PDD of the p_{diesel} in the monitoring period.																	
Project Participant Response:				Date: 11/03/2014													
Information on the national standard "Automobile Diesel Fuels" is summarized as below:																	
<table border="1"> <thead> <tr> <th>Version No.</th><th>Effective date</th><th>Conservative value of diesel</th></tr> </thead> <tbody> <tr> <td>GB/T19147-2003</td><td>01/10/2003</td><td>0.86 kg/liter</td></tr> <tr> <td>GB19147-2009</td><td>01/01/2010</td><td>0.85 kg/liter</td></tr> <tr> <td>GB19147-2013</td><td>07/02/2013</td><td>0.85 kg/liter</td></tr> </tbody> </table>						Version No.	Effective date	Conservative value of diesel	GB/T19147-2003	01/10/2003	0.86 kg/liter	GB19147-2009	01/01/2010	0.85 kg/liter	GB19147-2013	07/02/2013	0.85 kg/liter
Version No.	Effective date	Conservative value of diesel															
GB/T19147-2003	01/10/2003	0.86 kg/liter															
GB19147-2009	01/01/2010	0.85 kg/liter															
GB19147-2013	07/02/2013	0.85 kg/liter															
To be conservative, 0.86kg/liter is applied before 25/01/2010 according to GB/T 19147-2003, and 0.85 kg/liter is applied after 25/01/2010 according to GB19147-2009 and GB19147-2013. Monitoring report and ER spreadsheet have been updated accordingly.																	
Documentation Provided as Evidence by Project Participant:																	
Monitoring report version 02, dated 11/03/2014.																	
ER calculation spreadsheet version 02, dated 11/03/2014.																	
Information Verified by Lead Assessor:																	
Monitoring report version 02, dated 11/03/2014.																	
ER calculation spreadsheet version 02, dated 11/03/2014																	
GB/T19147-2003, GB19147-2009, and GB19147-2013.																	
Reasoning for not Acceptance or Acceptance and Close Out:																	
As verified GB19147 version 2003 was updated in 2009 and 2013. The information in the three versions of Automobile Diesel Fuels were verified as follows:																	
<table border="1"> <thead> <tr> <th>Version No.</th><th>Effective date</th><th>Conservative value of diesel</th></tr> </thead> <tbody> <tr> <td>GB/T19147-2003</td><td>01/10/2003</td><td>0.86 kg/liter</td></tr> <tr> <td>GB19147-2009</td><td>01/01/2010</td><td>0.85 kg/liter</td></tr> <tr> <td>GB19147-2013</td><td>07/02/2013</td><td>0.85 kg/liter</td></tr> </tbody> </table>						Version No.	Effective date	Conservative value of diesel	GB/T19147-2003	01/10/2003	0.86 kg/liter	GB19147-2009	01/01/2010	0.85 kg/liter	GB19147-2013	07/02/2013	0.85 kg/liter
Version No.	Effective date	Conservative value of diesel															
GB/T19147-2003	01/10/2003	0.86 kg/liter															
GB19147-2009	01/01/2010	0.85 kg/liter															
GB19147-2013	07/02/2013	0.85 kg/liter															
In compliance with the revised PDD, the default value of diesel density in GB/T19147-2003 of 0.86 kg/liter was applied for period from 26/03/2009 to 25/01/2010 and 0.85 kg/liter is applied for period from 26/01/2010 to 25/12/2012 and was accepted by the assessment team.																	
The links in the ER spreadsheet was checked and confirmed that corresponding updating in the calculation of the ER for this monitoring period resulting from CL #2 was correct. Therefore, CL #2 was closed out.																	
Acceptance and Close out by Lead Assessor: Karen Tong				Date: 30/03/2014													

Date:	06/03/2014		Raised by:	Karen Tong and Liao Yi	
Type:	CL	Number:	#3	Reference:	Section 3.4
Lead Assessor Comment:				Date: 06/03/2014	
In the Guidance Completing the Monitoring Form (version 04.0). Calibration frequency shall be reported in the monitoring report Section D.2. Please clarify the calibration frequency of the meters used to measure the volume quantity of diesel consumed by the project and have this transparently reported in the MR.					
Project Participant Response:				Date: 11/03/2014	
Information on calibration frequency has been added in monitoring report version 02.					
Calibration frequency of flow meter CS2000-30CA (serial no. 283992690) is once per two year, and calibration frequency of flow meter JDK50C111 (serial no. 0606082) is once per year, which are consistent with the validity of calibration certificates.					
Documentation Provided as Evidence by Project Participant:					
Monitoring report version 02, dated 11/03/2014.					
Information Verified by Lead Assessor:					
Monitoring report version 02, dated 11/03/2014.					
Calibration certificates for the flow meters used during this monitoring period.					
Reasoning for not Acceptance or Acceptance and Close Out:					
As clarified by the client in the response to this finding that the calibration frequency of flow meter CS2000-30CA (serial no. 283992690) and flow meter JDK50C111 (serial no. 0606082) is once per two year and once per year respectively, which are consistent with the validity of calibration certificates. The assessment team has checked the calibration certificates for this. In the revised MR version 02 dated 11/03/2014, the calibration frequency of the flow meters used during this monitoring period was reported in the revised MR section D.2 and CL #3 was closed out.					
Acceptance and Close out by Lead Assessor: Karen Tong				Date: 30/03/2014	

Date:	06/03/2014		Raised by:	Karen Tong and Liao Yi	
Type:	CAR	Number:	#4	Reference:	Section 3.2 and section 3.3.
Lead Assessor Comment:				Date: 06/03/2014	
1. In MR Version 01, Table E.2 the moisture of BF2 for period 25/11/2010-25/12/2010 and 26/12/2010-24/01/2011 are not consistent with the verified ones.					
2. In MR Version 01, Table E.6 the NCV of BF2 for period from 25/11/2010 to 25/12/2010, and NCV of BF1 for period from 23/02/2011 to 24/03/2011 are not consistent with the verified ones.					
Please check and take corrections and the ER spread sheet shall also be revised accordingly.					
Project Participant Response:				Date: 11/03/2014	
The incorrect values have been revised in monitoring report version 02 and ER spreadsheet version 02, and relevant results have been updated accordingly.					
Documentation Provided as Evidence by Project Participant:					
Monitoring report version 02, dated 11/03/2014					
ER spreadsheet version 02, dated 11/03/2014					
Information Verified by Lead Assessor:					
Monitoring report version 02, dated 11/03/2014.					
ER spreadsheet version 02, dated 11/03/2014.					
The original meter recording of the moisture and NCV of BF2 (Wood residues).					

Reasoning for not Acceptance or Acceptance and Close Out:	
By reviewing the revised MR and ER spreadsheet version 02, dated 11/03/2014, it was confirmed that the mistakes were corrected. The formulas in the ER spreadsheet was checked and confirmed that corresponding updating in the calculation of the ER for this monitoring period resulting from CAR #4 was correct. Therefore, CAR #4 was closed out.	
Acceptance and Close out by Lead Assessor: Karen Tong	Date: 30/03/2014

Date:	11/04/2014		Raised by:	Karen Tong		
Type:	CAR	Number:	#5		Reference:	ER spread sheet
Lead Assessor Comment:				Date:11/04/2014		
In sheet “EGy” of ER calculation spreadsheet, G59-G104, the formula used (MIN (data from meter reading, data from sale receipts)) is not correct. Please make revision to the ER calculation spreadsheet in this regard						
Project Participant Response:				Date: 11/04/2014		
Formulas have been revised in ER spreadsheet version 03.						
Documentation Provided as Evidence by Project Participant:						
ER spreadsheet version 03, dated 11/04/2014.						
Information Verified by Lead Assessor:						
ER spreadsheet version 03, dated 11/04/2014.						
Reasoning for not Acceptance or Acceptance and Close Out:						
The ER calculation spreadsheet was revised and updated to version 03, dated 11/04/2014.The Formulas were verified to be correct. CAR #5 was closed. There is no change to the final values result from this finding due to the values in the MRR and in the ETNs are the same.						
Acceptance and Close out by Lead Assessor: Karen Tong				Date: 11/04/2014		

Date:	07/07/2014	Raised by:	Karen Tong		
Type:	CAR	Number:	#6	Reference:	MR and ER spreadsheet.
Lead Assessor Comment:			Date:07/07/2014		
There are some minor typos in the MR and ER spreadsheet. Please review the take necessary corrections.					
MR					
d) Page 8, the spelling of parameter EF _{grid} is incorrect, please revised.					
e) Pages 16 and 17, under the header “measuring/reading/recording frequency”, the text are a different font/format from MR template text. Please revise.					
f) Page 26, the version of the methodology shall be added.					
ER spreadsheet					
The verification of the MR is against the revised PDD, thus, the “PDD” in cover page tab, cell B15 and ER calculation tab, Cell A422 shall be “revised” PDD.					
Project Participant Response:			Date: 08/07/2014		
These typos have been revised in MR and ER spreadsheet.					
Documentation Provided as Evidence by Project Participant:					
Monitoring report version 02 and ER spreadsheet version 03.					
Information Verified by Lead Assessor:					
By reviewing the revised Monitoring report version 02 dated 11/03/2014 and ER spreadsheet version 03 dated 11/04/2014, it was found that all the typos are corrected.					



Reasoning for not Acceptance or Acceptance and Close Out:	
The typos are revised as required. These are minor issues, the version number of the MR and ER spreadsheet remain unchanged. It is accepted by the assessment team. CAR #6 was closed out.	
Acceptance and Close out by Lead Assessor: Karen Tong	Date:08/07/2014

10. Statement of Competence

Statement of Competence

Name: Karen Tong

Status

- Lead Assessor	<input checked="" type="checkbox"/>	- Expert	<input checked="" type="checkbox"/>
- Assessor	<input checked="" type="checkbox"/>	- Financial Expert	<input type="checkbox"/>
- Local Assessor	China	- Technical Reviewer	<input type="checkbox"/>

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	<input checked="" type="checkbox"/>
Technical Area(s): TA 1.2 Energy generation from renewable energy sources	
2. Energy Distribution	<input type="checkbox"/>
Technical Area(s):	
3. Energy Demand	<input type="checkbox"/>
Technical Area(s):	
4. Manufacturing	<input type="checkbox"/>
Technical Area(s):	
5. Chemical Industry	<input type="checkbox"/>
Technical Area(s):	
6. Construction	<input type="checkbox"/>
Technical Area(s):	
7. Transport	<input type="checkbox"/>
Technical Area(s):	
8. Mining/Mineral Production	<input type="checkbox"/>
Technical Area(s):	
9. Metal Production	<input type="checkbox"/>
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	<input type="checkbox"/>
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	<input checked="" type="checkbox"/>
Technical Area(s): TA 11.2 GHG capture and destruction	
12. Solvent Use	<input type="checkbox"/>
Technical Area(s):	
13. Waste Handling and Disposal	<input type="checkbox"/>
Technical Area(s):	
14. Afforestation and Reforestation	<input type="checkbox"/>
Technical Area(s):	
15. Agriculture	<input type="checkbox"/>
Technical Area(s):	

Approved Member of Staff by:

Siddharth Yadav

Date:

06/02/2012



Statement of Competence

Name: Sarah Chan

Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	China	- Technical Reviewer	

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	x
Technical Area(s): TA1.2 Energy generation from renewable energy sources	
2. Energy Distribution	
Technical Area(s):	
3. Energy Demand	
Technical Area(s):	
4. Manufacturing	
Technical Area(s):	
5. Chemical Industry	
Technical Area(s):	
6. Construction	
Technical Area(s):	
7. Transport	
Technical Area(s):	
8. Mining/Mineral Production	
Technical Area(s):	
9. Metal Production	
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	x
Technical Area(s): TA11: 11.2 GHG capture and destruction	
12. Solvent Use	
Technical Area(s):	
13. Waste Handling and Disposal	
Technical Area(s):	
14. Afforestation and Reforestation	
Technical Area(s):	
15. Agriculture	
Technical Area(s):	

Approved Member of Staff by: Siddharth Yadav Date: 30/11/2012



Statement of Competence

Name: Yi
Liao

Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	China	- Technical Reviewer	

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	x
Technical Area(s): TA 1.1 Thermal energy generation from fossil fuels and biomass including thermal electricity from solar	
TA 1.2 Energy generation from renewable energy sources	
2. Energy Distribution	
Technical Area(s):	
3. Energy Demand	
Technical Area(s):	
4. Manufacturing	
Technical Area(s):	
5. Chemical Industry	
Technical Area(s):	
6. Construction	
Technical Area(s):	
7. Transport	
Technical Area(s):	
8. Mining/Mineral Production	
Technical Area(s):	
9. Metal Production	
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	
Technical Area(s):	
12. Solvent Use	
Technical Area(s):	
13. Waste Handling and Disposal	x
Technical Area(s): TA 13.1: Waste handling and disposal	
14. Afforestation and Reforestation	
Technical Area(s):	
15. Agriculture	
Technical Area(s):	

Approved Member of Staff by: Siddharth Yadav Date: 15/02/2012



Statement of Competence

Name: Linda Hu

Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	China	- Technical Reviewer	x

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	x
<i>Technical Area(s): 1.2 Energy generation from renewable energy sources</i>	
2. Energy Distribution	
<i>Technical Area(s):</i>	
3. Energy Demand	
<i>Technical Area(s):</i>	
4. Manufacturing	
<i>Technical Area(s):</i>	
5. Chemical Industry	
<i>Technical Area(s):</i>	
6. Construction	
<i>Technical Area(s):</i>	
7. Transport	
<i>Technical Area(s):</i>	
8. Mining/Mineral Production	
<i>Technical Area(s):</i>	
9. Metal Production	
<i>Technical Area(s):</i>	
10. Fugitive Emissions from Fuels (solid, oil and gas)	
<i>Technical Area(s):</i>	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	x
<i>Technical Area(s): TA 11.2 GHG capture and destruction</i>	
12. Solvent Use	
<i>Technical Area(s):</i>	
13. Waste Handling and Disposal	
<i>Technical Area(s):</i>	
14. Afforestation and Reforestation	
<i>Technical Area(s):</i>	
15. Agriculture	
<i>Technical Area(s):</i>	

Approved Member of Staff by: Siddharth Yadav Date: 10/09/2012



Statement of Competence

Name: **Jumson Fu**

Status

- Lead Assessor	<input type="checkbox"/>	- Expert	<input checked="" type="checkbox"/>
- Assessor	<input type="checkbox"/>	- Financial Expert	<input type="checkbox"/>
- Local Assessor	<input type="checkbox"/>	- Technical Reviewer	<input type="checkbox"/>

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	<input checked="" type="checkbox"/>
Technical Area(s): TA 1.1 Thermal energy generation from fossil fuels and biomass including thermal electricity from solar	
2. Energy Distribution	<input type="checkbox"/>
Technical Area(s):	
3. Energy Demand	<input type="checkbox"/>
Technical Area(s):	
4. Manufacturing	<input type="checkbox"/>
Technical Area(s):	
5. Chemical Industry	<input type="checkbox"/>
Technical Area(s):	
6. Construction	<input type="checkbox"/>
Technical Area(s):	
7. Transport	<input type="checkbox"/>
Technical Area(s):	
8. Mining/Mineral Production	<input type="checkbox"/>
Technical Area(s):	
9. Metal Production	<input type="checkbox"/>
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	<input type="checkbox"/>
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	<input type="checkbox"/>
Technical Area(s):	
12. Solvent Use	<input type="checkbox"/>
Technical Area(s):	
13. Waste Handling and Disposal	<input type="checkbox"/>
Technical Area(s):	
14. Afforestation and Reforestation	<input type="checkbox"/>
Technical Area(s):	
15. Agriculture	<input type="checkbox"/>
Technical Area(s):	

Approved Member of Staff by: **Siddharth Yadav** Date: **15/02/2012**

11. Photographic Evidence

Unique reference number: 210299720

Parameter: EG_y and $EC_{PJ,y}$ (the main meter, the pictures of the other seven meters were not taken due to the restriction condition of the project)
Date: 20/02/2014

Name of equipment: Electricity meter



Unique reference number: 20061206

Parameter: $BF_{k,y}$
Date: 20/02/2014

Name of equipment: Electric truck scale



Unique reference number: 20070701
Name of equipment: Electric truck scale

Parameter: BF_{k,y}
Date: 20/02/2014



Unique reference number: 0606082
Name of equipment: Flow meter

Parameter: FF_{project site,i,y}
Date: 20/02/2014



Unique reference number: 1406128
Name of equipment: Calorimeter

Parameter: NCV_k
Date: 20/02/2014



Unique reference number: 3506073
Name of equipment: Moisture Analyzer

Parameter: Moisture content
Date: 20/02/2014



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