PERRY JOHNSON REGISTRARS

Carbon Emissions Services, Inc.

VALIDATION REPORT

EDF TRADING LIMITED

ANHUI GUZHEN BIOMASS GENERATION PROJECT IN CHINA

REPORT NO. C-1-C-01-L-0236-VA

REVISION NO.01

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VALIDATION REPORT

Date of first issue:	Project No:
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Approved by and date:	**Organisational unit:**
Bilal Anwar (21 October 2012)	Perry Johnson Registrars Carbon Emissions Services, INC
Client:	**Client ref.:**
EDF Trading Limited	Crystal Cui

Project Name: Anhui Guzhen Biomass Generation Project
Country: China
Methodology: ACM0018
Version: version 2.0
Sectoral Scope: 01
Project Type and Technology: Biomass based power generation to grid
ER estimate: 132,072 tCO_2 e per annum (average)

Size
☒ Large Scale
☐ Small Scale

Validation Status
☐ Corrective Actions Requested
☐ Clarifications Requested
☒ Full Approval and submission for registration
☐ Rejected

In summary, it is PJRCES's opinion that the Anhui Guzhen Biomass Generation Project in China, as described in the PDD "version 2.0 of 21 September 2012", meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0018, version 2.0. PJRCES thus requests the registration of the project as a CDM project activity.

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C-1-C-01-L-0236-Va	21 October 2012	01	Climate Change Kyoto Protocol Validation Clean Development Mechanism
Report title:			
Anhui Guzhen Biomass Generation Project			
Work carried out by:			
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Work verified by:			
S. Sathis Kumar -Independent Technical Reviewer			

ABBREVIATIONS

BAU	Business as usual
BM	Building Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO_2e	Carbon dioxide equivalent
CM	Combined Margin
DNA	Designated National Authority
EB	Executive Board
ECPG	East China Power Grid
EIA	Environmental Impact Assessment
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse gas(es)
GSP	Global Stakeholder Publication
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
LoA	Letter of Approval
MP	Monitoring Plan
NCV	Net Caloric Value
NDRC	National Development Reform Commission
ODA	Official Development Assistance
OM	Operational Margin
PDD	Project Design Document
PJRCES	Perry Johnson Registrars Carbon Emissions Services, INC
PPA	Power Purchase Agreement
RMB	Renminbi, Chinese currency (Yuan)
tCO_2e	Tonnes of CO_2 equivalents
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value Added Tax
VVM	Validation & Veriifcation Manual

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1 INTRODUCTION

The EDF Trading Limited has commissioned Perry Johnson Registrars Carbon Emissions Services, INC (PJRCES) to perform a validation of the Anhui Guzhen Biomass Generation Project in China (hereafter called "the project"). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

1.1 OBJECTIVE

Purpose of this validation is to have an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with

- the requirements of Article 12 of the Kyoto Protocol; the CDM modalities and procedures as agreed in the Marrakesh Accord under decision 17/CP.7; the annex to the decision; the modalities and procedures for small scale subsequent decisions made by CDM Executive Board,
- other relevant rules, including the Host Country legislation and sustainability criteria.

The above requirements are validated, in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen necessary to provide assurance to stakeholders on the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 SCOPE

The validation scope is given as an independent and objective review of the project design, the project's baseline study and monitoring plan which are included in the PDD and other relevant supporting documents.

The scope of the validation is defined as below:

- The Kyoto Protocol, in particular § 12 and modalities and procedures for the CDM
- Decision 2/CMP1 and Decision 3/CMP.1 (Marrakech Accords)
- Further COP/MOP decisions with reference to the CDM (e.g. decisions 4 – 8/CMP.1)
- Decisions and specific guidance by the EB published under http://cdm.unfccc.int
- Guidelines for Completing the Project Design Document (CDM-PDD), and the Proposed
- New Baseline and Monitoring Methodology (CDM-NM)
- Baselines and monitoring methodologies
- Management systems and auditing methods
- Environmental issues relevant to the sectoral scope applied for

- Applicable environmental and social impacts and aspects of CDM project activity
- Sector specific technologies and their applications
- Current technical and operational knowledge of the specific sectoral scope and information on best practice

The information included in the PDD and the supporting documents have been reviewed against the requirements and criteria mentioned above and the Quality Management System (QMS) of PJRCES. The validation team has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consultation to the organization(s). However, stated requests for clarifications and / or corrective actions may provide input for improvements of the project design.

2 VALIDATION TEAM AND QUALITY CONTROL

The validation of the project activity has been carried out by qualified personnel in line with the procedures defined in PJRCES's quality manual for validation and team definition. The validation report has undergone a technical review before requesting registration of the project activity. The technical review was performed by an independent technical reviewer.

***Validation team*:**

Name	Country	Role	Type of work carried out
Zhang Xiaojun Johnsen	China	Validator and Team Leader	Desk review, site visit, Resolution of issues, preparation of draft and final validation report, supervision of entire validation activity
Chandra Mohan	India	Technical Expert	Desk review, site visit, Sector specific inputs
S. Sathis Kumar	India	Technical Reviewer/Sector expert	Independent Technical review

3 METHODOLOGY OF VALIDATION

The validation of the project activity is carried out in the following phases:

- Desktop review of PDD and other relevant documents
- Follow up interviews (site visits) with the relevant stakeholders
- Resolution of the identified corrective action requests (CARs), clarification requests (CL) and forward action requests (FARs) if any, followed by the issuance of the final validation opinion and final validation report.

3.1 DESK REVIEW

The desktop review includes:

- A review of the PDD (including annexes) and the relevant supporting documents. The detailed list of documents reviewed throughout the validation process, are included in the section 7, under references.
- Preparation of project specific validation protocol in line with the requirements of the validation and verification Manual
- Background investigation and follow-up interviews with personnel of the project proponent, the consultant, legal authorities and other stakeholders.
- Reporting of validation findings taking into account the public comments received on UNFCCC website

In order to ensure consideration of all relevant assessment criteria, a validation protocol was used. The protocol shows, in a transparent manner, criteria and requirements, means of verification and the results from pre-validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, details and clarifies the requirements that a CDM project is expected to meet;
- It ensures a transparent validation process where the independent entity will document how a particular requirement has been validated and the result of the determination

The validation protocol consists of three tables: Table 1 (Mandatory Requirements);

Table 2 (Requirement checklist); and table 3 (Resolution of corrective Action and clarification request) as described in figure 1

The completed validation protocol is enclosed in Appendix to this report identifying Corrective Action Requests and clarification Requests.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities		
Requirement	***Reference***	***Conclusion***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*

Validation Protocol Table 2: Requirement checklist			
CDM Validation requirement	***Remarks / comments***	***Evidence***	***Conclusion***
The various requirements as per para 37 of the CDM modalities and procedures, in line with the validation and verification manual *The various requirements in Table 2 are linked to checklist questions the project should meet.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable*	*Final conclusion on the checklist question*

Validation Protocol Table 3: Resolution of issues identified in Table 2			
Draft report clarifications, corrective action requests and forward action requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Validation conclusion***
If the conclusions from the draft Validation are either a CAR, FAR or a CL, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the CAR, FAR or CL is explained.*	*The responses given by the project participants during the communications with the validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

3.2 FOLLOW-UP INTERVIEWS

Between 18-19 March 2012, Zhang Xiaojun Johnsen and Chandra Mohan of PJRCES visited the project site and interviewed project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of National Guzhen Bio Energy Co., Ltd and EDF Trading Limited and local representatives were interviewed /1/ /2/ /3/ /4/.

The main topics of the interviews are summarised in the table below.

	Date	Name	Organization	Topic
/1/	18-19 March 2012	Sam Wu Julia Lee Cindy Yang	EDF Trading Limited	• Baseline determination of the project • Applicability of selected methodology • Issues related to the additionality • Common practice analysis • Emission reductions calculation • Emission reduction monitoring plan and project management
/2/	18-19 March 2012	Zhao Hui Li Zheng Wang Zhang Zhang Li	National Guzhen Bio Energy Co., Ltd	• Availability of biomass, electrical supply through the power plant • The approval status (incl. EIA approval, the FSR approval, CDM project approval) • Pre-project activity scenario, fuel supply, factors determining selection of technology, financing of the project activity • Electrical distribution system, pattern of steam generation, monitoring plan, Procedures for measurement and Project management • Consulting process for stakeholder's comments and rationality of questionnaires. • Sources of funds for the project activity, cost of the project activity
/3/	18-19 March 2012	Zhou Kang	Local DRC	• The approval status (incl. EIA approval, the FSR approval, CDM project approval) • Sustainability issues • Local availability of biomass residues
/4/	18-19 March 2012	Wang Jianmin Xu Shanfeng	Local villagers	• Agricultural pattern and seasonal availability of biomass • Utilization and disposal • Price of the biomass residues • Stakeholder consultation • Benefits from the proposed project

3.3 RESOLUTION OF CLARIFICATION AND CORRECTIVE ACTION REQUESTS

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified prior to PJRCES's positive conclusion on the project design. In order to ensure transparency, a validation protocol is customised for the project. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified.

Corrective action requests ***(CAR)*** are issued, where:

i) Mistakes have been made with a direct influence on project results;
ii) CDM and/or methodology specific requirements have not been met; or
iii) There is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification ***(CL)*** may be used where additional information is needed to fully clarify an issue.

Additionally, a forward action request ***(FAR)*** may be raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. The FARs so identified however, shall not relate to the CDM requirements for registration.

Main changes between the PDD, version 01.1 dated 1 March 2012 published for the 30 days stakeholder commenting period and the final PDD, version 2.0 of 21 September 2012 submitted for registration:

- Methodology ACM0018 version change from version 1.3.0 at GSC to version 2.0, to use the "Project and leakage emissions from road transportation of freight" version 1.0.0
- One more parameter that contributes to more than 20% of the cost has been discussed in sensitivity analysis, and all the parameters' variation has been extended to the point where it crosses the benchmark and likelihood of that not to happen was justified (refer to resolution of CAR 4).
- The common practice analysis in the PDD has been correctly interpreted in the revised PDD for registration following Guidelines on common practice, version 2.0 (refer to resolution of CAR 5).

- More information has been supplemented to address some of baseline scenario exclusion in the PDD for GSC (refer to resolution of CL 3).
- Further clarity and information provided to support the concern of the serious consideration of the CDM (refer to resolution of CL 4).
- Public evidences were presented to support the availability and reasonability of financial input parameters at the time of decision making (refer to resolution of CL 5).
- Net calorific value (43.3GJ/ton) of the fossil fuel type ($NCV_{i,y}$) was sourced from IPCC 2006, which is conservative, to replace the national default value (42.652GJ/ton) (refer to resolution of CL 8).
- Monitoring plan was updated to be in line with methodology and to be practical for the proposed project (refer to resolution of CL 8).
- Other necessary changes resulting from the closure of CLs and CARs.

4 VALIDATION FINDINGS

The details of the assessment and the main results have been described below in accordance with the VVM reporting requirements. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

4.1 PARTICIPATION REQUIREMENTS

As per section A.3 and Annex 1 of the PDD, version 2.0 of 21 September 2012, China has been identified as the host Party and the Annex I Party is France. The sole project participant from the host Party China is National Guzhen Bio Energy Co., Ltd, and EDF Trading Limited is the only project participant from the Annex I Party France.

Keeping in view the requirements of Validation and Verification Manual, PJRCES confirms:

a) The host Party (China) and the Annex I Party (France) meet all relevant participation requirements, and have ratified the Kyoto Protocol and established their own DNA as per the participating requirements for CDM under the Kyoto Protocol. China has ratified the Kyoto Protocol on 30 August 2002 and its DNA is National Development and Reform Commission (NDRC). France has ratified the Kyoto Protocol on 31 May 2002 and its DNA is Ministry of Ecology, Sustainable Development, Transports and Housing.

b) The DNA of China issued a LoA on 28 March 2012, authorizing National Guzhen Bio Energy Co., Ltd as project participant and also confirms that the project assists in achieving sustainable development.

c) The DNA of France issued a LoA on 13 September 2012, authorizing EDF Trading Limited as project participant.

d) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.

e) That the project participants are listed in tabular form in section A.3 of the PDD and that this information is consistent with the contact details provided in annex 1 of the PDD and no entities other than those approved as project participants are included in these sections of the PDD.

f) Written approvals from the DNA's of respective countries also confirm the voluntary participation of the Parties involved.

g) PJRCES received LoAs of China and France from project participant directly and did not doubts the authenticity of the letter of approval, nevertheless approval status has been cross checked from,

- Chinese DNA web-page: http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2825.pdf
- Email communications between EDF Trading Limited and Ministry of Ecology, Sustainable Development, Transports and Housing of France.

The validation team also reviewed the bank (Beijing Branch, Huaxia Banking Co., Ltd) loan contract /31/. Based on this, PJRCES confirms that the project has not received any public funding and/or Official Development Assistance (ODA) funding towards China.

4.2 PROJECT DESIGN

The project is a Greenfield biomass residue fired power only plant where currently no power generation occurs, which was verified on site. The whole of the electricity generated in the project after meeting the auxilairy consumption will be exported to East China Power Grid. The power-only plant involves the installation of one set of high temperature and high pressure, natural circulation boiler with the capacity of 130 t/h each and one set of steam turbine generator with installed capacity 30MW. The biomass residues consumed per year has been estimated as 310,000 tonnes on wet basis (rice straw, peanut straw, maize straw and wood residue) to displace 186,900 MWh of electricity, which would otherwise be produced by ECPG. The plant load hours will be 7,000 hours (PLF of 79.9%), according to the FSR.

The project is located on Guzhen County, Bengbu City, Anhui Province, P. R. China. The geographical coordinates are east longitude of 117°20′13″ and north latitude of 33°13′08″. All these coordinates have been verified by PJRCES through the FSR /6/.

The model numbers of the one set of turbine (N30-8.83) and generator (QF-30-2) are verified to be the same as stated in the equipment purchase contract /15/ /17/. The following table outlines the specifications of the boilers and power generation system to be used for the proposed project.

TABLE 1 TECHNICAL SPECIFICATIONS

Boilers (1 Unit)	
Manufacturer	Longji Power Co., Ltd
Type	high temperature and high pressure, natural circulation boiler
Rated steam output	130 t/h

Rated steam pressure	9.2 MPa
Rated steam temperature	540 □
Turbine	
Manufacturer	Qingdao Jieneng Power Station, Engeering Co., Ltd.
Type	N30-8.83 condensing steam turbine
Nominal rating	30MW
Medium	Superheated steam
Rated pressure of main steam	8.83 MPa
Rated temperature of main steam	535 □
Rated flux of main steam	130 t/h
Generator	
Manufacturer	Shandong Jinan Power Equipment Factory
Type	QF-30-2 Air Cool
Rated voltage	10.5 kV
Rated rotating speed	3,000 r/min
Rated power	30MW

The applied technology essentially comprises of direct combustion of biomass residues in boilers to generate steam, which is subsequently expanded through turbines and then drives the generator to generate electricity. Boiler, generator, turbine and accessories are manufactured in China /15/ /17/. The biomass generation technology applied in this project activity is deemed to reflect current good practice in China.

It is expected that the proposed project activity generate gross electricity of 210,000 MWh and will supply 186,900 MWh net electricity per year to the East China Power Grid (ECPG).

The proposed project activity will achieve greenhouse gas (GHG) emission reductions by replacing the equivalent capacity of fossil fuel fired which is predominantly coal-fired power

plants and reduction of methane emissions from biomass dumping. However in the case of this project activity emission due to decay of biomass are not claimed for simplification. The emission reductions are estimated to be on average 132,072 tCO_2e per year and 924,504 tCO_2e over the first seven-year of the renewable crediting period.

The biomass residues consumed per year has been estimated as 310,000 tonnes on wet basis as per FSR /6/. The biomass residues used in this project composed of rice straw, peanut straw, maize straw and wood residue produced in the local region and which are normally dumped in an uncontrolled manner. Those biomass residue types are first collected in the field. Each type of the biomass after being weighed, analyzed for net calorific value and moisture, is segregated in the storage area and blended just before being introduced to the biomass boilers. There is no waste water for rice straw, peanut straw, maize straw and wood residue treated under anaerobic condition.

The collected biomass residues will be transported by vehicles to biomass residue sheds at the project site before being burnt in boilers for electricity generation.

Prior to the implementation of the proposed project activity, it was observed that no power generation unit was operating at the project site; and the electricity was supplied by ECPG dominated by fossil fuel-fired power plants. And the unused biomass residues are dumped or left to decay under mainly aerobic conditions as per FSR /6/, which is also the baseline scenario.

Being a renewable electricity project, the project activity will generate greenhouse gas (GHG) emission reductions by: 1) avoiding the CO_2 emissions from the displacement of grid connected electricity generation by fossil fuel power projects; and 2) avoidance of methane emissions from biomass dumping at immediate sites. However, PP has claimed only emission reductions on account of CO_2 emissions avoided from the electricity generated by fossil fuel fired power plants; while methane emissions from dumping of biomass have not been claimed for the baseline and project scenario.

PJRCES considers the project description to be complete and accurate. PJRCES also confirms that the final Project Design Document (PDD), version 2.0 of 21 September 2012 for the proposed project has been prepared using the CDM PDD Form – Project Design Document form, version 3 and filled in line with the Guidelines for completing the Project Design Document (CDM-PDD) /44/.

4.3 CREDITING PERIOD AND PROJECT DURATION

At the date of site visit of 18-19 March 2012, Anhui Guzhen Biomass Generation Project was fully operational.

From the construction permit /18/, it was confirmed that the Anhui Guzhen Biomass Generation Project started construction on 31 March 2010 and began its formal operation on 3 January 2011, evidenced from 72+24 hours commissioning acceptance on 3 January 2011 /29/.

The expected operational lifetime of the project activity is 20 years according to the FSR /6/.

A renewable crediting period of 7 years has been chosen for the project, starting on 1 November 2012 or date of effective registration of CDM project activity whichever occurs later.

4.4 ELIBIBILITY AS SCALE OF PROJECT ACTIVITY

The proposed project (Anhui Guzhen Biomass Generation Project) falls within the "Large scale CDM project", as its capacity is 30MW.

4.5 APPLICABILITY OF METHODOLOGY TO PROJECT ACTIVITY

The project correctly applies the approved baseline methodology ACM0018 (version 2.0), titled "*Consolidated methodology for electricity generation from biomass residues in power-only plants*" /35/. As per the methodology the project activity involves generation of electricity using biomass residue in a power only plant. It involves the installation of a new biomass residue fired power-only plant at a site where currently no power generation occurs (i.e. it's a Greenfield power project);

The applied baseline methodology is justified as all the criteria set in the methodology were met, which was elaborated in the table below.

Applicable conditions of Methodology ACM0018	In the proposed project activity
No other biomass types than biomass residues, as defined in page 1 and 2 of ACM0018 version 2.0, are used in the project plant;	Project activity only uses biomass residues /6/ /7/ as fuel. The project combusts the renewable biomass (rice straw, peanut straw, maize straw and wood residue) /6/ /7/ for power generation;
Fossil fuels may be co-fired in the project plant. However, the amount of fossil fuels co-fired shall not exceed 80% of the total fuel fired on an energy basis;	It is not anticipated that any fossil fuel will be co-fired with the biomass residues.
For projects that use biomass residues from a production process (e.g. production of sugar or wood panel boards), the implementation of the project shall not result in an increase of the processing capacity of raw input (e.g. sugar, rice, logs etc.) or in other substantial changes (e.g. product change) in this process;	The project utilizes only the biomass residues (rice straw, peanut straw, maize straw and wood residue) for power generation; and this biomass is the by-product of the agricultural result, not from a production process.
The biomass residues used by the project facility should not be stored for more than one year;	According to the biomass residues collection and disposal conditions of the project activity, the storage period of the biomass residues would not be stored for more than one year, from interviews with local villagers /4/ and local governmental officers /3/. And also it was confirmed that the site storage capacity is 50,000 tonnes, composing only 16% of the total yearly consumption (310,000 tonnes on

	wet basis).
Projects that chemically process the biomass residues prior to combustion (e.g. by means of esterification, fermentation and gasification) are not eligible under this methodology. The biomass residues can however be processed physically such as by means of drying, pelletization, shredding and briquetting;	Biomass residues (rice straw, peanut straw, maize straw and wood residue) are not processed chemically prior to combustion, verified on site visit /1/ /2/ /3/. The biomass residues (rice straw, peanut straw, maize straw and wood residue) needs only natural drying and will require energy for transportation (from biomass residue site to project activity site) and mechanical treatment (shredding shorten).
No power and heat plant operates at the project site during the crediting period;	The project activity is solely a power-only plant during the crediting period, where currently no heat occurs, observed on site visit /1/ /2/ /3/.
If any heat which is used for purposes other than power generation (e.g. heat which is produced in boilers or extracted from the heater to feed thermal loads in the process) is generated during the crediting period or was generated prior to the implementation of the project activity, by any on-site or off-site heat generation equipment connected to the project site, the following conditions should apply: a) The implementation of the project activity does not influence directly or indirectly the operation of the heat generation equipment, i.e. the heat generation equipment would operate in the same manner in the absence of the project activity; b) The heat generation equipment does not influence directly or indirectly the operation of the project plant (e.g. no fuel is diverted from the heat generation equipment to the project plant); and c) The amount of fuel used in the heat generation equipment can be monitored and clearly differentiated from any fuel used in the project activity.	The proposed project is the power-only plant, as verified from design /6/ and onsite observation /1/ /2/ /3/. There is no heat, which is used for purposes other than power generation (e.g. heat which is produced in boilers or extracted from the heater to feed thermal loads in the process), generated during the crediting period or generated prior to the implementation of the project activity, by any on-site or off-site heat generation equipment connected to the project site.
In the case of fuel switch project activities, the use of biomass residues or the increase in the use of biomass residues as compared to the baseline scenario is technically not possible at the project site without a capital investment in: • The retrofit or replacement of	The project is a green field power-only generation plant without fuel switch activities /1/.

existing heat generators/boilers; or • The installation of new heat generators/boilers; or • A new dedicated biomass residues supply chain established for the purpose of the project (e.g. collecting and cleaning contaminated new sources of biomass residues that could otherwise not be used for energy purposes); • Equipment for preparation and feeding of biomass residues	

As per methodology, for this project, the identified most plausible baseline scenario, in the section 4.7 of this report, turns out to be (P5+B1), fully in compliance with the requirement of the methodology ACM0018 (version 2.0) /35/, where it states that 1) for power generation: Scenarios P2 to P7, or a combination of any of those scenarios; 2) For biomass use: Scenarios B1 to B8, or a combination of any of those scenarios. Whereas note that for scenarios B5 to B8, leakage emissions should be accounted for as per the procedures of the methodology. Thus the assessment of the project's compliance with the applicability criteria of ACM0018 (version 2.0) /35/ are documented in detail in section B.1 of Table 2 in the validation protocol in Appendix A to this report.

4.6 PROJECT BOUNDARY

As per the methodology the project activity involves generation of electricity using biomass residue in a power only plant. It involves the installation of a new biomass residue fired power-only plant at a site where currently no power generation occurs (i.e. it's a Greenfield power project).

The spatial extent of the project boundary is clearly defined as the site of project activity and all power plants connected physically to the ECPG. The electricity generated by the project activity will displace part of the electricity generated by the ECPG, which is dominated by coal-fired power plants, and thus greenhouse gas (GHG) emissions are expected to be reduced.

➢ The spatial extent of the project boundary encompasses the power plant (including, *inter alia*, heat generators, heat engines, electricity generators, gear boxes and speed reducers, instrumentation and control equipment, cooling equipment, pumps, fans, and also the systems required for the preparation, storage and transportation of biomass) at the project site, the biomass residues used in the Project will only involve simple physical processing prior to combustion, such as drying or necessary shredding, and these will also be conducted in the project activity power-only plant, the trucks which transport biomass residue to the project site,

the biomass collection area (within 50 km area around the project plant) where the biomass residues would have been left for decay or dumped and all power plants connected physically to the ECPG comprising Shanghai, Jiangsu, Zhejiang, Anhui and Zhejiang power grids, to which the project is connected. This is in line with the delineation of grid boundary as provided by the DNA of China /50/. Also, the defined project boundary is in line with the applied methodology ACM0018 (version 2.0) /35/.

The selected sources and gases are justified for the project activity. Emission sources and gases included in the project boundary are:

TABLE 2 JUSTIFICATION OF SELECTED SOURCES AND GASES

	Source	*Gas*	*Incl./Excl.*	*Description & Validation*
Baseline	Electricity generation	CO_2	Included	The GHG emission reduction due to displacement of electricity from the baseline coal fired power plant. The baseline emissions factor for the project are determined ex-ante as a combined margin, consisting of combination of the operating margin (OM) and build margin (BM) of the ECPG.
		CH_4	Excluded	Excluded for simplification. This is conservative.
		N_2O	Excluded	
	Uncontrolled burning or decay of surplus biomass residues	CO_2	Excluded	It is assumed that CO_2 emissions from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector
		CH_4	Excluded	In PDD, for simplification of emission calculation, this emission was not accounted for by project owner.
		N_2O	Excluded	Excluded for simplification. This is conservative.
Project	On-site fossil fuel consumption	CO_2	Included	Fossil fuel may be consumed, as described in design /6/, which will be monitored.
		CH_4	Excluded	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	Excluded	
	On-site and offsite transportation and processing of biomass residues	CO_2	Included	Transportation trucks consumed fossil fuel, which will be monitored.
		CH_4	Excluded	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	Excluded	
	Combustion of biomass residues for electricity	CO_2	Excluded	It is assumed that CO_2 emissions from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector
		CH_4	Excluded	This emission source is excluded as CH_4 emissions from uncontrolled burning or decay

				of biomass residues in the baseline scenario are excluded.
		N_2O	Excluded	Excluded for simplification. This emission source is assumed to be small.
	Storage of biomass residues	CO_2	Excluded	It is assumed that CO_2 emissions from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector
		CH_4	Excluded	Excluded for simplification. Since biomass residues are stored for not longer than one year, this emission source is assumed to be small.
		N_2O	Excluded	Excluded for simplification. This emissions source is assumed to be very small.
	Wastewater from the treatment of biomass residues	CO_2	Excluded	It is assumed that CO_2 emissions from surplus biomass residues do not lead to changes of carbon pools in the LULUCF sector
		CH_4	Excluded	This emission source is excluded since the waste water is not treated (or partly) under anaerobic conditions, confirmed from site visit /1/ /2/ /3/ and from design /6/.
		N_2O	Excluded	Excluded for simplification. This emission source is assumed to be small

The identified boundary and selected sources and gases are justified for the project activity. Furthermore, on the basis of the on-site assessment, PJRCES hereby also verifies that, as a result of the implementation of the project, no greenhouse gas emissions occurring within the project boundary, which are expected to contribute more than 1% of the overall expected average annual emissions reductions, are not addressed by the applied methodology.

4.7 BASELINE ASSESEMENT

The baseline scenarios have been identified as per the baseline and monitoring methodology ACM0018, version 2.0 /35/.

Step 1: Identification of alternative scenarios

Step 1a: Define alternative scenarios to the proposed CDM project activity

TABLE 3 LIST OF ALTERNATIVE SCENARIOS FOR ELECTRICITY POWER

	Description	**Assessment and justification by PJRCES**	**Considered further**
P1	The proposed project activity not undertaken as a CDM project activity	This is a credible alternative	Yes
P2	If applicable, the continuation of power generation in existing power-only plants fired with biomass residues, or fossil fuels,	Not applicable, there is no existing power-only plant at the project site, this has been confirmed on the site	No

	or a combination of both, at the project site. The existing power-only plants would operate at the same conditions (e.g. installed capacities, average load factors, or average energy efficiencies, fuel mixes, and equipment configuration) as those observed in the most recent three years prior to the project activity	visit /1/ /2/ /3/ and from the project design /6/.	
P3	If applicable, the continuation of power generation in existing power-only plants fired with biomass residues, or fossil fuels, or a combination of both, at the project site. The existing power-only plants would operate with different conditions from those observed in the most recent three years prior to the project activity.	Not applicable, there is no existing power-only plant at the project site, this has been confirmed on the site visit /1/ /2/ /3/ and from the project design /6/.	No
P4	If applicable, the retrofitting of existing power-only plants fired with biomass residues, or fossil fuels, or a combination of both, at the project site. The retrofitting may or may not include a change in fuel mix.	Not applicable, there is no existing power-only plant at the project site, this has been confirmed on the site visit /1/ /2/ /3/ and from the project design /6/.	No
P5	The generation of power in the grid.	This is the baseline scenario	Yes
P6	The installation of new power-only plants fired with biomass residues, or fossil fuels, or a combination of both, at the project site, using the same amount or less biomass residues than under scenario P1.	N/A The proposed project activity is the establishment of a greenfield power plant and supplies electricity only to the grid, then the alternatives considered for power generation should include only the scenarios P1 and P5.	No
P7	The installation of new power-only plants fired with biomass residues, or fossil fuels, or a combination of both, at the project site, using more biomass residues than under scenario P1.	N/A The proposed project activity is the establishment of a greenfield power plant and supplies electricity only to the grid, then the alternatives considered for power generation should include only the scenarios P1 and P5.	No

TABLE 4 LIST OF ALTERNATIVE SCENARIOS FOR USE OF BIOMASS RESIDUES (RICE STRAW, PEANUT STRAW, MAIZE STRAW AND WOOD RESIDUE)

	Description	**Assessemnt and justification by**	**Considered**

		PJRCES	further
B1	The biomass residues are dumped or left to decay mainly under aerobic conditions. This applies, for example, to dumping and decay of biomass residues on fields.	The scenario prior to the proposed project is that the rice straw, peanut straw, maize straw and wood residue are dumping and decay of biomass residues on fields under aerobic conditions,which was verified from document such as FSR /6/ and EIA /7/, also verified from site observation during site visit.	Yes
B 2	The biomass residues are dumped or left to decay under clearly anaerobic conditions. This applies, for example, to landfills which are deeper than 5 meters. This does not apply to biomass residues that are stock-piled or left to decay on fields.	The scenario prior to the proposed project is that the rice straw, peanut straw, maize straw and wood residue are dumping and decay of biomass residues on fields under aerobic conditions.	No
B 3	The biomass residues are burnt in an uncontrolled manner without utilizing it for energy purposes.	This alternative can be an alternative scenario.	Yes
B 4	The biomass residues are used for electricity generation in power-only plant configuration at the project site in new and/or existing power plants.	This is the project activity without CDM.	Yes
B 5	The biomass residues are used for power and/or heat generation in other existing or new power plants at other sites.	In the region, it was confirmed /1/ /2/ /3/ /4/ /6/ that rice straw, peanut straw, maize straw and wood residue are not utilized for power or heat generation before the proposed project. Besides, new power or heat generation plants if any at other sites would incur the same barrier as per the project activity; therefore this is not a credible alternative.	No
B 6	The biomass residues are used for other energy purposes, such as the generation of bio-fuels.	The rice straw, peanut straw, maize straw and wood residue is apparently not feasible for generation of bio-fuels.	No
B 7	The biomass residues are used for non-energy purposes, e.g. as fertilizer or as feedstock in processes (e.g. in the pulp and paper industry).	The rice straw, peanut straw, maize straw and wood residue is not utilized in the local area as feedstock for any process.	No
B 8	The primary source of the biomass residues and/or their fate in the absence of the project activity cannot be clearly identified	The rice straw, peanut straw, maize straw and wood residue is sourced from local agricultural area and its fate in the absence of the project activity is clearly identified.	No

Biomass residues categories

For the biomass types, sources, fates and respective amount, PJRCES has verified that the data in the PDD represents the actual circumstances from site visit (interview) /1/ /2/ /3/ /4/ and from the documents /6/ /7/ provided.

TABLE 5 TABLE FOR BIOMASS RESIDUES CATEGORIES

Biomass residue category (*k*)	Biomass residue type	Biomass residue source	Biomass residue's fate in the absence of the project activity	Biomass residue use in project scenario	Biomass residue quantity (10^4 tonnes on dry-basis)
1	Rice straw	Offsite from local farmer	Dumped (B1)	Power generation on site	4.80
2	Peanut straw	Offsite from local farmer	Dumped (B1)	Power generation on site	2.56
3	Maize straw	Offsite from local farmer	Dumped (B1)	Power generation on site	3.45
4	Wood residues	Offsite from local farmer	Dumped (B1)	Power generation on site	8.86

Biomass residues availability

For the biomass residue sufficiency as per FSR /6/, further it is checked from the survey conducted by a third party called DRC of Guzhen County, that total quantity of biomass residue available within 50 kilometers is 2,382,000 tonnes annually on wet basis, far exceeding the consumption of all the biomass residues from the area including the proposed project (970,000 tonnes (660,000+310,000) of biomass residue per year on wet basis).

The quantity of biomass residues available in the region exceeds the quantity of biomass residues utilized by about 146%, which is much higher than 25% of un-consumed biomass residue benchmark required as the criteria to rule out competing uses for the biomass residues.

The details are shown in the following table.

Biomass residue type	Annual available amount (10^4 tonnes)	Other use, excluding the Project (10^4 tonnes)	The Project use (10^4 tonnes)	Annual available amount/Total annual use
Rice straw	55.3	16.8	6.4	=55.3/(16.8+6.4)=238 %
Peanut straw	35.7	12.0	3.2	=35.7/(12.0+3.2)=235 %
Maize straw	55.1	16.4	5.3	=55.1/(16.4+5.3)=254 %
Wood residues	92.1	20.8	16.1	=92.1/(20.8+16.1)=250 %

Step 1b: Consistency with mandatory applicable laws regulations

All alternative scenarios herein except B3 are in compliance with mandatory applicable laws and regulations. Burning biomass residues in an uncontrolled manner without utilizing it for energy purposes is against the "*Notice about Prohibiting to Burn Agricultural Straw in an Uncontrolled Manner*" issued by Ministry of Agriculture of the People's Republic of China /55/. Hence scenario B3 is not consistent with mandatory applicable law in host country.

Therefore, the remaining alternative scenarios are as follows:

Power generation: P1& P5, which is in line with the methodology ACM0018, version 2.0 /35/, in which it states that if the project activity is the establishment of a Greenfield power plant and supplies electricity only to the grid, then the alternatives considered for power generation should include only the scenarios P1 and P5.

Use of biomass residue (rice straw, peanut straw, maize straw and wood residue): as the green field project and power-only nature, the biomass scenarios only reduce to B1& B4.

Realistic combinations of these alternatives are formulated:

- **Scenario 1**: P1+B4; proposed project not undertaken as CDM project activity;
- **Scenario 2**: P5+B1; continuation of current practices: Purchasing electricity from ECPG; and dumping or leaving biomass residues to naturally decay in the field.

Step 2: Barrier Analysis

Step 2a: Identify barriers that would prevent the implementation of alternative scenarios

No investment and technological barriers have been identified in this step.

Step 2b: Eliminate alternative scenarios which are prevented by the identified barriers

No barriers identified in step 2. Hence all the remaining alternatives (P1+B4 and P5+B1) are considered for the subsequent step i.e. investment analysis.

Step 3: Investment Analysis

For the proposed project the financial analysis is conducted to further illustrate the selection of the baseline scenario as per Guidelines on the assessment of the investment analysis" /45/.

Based on the discussion above, two realistic and plausible scenarios left to be scenarios for the proposed project activity, i.e. (P1+B4 and P5+B1).

PP selects IRR as financial indicator, suitable for the project activity and decision-making context, to analyze the financial situation of scenario 1 (P1+B4), against benchmark of project-IRR of 8% (after tax); the result in section 4.8 of the report below, shows that, (**Scenario 1**: P1+B4) is less financially attractive. Thus this scenario is eliminated for further consideration.

(**Scenario 2**: P5+B1; continuation of current practices: Purchasing electricity from ECPG; and dumping or leaving biomass residues to naturally decay in the field) most reasonably represents what would occur in the absence of the proposed CDM project activity.

All the assumption and data used by the project participants are listed in the PDD /5/ and/or supporting documents. All documentation relevant for establishing the baseline scenario is correctly quoted and interpreted in the PDD /5/. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD /5/.

4.8 ADDITIONALITY ASSESSMENT

The financial analysis (input parameters and financial result, in consistent with FSR of the proposed project where the investment decision making was based) has been fully presented in this validation report for transparency purposes. In addition, the bank loan contract /31/ and other third parties documents /11/-/30/, among others, were carefully checked to verify the authentic and reliability of the information.

In the following sections, the steps undertaken, the information obtained, the data sources and the method utilized, where necessary, to determine the authenticity of figures and facts, were accurately explained and documented.

4.8.1 PRIOR CDM CONSIDERATION AND CONTINUED ACTION TO SECURE CDM STATUS

Project start date:

PJRCES has assessed and verified the evidences relating to project timeline in order to ascertain the project starting date as shown in Table 6 Timeline of the Project:

TABLE 6 TIMELINE OF THE PROJECT

Date	Ref	Events
August 2009	/6/	Feasibility Study Report (FSR) was finalized by State Power Economic Research Institute, in which the CDM revenues are seriously considered.
8 December 2009	/10/	Due to the IRR lower than the benchmark, the board decided to implement the project considering the CDM revenue
17 March 2010	/6/	FSR was approved by Anhui Energy Bureau and the CDM is a decisive factor for this approval.
28 March 2010	**/14/**	**Construction contract signed between the PP and Shandong Power Construction 1st Engineering Company (the starting date of the Project)**
31 March 2010	/18/	Construction permission
3 April 2010	/15/	Steam turbine Purchase Agreement was signed between the PP and Qingdao Jieneng Power Station, Engeering Co., Ltd.
3 April 2010	/17/	Generator Purchase Agreement was signed between the PP and Shandong Jinan Power Equipment Factory
20 May 2010	/11/	Commencement notification letter for the proposed project activity was sent to DNA of China on 20 May 2010 and confirmation by China's DNA was received on 20 May 2010
CDM Notification form dated: 5 September 2010/eMail carrying this CDM form, sent date to UNFCCC: 26 September 2010	/12/	The prior consideration of the CDM Form to UNFCCC was sent on 26 September 2010 .
22 December 2010	/31/	Beijing Branch, Huaxia Banking Co., Ltd agreed to give loan, after taking into consideration of the CDM revenues, the proposed project can obtain as a CDM project.
26 October 2011	/13/	Due to the network problem between the UNFCCC secretariat and the project owner, the email hasn't been received by UNFCCC secretariat. Chen Fang of National Guzhen Bio Energy Co., Ltd, sent an email again to UNFCCC to get the confirmation of CDM consideration notification for the project
9 November 2011	/23/	ERPA signed between National Guzhen Bio Energy Co., Ltd and EDF Trading Limited

29 November 2011	/13/	Crystal Cui of EDF Trading Limited, sent an email to UNFCCC secretariat to enquire about CDM consideration notification form not showing on UNFCCC web, requesting further confirmation of prior CDM consideration from UNFCCC
3 March 2012		PDD publication for Global Stakeholder Comments
28 March 2012	/32/	Letter of Approval from Chinese DNA.

The project adopts 28 March 2010 /14/, as the starting date of the project activity which is the date of signing of construction contract beween National Guzhen Bio Energy Co., Ltd and Shandong Power Construction 1st Engineering Company. Taking into consideration that construction is the key project component and it is also an important and earliest milestone in the project implementation with significant financial commitments, thus justifies 28 March 2010 /14/ as the appropriate project starting date and in accordance with 'Glossary of CDM terms /46/.

PJRCES, having verified the project implementation timelines and activities, is able to confirm that the project start date correctly represents the earliest financial commitment for the project activity. The determination of the project start date is found to be in accordance with the guidance provided by the Executive Board in 'Glossary of CDM terms' /46/.

Serious consideration of CDM and efforts to secure CDM status:

The starting date (28 March 2010 /14/) of the proposed project activity is later than 2 August 2008, therefore the project is considered a new project activity, as per the 'guidelines on the demonstration and assessment of prior consideration of CDM' /42/ by the Executive Board.

The starting date (28 March 2010 /14/) of the proposed project activity is prior to the start of validation, which is the date of publication of the PDD for global stakeholder consultation (3 March 2012). PP had notified both Chinese DNA and UNFCCC (mail sent to "CDM Registration and Issuance" <Cdmregistration@unfccc.int>) on 20 May 2010 and 26 September 2010 /12/ respectively. For notification to Chinese DNA, the confirmation letter was received on 20 May 2010 /11/.

The submission request of notification to UNFCCC was not shown on the list of UNFCCC web as anticipated. Thus PP continued their efforts with UNFCCC to ask the status of the request of submission of notification and request for confirmation of prior CDM consideration. The following email communications between PP and UNFCCC were checked by PJRCES to confirm the CDM consideration for the project:

- Email dated 26 October 2011 /13/ from Chen Fang of National Guzhen Bio Energy Co., Ltd, to UNFCCC (mail sent to "CDM Registration and Issuance" <Cdmregistration@unfccc.int>), asking the status of CDM notification sent for the project on 26 September 2010 /12/ with no response from UNFCCC.

- Email dated 29 November 2011 from Crystal Cui of EDF Trading Limited to UNFCCC /13/, asking the status of CDM notification sent for the project on 26 September 2010 /12/, JThompson@unfccc.int on behalf of CDM Registration and Issuance Cdmregistration@unfccc.int confirmed the receipt of the email on 2 December 2011 /13/.

- PJRCES while undertaking the validation of prior consideration, sent a message to UNFCCC secretariat on 03 October 2012 in order to further confirm the notifications of prior consideration submitted by the client. Having received no response and reviewing the evidences it is noted that notification were submitted by the client within six months of the starting date of the project activity.

As per Para 101 of VVM: PJRCES can confirm by vaidating prior consideration notifications /11/ /12/ from the communication trail between the project proponent, the UNFCCC secretariat /13/ and the host Party DNA regarding the commencement of a new project activity, that such notifications and further actions (communication mail with UNFCCC secretariats) has been provided by the project participants within six months of the project activity start date (28 March 2010 /14/), PJRCES can determine that the CDM was seriously considered in the decision to implement the project activity.

PJRCES has assessed the reliability and authenticity of such communications, at the same time through interviewing, with responsible staffs from National Guzhen Bio Energy Co., Ltd and EDF Trading Limited.

In addition, the FSR was completed in August 2009 and approved by the Anhui Energy Bureau on 17 March 2010 /6/. In the FSR, it has been demonstrated that the project IRR is lower than the industry (power plant) benchmark of project-IRR of 8% (after tax) and hence proposed project is considered to be financially unattractive /6/. The project developer identified CDM as a mean to overcome the investment barriers to proceed with the project, as evidenced in the board meeting minutes of Anhui Guzhen Biomass Generation Project for the CDM development on 8 December 2009 /10/ and also substantiated by checking the bank loan statement /31/. ERPA was signed on 9 November 2011 /23/. PP gained LoA from China's DNA on 28 March 2012 /32/.

It is PJRCES's opinion that the proposed CDM project activity complies with the requirements of the latest version of the guidance /42/ on prior consideration of CDM.

4.8.2 INVESTMENT ANALYSIS: CHOICE OF APPROACH

Since the proposed project generates financial and economic benefits other than CDM-related income through the sales of electricity and the baseline alternative does not involve an investment for the project participants, a benchmark analysis is justified for conducting the investment analysis.

4.8.3 INVESTMENT ANALYSIS: BENCHMARK SELECTION

According to the 'Interim Rules on Economic Assessment of Electric Power Engineering Retrofit Projects' /51/, in China a project-IRR of 8% (after tax) is regarded as a benchmark for investing in biomass fired plants. The benchmark of project-IRR of 8% (after tax) is therefore appropriate for this project. PJRCES was able to confirm this is suitable and reasonable benchmark for the project based on the reasons outlined below:

a) This benchmark was determined by the national administration of this industry in China /51/;
b) This benchmark is for project and after tax and the investment analysis for this project will be for project and after tax also;
c) Interim Rules on Economic Assessment of Electric Power Engineering Retrofit Projects is referred to the risk premiums of large scale power plant project /51/; and
d) The benchmark is widely used for power plant projects in China.

PJRCES confirms that this benchmark is suitable and reasonable.

4.8.4 INVESTMENT ANALYSIS: INPUT PARAMETERS

The FSR was prepared by the accredited third party State Power Economic Research Institute in August 2009 /6/ and approved by Anhui Energy Bureau on 17 March 2010/6/ based on the public assessment from the sector experts designated by the government.

A FSR in China is required to be developed by a third party accredited of this task directly by the government. An approval letter of the FSR is issued by the government only after it passes the public assessment of the sector experts designated by the government. It is PJRCES's opinion that a FSR can be regarded as an accurate and trustworthy source of information coming from a recognized entity once it has the approval letter from the government.

The input parameters used in the financial analysis of this project are taken from the FSR developed by State Power Economic Research Institute in August 2009 and approved by Anhui Energy Bureau on 17 March 2010. The input parameters used in the financial analysis can thus be considered information provided by an independent and recognized source.

PJRCES compared the input parameters for the financial analysis included in the PDD /5/ with the parameters stated in the FSR /6/ and was able to confirm that the values applied in PDD are consistent with the values stated in the FSR /6/.

The FSR was approved on 17 March 2010 /6/ i.e. less than a month prior to the decision to proceed with the project activity (i.e. the start date of the project) which was on 28 March 2010 /14/. Given this short period of time between the approval of FSR and the decision to proceed with the project activity as CDM, it is unlikely in the context of the project that the input values would have materially changed. Therefore, it is reasonable to assume that the FSR /6/ could be the basis of the decision to proceed with the investment in the proposed project activity.

The input parameters used in the financial analysis were compared with the data reported for other registered similar biomass power generation CDM projects in China, regarding the investment costs per kW, operation hours, applied electricity tariff, biomass residue price (excl. 13% VAT), unit O&M costs (including the cost of biomass residues) per kWh and auxiliary consumption as following **TABLE 7–***[THE INPUT PARAMETERS COMPARISON BETWEEN ANHUI GUZHEN BIOMASS GENERATION PROJECT AND REGISTERED CDM PROJECTS IN CHINA]*.

TABLE 7–*[THE INPUT PARAMETERS COMPARISON BETWEEN ANHUI GUZHEN BIOMASS GENERATION PROJECT AND REGISTERED CDM PROJECTS IN CHINA]*

Ref No.	Project Title	Installed Capacity (MW)	Self-cons. rate (%)	Operation hours (hours)	Investment costs per kW (RMB/kW)	O&M costs (incl. biomass cost) / electricity generated (RMB/kWh)	Tariff, incl. VAT (RMB/kWh)	Biomass residue price, excl. VAT (RMB/tonne)	Ash Revenue
1263	Shandong Wudi Biomass Generation Project	24	15.0	5,500	10,322	1.33	0. 595	200	N/A
1375	Shandong Gaotang 30MW Biomass Power Generation Project	30	12.0	5,500	9,698	1.54	0.594	239	N/A
1366	Biomass generation project, in Sheyang county, Jiangsu province, P.R. China	25	8.0	5,500	11,043	1.46	0.636	205	N/A
2230	Jiangsu Rudong Biomass Power Generation Project	25	10.0	6,975	11,248	2.28	0.636	221	N/A
2440	Anhui Anqing 30MW Biomass Power Generation Project	30	10	6,500	8,789	2.15	0.619	212	N/A
1892	Jiangsu Longyuan Donghai Biomass Power Project	24	12.0	6,000	10,032	2.78	0.636	272	No
2526	Shandong Kenli Biomass Generation Project	30	12.0	5,500	9,435	1.63	0.594	285	No
2963	Guodian Liaocheng Biomass Power Project	30	16.0	5,500	7,819	1.75	0.594	260	No
3102	Anhui Nongan 50MW Biomass Power Plant Project	50	12.0	6,000	10,060	1.47	0.606	228	No
3606	Shandong Juye Biomass Power Generation Project	12	12.8	6,500	13,430	0.62	0.594	203	No

Ref No.	Project Title	Installed Capacity (MW)	Self-cons. rate (%)	Operation hours (hours)	Investment costs per kW (RMB/kW)	O&M costs (incl. biomass cost) / electricity generated (RMB/kWh)	Tariff, incl. VAT (RMB/kWh)	Biomass residue price, excl. VAT (RMB/tonne)	Ash Revenue
3664	Liucheng Biomass Power Generation Project in Anhui Province Zhuang Autonomous Region, China	30	12.3	6,000	8,682	1.79	0.62	224	No
3263	Jiangsu Guoxin Siyang Biomass Power Generation Project	30	10.0	6,000	8,646	2.16	0.64	256	No
3838	Biomass Generation Project in Xun county, Henan province, P.R. China	30	9.9	7,000	8,968	0.55	0.586	221	No
3965	Anhui Suzhou 2×12.5MW Biomass Power Generation Pr	25	15.0	6,500	10,524	1.95	0.619	200	No
4055	Heilongjiang Youyi Biomass Power Generation Project	30	9.0	5,500	9,864	1.67	0.587	195	No
4053	Heilongjiang Qianjin Biomass Power Generation Project	30	9.0	5,500	9 613	1.66	0.587	195	No
4522	Handan Biomass Power generation Project	48	15.0	6,000	9,223	2.58	0.6168	230	No
4571	Hunan Lixian 15 MW Biomass Power Phase Two Project	15	12.0	6,500	8,065	3.39	0.634	265	No
4079	Biomass Power Generation Project by Everbright Alternative Energy (Dangshan) Limited	30	12.6	6,500	8,823	3.00	0.619	250	No

Ref No.	Project Title	Installed Capacity (MW)	Self-cons. rate (%)	Operation hours (hours)	Investment costs per kW (RMB/kW)	O&M costs (incl. biomass cost) / electricity generated (RMB/kWh)	Tariff, incl. VAT (RMB/kWh)	Biomass residue price, excl. VAT (RMB/tonne)	Ash Revenue
4968	Hubei Dangyang 25MW Biomass Power Project	25	13.0	6,000	7,247	0.346	0.616	257	No
5249	Zhanjiang Biomass Power Generation Project in Guangdong Province	100	10.0	6,000	7,984	0.406	0.689	335	No
5352	Changge Hengguang Biomass Power Generation Project	24	9.6	5,500	5,719	0.401	0.586	261	No
4727	Tianshui Kaidi Biomass Power Project	30	12.0	6,500	10,122	0.463	0.75	320	No
5847	Jiexiu City Guotai Green Energy Co., Ltd Biomass Power Generation Project in Shanxi Province	30	10.5	6,500	8,017	0.432	0.509	300	No
5890	Beiliu Kaidi Biomass Power Project	30	12.0	6,500	9,015	0.471	0.75	330	No
MAX	/	100	16.0	7,000	13,430	0.544	0.75	335	No
MIN	/	12	8.0	5,500	5,719	0.272	0.509	195	No
AVER.	/		11.7	6,079	9,296	0.364	0.621	247	No
	Anhui Guzhen Biomass Generation Project (Proposed CDM Project)	30MW	11.0	7,000	9,761	0.475	0.621	270	No

1) Annual Power Generation

Operating hours

In order to validate the operating hours of 7,000 reported in the PDD, PJRCES has assessed the followings:

- Annex 11 to the CDM-EB 48th meeting report /41/ gives guidelines for validation of plant load factor for renewable energy projects. One option is to use plant load factor provided to the government while applying the project activity for approval. Since the PLF has been specified in the FSR /6/ and considering that FSR has been approved by Anhui Energy Bureau, hence, the PLF of the project activity complies with the requirements of the CDM regulation. The estimated electricity generation used in the PDD is in line with the government approved FSR /6/.
- Comparing with the operating hour reported for other similar registered biomass projects in the China, the operating hours of the proposed project (7,000 hours) were found to be at the higher end of the range (5,500 – 7,000 hours) of other similar projects, shown in *TABLE 7–[THE INPUT PARAMETERS COMPARISON BETWEEN ANHUI GUZHEN BIOMASS GENERATION PROJECT AND REGISTERED CDM PROJECTS IN CHINA].*

Hence, it is concluded by PJRCES that the assumed operating hours applied in the investment analysis is reasonable and acceptable.

Auxiliary consumption

For the projects listed in *TABLE 7–[THE INPUT PARAMETERS COMPARISON BETWEEN ANHUI GUZHEN BIOMASS GENERATION PROJECT AND REGISTERED CDM PROJECTS IN CHINA]*, the auxiliary electricity consumption rate varies from 8% to 16%, with an average of 11.7%. The rate of the proposed project is assumed as 11.0% which is lower than the average rate. It is also found in the survey conducted by national authorities' /57/ (i.e., Energy Bureau of NDRC, Ministry of Finance and State Electricity Regulatory Commission) that the auxiliary electricity consumption rate of biomass power plant reaches to 12%. Thus, the auxiliary consumption rate used in the proposed project is considered reasonable.

Net electricity supplied to the Grid

The proposed project is aimed to supply ECPG approximately 186,900 MWh net electricity per year at a plant load factor (PLF) of 79.9%, sourced from FSR prepared by State Power Economic Research Institute in August 2009 /6/.

The net electricity supplied to the grid of 186,900 MWh/year is based on the gross electricity (210,000 MWh) generated after exclusion of auxiliary consumption of 11.0%.

2) Electricity Tariff

Before the start date of the proposed project activity on 28 March 2010 /14/, the tariff was assumed in the FSR /6/ to be 0.621 RMB/kWh. According to the "*Interim Regulation for Tariff of Renewable Energy Power Generation and Appointment of Expenses*" as part of Chinese renewable energy law promulgated by China's National Development and Reform Commission (NDRC) /58/, a consolidated tariff guidance for biomass projects in China should be followed. This approved tariff was split into two components: 1) de-sulfurized coal fired power tariff (0.371 RMB/kWh of 2005 year level) and 2) subsidy of 0.25 RMB/kWh (including VAT).

PJRCES was able to confirm that the electricity tariff of the project (0.621 RMB/kWh including VAT) indicated in the FSR /6/ and PDD is consistent; and this tariff is the latest available tariff before the FSR was finalized in August 2009 and got approved on 17 March 2010.

Later Anhui Price Bureau approved the tariff for Anhui Guzhen Biomass Generation Project on 28 June 2010 /27/ in the way as stated above.

Later on in 18 July 2010, another tariff regulation, in the purpose to address the worsening economic barrier faced by the biomass power plant developer was advocated. This new released policy called *Notice regarding On-grid Tariff of Electricity Generation from Agroforestry Biomass Residues* /56/, regulating that the on-grid tariff of generation from agroforestry biomass residues is fixed to be 0.75RMB/kWh (including VAT) without any escalation. It is to be noted that this new tariff policy of 18 July 2010 came later on and was not available to the PP at the time of decision taken for the project. Hence as per guidance 6 of EB62 annex 05, this new tariff need not be taken into account for the investment analysis. But just as a cross check, this higher tariff of 0.75 RMB/kWh was applied and it was found that, the IRR of the proposed project is 6.04%, which is still lower than the benchmark of 8%.

Hence, PJRCES was able to confirm the tariffs of 0.621RMB/kWh available at the time of decision taken and applied in the FSR /6/ and the PDD are reasonable and appropriate.

3) Revenue from residual ash

The major solid waste generated by the proposed project is the ash from the boilers. The ash has high potassium and phosphorous content and can be served as good fertilizer for agriculture /6/. All the ash will be used as fertilizer in local farmland, which will realize the comprehensive utilization. And this ash as fertilizer was taken away free of charge by the transportation agent, who does not claim for the transportation fee for the ash from National Guzhen Bio Energy Co., Ltd

And no other biomass projects registered have considered this ash revenue as can be seen in the *TABLE 7–[THE INPUT PARAMETERS COMPARISON BETWEEN ANHUI GUZHEN BIOMASS GENERATION PROJECT AND REGISTERED CDM PROJECTS IN CHINA]* above and hence it has not been considered in the proposed project also as ash is given free of charge to nearby farm land.

4) Total static Investment

The investment used in the financial analysis of the proposed project activity is taken from the FSR /6/ with the value of 292.8464 million RMB. It can be seen from *TABLE 7–[THE INPUT PARAMETERS COMPARISON BETWEEN ANHUI GUZHEN BIOMASS GENERATION PROJECT AND REGISTERED CDM PROJECTS IN CHINA]* above that the investment cost per kW for the proposed project is 9,761 RMB/kW, which is in the middle of range of the investment costs per kW (5,719 RMB/kW to 13,430 RMB/kW) for other registered CDM biomass power projects in China. This shows that the investment assumed in the FSR /6/ is reasonable and appropriate at the time decision making.

In addition, the static investment cost was cross checked against actual contracts signed and financial closure report of equipment and construction for Anhui Guzhen Biomass Generation Project /78/. The actual contracts signed (297.59 million RMB, shown in the table below) overrun estimated static investment cost (292.8464 million RMB) in the FSR /6/. PJRCES can thus confirm that the static investment cost estimated in the FSR /6/ is reasonable.

TABLE 8 SUM OF THE CONTRACTS SIGNED

	Actual (Million RMB)	Reference
Equipment		
Boiler	68.00	/16/
Turbine	9.88	/15/
Generator	7.06	/17/
Construction		
Construction and Installation General Contract	96.23	/14/
Project supervision contract	6.60	/20/
Land acquisition	10.41	/19/
Others	99.41	/21/
Total	**297.59**	

5) Biomass residue cost

In the biomass assessment survey report by DRC of Guzhen County in the region of the project activity /75/, it was shown that there is an abundant surplus of the biomass residues (rice straw, peanut straw, maize straw and wood residue) which is not utilized, including the project plant. The surplus of biomass residues could not be utilized for any other purpose and thus has to be dumped or left to decay under mainly aerobic conditions in the baseline scenario.

The biomass residues are not generated by the project owner but the supplier (i.e., local farmer and/or agriculture plants) and therefore not the project owner's property. It is confirmed through

on site investigation and interviewing with project owner /2/ and local government authority /3/. This differs from the situation where the biomass residue is owned by the project owner, for which a purchase price is less likely. The fact that the biomass residues are able to be used as fuel or raw material for production in general makes their intrinsic value. However, the value doesn't directly equal to a price. Without proper demand and potential buyer/market, the value cannot be materialized as a price. As long as no actual demand for other utilization exists, no price can be issued. With the proposed project being constructed, actual demand is created that leads to the supplier expecting a purchasing price for the value of biomass residue as well as the cost of collection, treatment, transportation and storage.
As above analysis, the biomass price assumed in the FSR /6/ is based on:

i. intrinsic value as fuel,
ii. reasonable cost of collection, treatment, transportation and storage.

The biomass price listed in *TABLE 7–[THE INPUT PARAMETERS COMPARISON BETWEEN ANHUI GUZHEN BIOMASS GENERATION PROJECT AND REGISTERED CDM PROJECTS IN CHINA]* ranges within 195 RMB/tonne and 335 RMB/tonne (excl. VAT).. And the proposed project used appropriate price as 270 RMB/tonne (excl. VAT) for investment analysis, which is in the range of the 195 RMB/tonne and 335 RMB/tonne (excl. VAT) for the similar registered biomass power plants in China.
As the project is already commissioned, the validation team further cross-checked the biomass residue purchase invoices in November 2011 /77/ for this project. They show that the price of rice straw, peanut straw, maize straw and wood residue was at average of 292 RMB/tonne (excl. VAT) which is higher than the estimation (270 RMB/tonne (excl. VAT)) in FSR /6/ and PDD. Therefore, the validation team can confirm that the estimated biomass price was determined conservatively in the FSR /6/ and financial analysis by means of observations from the actual operation of the project.
It should also be noted that a purchase price of biomass residue as applied in the investment analysis doesn't contradict with the baseline scenario as they are either dumped or left decay under mainly aerobic conditions in the absence of the project activity. The reason lies in the fact that biomass residue's intrinsic value comes up when such biomass is not a waste anymore, and further cost incurred for post collection, treatment, transportation and storage add to the cost.
Hence, it is concluded that the biomass fuel price for the project applied in the investment analysis is deemed to be reasonable.

6) O&M costs and other (miscellaneous) cost

PJRCES has verified that the average O&M annual costs (incl. biomass cost) value in the FSR /6/ is 99.836 million RMB.

According to the *Economic Evaluation Code and Parameter for Construction Project* /52/, the annual O&M costs mainly consist of materials cost, salary and social welfare, repair cost,

insurance fee and other costs (including labor union fee, staff training fee, labor insurance, waste emission charge, travel expense etc).

The project's O&M costs were compared with data reported for similar registered CDM projects in China as referring to *TABLE 7–[THE INPUT PARAMETERS COMPARISON BETWEEN ANHUI GUZHEN BIOMASS GENERATION PROJECT AND REGISTERED CDM PROJECTS IN CHINA]* above. The range of O&M cost (incl. biomass cost) per kWh was found to be in a range of 0.272 to 0.544 RMB/kWh. With O&M cost (incl. biomass cost) per kWh for the proposed project being 0.475 RMB/kWh, it can be deemed reasonable for the proposed project activity when compared with other similar projects in China. PJRCES considers the O&M costs value used in the investment analysis reasonable.

--Other (miscellaneous) cost rate

According to Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects /51/ and Economic Evaluation Code and Parameter for Construction Project /52/, the other expense includes expenses on labor union fee, staff training fee, labor insurance, waste emission charge, travel expense etc.

The other cost rate used in the IRR spreadsheet /8/ for this proposed project is 16 RMB/MWh, which is taken from the FSR /6/. PJRCES considers the other costs value used in the investment analysis reasonable.

Assessment of the appropriateness and reasonability of the complete parameters in the O&M cost

The O&M cost against the investment cost for the proposed project has been fully investigated using breakdown of its components, as following:

Subentry of the annual O&M costs	**Elemental value applied**	**Cross-check: Regulation/code to support the assumption**
Number of employees	74	*An experience value* To be in line with *Unit Cost Referenced index of Fossil-fired Power Engineering and Design 2008* /73/
Annual salary and welfare per employee	25,000 RMB for basic wage 50% of the basic wage as the social welfare	"25,000 RMB for basic wage, 50% of the basic wage as the social welfare", to be in line with *Unit Cost Referenced index of Fossil-fired Power Engineering and Design 2008* /73/
Material fee	12 RMB/MWh	In line with *Unit Cost Referenced index of Fossil-fired Power Engineering and Design 2008 /73/*
Miscellaneous	16 RMB/MWh	PJRCES has verified that the other O&M costs for the

cost (offices fees, travel fees, research fees, training fees, etc.)	(3.36 million RMB/210,000 MWh)	proposed project in the FSR /6/ is 16 RMB/MWh. PJRCES could confirm that the composition of other costs is deemed to be appropriate, the other expense includes expenses on labor union fee, staff training fee, labor insurance, waste emission charge, travel expense etc /52/. PJRCES considers the other costs value used in the investment analysis as reasonable. The other cost per MWh (i.e. 16 RMB/MWh) used in the IRR spreadsheet /8/ is taken from the FSR /6/, which is verified to be in line with *Unit Cost Referenced index of Fossil-fired Power Engineering and Design 2008* /73/.
Maintenance Rate	2.5% of original value of fixed assets	*2.5% in Unit Cost Referenced index of Fossil-fired Power Engineering and Design 2008* /73/.
Insurance fee	0.25% of original value of fixed assets	"0.25%", P125, *Unit Cost Referenced index of Fossil-fired Power Engineering and Design 2008* /73/
Annual water consumption	1, 333,000 t	FSR value resulting from systematic calculation
Water price	0.3 RMB/t	*As per Unit Cost Referenced index of Fossil-fired Power Engineering and Design 2008* /73/ it is 0.5 RMB/t. *Hence water price of 0.3 RMB/t assumed in this project is reasonable.*

7) Working capital

The working capital (10.2025 million RMB) has been returned in the last year of operation time in the IRR spreadsheet /8/.

8) Loan and interest rate

Out of a total project cost of 292.8464 million RMB, 59.9527 million RMB has been contributed by the project proponent and the debt portion is 232.8937 million RMB, which satisfied the requirement on the ratio of owned capital (no less than 20%), according to the bank loan allowance notification.

The interest rate (5.94%) applied in the investment analysis (sourced from the FSR), is the same as prevailing commercial interest rates in China /67/. PJRCES consider this practice is common practice in China. After comparing with actual interest rate of 6.08% in the loan contract /31/, PJRCES found the interest rate applied in the investment analysis in the same magnitude, which will not result in much impact on IRR. Even when considering the actual interest rate of 6.08%

as per the guidance 11 of EB62 annex05, the project remains additional." Thus it is acceptable for the assumed interest rate of 5.94% based on FSR and available at the investment decision time in fianancial analysis.

9) Operation period and the period of IRR assessment

The project participants used manufacturer's information to determine the lifetime of the proposed project activity.

In the technical specification of the boiler /16/, turbine /15/ and generator /17/, it is mentioned that the lifetime of those major compents of the project shall be ensured to 20 years. Hence, 20 years of lifetime is used for the proposed project activity in FSR /6/.

For financial analysis period, it is 20 years. This is in compliance with *Guidelines on the assessment of investment analysis* /45/, where it is stated: project IRR calculations shall as a preference reflect the period of expected operation of the project activity (technical lifetime).

10) Taxes and depreciation

The rates of taxes and period of depreciation applied in the project financial assessment are shown in the following *TABLE 9 – [TAX RATES AND PERIOD OF DEPRICIATION INVOLVED IN THE PROJECT*:

TABLE 9 – *[TAX RATES AND PERIOD OF DEPRICIATION INVOLVED IN THE PROJECT]*

Rate of Value Added Tax (VAT) for power generation	17%
Tate of Value Added Tax (VAT) for biomass	13%
Value Added Tax (VAT) for water consumption	6%
Rate of Enterprise Income Tax	25%
Rate of Residual Value	5%
Period of Depreciation (years)	15
Rating depreciation	6.33%
Rate of Education Tax (of the VAT)	3%
City maintenance and construction tax (of the VAT)	7%

(i) VAT rate

PJRCES has verified that the VAT of 17% used in the investment analysis and the PDD is according to the FSR /6/.

The applicable VAT for material and electricity was selected as of 17%, which was confirmed to be in line with Provisional Regulations on Value Added Tax of the People's Republic of China issued on 10 November 2008 and effective since 01 January 2009 /60/ until now.

The biomass VAT of 13% and water VAT of 6% are determined according to *Notice on Low VAT Rate and Simple Taxation Methods for Some Kinds of Goods* /61/.

17% of the original equipment investment is reimbursed as cash flow, which is in compliance with *Provisional Regulations of the People's Republic of China on Value Added Tax* /60/ and *Notification on Several Issues regarding National Wise Implementation of the VAT Reform* /62/. The application of VAT return is according to *Notice about Policies regarding the Value Added Tax on Products Made through Comprehensive Utilization of Resources and Other Products* /63/.

Therefore, the selected VAT is in accordance with the regulation in force at the time of the investment decision (8 December 2009 /10/).

(ii) Rate of enterprise income tax

The income tax of 25% is in accordance with Enterprise Income Tax Law of the People's Republic of China (promulgated in Document Order of the President of the People's Republic of China (No. 63) published on 16 March 2007 /60/, the income tax has been regulated at 25% and became valid since 1 January 2008.

According to the "Guidance on the Assessment of Investment Analysis" issued by CDM-EB 62 Annex 5 /45/, the interest payable should be taken into account for the purpose of income tax calculation in cases where the benchmark applied in the investment analysis is post tax. As for the proposed project, the IRR benchmark is project-IRR of 8% (after tax) and the interest tax payable has been verified to be included in the calculation of the income tax /8/. Although the interest rate of 5.94% as per FSR has been used in the income tax calculation, even when considering the actual interest rate of 6.08% as per the guidance 11 of EB62 annex05, the project remains additional." Thus it is acceptable for the assumed interest rate of 5.94% based on FSR and available at the investment decision time in the fianancial analysis.

(iii) Rate of residual value

PJRCES has verified that the salvage value (5%) used in the investment analysis and the PDD is according to the FSR /6/.

According to the Notification on determination of residual rate for enterprise fixed asset issued by State Tax Bureau on 14 September 2005, the salvage value ranged from 0% to 5% /69/ and it can be determined by the company what percentage to use for the investment analysis. Calculating the IRR with 5% residual value for the proposed project is in accordance with the China National Tax law.

(iv) Period of depreciation

The project applies a depreciation period of 15 year (the depreciation rate per year is 6.33%) in accordance with the FSR /6/. According to the Notification on determination of residual rate for enterprise fixed asset issued by State Tax Bureau /69/, an enterprise shall begin computing depreciation for a fixed asset in the following month when the asset is put into service, and shall cease computing depreciation for a fixed asset in the following month in which the asset's use is ceased. The minimum number of years for computing depreciation of fixed assets is 10 years for the manufacturing and business operations. Therefore, the depreciation period of 15 years for the proposed project activity is in line with the Notification on determination of residual rate for enterprise fixed asset issued by State Tax Bureau /69/.

(v) Rate of education tax (of the VAT)

PJRCES was able to confirm that rate of the education tax (of the VAT) is in accordance with national regulations in China. In terms of the Provisional Regulations of the People's Republic of China on Education Tax which is effective since 2005 until now /72/, the "Rate of education tax" of 3% shall be applied for companies in China, which was followed by the proposed project as indicated in the IRR spreadsheet /8/. The education tax (of the VAT) is in accordance with the regulation in force at the time of the investment decision.

(vi) Rate of city build tax (of the VAT)

In accordance with the Provisional Regulations of the People's Republic of China on Urban Maintenance and Construction Tax /70/, the rate of city build tax will be determined by the taxpayer's location: 7% for urban areas, 5% for county and town, and 1% for others. Due to project owner's location in the Guzhen County, Bengbu City, Anhui Province, P. R. China which has been verified by PJRCES during on-site visit, the tax rate for urban maintenance and construction of 7% (of the VAT) was properly applied for this project.

4.8.5 INVESTMENT ANALYSIS: CALCULATION AND CONCLUSION

The IRR calculations for 21 years (including one year of construction) were provided in a spread sheet /8/. The calculations were verified and found to be correct by PJRCES. The assumptions used in the calculations were deemed to be correct by PJRCES. The project-IRR without CDM revenues is -7.52%, which confirms that the project in the absence of CDM benefits and when compared to the benchmark is not financially attractive. With CER revenues the project IRR increases to 8.25%, which is above the benchmark.

4.8.6 INVESTMENT ANALYSIS: SENSITIVITY ANALYSIS

A sensitivity analysis has been carried out for parameters contributing more than 20% to revenues or costs to check the robustness of the financial analysis. Reasonable variations of static total investment, annual O&M cost, net electricity supply to grid, electricity tariff and cost of biomass were checked by calculating the variation necessary to reach the benchmark and then

discussing the likelihood for that to happen. None of the parameters in the sensitivity analysis are considered to have any significant positive correlation.

PJRCES was able to verify that the project IRR will reach the benchmark only if the parameters change by values as mentioned below:

Key Indicators	***Variation of the parameter indicator needed to reach benchmark of project-IRR of 8% (after tax)***
Static total investment	-70.91%
Annual O&M cost	-25.94%
Electricity tariff	+25.15%
Annual electricity generation	+25.15%
Cost of biomass	-30.75%

- **Fixed assets investment:** If the fixed asset investment decreases by 70.91%, the project-IRR will reach the benchmark of project-IRR of 8% (after tax). It is unlikely that this scenario would take place during the operational lifetime of the project as historical trends have shown construction and installation costs to increase and not decrease as the static investment price index has been growing in the past five years (2006-2010) issued by National Bureau of Statistics of China /80/. Besides, the real contracts already signed for the project sums up to 297.59 million RMB /14/ /15/ /16/ /17/ /18/ /19/ /20/ /21/, is more than the value estimated of 292.8464 million RMB assumed in the FSR /6/. Hence this scenario of investment cost decreasing by 70.91% is not likely to occur.
- **Annual O&M costs**: A reduction of 25.94% in operation cost would be required to enable the project-IRR reaching the benchmark of project-IRR of 8% (after tax). According to the project FSR /6/, the O&M costs consist of materials cost, salary and social welfare, repair cost, insurance fee and other cost. Maintenance cost and biomass cost make up almost all of the total operation expenses. Biomass price and static investment price index show an increasing trend /80/ /81/, and hence a reduction in operation and maintenance cost in such magnitude is unrealistic.
- **Annual electricity generation**: To reach the benchmark of project-IRR of 8% (after tax) benchmark, the annually operating hours must increase by 25.15%, i.e. 8,760.5 hours, which is not likely to happen, as normal hours of one year gives only 8,760 hour.
- **Electricity tariff**: If the electricity tariff increases by 25.15%, benchmark of project-IRR of 8% (after tax) can be overtaken, Compliance with the guidance *Interim Regulation for Tariff of Renewable Energy Power Generation and Appointment of Expenses* as part of Chinese Renewable Energy Law issued by NDRC /58/, the tariff is 0.621 RMB/kWh

(including VAT). The project tariff is also approved by Anhui Price Bureau. Therefore, the tariff applied of the project is deemed to be stable and an increase of 25.15% is unlikely. Further, even if applying the higher tariff of 0.75 RMB/kWh (including VAT) which came later in July 2010, the IRR of the proposed project is 6.04%, which is still lower than the benchmark of 8%.

- **Biomass price**: PJRCES was able to verify through NDRC website **/82/** that the biomass residual cost is increasing and this could hamper the biomass utilization project development in China. In addition, from the actual average price of rice straw, peanut straw, maize straw and wood residue from invoices /77/, an increasing trend can be observed. Hence, a 30.75% decrease in the cost of biomass residue consumption is unlikely.

The sensitivity analysis shows that even with substantial variation of the key indicators, the project-IRR of the proposed project is lower than the benchmark of project-IRR of 8% (after tax) , even when the possible variations of the main parameters are considered.

In conclusion, the investment analysis and sensitivity analysis have shown that the project activity is unlikely to be financially attractive.

4.8.7 BARRIER ANALYIS

Not applicable for the proposed project, since the proposed project has adopted the financial analysis to assess the economic viability of the proposed project.

4.8.8 COMMON PRACTICE ANALYSIS

This analysis is carried out as a credibility check to demonstrate additionality and complements the barrier analysis (STEP 2) and investment analysis (STEP 3), by analyzing to which extent similar activities to the proposed CDM project activity have been underway.

Sub-step 4-1: Calculate applicable capacity or output range as +/-50% of the total design capacity or output of the proposed project activity.

The projects with the installed capacity range as +/-50% of the capacity of the proposed project activity (15 MW to 45 MW) have been identified as the applicable output range of projects, which has been verified to be in accordance with the *Guidelines on Common Practice* issued in the EB 69 meeting report /37/.

Sub-step 4-2: Identify similar projects (both CDM and non-CDM) which fulfil all of the following conditions.

(a) The projects are located in the applicable geographical area;

(b) The projects apply the same measure as the proposed project activity;

(c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity;

(d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant;

(e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step sub-step 4-1;

(f) The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

In China, most policies are promulgated at provincial level (in terms of biomass resources, tariff, , similar investment climate, access to technology, access to financing etc.) by combining the national policy with the region's condition. Thus, Anhui province is selected as applicable geographical area for common practice analysis and this is deemed to be appropriate and reasonable by validation team.

The start date of the proposed project is 28 March 2010 /14/ and similar projects are those biomass residues fired power plants within the applicable output range of 15 MW-45 MW before date 28 March 2010 /14/ in Anhui province were correctly selected as similar and comparable projects.

Sub-step 4-3: Within the projects identified in Sub-step 4-2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number N_{all}.

N_{all} is the number of biomass residues fired power plants, meeting creteria set in the *Sub-step 4-2* in Anhui province, excluding "the registered CDM projects, projects submitted for registration and under validation projects".

Sub-step 4-4: within similar projects identified in Sub-step 4-3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number N_{diff}.

Noting that the projects implemented before 2002 compeletely differ from the project afterwards due to fact that investment and operation environment for power generation projects in China have fundamentally changed in 2002 **/71/**.

Assume $N_{all} = N_{all\ before\ 2002} + N_{all\ after\ 2002}$, and $N_{all\ before\ 2002}$ can be categorized as $\mathbf{N_{diff}}$; then the number $N_{all\ before\ 2002}$ is counted in the N_{diff}.

PJRCES confirms that all plants (excluding the registered CDM projects) that deliver the same output or capacity *within the applicable output range calculated in Sub-step 4-3* in the Anhui Province /79/ and that have started commercial operation before the start date of the proposed

project (i.e. 28 March 2010 /14/) have been identified and all biomass power projects with capacity of 15MW-45MW operated from 2002 to 28 March 2010 /14/ in Anhui province are registered as CDM projects or undergoing validation. Therefore, $N_{all\ after\ 2002} = 0$.

Sub-step 4-5: Calculate factor $F=1-N_{diff}/N_{all}$ representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.

As discussed in the *Sub-step 4-4* above,

Since $N_{all} = N_{all\ before\ 2002} + N_{all\ after\ 2002}$, $N_{diff} = N_{all\ before\ 2002}$, $N_{all\ after\ 2002}=0$

Then $N_{all} = N_{diff,}$ which leads to fraction (N_{diff}/N_{all}) to equal to 1. Up to now it makes the situation even apparent that not necessarily to identify the exact number of those that apply technologies different that the technology applied in the proposed project activity.

$F=1-N_{diff}/N_{all}=1-1=0$, less than 0.2 as defined in the *Guidelines on Common Practice* /37/.

Hence, PJRCES was able to confirm that the biomass residue for power generation project is not a common practice in Anhui Province.

In conclusion, the assessment of the argumentations presented above is deemed to be sufficient to demonstrate that the project is not a likely baseline scenario, and that emission reductions resulting from the project activity are additional.

4.9 MONITORING PLAN

The monitoring plan is in line with the monitoring methodologies of ACM0018 (version 2.0) /35/ and can be implemented by the project participant. This was confirmed during the onsite interviews with the project proponent /1/. The monitoring plan is in accordance with the monitoring methodology, which will give opportunity for real measurements of achieved emission reductions.

4.9.1 PARAMETERS DETERMINED EX-ANTE

The combined margin emission factor is determined ex-ante based on the most recent information available upon the PDD's global stakeholder comment; the detailed calculations of the combined margin emission factor are described in the following section 4.10. The following parameters are determined ex-ante and verified by PJRCES.

Data and parameters	*Unit*	*Ex-ante determined value*	*Data sources*
Operating margin of ECPG	tCO_2/MWh	0.8367	China Electric Power Yearbook

(OM)			2006-2010 /48/
Build Margin of ECPG (BM)	tCO_2/MWh	0.6622	China Energy Statistical Yearbook 2008-2010 /49/
Emission factor of ECPG (CM)	tCO_2/MWh	0.74945	Calculated
Rice straw	10^4 tonnes on dry-basis	4.80	FSR /6/
Peanut straw	10^4 tonnes on dry-basis	2.56	FSR /6/
Maize straw	10^4 tonnes on dry-basis	3.45	FSR /6/
Wood residues	10^4 tonnes on dry-basis	8.86	FSR /6/
$EF_{CO2,f}$-Average CO_2 emission factor for freight transportation activity f	gCO_2/km	245	Taken from the tool "Project and leakage emissions from road transportation of freight" approved by EB.

4.9.2 PARAMETERS MONITORED EX-POST

According to the monitoring methodology, the following parameters shall be monitored ex-post as per ACM0018 (version 2.0) /35/:

- Quantity of electricity generated and self-consumed in year y: Continuous monitoring and monthly recording
- Biomass consumption
  - Types and quantity of biomass consumed in year y: Continuously measured with weight meters and aggregated as appropriate. Crosscheck the measurements with an annual energy balance that is based on purchased quantities and stock changes. These quantities should be updated every year of the crediting period as part of the monitoring plan so as to reflect the actual use of biomass residues.
  - Net calorific value on dry basis of biomass residues of category n in year y: It should be monitored at least every six months, taking at least three samples for each measurement.

- Moisture content of the biomass residues: Measurements shall be carried out at reputed laboratories and according to relevant international standards.
- Biomass assessment to check the surplus availability.

- Transportation information for biomass residues in year y:
  - Total mass of of freight transported in freight transportation activity *f* in year y
  - Return trip road distance between the origin and destination of freight transportation activity *f*

- Type and weight of fossil fuels consumed if any in year y:
  - Mass or volume unit per year
  - $NCV_{i,y}$ - Weighted average net calorific value of fuel type i in year y
  - Weighted average CO_2 emission factor of fuel type *i* in year *y*

From onsite visit and interview with PPs /1/ /2/ /3/ /4/, it was confirmed that there will not be any off site consumption of electricity for off-site preparation, processing, storage and transportation of biomass residues. Hence it has been neglected.

The details are given in the following,

$BE_{EL,y}$-Monitoring of emission reductions due to displacement of electricity

1) $EG_{PJ,gross,y}$ Gross quantity of electricity generated in year y;

2) $EG_{PJ,aux,y}$ Total auxiliary electricity consumption required for the operation of the power plants at the project site in year y;

The meters for power generated and self-consumed will be installed, be measured continuously and recorded on a monthly basis. The electricity sales receipts (if available) will be provided for data cross check; and also 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 meter to be installed at the project site will be a bidirectional electricity meter, with accuracy no less than 1.0. The meters would be calibrated once a year by qualified third parties. And such calibration will be carried out in line with national norms /83/.
On-site electricity consumption attributable to the project activity $EG_{PJ,aux,y}$. Actual consumption of this total auxiliary electricity consumption required for operation of the power plans will be monitored.

$PE_{TR,y}$-Monitoring of project emissions from transportation of biomass residues

- $D_{f,m}$-Return trip road distance between the origin and destination of freight transportation activity *f* in period m (km). Records of vehicle operator or records by PP.

- $FR_{f,m}$-Total mass of freight transported in freight transportation activity *f* in period m (t), which will be recorded.

$PE_{EF,y}$-Monitoring of project emissions from on-site consumption of diesel by the project activity

- $FC_{i,j,y}$-Quantity of diesel consumed by the project activity $FC_{i,j,y}$. The quantity will be measured using weight meters and cross-checked against the diesel purchase invoice. The flow meter will be calibrated annually in line with the relevant standard.
- CO_2 emission factor of the diesel $EF_{CO2,i,y}$. The IPCC default emission factor at the upper limit of the uncertainty at a 95% confidence interval is applied, and will be updated in compliance with any future revision of the IPCC Guidelines.
- Net calorific value of diesel $NCV_{i,y}$. The value refers to the IPCC default values at the upper limit of the uncertainty at a 95% confidence interval, and taken into account future revision of the IPCC Guidelines.

Monitoring of biomass residues categories and quantities used in the project activity

- Types;
- Source;
- Fate in the absence of the project activity (scenarios B);
- Use in the project scenario (scenarios P);
- Quantity (tonnes on dry-basis)
- Quantity of available biomass residues of type n in the region/ quantity of biomass residues of type n that are utilized/ Availability of a surplus of biomass residues type n, if biomass residues categories for which scenarios B1:, B2: or B3 are applied;
- Moisture content of the biomass residues. In case of dry biomass, monitoring of this parameter is not necessary;
- Net calorific value of biomass residues of category n in year *y*

The quantity of biomass residues combusted will be collected separately for each fuel type of biomass, the measurement will be done using weight meters, adjusted for the moisture content in order to determine the dry quantity of the biomass. The total quantity of the biomass consumed will be cross-checked with an annual energy balance that is based on electricity generated and any fuel purchase receipts, taking into consideration of purchased quantities and stock changes. The weighing bridge will be calibrated once a year by qualified third parties. And such calibration will be carried out in line with national norms.

If other biomass residues other than rice straw, peanut straw, maize straw and wood residue, should be used in the project scenario, a new line will be added to the biomass residues categories table and those quantities will be updated every year of the crediting period as part of the monitoring plan.

Net calorific value of each kind of biomass residues combusted in the project activity $NCV_{n,y}$. The net calorific value will be measured at least every six months at reputed laboratories in line with relevant international standards, and the measurement is based on the dry biomass by taking at least three samples for each measurement.

The moisture content will be monitored for each batch of biomass of homogeneous quality. The weighted average will be calculated for each monitoring period and used in the calculations.

All data collected as part of monitoring plan will be archived electronically and be kept for at least 2 years after the end of the last crediting period.

4.9.3 MANAGEMENT SYSTEM AND QUALITY ASSURANCE

The monitoring and recording of the required parameters will be carried out by trained personnel who will be managed on day to day basis by a CDM Manager. Overall responsibility of the project management lies with the Board of National Guzhen Bio Energy Co., Ltd.

Some of the procedures required for proper project management include procedures for (a) addressing erroneous data measurements, (b) registration, monitoring, measurement and reporting, (c) handling of day-to-day records, (d) training of monitoring personnel, (e) handling of emergencies situations, (f) internal review of monitoring data, and (g) corrective actions. These procedures have been defined in the final version of the PDD and will be implemented prior to the start of the project activity.

Adequate training will be provided to relevant personnel before the commencement of the project. Relevant project management procedures will also be established and implemented before the commencement of the project.

All monitoring data will be archived for the crediting period plus 2 years beyond as per the approved monitoring methodology

The application of the monitoring methodology is transparent and PJRCES considers that the project participants are able to implement the monitoring plan.

4.10 CALCULATIONS OF GHG EMISSION REDUCTIONS

The GHG emission reduction calculations are in accordance with the formulae given in the baseline and monitoring methodology ACM0018 (version 2.0) /35/.

The emission reductions (ER_y) by the project activity during the crediting period are difference between the baseline emissions BE_y and the project emissions PE_y and leakage LE_y:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y	Emission reductions in year *y* (tCO_2/y)
BE_y	Baseline Emissions in year *y* (tCO_2/y)
PE_y	Project emissions in year *y* (tCO_2/y)
LE_y	Leakage emissions in year *y* (tCO_2/y)

4.10.1 BASELINE EMISSIONS

As per the baseline methodology, the source of baseline emissions in such type project activity could be from:

- CH_4 emissions from anaerobic decay of biomass residues and/or CH_4 emissions from uncontrolled burning of biomass residues without utilizing them for energy purposes.
- CO_2 emissions from grid-connected fossil fuel power plants in the electricity system;

Hence, baseline emissions could be calculated using the formula:

$$\boldsymbol{BE_y = BE_{EL,y} + BE_{BR,y}}$$

Wherein:

$\boldsymbol{BE_y}$	Baseline emissions in year *y* (tCO_2e)
$\boldsymbol{BE_{EL,y}}$	Baseline emissions due to generation of electricity in year *y* (tCO_2e)
$\boldsymbol{BE_{BR,y}}$	Baseline emissions due to uncontrolled burning or decay of biomass residues in year *y*(tCO_2e)

However, for the proposed project activity, PP has not considered the methane (CH_4) emissions from anaerobic decay of biomass residues both in the baseline and project scenarios. Hence, $BE_{BR,y}$ i.e. baseline emissions due to uncontrolled burning or decay of biomass residues has been considered as zero.

Considering above discussion, the baseline emission can be attributed only to $BE_{EL,y}$, which is the product of net quantity of electricity generated at the project site ($EG_{PJ,y}$) multiplied with baseline grid emission factor (East China Power Grid– ECPG).

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$$BE_y = BE_{EL,y} = EG_{PJ,y} * EF_{CO_2,grid,y}$$

Where:

BE_y	Baseline Emissions in year *y* (t $CO_{2)}$
$EG_{PJ,y}$	Quantity of net electricity generated as a result of the implementation of the CDM project activity in year *y* (MWh)
$EF_{CO2,grid,y}$	CO_2 emission factor of the grid in year *y* (t CO_2/MWh)

The baseline emission factor for the project is determined ex-ante as a combined margin, consisting of combination of the operating margin (OM) and build margin (BM) according to "*Tool to calculate the emission factor for an electricity system*" (version 2.2.1) /38/. The grid emission factor of the ECPG is determined ex-ante for the 7 years crediting period according to the ACM0018 (version 2.0) /35/, based on the most recent information available at the time when the PDD was web-hosted on 3 March 2012. It has been calculated as the weighting average (w_{OM} = 0.5: w_{BM} = 0.5) of the operating margin and the build margin.

The data used in the EF calculation is in accordance with the data in the China Electric Power Yearbook from 2006-2010 (published annually) /48/ and the China Energy Statistical Yearbook from 2008-2010 (published annually) /49/.

Operating Margin: Simple OM was chosen since low-cost /must run power plants constitute less than 50% of the total grid generation, i.e. 11.31% of its total electricity generation from renewable energy sources in 2009, 12.32% in 2008, 10.92% in 2007, 11.44% in 2006 and 11.94% in 2005.

The aggregated generation (sourced from China Electric Power Yearbooks 2006-2010 /48/) and fuel consumption data (sourced from China Energy Statistical Yearbooks 2008-2010 /49/) are used due to the fact that more disaggregated data for power plants are not available in the ECPG. Country specific data for net calorific value of each type of fossil fuel, which was obtained from the China Energy Statistical Yearbook from 2008-2010 /49/, the emission factor of each type of fossil fuel which was taken from the IPCC 2006 default values /47/, and the total electricity delivered to the ECPG which are obtained from the China Electric Power Yearbook from 2006-2010 /48/, are deemed reasonable.

Vintage data for the years 2007, 2008 and 2009 from China Energy Statistics Yearbooks 2008-2010 /49/ and China Electric Power Yearbooks 2006-2010 /48/ are used for OM calculation, which are the most recent available at the time of PDD webhosting (3 March 2012).

The OM is calculated to be 0.8367 tCO_2/MWh as the generation-weighted average for the most recent three years. The sources and calculation have been verified by PJRCES.

Build margin: Build margin was determined ex-ante. Since plant specific fuel consumption and electricity generation data are not publicly available in China, the guidance requested from the CDM Executive Board for a deviation of the baseline methodology of AM0005 /43/ has been

applied for calculation of the build margin (BM) emission factor of this project /50/:

- Use of capacity additions from the years 2006 to 2009 is chosen and reaches 27.95% of the total installed capacity /48/.
- Use of weights estimated using installed capacity in place of annual electricity generation. Thermal power plant accounts for 84.33% of the total installed capacity additions in this period ECPG /49/.
- Use of the efficiency level of the best technology commercially available in the provincial/regional or national grid of China, as a conservative proxy, for each fuel type in estimating the fuel consumption. This is 39.45% for coal power plants and 51.77% for oil power plants and gas power plants.

The BM is calculated to be 0.6622 tCO_2e/MWh, which can be verified by the emission factor calculation spreadsheet /8/. The calculated combined margin emission factor of 0.74945 tCO_2e/MWh /50/ is fixed ex-ante over the selected 7 year renewable crediting period.

Net Electricity generated by the project activity:

In line with the methodology ACM0018, version 2.0, the net quantity of electricity generated in all power plants which are located at the project site and included in the project boundary ($EG_{PJ,y}$) is determined as the difference between the gross electricity generation at the project site ($EG_{PJ,gross,y}$) and the auxiliary electricity consumption required for the operation of the power plants at the project site ($EG_{PJ,aus,y}$), as follows:

$$EG_{PJ,y} = EG_{PJ,gross,y} - EG_{PJ,aus,y}$$

At the project site, there is only one power plant i.e. the proposed project activity, hence, PP has considered the same while calculating the parameter $EG_{PJ,gross,y}$. PJRCES was able to verify that the yearly gross electricity generation from the proposed project activity would be 210,000 MWh/6/ and the auxiliary power consumption of the proposed project has been assumed to be 11.0% (as verified from FSR /6/). Hence, the net annual electricity delivered ($EG_{PJ,y}$) by the project activity to ECPG is expected to be 186,900 MWh (210,000 MWhx(1-11.0%)) /5/.
Considering the above discussion, the annual estimated baseline emissions resulting from the proposed project activity are 140,072 tCO_2e/year.

The baseline emission estimate can be replicated using the data and parameter values provided in the PDD and supporting files submitted for registration. Data sources mentioned have been verified by PJRCES.

4.10.2 PROJECT EMISSIONS

According to the methodology ACM0018 (version 2.0) /35/, project emissions due to the project activity are calculated as:

$$PE_y = PE_{FF,y} + PE_{EL,y} + PE_{TR,y} + PE_{BR,y} + PE_{WW,y}$$

Where:

PE_y	Project emissions during year y (tCO_2e)
$PE_{FF,y}$	Emissions during the year y due to fossil fuel consumption (tCO_2)
$PE_{EL,y}$	Emissions during the year y due to electricity use off-site for the processing of biomass residues (tCO_2)
$PE_{TR,y}$	Emissions during the year y due to transport of the biomass residues to the project plant (tCO_2)
$PE_{BR,y}$	Emissions from the combustion of biomass residues during the year y (tCO_2e)
$PE_{WW,y}$	Emissions from wastewater generated from the treatment of biomass residues in year y (tCO_2e)

For the proposed project activity, PP has correctly excluded the following sources of project emissions,

a) Emissions from the combustion of biomass residues during the year y (tCO_2e) i.e. $PE_{BR,y}$
b) Emissions from wastewater generated from the treatment of biomass residues in year y (tCO_2e) i.e. $PE_{WW,y}$
c) project emissions from off-site consumption of electricity i.e. $PE_{EL,y}$;

Due to the fact that 1) emissions from the decay of biomass residues are not accounted in the baseline; 2) There is no anaerobic waste water treatment as observed on site visit; 3) the biomass residues are directly sent by local farmers to PP, no off-site electricity usage for the processing of biomass residues.

The remaining sources of project emissions have been considered for the project activity:

- project emissions from on-site consumption of fossil fuel by the project,
- project emissions from transportation of biomass residues

$$PE_y = PE_{FF,y} + PE_{TR,y}$$

(1) Project emissions from on-site consumption of fossil fuel by the project ($PE_{FF,y}$)

The project developer has confirmed that there is no co-firing of any fossil fuel in the project activity and only the biomass residues are used as fuel. For quantity of diesel combusted that are attributable to the project activity during the year y, such as being used for the operation of equipment related to the on-site preparation, storage, processing and transportation of fuels and biomass residues (e.g. for mechanical treatment of the biomass, conveyor belts, driers, shredding, etc. The emissions resulting from the consumption of diesel during the crediting period would be considered as project emissions and the same would be calculated using the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", version 2 /40/:

$$PE_{FF,y} = \sum FC_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,y}$$

In the PDD, for the emission reduction estimations, the quantity of diesel consumed per year is assumed to be 125 tonne according to FSR /6/; the NCVof diesel has been considered as 43.3 GJ/t as verified from IPCC 2006; and diesel emission factor of 0.0748 tCO_2/GJ has been considered as verified from IPCC 2006.

Considering the above values, the project emissions due to on-site consumption of fossil fuel (diesel) has been estimated as 405 tCO_2e. However, this parameter i.e. amount of diesel consumed per year has also been included in the monitoring plan and the actual consumption figure would be used to arrive at the actual project emissions during the crediting period.

Hence, the project emissions due to on-site fossil fuel consumption are estimated to be $PE_{FF,y} = \sum FC_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,y} = 125 \times 43.3 \times 0.0748 = 405\ tCO_2e$.

(2) Project emissions from transportation of biomass residues ($PE_{TR,y}$)

As per methodology ACM0018 (version 2.0) /35/, Option B from "Project and leakage emissions from road transportation of freight" /39/ is used to calculate the project emission from transportation of biomass residues.

The default emission factor for light vehicles as per the option B is 245 (gCO_2 /t km). Also as a conservative approach, the value of 245 (gCO_2/t km) will be adopted for $PE_{TR,m}$ calculations, no matter the freights are transported by Light vehicles or Heavy vehicles.,

$$PE_{TR,y} = \sum D_{f,m} \times FR_{f,m} \times EF_{CO_2,f}$$

Where:

$D_{f,m}$	Return trip road distance between the origin and destination of freight transportation activity *f* in monitoring period m (km)

$FR_{f,m}$ Total mass of freight transported in freight transportation activity *f* in monitoring period *m* (t)

$EF_{CO2,f}$ Average CO_2 emission factor for freight transportation activity *f*

For project emissions estimations, following values have been considered:

a) $D_{f,m}$-Return trip road distance between the origin and destination of freight transportation activity f in period m: During on-site assessment by PJRCES, the validation team observed that the rice straw, peanut straw, maize straw and wood residue (biomass used in the project activity) would be transported from many sites. Since the collection sites are not yet decided or fixed, PP decided to consider the longest distance (100 km) to estimate the project emissions. However, this parameter has also been included in the monitoring plan and the actual value would be used to calculate the actual project emissions during crediting period.

b) For the estimation purpose, PP has considered 310,000 tonnes for $FR_{f,m}$-Total mass of freight transported and the same has been sourced from FSR /6/. This parameter has also been included in the monitoring plan and the actual monitored value would be used for actual project emission calculations during the crediting period.

c) $EF_{CO2,f}$: Average CO_2 emission factor for freight transportation, to the point of simplification, Option B, where the default value is used by the project participants. The emission factor of " Light vehicles" (0.000245tCO_2/t km) is used for all trips as the most conservative way.

Hence, the project emissions due to transportation are estimated to be $PE_{TR,y}$=100×310,000×0.000245=7,595 tCO_2e

Considering the above discussion, the estimated total project emissions resulting from the proposed project activity are:

Project emissions PE_y = $PE_{FF,y}$ + $PE_{TR,y}$ =405tCO_2e +7,595 tCO_2e=8,000tCO_2e

4.10.3 LEAKAGE

In line with the applied baseline and monitoring methodology, ACM00018, version 2.0, the potential source of leakage for this project activity is an increase in emissions from fossil fuel combustion or other sources due to diversion of biomass residues from other uses to the project plant as a result of the project activity. And the baseline scenarios for which potential leakage is relevant are B5, B6, B7 and B8. However, based on PJRCES's assessment, the baseline scenario

for biomass use in the absence of proposed project activity have been identified B1. Hence, in line with the methodology, no leakage emissions have to be considered for the proposed project activity.

Further, PP has also carried out an assessment for the biomass availability in the region. It was confirmed that biomass supply / demand situation in Guzhen County, through reviewing the FSR /6/ that total quantity of rice straw, peanut straw, maize straw and wood residue residue available within 50 kilometers is 2,382,000 tonnes annually, far exceeding the consumption of all the biomass residues from the area including the proposed project. Refer to detailed discussion on section 4.7 of this report in which it has been demonstrated that the quantity of the type of biomass residues available in the region is more than 25% larger than the quantity of biomass residues of the type which is utilized in the region, including the project plant.

Considering the above discussion, it is concluded that the proposed project does not result in any leakage emissions.

$L_{Py} = 0$

Furthermore, PP will periodically monitor supply/demand status within the proposed project influence area as indicated in the chosen baseline and monitoring methodologies applied to this project activity. If other biomass residues other than rice straw, peanut straw, maize straw and wood residue, should be used in the project scenario, a new line will be added to the biomass residues categories table and those quantities will be updated every year of the crediting period as part of the monitoring plan.

Considering the above estimated values of baseline emissions, project emissions and leakage emissions, the total estimated emission reductions resulting from the project activity per year are:

ER = Baseline emissions – Project emissions – Leakage =140,072tCO_2e – 8,000tCO_2e - 0 tCO_2e = 132,072tCO_2e

All assumptions and data used by the project participants are listed in the PDD and/or supporting documents, including their references and sources. All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD. All values used in the PDD are considered reasonable in the context of the proposed CDM project activity. The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakages and emission reductions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the PDD.

In summary, the baseline emission estimate, project emission estimate and leakage estimate can be replicated using the data and parameter values provided in the PDD and supporting files

submitted for registration. Data sources mentioned have been verified by PJRCES. No other project emission or leakage sources contributing more than 1% and not mentioned by the methodology ACM0018 (version 2.0) /35/ have been found.

4.11 ENVIRONMENTAL IMPACTS

Environmental Impact Assessment (EIA) of the project activity has been conducted by Anhui Institute of Environmental Science in accordance with the Law of the People's Republic of China on Evaluation of Environmental Impact /68/ in October 2009 /7/. The EIA of the proposed project has been officially approved by Anhui Environment Protection Bureau on 11 December 2009 /7/. The potential environmental impacts, such as land occupation, solid waste, waste water, air pollution and noise, water and soil loss, and ecological environment, have been sufficiently identified. No significant environmental impacts are expected from the project activity.

4.12 COMMENTS BY LOCAL STAKEHOLDERS

Prior to the publication of the PDD on the UNFCCC website (3 March 2012), National Guzhen Bio Energy Co., Ltd invited comments from local stakeholders through varied means, such as discussion, hearing and visits, to collect the comments from local stakeholders. On 14 December 2009 /22/, 50 copies of questionnaires /22/ were distributed to local area in Guzhen County, Bengbu City, Anhui Province, P. R. China and soliciting responses from all interviewees from residents near the project area, with regard to the project's impact on the environment and compliance with local regulation. 50 questionnaires were recovered with 100% feedback.

The returned questionnaires /22/ was maintained by the PP and was presented to PJRCES for assessment during the site visit of the validation activity. All of the local stakeholders are supportive of the project implementation.

The stakeholders have recognized the contribution of the project to local environment and social economy.

Their views were endorsed by the local stakeholders interviewed during the site visit of the validation activity.

During the on-site visit, PJRCES has conducted an interview with local stakeholders and confirms that the stakeholders affected had been equitably invited in a transparent manner. The interview with stakeholders and review of returned questionnaires shows that the summary of the comments received has been completely provided in the PDD and due account of the comments has been described in the PDD. PJRCES hereby confirms that the process of local stakeholder consultation is deemed to be adequate.

PJRCES considers the local stakeholder consultation carried out adequately. The project will be beneficial to the local sustainable development without negative effect on the local stakeholders.

4.13 COMMENTS BY PARTIES, GLOBAL STAKEHOLDERS AND NGOS

The PDD of Anhui Guzhen Biomass Generation Project was made publicly available on UNFCCC's climate change website (http://cdm.unfccc.int/Projects/Validation/DB/HL54J1VU4UANNJA9KUDN6H54SK7XVI/view.html) and Parties, stakeholders and NGOs were invited through the UNFCCC CDM website to provide comments during a 30 days period from 3 March 2012 to 1 April 2012.

No comment were received during this period.

5 VALIDATION OPINION

PJRCES has performed a validation of the Anhui Guzhen Biomass Generation Project in China. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided PJRCES with sufficient evidence to determine the fulfilment of stated criteria.

The host country is China and the Annex I country is France. Both countries fulfil the participation criteria and have approved the project and authorized the project participants. The DNA from China confirmed that the project assists in achieving sustainable development.

The project correctly applies ACM0018 "Consolidated methodology for electricity generation from biomass residues in power-only plants" version 2.0.

By utilization of biomass residues to generate power which would otherwise is provided from fossil fired power plant, the project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 132,072 tCO_2e per year over the selected 7 year crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been implemented.

In summary, it is PJRCES's opinion that the Anhui Guzhen Biomass Generation Project in China, as described in the PDD of "version 2.0 of 21 September 2012", meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0018 "Consolidated methodology for electricity generation from biomass residues in power-only plants" version 2.0. PJRCES thus requests the registration of the project as a CDM project activity."

6 REFERENCES

The following tables list the documentation that was reviewed during the validation

Documents provided by the project participants

/5/	EDF Trading Limited: *CDM-PDD for project activity* "Anhui Guzhen Biomass Generation Project", GSP version 01.1 dated 1 March 2012; final version 2.0 of 21 September 2012
/6/	State Power Economic Research Institute: FSR of "Anhui Guzhen Biomass Generation Project", dated August 2009 Anhui Energy Bureau: Approval of the FSR of "Anhui Guzhen Biomass Generation Project", dated 17 March 2010
/7/	Anhui Institute of Environmental Science: EIA of "Anhui Guzhen Biomass Generation Project" dated October 2009 Anhui Environment Protection Bureau: Approval for the EIA of "Anhui Guzhen Biomass Generation Project", dated 11 December 2009
/8/	EDF Trading Limited: IRR Calculation Spreadsheet for "Anhui Guzhen Biomass Generation Project", dated 11 July 2012
/9/	EDF Trading Limited: EF and ER Calculation Spreadsheet for "Anhui Guzhen Biomass Generation Project", dated 11 July 2012
/10/	National Guzhen Bio Energy Co., Ltd: Board meeting minutes for "Anhui Guzhen Biomass Generation Project", dated 8 December 2009
/11/	National Guzhen Bio Energy Co., Ltd: CDM notification of prior consideration to NDRC of China for "Anhui Guzhen Biomass Generation Project" was submitted on 20 May 2010 and confirmed on 20 May 2010.
/12/	National Guzhen Bio Energy Co., Ltd: CDM notification of prior consideration to UNFCCC for "Anhui Guzhen Biomass Generation Project" was submitted to UNFCCC on 26 September 2010.
/13/	Furher efforts for request of uploading of notificaiton forms listed on UNFCCC web: Chen Fang of National Guzhen Bio Energy Co., Ltd, asking the status of notificaion of original notificaiton on 26 October 2011 Crystal Cui of EDF Trading Limited, Corresponding letter for confirmation of prior CDM considration from UNFCCC on 29 November 2011 and confirmed the receipt of the email on 2 December 2011
/14/	National Guzhen Bio Energy Co., Ltd and Shandong Power Construction 1st

	Engineering Company: Construction contract signed, dated 28 March 2010
/15/	National Guzhen Bio Energy Co., Ltd and Qingdao Jieneng Power Station, Engeering Co., Ltd.: Turbine Purchase Contract signed, on 3 April 2010
/16/	National Guzhen Bio Energy Co., Ltd and Longji Power Co., Ltd, 130 T/h Boiler contract, of 2 April 2010
/17/	National Guzhen Bio Energy Co., Ltd and Shandong Jinan Power Equipment Factory: Generator Purchase Contract signed, on 3 April 2010
/18/	National Guzhen Bio Energy Co., Ltd to Shandong Power Construction 1st Engineering Company: Construction start permit, on 31 March 2010
/19/	National Guzhen Bio Energy Co., Ltd and National Land Bureau of Guzhen County, Land acquisition contract, 13 April 2010
/20/	Anhui Province Power Engineering Supervision Co., Ltd. Construction supervision contract, of 28 March 2010
/21/	National Guzhen Bio Energy Co., Ltd: Financial enclosure of the "Anhui Guzhen Biomass Generation Project"
/22/	National Guzhen Bio Energy Co., Ltd: Meeting and questionnaires of stakeholder perception survey, dated 14 December 2009; 50 copies of questionnaires distributed.
/23/	National Guzhen Bio Energy Co., Ltd and EDF Trading Limited: ERPA, dated 9 November 2011
/24/	National Land Bureau of Anhui Province, Project site approval for "Anhui Guzhen Biomass Generation Project", of 13 April 2010
/25/	Water and Resource Bureau of Anhui Province, Water and soil conservation approval for "Anhui Guzhen Biomass Generation Project", of 2010
/26/	Power Company of Bengfu, Grid connection approval for "Anhui Guzhen Biomass Generation Project", of 15 September 2010
/27/	Anhui Province Price Bureau: Letter of approval on grid-connection tariff for "Anhui Guzhen Biomass Generation Project", 28 June 2010 http://www.ahpi.gov.cn:8181/wjjhd/information.jsp?xxnr_id=10076020
/28/	Anhui Province Price Bureau: Notification of tariff implementation in coal fired plant http://law.baidu.com/pages/chinalawinfo/1684/64/620123c103ed129661faef67a8d1b9c9_0.html
/29/	National Guzhen Bio Energy Co., Ltd, Anhui Power Surveillance Co., Ltd and State Power Economic Research Institute, the 72+24 hours commissioning acceptance, 3 January 2011

/30/	Guzhen County Industrial and Commercial Administrative Bureau, Business license of National Guzhen Bio Energy Co., Ltd, of 28 August 2009
/31/	Beijing Branch, Huaxia Banking Co., Ltd: The loan contract, 22 December 2010

Letter of approval

/32/	National Development and Reform Commission (DNA of China): Letter of approval (LoA) for "Anhui Guzhen Biomass Generation Project", dated 28 March 2012 http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2847.pdf
/33/	Ministry of Ecology, Sustainable Development, Transports and Housing (DNA of Annex I Party France): Letter of approval of "Anhui Guzhen Biomass Generation Project"dated 13 September 2012 France DNA (Ministry of Ecology, Sustainable Development, Transports and Housing): Email communication with project proponents

Methodologies, tools and other guidance by the CDM Executive Board

/34/	CDM Executive Board: *Validation and Verification Manual*, Version 1.2, dated 30 July 2010, EB55 http://cdm.unfccc.int/Reference/Manuals/accr_man01.pdf
/35/	CDM Executive Board: Baseline and monitoring methodology ACM0018, "*Consolidated methodology for electricity generation from biomass residues in power-only plants*", version 2.0
/36/	CDM Executive Board: "*Demonstration and assessment of additionality*" version 6.0.0
/37/	CDM Executive Board: *Guidelines on Common Practice, version 2.0*
/38/	CDM Executive Board: *Tool to calculate the emission factor for an electricity system*, Version 2.2.1, 29 september 2011 http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf
/39/	CDM Executive Board: "Project and leakage emissions from road transportation of freight"
/40/	CDM Executive Board: *Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion*, Version 2, 2 August 2008 http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf

/41/	CDM Executive Board: *Guidelines for the reporting and validation of plant load factors*, EB48 Annex 11.
/42/	CDM Executive Board: *Guidelines on the demonstration and assessment of prior consideration of the CDM*, version 4, EB 62, Annex 13, of 15 July 2011
/43/	CDM Executive Board: Guidance for request for deviation titled "*Application of AM0005 and AMS-I.D in China*" http://cdm.unfccc.int/Projects/deviations
/44/	CDM Executive Board: "*Guidelines for completing the project design document and the proposed new baseline and monitoring methodologies*", version 7, adopted at EB41
/45/	CDM Executive Board: *Guidelines on the assessment of investment analysis*, version 5, EB 62, Annex 5, of 15 July 2011
/46/	CDM Executive Board: Glossary of CDM terms, version 6, EB 66, 2 March 2012 http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf

Documents used by PJRCES to validate/cross-check the information provided by the project participants

/47/	IPCC: 2006 IPCC *Guidelines for National Greenhouse Gas Inventories*, Volume 2 Energy
/48/	Compilation Committee of China Electric Power Yearbook: China Electric Power Yearbook 2006-2010.
/49/	Department of Industry and Transport Statistics of National Bureau of Statistics and Energy Bureau of NDRC of China: China Energy Statistical Yearbook 2008-2010.
/50/	National Development and Reform Committee (NDRC): Emission factor calculation for each power grid of China (including the Chinese DNA's guidance for the determination of grid boundaries), dated 20 October 2011. http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2720.pdf
/51/	The Ministry of Water Resources: *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects*, 2003 http://cdm.ccchina.gov.cn/web/NewsInfo.asp?NewsId=3359
/52/	China NDRC and National Construction Committee, *Economic Evaluation Code and Parameter for Construction Project*, version 3 dated 2006

/53/	NDRC: *Law of the People's Republic of China on Conserving Energy*, 25 August 2008 http://www.chinatax.gov.cn/n480462/n480513/n480902/8083826.html
/54/	NDRC: Power industry 11th Five-Year Plan of China, April 2007 http://www.ccchina.gov.cn/WebSite/CCChina/UpFile/File186.pdf
/55/	Ministry of Agriculture of the People's Republic of China, *Notice for Prohibiting Burn straw in Uncontrolled Manner* , of 14 June 2007 http://law.baidu.com/pages/chinalawinfo/9/41/040fb00376e1ba5bfa1d3b9209319b1f_0.html
/56/	National People's Congress: Air Pollution Prevention Law of China, 29 April 2000
/57/	National Development and Reform Commission, Promotion of biomass power plant http://www.ndrc.gov.cn/zjgx/t20071123_174054.htm
/58/	NDRC: *Interim Regulation for Tariff of Renewable Energy Power Generation and Appointment of Expenses* (Fagaijiage[2006]No.7), 1 January 2006 http://www.china.com.cn/chinese/2006/Feb/1118762.htm
/59/	*NDRC, Notice regarding On-grid Tariff of Electricity Generation from Agroforestry Biomass Residues,* of 18 July 2010 http://www.ndrc.gov.cn/zcfb/zcfbtz/2010tz/t20100728_363362.htm.
/60/	State Council of the People's Republic of China: : *Provisional Regulations of the People's Republic of China on Value Added Tax* Law of People's Republic of China, State Council 10 November2008. http://www.gov.cn/zwgk/2008-11/14/content_1149516.htm
/61/	Ministry of Finance and State Administration of Taxation, *Notice on Low VAT Rate and Simple Taxation Methods for Some Kinds of Goods,* 19 January 2009. http://www.chinatax.gov.cn/n8136506/n8136593/n8137537/n8138502/8786685.html
/62/	Ministry of Finance and State Administration, *Notification on Several Issues regarding National Wise Implementation of the VAT Reform,* 19 December 2008 http://www.chinatax.gov.cn/n8136506/n8136593/n8137537/n8138502/8745403.html
/63/	Ministry of Finance and the State Administration of Taxation, *Notice about Policies regarding the Value Added Tax on Products Made through Comprehensive Utilization of Resources and Other Products,* 9 December 2008 http://www.js-n-tax.gov.cn/Page/StatuteDetail.aspx?StatuteID=8931
/64/	Ministry of Justice of the People's Republic of China: *Law of People's Republic of*

	China on Enterprise Income Tax, President decree No.63, issued on 16 March 2007 and effective on 1 January 2008.
/65/	Ministry of Finance and the State Administration of Taxation: *Notice of preferential policies on enterprise income tax*, Caishui [2008] No.1, dated 22 February 2008. http://www.js-n-tax.gov.cn/Page/StatuteDetail.aspx?StatuteID=8382
/66/	Ministry of Finance: *Implementation Rules for Provisional Regulation of Enterprise Income Tax* of People's Republic of China, Caifazi [1994] No. 3, issued on 1 January 1994 and abolished on 31 December 2007. http://www.chinaacc.com/new/63/67/84/1993/12/ad22761730111722139917400.htm
/67/	Benchmark lending rate published by The People's Bank of China: http://www.shibor.org/shibor/web/html/shibor.html
/68/	Ministry of Justice of the People's Republic of China: the *Law of the People's Republic of China on Evaluation of Environmental Impact*, [2002] No.77 dated on 1 September 2003.
/69/	State Tax Bureau: Notification on determination of residual rate for enterprise fixed asset, 14 September 2005 http://www.chinatax.gov.cn/n8136506/n8136563/n8193451/n8193526/n8194270/8245508.html
/70/	State Council: *Provisional Regulations of the People's Republic of China on Urban Maintenance and Construction Tax*, GuoFa [1985] No.19, dated 8 February 1985. http://www.tjtdxy.cn/show.aspx?id=1932&cid=69
/71/	NDRC: Promulgation of Electric Power Industry Reform, dated 11 February 2002: http://www.ndrc.gov.cn/xwfb/t20050708_28096.htm
/72/	State Council: *Provisional Regulations of the People's Republic of China on Education Tax*, dated 20 August 2005. http://www.law-lib.com/law/law_view1.asp?id=99771
/73/	Power Planning Institute, *Unit Cost Referenced index of Fossil-fired Power Engineering and Design 2008,* of February 2009
/74/	China stocks and bonds newspaper: The annual utilized hours of thermal power plants in 2008, dated 23 January 2009. http://www.chinabidding.com.cn/zbw/dlpd/info_show.jsp?record_id=1461
/75/	DRC of Guzhen County: The investigation report of local biomass resource, 17 February 2012

/76/	National Guzhen Bio Energy Co., Ltd: Training plan of plant staff, of 2011
/77/	National Guzhen Bio Energy Co., Ltd: Purchase invoice of biomass residues, 1 November 2011
/78/	National Guzhen Bio Energy Co., Ltd: The financial closure report of equipment and construction for Anhui Guzhen Biomass Generation Project, 2012
/79/	The development of biomass power project in China: http://www.cqvip.com/qk/80913X/200809/28202636.html http://www.neoman.cn/neoman/29548/g.htm http://epaper.rmzxb.com.cn/2007/20070313/t20070313_126623.htm http://www.crein.org.cn/2007news/2007020601.htm
/80/	National Bureau of Statistics of China: Statistical Bullet of National Economic and Social Development, 28 February 2011 http://www.stats.gov.cn/tjgb/ndtjgb/qgndtjgb/t20110228_402705692.htm
/81/	Price Bureau of NDRC of China: The trend of industrial production and material price in 2007, 2008, 2009, 2010 http://jgs.ndrc.gov.cn/jgqk/t20100819_366679.htm http://jgs.ndrc.gov.cn/jgqk/t20090915_302204.htm http://jgs.ndrc.gov.cn/jgqk/t20080715_224213.htm http://jgs.ndrc.gov.cn/jgqk/t20071217_179248.htm
/82/	NDRC Website information about biomass residual price, 29 December 2005 http://www.sdpc.gov.cn/zdxm/t20051229_55135.htm
/83/	State Economic and Trade Commission: Technical administrative code of electric energy metering (DL/T 448-2000), dated 3 November 2000 and valid since 1 January 2001.

APPENDIX A
VALIDATION PROTOCOL

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	~~CAR 1~~
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK
About additionality		

Requirement	Reference	Conclusion
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	~~CL 4~~ ~~CL 5~~
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	~~CL 3~~
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK
About small-scale project activities (if applicable)		
13. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech Accords and shall not be a debundled component of a larger project activity.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	N/A
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	N/A
15. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	N/A
About stakeholder involvement		
16. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK

Requirement	Reference	Conclusion
17. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
Other		
18. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
19. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies & circumstances.	CDM Modalities and Procedures §45c,d	~~CL 3~~ ~~CL 6~~
20. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
21. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
22. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	~~CL 8~~

Table 2: Requirements Checklist

CDM Validation Requirement	*Remarks*	*Evidence*	*Conclusion*
A. General requirements			
A.1 Project description and PDD			
A.1.1 Does the PDD sufficiently cover all the relevant elements of the project activity, is accurate as per the planned and/or implemented scheme, and provides a clear understanding of the nature of the project activity?	The project is a greenfield project, involving the installation of one set of biomass combustion boiler with the capacity of 130 t/h and one set of steam turbine generator with installed capacity 30MW, the biomass residues consumed per year will be summed up to 310,000 tonnes. It is expected that net quantity of electricity generation of the Project is 186,900 MWh, which will be delivered to ECPG. The project boundary includes the project geographical location and the ECPG. The electricity generated by the project activity will displace part of the electricity generated by the ECPG, which is dominated by coal-fired power plants, and thus greenhouse gas (GHG) emissions are expected to be reduced. Being a renewable electricity project, the project activity will generate greenhouse gas (GHG) emission reductions by avoiding the CO_2 emissions from the electricity generation by fossil fuel power projects. The emission reductions are estimated to be on	PDD /5/ FSR and its approval /6/	~~CL 1~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
	average 132,072 tCO_2e per year and 924,504 tCO_2e over the first seven-year crediting period. Clarification is needed for the gross electricity generated and in-house auxiliary power consumption share of the total electricity generated. It was stated in the PDD GSC version 01.1 that the capacity of biomass combustion boiler equipped for the project was of 130t/d. However, according to the approved FSR, the consumption of biomass residues is of 130t/hour.		
A.1.2 Is the project a new installation and already commissioned, or does the project involve alteration of existing installation or process?	The proposed project activity is a Greenfield project, does not involve alteration of existing installations, which was witnessed on site by validation team. There are no existing power plants within the project boundary, hence, the project has been considered as new installation/future project as per the PDD, version 2.0 of 21 September 2012.	PDD /5/ Interviews with site-personnel and direct view /1/ /2/	OK
A.1.3 What category does the project activity fall under: ▪ Large scale CDM project ▪ Non-bundled small scale CDM project with annual emission reductions more than 15,000 tonnes	The project activity falls under the category of "Larger scale CDM project", as the capacity of the proposed project is 30MW, as per ACM0018 version 2.0.	PDD /5/ Emission reduction calculation sheets /9/	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
▪ Bundled small scale with annual emission reductions more than 15,000 tonnes ▪ Small scale CDM project activity with annual emission reductions less than 15,000 tonnes Has a site visit been carried out for the project activity? If not, pl justify	A site visit was conducted by PJRCES Inc. (PJRCES) on 18-19 March 2012.		
A.1.4 Is the PDD prepared in accordance with the latest guidance from the CDM EB available on the UNFCCC website	The PDD version 01 dated 20 February 2012 submitted by the client did not meet the requirements of the "Guidelines for completing the project design document and the proposed new baseline and monitoring methodologies". The same was brought out during the completeness check evaluation by PJRCES before webhosting the PDD for global stakeholder consultation and communicated to the client (F-06.14). The PP revised the PDD which was then submitted for global stakeholder consultation.	PDD /5/ "Guidelines for completing the project design document and the proposed new baseline and monitoring methodologies" /44/	OK
A.2 Participation and Approval			
A.2.1 Pl include and confirm the details of the participating project participants and the Parties involved.	The PDD identifies China as the Host Party. France as Annex-I Party has been identified. The PP identified from the host Party China is National Guzhen Bio Energy Co., Ltd as per the Letter of Approval (LoA) from the host Party. The PP is requested to provide the Letter of Approval (LoA) from Annex I.	PDD /5/ LoAs /32/ /33/	~~CAR 1~~
A.2.2 Has the participation of each project	LoA from China has been issued on 28 March	PDD /5/	~~CAR 1~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
participant been approved by at least one Party involved, either in a letter of approval or in a separate letter specifically to approve participation?	2012 LoA from France did not reach PJRCES.	LoAs /32/ /33/	
A.2.3 Has the letter of approval (LoA) been submitted and reviewed by the PJRCES? Pl confirm if the same was provided by the PP or directly by the DNA of the Party involved?	LoA from China has been issued on 28 March 2012 LoA from France did not reach PJRCES.	PDD /5/	~~CAR 1~~
A.2.4 Does the LoA confirm the following: - Ratification of the Kyoto Protocol - Voluntary participation - The CDM project activity contributes to Host country's sustainable development - Title of the project activity is same as the PDD sent for registration	LoA from China has been issued on 28 March 2012 LoA from France did not reach PJRCES.	PDD /5/	~~CAR 1~~
A.2.5 Is the LoA conditional to a specific version of PDD or the validation report?	LoA from China has been issued on 28 March 2012 LoA from France did not reach PJRCES.	PDD /5/	~~CAR 1~~
B. Baseline and monitoring methodology			
B.1 Methodology applicability			
B.1.1 Has the project proponent applied the relevant baseline and monitoring methodology that has been previously approved by the CDM Executive Board?	The project proponent is using an approved CDM methodology under the approved baseline methodology ACM0018 (version 2.0), titled "Consolidated methodology for electricity generation from biomass residues in power-only	PDD /5/ ACM0018, version 2.0 /35/	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	plants".		
B.1.2 Does the project activity meet all of the applicability criteria defined in the approved methodology? Pl clarify i) No other biomass types than biomass residues, as defined in page 1 of ACM0018 version01.3.0, are used in the project plant ii) Fossil fuels may be co-fired in the project plant. However, the amount of fossil fuels co-fired shall not exceed 80% of the total fuel fired on an energy basis; iii) For projects that use biomass residues from a production process (e.g. production of sugar or wood panel boards), the implementation of the project shall not result in an increase of the processing capacity of raw input (e.g. sugar, rice, logs etc) or in other substantial changes (e.g. product change) in this process; iv) The biomass residues used by the project facility should not be stored for more than one year; v) No significant energy quantities, except from transportation or mechanical treatment of the biomass residues, are required to prepare the biomass residues for fuel combustion, i.e.projects that process the biomass residues prior to combustion (e.g. esterification of waste oils, gasification, etc) are not eligible under this methodology; vi) No power and heat plant operates at the project	Project activity only uses biomass residues as fuel. The project combusts the renewable biomass (rice straw, peanut straw, maize straw and wood residue) for power generation; It is not anticipated that any fossil fuel will be co-fired with the biomass residues. The project utilizes only the agricultural biomass (rice straw, peanut straw, maize straw and wood residue) for power generation; and this biomass is the by-product of the agricultural result, not from a production process. According to the biomass residues collection and disposal conditions of the project activity, the storage period of the biomass residues would not be stored for more than one year, from interviews with local villagers /4/ and local governmental officers /3/. Biomass residues (rice straw, peanut straw, maize straw and wood residue) are not processed chemically prior to combustion, verified on site visit /1/ /2/ /3/. The biomass residues (rice straw, peanut straw, maize straw and wood residue) needs only natural drying and will require energy for transportation (from biomass residue site to project activity site) and mechanical treatment (shredding shorten), which will be monitored during operation.	PDD /5/ ACM0018, version 2.0 /35/ FSR /6/ PPA	~~CL 2~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
site during the crediting period; vii) In the case of fuel switch project activities, the use of biomass residues or the increase in the use of biomass residues as compared to the baseline scenario is technically not possible at the project site without a capital investment.	The project activity is solely a power plant during the crediting period; No heat is generated in the project site previously or currently, observed on site visit /1/ /2/ /3/. The proposed project is the power-only plant, as verified from design /6/ and onsite observation /1/ /2/ /3/. There is no heat, which is used for purposes other than power generation (e.g. heat which is produced in boilers or extracted from the heater to feed thermal loads in the process), generated during the crediting period or generated prior to the implementation of the project activity, by any on-site or off-site heat generation equipment connected to the project site. The project is a green field power-only generation plant without fuel switch activities /1/. What is the commitment from the project owner, to use only rice straw, peanut straw, maize straw and wood residue as fuel, in the case of other biomass types available in the area. PP cannot add any new biomass types other than that described in the PDD, or there is a change of project design else. More evidence is sought regarding that the biomass residues used by the project facility will not be stored for more than one year.		

CDM Validation Requirement	Remarks	Evidence	Conclusion
B.1.3 Does the project activity involve any emissions within the project boundary that contribute to more than 1% of the total expected annual average emission reductions which are not addressed/considered in the methodology? Pl explain, if any.	The baseline, project and leakage emissions have been checked to be appropriate in PDD as per methodology ACM0018 (version 2.0). There are no emissions identified within the project boundary that contribute to more than 1% of the total expected annual average emission reductions which are not addressed in the methodology.	PDD /5/ ACM0018, version 2.0 /35/ Site-visit plan /1/ /2/	OK
B.1.4 Does the project boundary defined include all emission sources and the clear demarcation on the physical and geographical boundary of the proposed CDM project activity? Is the selection of all emission sources (baseline, project and leakage) been justified?	The project's system boundaries are defined and verified to be in accordance with the methodology ACM0018, version 2.0. The spatial extent of the project boundary includes the proposed project and all power plants connected physically to the ECPG that the proposed project is connected to. The project boundary defined includes all emission sources as per the methodology and the selection of these sources also is justified.	PDD /5/ ACM0018, version 2.0 /35/	OK
B.2 Baseline Selection			
B.2.1 Does the methodology define a specific baseline directly for the project type, or Does it refer to a tool for arriving at the baseline for the project activity?	The baseline scenarios have been identified as per the baseline and monitoring methodology ACM0018, version 2.0 /35/.	PDD /5/ ACM0018, version 2.0 /35/	OK
B.2.2 Has the CDM project activity considered all alternatives available to the project proponent?	**Assessemnt and justification by PJRCES**	PDD /5/	~~CL 3~~

CDM Validation Requirement		Remarks		Evidence	Conclusion
	Description			Site-visit plan /1/ /2/	
P1	The proposed project activity not undertaken as a CDM project activity	P1	This is a credible alternative		
P2	If applicable, the continuation of power generation in existing power-only plants fired with biomass residues, or fossil fuels, or a combination of both, at the project site. The existing power-only plants would operate at the same conditions (e.g. installed capacities, average load factors, or average energy efficiencies, fuel mixes, and equipment configuration) as those observed in the most recent three years prior to the project activity	P2	Not applicable, there is no existing power-only plant at the project site, this has been confirmed on the site visit /1/ /2/ /3/ and from the project design /6/.		
P3	If applicable, the continuation of power generation in existing power-only plants fired with biomass residues, or fossil fuels, or a combination of both, at the project site. The existing power-only plants would operate with different conditions from those observed in the most recent three years prior to the project activity.	P3	Not applicable, there is no existing power-only plant at the project site, this has been confirmed on the site visit /1/ /2/ /3/ and from the project design /6/.		
P4	If applicable, the retrofitting of existing power-only plants fired with biomass residues, or fossil fuels, or a combination of both, at the project site. The retrofitting may or may not include a change in fuel mix.	P4	Not applicable, there is no existing power-only plant at the project site, this has been confirmed on the site visit /1/ /2/ /3/ and from the project design /6/.		
P5	The generation of power in the grid.	P5	This is the baseline scenario		
P6	The installation of new power-only plants fired with biomass residues, or fossil fuels, or a combination	P6	It is technologically impossible for new biomass residue fired power-only plant to provide the same amount of power using less biomass residues than under scenario P1, under the current technology conditions. This is not a credible alternative.		
		P7	If the project activity uses more biomass residues than those under scenario P1, the project would have a relatively lower efficiency and less financially attractive than scenario P1. This is not realistic.		
		B1	The scenario prior to the proposed project is that the rice straw, peanut straw, maize straw and wood residue are dumping and decay of biomass residues on fields under aerobic conditions.		
		B 2	The scenario prior to the proposed project is that the rice straw, peanut straw, maize straw and wood residue are dumping and decay of biomass		

CDM Validation Requirement	Remarks	Evidence	Conclusion
of both, at the project site, using the same amount or less biomass residues than under scenario P1. P7 The installation of new power-only plants fired with biomass residues, or fossil fuels, or a combination of both, at the project site, using more biomass residues than under scenario P1. B1 The biomass residues are dumped or left to decay mainly under aerobic conditions. This applies, for example, to dumping and decay of biomass residues on fields. B 2 The biomass residues are dumped or left to decay under clearly anaerobic conditions. This applies, for example, to landfills which are deeper than 5 meters. This does not apply to biomass residues that are stock-piled or left to decay on fields. B 3 The biomass residues are burnt in an uncontrolled manner without utilizing it for energy purposes. B 4 The biomass residues are used for electricity generation in power-only plant configuration at the project site in new and/or existing power plants. B 5 The biomass residues are used for power and/or heat generation in other existing or new power plants at other sites. B 6 The biomass residues are used for other energy purposes, such as the generation of bio-fuels. B 7 The biomass residues are used for non- energy purposes, e.g. as fertilizer or as feedstock in processes (e.g. in the pulp and paper industry). B 8 The primary source of the biomass residues and/or their fate in the absence of the project activity cannot be clearly identified.	residues on fields under aerobic conditions. B 3 An uncontrolled manner without utilizing it for energy purposes is against the notice issued by Ministry of Agriculture of the People's Republic of China /55/. B 4 This is the project activity without CDM. B 5 In the region, it was confirmed /1/ /2/ /3/ /4/ /6/ that rice straw, peanut straw, maize straw and wood residue are not utilized before the proposed project utilizes it for power or heat generation. Besides, new power or heat generation plants if any at other sites would incur the same barrier as per the project activity; therefore this is not a credible alternative. B 6 The rice straw, peanut straw, maize straw and wood residue is apparently not feasible for generation of bio-fuels. B 7 The rice straw, peanut straw, maize straw and wood residue is not utilized in the local area as feedstock for any process. B 8 The rice straw, peanut straw, maize straw and wood residue is sourced from local agricultural area and its fate in the absence of the project activity is clearly identified. Clarification is requested for the local/regional policy concerning the biomass residue in the baseline scenario, B3: Whether there is an existing regulatory to ban "The biomass residues are burnt in an uncontrolled manner without utilizing it for energy purposes."		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	For excluding the scenario B6, it is explained in the PDD GSC version 01.1 that "*the surplus biomass residues will not be used in other existing or new boilers*", however, it is not relevant to the explanation about "*the other energy purposes of the biomass residues*" as indicated in the scenario B6. For excluding the scenario B7, the explanation in the PDD GSC version 01.1 is not relevant to the statement about biomass residues used for non-energy purposes in the scenario B7. Further explanation is requested.		
B.2.3 Is the documentation of the baseline determination clear w.r.t the following: - All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. - All Documentation is relevant as well as correctly quoted and interpreted - Assumptions and data can be deemed reasonable. - Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD and the same has been confirmed. - The methodology is correctly applied to identify what would have happened in the absence of the CDM project activity proposed.	PJRCES can confirm that: - All assumptions and data have been listed in the PDD and corresponding documents provided. - The references provided are relevant to the type of project activity being implemented. - Assumptions and data can be deemed reasonable - The Relevant national and /or sector policies are considered and listed in the PDD. - The baseline scenario is the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources.	PDD /5/ ACM0018, version 2.0 /35/	OK
B.2.4 Have all the assumptions, calculations, rationale and other sources described in the PDD been verified to determine if the baseline scenario	The assumptions and calculations have been checked, and the discussion in B.2.3 would be applicable here as well.	PDD /5/	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
identified is reasonable.			
B.2.5 Cross check the information provided in the PDD with other verifiable and credible sources, such as local expert opinion, if available	Information provided in the PDD was checked and was found to be in line.	PDD /5/ FSR /6/	OK
B.3 Additionality			
B.3.1 Is the tools applied to discuss additionality in line with the CDM tools and documents provided CDM EB and the specific methodology applied for the project activity?	No, using ACM0018.	PDD /5/ ACM0018 version 2.0	OK
B.3.2 If the start date of the project activity prior to the date of publication of the PDD for stakeholder comments it shall be demonstrated that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity in line with the *"Guidance on the Demonstration and Assessment of prior consideration of the CDM"?* **Proposed project activities with a start date prior to 2 August 2008** a. Awareness of the CDM prior to the project activity start date and benefits of CDM were a decisive factor in decision to proceed with the project; b. Continuing and real actions were taken to secure CDM status for the project in parallel with its implementation;	The start date of the project activity (28 March 2010) is prior to the date (3 March 2012) of the publication of the PDD for stakeholder comments. Using the guidelines on the demonstration and assessment of prior consideration of the CDM, version 4, the following compliance has been observed: - Minutes of the board of director, related to consideration of the decision of the project participant, to undertake the project as a CDM project activity; - emission reduction purchase agreement (ERPA) term sheets, - earlier correspondence on the project with the DNA and the UNFCCC secretariat. The milestones (such as major equipment	Assessment of Prior Consideration of the CDM /42/	~~CL 4~~ ~~CAR 2~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
c. There is less than 2 years of a gap between the documented evidence.	contract, construction, commissioning and full operation) of the project activity have to be included in the PDD. The notification letter to EB about the intention to seek CDM status submitted on 26 September 2010. Nevertheless, this notificaiton was not shown on UNFCCC website. Thus, further justification was needed to supplement that the CDM has been seriously considered in the decision to implement the project activity.		
B.3.3 What are the barriers applicable to the project activity that have been discussed to prove the project additionality?	The PP has chosen financial analysis to demonstrate the additionality of the project activity, hence this is not applicable.	PDD /5/	OK
B.3.4 ***Investment Analysis***: *The list of questions below must be adjusted to the parameters in the investment analysis relevant to the project under validation.*	The project proponent has chosen investment analysis to demonstrate additionality. Following aspects have been reviewed by PJRCES to reach whether the satisfactory conclusion can be drawn.	PDD /5/	OK
I. In case of investment cost analysis, pl confirm if a suitable indicator has been considered for the remaining alternatives available to the project activity.	It is not applicable since no alternative identified to the project activity involves the investment.	PDD /5/	OK
II. In case of Benchmark analysis, pl confirm whether the benchmark applied is relevant to the type of the financial indicator	The project generates economic benefits apart from the CDM revenue, so the simple cost analysis cannot be applied. The investment comparison is not applicable to	ACM0018 version 2.0 *Interim Rules on Economic Assessment*	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	the project since the alternative to the proposed project are not similar investment activities. The choice of benchmark analysis is considered by PJRCES to be correct. According to Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects, which is still valid, project-IRR of 8% (after tax) for the total investment of a project is regarded as a benchmark for investing in biomass power plants in China. The benchmark of project-IRR of 8% (after tax) is therefore appropriate for this project. This benchmark of project-IRR of 8% (after tax) is widely accepted and applied in the China biomass power industry. At present, the benchmark has been applied as indicator for investors, commercial banks and other stakeholders for the biomass power industry in China and there is no alternative benchmark. Based on the discussion given above, PJRCES validation team is able to confirm the benchmark selected being suitable and reasonable.	*of Electrical Engineering Retrofit Projects* /51/	
III. Is the period of assessment considered for the financials in line with the guidance?	The project applies 20 year assessment for the financial analysis to determine the economic viability of the project which is consistent with that in FSR /6/ and the fair value are set to be 5%	Notification on determination of residual rate for enterprise fixed asset	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	which is in compliance with the Notification on determination of residual rate for enterprise fixed asset issued by State Tax Bureau /69/.	issued by State Tax Bureau /69/	
IV. Are the input values considered in the investment analysis are valid and applicable at the time of the investment decision taken by the project participant?	The input values are sourced from the FSR developed in August 2009, and a FSR in China is required to be developed by a third party accredited of this task directly by the government. An approval letter of the FSR is issued by the government only after it passes the public assessment of the sector experts designated by the government. The Board meeting was held on 08 December 2009 making decision to implement the project considering the CDM revenue, which is only 4 months after the completion of the FSR. The FSR was approved on 17 March 2010, and thus less than 1 month prior to the start date of the project which was on 28 March 2010 /14/. Given this short period of time between the FSR and the decision to proceed with the project activity as CDM, it is unlikely in the context of the project that the input values would have materially changed. Therefore, it is reasonable to assume that the FSR has been the basis of the decision to proceed with the investment in the proposed project activity. Thus it is confirmed that input values used in all	FSR and its approval /6/ Contracts of relevant contracts and procurement /14/ /15/ /17/	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	investment analysis are valid and applicable at the time of the investment decision taken by the project participant.		
V. In cases where PP rely on the values from Feasibility Study Report (FSRs) approved by National authorities, to ensure that the same is in line with the guidance in the VVM. (*Paragraph 113 of VVM, ver 01.2)*	The input parameters used in the financial analysis of this project (PDD and IRR spreadsheet) are taken from the FSR, developed by State Power Economic Research Institute in August 2009 and approved by Anhui Energy Bureau on 17 March 2010. PJRCES has validated that the presented input values in PDD are from FSR and have been consistently applied in all calculations. In order to further support of the relevance of input values used for the investment analysis in the PDD, further clarification is requested regarding as follows: • The supportive evidences for the choosing auxiliary electricity consumption rate applied to estimate the net electricity supplied to the grid. • The applicability of electricity tariff applied to the project activity, given that a regulatory policy regarding on-grid tariff of electricity generation from agroforestry biomass residues was issued by National Development and Reform Commission on 18 July 2010. • The applicability of the average biomass	PDD /5/ FSR and its approval /6/	~~CL 5~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
	residues price applied to the project activity and the suitability of biomass residue price escalation, if applicable. • The reasonability of O&M cost and its component expenditure such as the water consumption, material fee, water fee, miscellaneous cost, maintenance rate, etc. • Whether selling ash can be considered as revenue in the investment analysis, provided that the ash can possibly be used produce the fertilizer to the local farmers? • More evidence is sought on the suitability of different VAT rates (e.g. biomass VAT, water VAT, repair VAT and material VAT) and the relevant VAT favorable policy applied in the project activity if applicable.		
VI. How was the amount of output (e.g. sales of electricity) assessed? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	The FSR has been used as the basis for the electricity generation estimate. PJRCES's sectoral experts can confirm that the number of operating hours is reasonable for this project, as also demonstrated when comparing the project with similar projects shown in the *TABLE 7– [THE INPUT PARAMETERS COMPARISON BETWEEN ANHUI GUZHEN BIOMASS GENERATION PROJECT AND REGISTERED CDM PROJECTS IN CHINA]* in China. Comparing with the operating hour reported for other similar registered biomass projects in the China, the operating hours of the	FSR and its approval /6/ The Input Parameters Comparison between Anhui Guzhen Biomass Generation Project and other similar projects	**OK**

CDM Validation Requirement	Remarks	Evidence	Conclusion
	proposed project (7,000 hours) were found to be compatible with that range of 5,500 – 7,000 hours for other similar projects.		
VII. How was the output price (e.g. electricity price) assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	It needs to clarify source of the used tariff in the PDD and the applicable of the chosen tariff. Is there any other consolidated evidence to supplement this assumption?	FSR and its approval /6/ *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects* /51/	~~CL 5~~
VIII. How was the investment costs assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	The investment costs used in the financial analyses were compared with the data reported for other similar proposed CDM projects in China. It can be seen from *Table 7–[The Input Parameters Comparison between Anhui Guzhen Biomass Generation Project and Registered CDM Projects in China]* that the investment cost per kW for the proposed project is 9,761 RMB/kW, which is in the middle of range of the investment costs per kW (5,719 RMB/kW to 13,430 RMB/kW) for other CDM registered biomass power projects in China. This shows that the investment assumed in the FSR /6/ is reasonable and appropriate at the time decision making.	FSR and its approval /6/ The Input Parameters Comparison between Anhui Guzhen Biomass Generation Project and other similar projects	~~CL 5~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
	Justification is needed for assuming the biomass costs in investment analysis since the baseline is that the biomass residues are waste and would be dumped. Actual investment cost needs to be provided for crosschecking, since the proposed has been in full operation.		
IX. How were the O&M costs assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	The O&M costs for the proposed project were assessed by cross-checking with the similar biomass power projects and found to be reasonable. The range of O&M cost (incl. biomass cost) per kWh was found to be in a range of 0.272 to 0.544 RMB/kWh. With a unit O&M cost of 0.475 RMB/MW, the proposed project activity is within the range of O&M costs for other similar projects in China. PJRCES considers the O&M costs value used in the investment analysis reasonable. In table B.4 of the PDD, biomass price and annual O&M cost are other key financial parameters, to be listed for transparency.	FSR and its approval /6/ The Input Parameters Comparison between Anhui Guzhen Biomass Generation Project and other similar projects	~~CAR 3~~
X. Describe the assessment of the other input parameters. Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	**(a) Other costs** The other cost for this proposed project is 16 RMB/kW and thus considered to be reasonable.	FSR and its approval /6/ Enterprise Income Tax Law of the People's Republic of	~~CL 5~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
	(b) VAT rate VAT is a tax that applies to most business transactions involving the transfer of goods and services. It is thus applicable to the proposed project activities. When the business is registered for VAT, it will pay VAT on its purchase of equipment and charge VAT on its sales. Referring to the PDD and FSR, the VAT rate applied by the proposed project activity was 17%. The VAT rate of 17% applied by the proposed project activity is in line with Provisional Regulations of the People's Republic of China on Value Added Tax. **(c) Rate of Enterprise Income Tax** The income tax of 25% is in accordance with Enterprise Income Tax Law of the People's Republic of China (promulgated in Document Order of the President of the People's Republic of China (No. 63) published on 16 March 2007 /60/, the income tax has been regulated at 25% and became valid since 1 January 2008.	China /60/ "Guidance on the Assessment of Investment Analysis" /45/ Provisional Regulations of the People's Republic of China on Education Tax /72/ Provisional Regulations of the People's Republic of China on Urban Maintenance and Construction Tax /70/	

CDM Validation Requirement	Remarks	Evidence	Conclusion
	According to the "Guidance on the Assessment of Investment Analysis" issued by CDM-EB 62 Annex 5 /45/, the interest payable should be taken into account of the income tax calculation in cases where the benchmark applied in the investment analysis is post tax. As for the proposed project, the IRR benchmark is project-IRR of 8% (after tax) and the interest tax payable has been verified to be included in the calculation of the income tax /8/. **(d) Rate of Education Surtax** PJRCES was able to confirm that rate of the education tax (of the VAT) is in accordance with national regulations in China. In terms of the Provisional Regulations of the People's Republic of China on Education Tax which is effective since 2005 until now /72/, the "Rate of education tax" of 3% shall be applied for companies in China, which was followed by the proposed project as indicated in the IRR spreadsheet /8/. The education tax (of the VAT) is in accordance		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	with the regulation in force at the time of the investment decision. **(e) Rate of Urban Maintenance and Construction Tax** In accordance with the Provisional Regulations of the People's Republic of China on Urban Maintenance and Construction Tax /70/, the rate of city build tax will be determined by the taxpayer's location: 7% for urban areas, 5% for county and town, and 1% for others. Due to project owner's location in the Guzhen County, Bengbu City, Anhui Province, P. R. China which has been verified by PJRCES during on-site visit, the tax rate for urban maintenance and construction of 7% (of the VAT) was properly applied for this project. Therefore, PJRCES confirms that all tax rates involved in the financial analysis of proposed project are consistent with current laws and regulations.		
XI. Have any sunk costs, if any, been used for the	This is a newly planned biomass projects; there is	FSR and its approval	OK

CDM Validation Requirement		Remarks	Evidence	Conclusion
	financials?	no sunk costs.	/6/	
XII.	Has the fair value/salvage value been considered at the end of the assessment period? Is the value considered for fair value in line with the guidance?	According to the Notification on determination of residual rate for enterprise fixed asset issued by State Tax Bureau on 14 September 2005, the salvage value is ranged from 0% to 5% /69/ and it can be determined by the company what percentage to use for the investment analysis. Calculating the IRR with 5% residual value for the proposed project is in accordance with the China National Tax law.	FSR and its approval /6/ Notification on determination of residual rate for enterprise fixed asset /69/ IRR spreadsheet /8/	OK
XIII.	Has the depreciation and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, are added back to net profits for the purpose of calculating the financial indicators (e.g. IRR, NPV)	It has been checked that depreciation and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, are added back to net profits for the purpose of calculating the financial indicators (e.g. IRR, NPV).	"Guidance on the Assessment of Investment Analysis" /45/ IRR spreadsheet /8/	OK
XIV.	Have any cost of financing expenditures (i.e. loan repayments and interest) included in the calculation of project IRR? Pl ensure the same is not considered in IRR calculation.	According to the "Guidance on the Assessment of Investment Analysis" issued by EB 62 Annex 5 /45/, the interest payable should be taken into account of the income tax calculation in cases where the benchmark applied in the investment analysis is post tax. As for the proposed project, the IRR benchmark is project-IRR of 8% (after tax) and the interest tax payable has been verified to be included in the calculation of the income tax /8/.	"Guidance on the Assessment of Investment Analysis" /45/ IRR spreadsheet /8/	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
XV. In case the project involves calculation of equity IRR, pl ensure that only the portion of investment costs, which is financed by equity is considered as the net cash outflow.	The proposed project uses the project IRR to perform the financial analysis, thus not applicable to the criteria of the calculation of equity IRR.	FSR and its approval /6/ IRR spreadsheet /8/	OK
XVI. Has the financials been presented transparently in a separate spreadsheets with formulas readable for the DOES?	The financials been presented transparently in a separate spreadsheets with formulas readable.	IRR spreadsheet /8/	OK
B.3.5 *Sensitivity analysis*: a) Have all variables that constitute more than 20% of either total project costs or total project revenues subjected to reasonable variation? b) Have the results of this variation presented in the PDD and the spreadsheets (reproducible manner)? c) Has a reasonable variation been considered in the sensitivity analysis in the project context?	a) The key parameters contributing to more than 20% of the revenue/costs during operating or implementation have been identified in the PDD, except the biomass residue price b) The results of this variation presented in the PDD and the spread sheets are reproducible. c) The key parameters have not been varied to reach the benchmark and the likelihood of this to happen have not been justified. Biomass residue price as another key parameter contributing to more than 20% of the cost, should be included in sensitivity analysis. As per "*Guidelines on the assessment of investment analysis"*, range of variations for each parameter should be up to reach the benchmark	PDD /5/ IRR spreadsheet /8/	~~CAR 4~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
	and assess in details for the likelihood of that not to happen.		
B.3.1 Have the data, rationales, assumptions, justifications and documentation provided by Project Participants to demonstrate the additionality of the project been assessed and verified for the reliability and credibility? Assess the presented evidence using local knowledge and sectoral and financial expertise.	Through assessing the presented evidences using local knowledge and sectoral and financial expertise, data/, rationales, assumptions, justifications and documentation provided by Project Participants to demonstrate the additionality of the project have been reviewed.	PDD /5/	~~CL 5~~ ~~CAR 4~~
B.3.2 ***Barrier Analysis***: a) Has it clearly been demonstrated that the issues identified in project implementation prevent a potential investor from pursuing the implementation of the proposed project activity without the project being registered as a CDM project activity? b) Do any of the issues identified have a clear direct impact on the financial returns of the project activity, except in cases of issues related to risk (like technical risks), or barriers related to unavailability of sources of finance, been discussed? c) Pl conclude if the barriers discussed are '*real and prevent the implementation of the project but not prevent at least one of the possible*	The project proponent did not use this barrier analysis.	PDD /5/	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
alternatives'?			
B.3.3 ***Common practice analysis***: Has a common practice analysis been carried out as a credibility check of the other available evidence used by the project participants to demonstrate additionality, in case of large-scale CDM project activities (unless the proposed project type is first-of-its kind). Pl confirm this is in line with the VVM and the additionality tools.	Common practice analysis has been carried out in the PDD to check the credibility of the other available evidences to supplement the additionality. According to "*Demonstration and assessment of additionality*" version 6.0.0 /36/, activities similar to the proposed project activity should be considered for the common practice analysis, which includes: • Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity; • In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. Note their number N_{all}; • Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed project activity. Note their number N_{diff}; • Calculate factor $F=1-N_{diff}/N_{all}$ representing	PDD /5/ "*Demonstration and assessment of additionality*" version 6.0.0 /36/ *Guidelines on Common Practice, version 2.0* /37/	~~CAR 5~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
	the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity; The common practice of *Guidelines on common practice*, was not correctly interpreted in the PDD, as the PP proposed the following: -After searching from public & available sources, the number N_{all}=0.		
***B.4* Emission Reduction Calculations**			
B.4.1 Baseline Emissions			
B.4.1.1 Are correct equations and parameters used in accordance with the approved methodology selected in calculating the baseline emissions?	The correct equations and formulae, as given in the approved methodology, have been applied in the calculation of baseline emissions.	PDD /5/ ACM0018, version 2.0 /35/	OK
B.4.1.2 In case of data and parameters that are not monitored throughout the crediting period, and have already been determined and will remain fixed throughout the crediting period, assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions (*less baseline emissions*)	PJRCES has reviewed the parameters not being monitored throughout the crediting period and the sources of data. Detailed are illustrated below. According to the PDD GSC version 01.1, the data of operating margin emission factor ($EF_{grid,OM,y}$) was referred to the *2011 Baseline Emission Factors for Regional Power Grid in China*, while it was stated in the page 24 that the build margin emission factor ($EF_{grid,BM,y}$) was referred to the *2010 Baseline Emission Factors for Regional Power Grid in China*. Further explanation is requested on the inconsistence	PDD /5/ ACM0018, version 2.0 /35/	~~CL 6~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
	of vintage data.		
I. How was the *Electricity generation* verified?	Electricity generation, the total electricity generation and the electricity generated by those low-cost/must-run power plants of the ECPG during 2005 to 2009. This parameter has been verified through cross-checking the reported data in the EF calculation spreadsheet with the China Electric Power Yearbook 2006-2010.	PDD /5/ China Electric Power Yearbook 2006-2010 /48/ China Energy Statitics Yearbook 2008-2010 /49/	OK
II. How was the $EG_{grid,y}$ verified?	$EG_{grid,y}$, the net electricity generated and delivered to the ECPG during 2007 to 2009, excluding those generated by low-cost/must runs power plants/units. This parameter has been verified through cross-checking the reported data in PDD and the EF calculation spreadsheet with China Electric Power Yearbook 2008-2010.	PDD /5/ China Electric Power Yearbook 2006-2010 /48/ China Energy Statitics Yearbook 2008-2010 /49/	OK
III. How was the *Installed Capacity* verified?	Installed Capacity, the installed capacity by different sources of the ECPG in 2007-2009. The parameter has been verified through cross checking the reported data in the EF calculation spreadsheet with the China Electric Power Yearbook 2008-2010.	PDD /5/ China Electric Power Yearbook 2006-2010 /48/ China Energy Statitics Yearbook 2008-2010 /49/	OK
IV. How was the $FC_{i,y}$ verified?	$FC_{i,y}$, Different fuel consumptions for power generation in ECPG in 2007-2009. The parameter is sourced with the China Energy	PDD /5/ China Electric Power Yearbook 2006-2010	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	Statistical Yearbook 2008-2010, which the official data can be identified.	/48/ China Energy Statitics Yearbook 2008-2010 /49/	
V. How was the $NCV_{i,y}$ verified?	$NCV_{i,y}$, Average low calorific values of fuels for electricity generation. The parameter can be sourced from the China Energy Statistical Yearbook 2010, where the official data can be identified.	PDD /5/ China Electric Power Yearbook 2006-2010 /48/ China Energy Statitics Yearbook 2008-2010 /49/	OK
VI. How was the $EF_{CO2,i,y}$ verified?	$EF_{CO2,i,y}$, Emission Factors of fuels for electricity generation. The parameter sourced from 2006 IPCC Guidelines for National Greenhouse Gas Inventories are verified to be acceptable.	PDD /5/ 2006 IPCC Guidelines for National Greenhouse Gas Inventories	OK
VII. How was the $EF_{Coal,Adv}$, $EF_{Oil,Adv}$, $EF_{Gas,Adv}$ verified?	$EF_{Coal,Adv}$, $EF_{Oil,Adv}$, $EF_{Gas,Adv}$, efficiency level of the best coal-based, oil-based and gas-based power generation technology commercially available in China.	PDD /5/ 2011 Baseline Emission Factors for Regional Power Grid in China published by China DNA	OK
B.4.2 Project Emission			
B.4.2.1 Are correct equations and parameters used in accordance with the approved methodology selected in calculating the	Project emissions are as following after exclusion of $PE_{BR,y}$ (emissions from the combustion of	PDD /5/ ACM0018, version 2.0 /35/	~~CL 7~~

CDM Validation Requirement		Remarks	Evidence	Conclusion
	project emissions?	biomass residues during the year y) and $PE_{WW,y}$ (emissions from wastewater generated from the treatment of biomass residues in year y): i) project emissions from on-site consumption of fossil fuel by the project, ii) project emissions from consumption of electricity and iii) project emissions from transportation of biomass residues: $PE_y = PE_{FF,y} + PE_{EL,y} + PE_{TR,y}$		
B.4.2.2	In case of data and parameters that are not monitored throughout the crediting period, and have already been determined and will remain fixed throughout the crediting period, assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions (*higher project emissions*)	$NCV_{diesel,y}$ sourced from *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, is confirmed to be 43.3 GJ/tonne. $EF_{FF,\ diesel,y}$ sourced from *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, is confirmed to be 0.0748 tCO_2e/GJ.	PDD /5/ ACM0018, version 2.0 /35/ *2006 IPCC Guidelines for National Greenhouse Gas Inventories*	
B.4.3 Leakage Emissions				
B.4.3.1	Are correct equations and parameters used in accordance with the approved methodology selected?	The proposed project has identified the categories of biomass residues whose baseline scenario has been identified as B1, other than B5:, B6:, B7: or B8, thus the leakage can be not taken into account	PDD /5/ ACM0018, version 2.0 /35/	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	as per methodology ACM0018 (version 2.0). Correct equations and parameters have been used in accordance with the approved methodology selected.		
B.4.3.2 In case of data and parameters that are not monitored throughout the crediting period, and have already been determined and will remain fixed throughout the crediting period, assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions (*less baseline emissions*)	Further, In line with the applied baseline and monitoring methodology, ACM00018, version 2.0, the potential source of leakage for this project activity is an increase in emissions from fossil fuel combustion or other sources due to diversion of biomass residues from other uses to the project plant as a result of the project activity. And the baseline scenarios for which potential leakage is relevant are B5, B6, B7 and B8. However, based on PJRCES's assessment, the baseline scenario for biomass use in the absence of proposed project activity have been identified B1. Hence, in line with the methodology, no leakage emissions have to be considered for the proposed project activity. Further, PP has also carried out an assessment for the biomass availability in the region. It was confirmed that biomass supply / demand situation in Guzhen County, through reviewing the FSR /6/ that total quantity of rice straw, peanut straw, maize straw and wood residue residue available within 50 kilometers is 2,382,000 tonnes annually, far exceeding the consumption of all the	PDD /5/ ACM0018, version 2.0 /35/	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	biomass residues from the area including the proposed project.		
B.4.4 Pl mention the expected emission reductions generated from implementation of the project activity.	The PDD indicates that the project activity would result in an estimated emission reductions to the tune of 132,072 t CO_2e	PDD /5/	OK
B.5 **Monitoring Plan**			
B.5.5 Does the monitoring plan defined in the PDD, contain all necessary parameters required for calculating '*baseline emissions*' in line with the methodology?	According to the monitoring methodology, the following parameters shall be monitored ex-post as per ACM0018 (version 2.0) /35/: - Types and quantity of biomass consumed in year y: Continuously measured with weight meters and estimate using annual energy/mass balance; these quantities should be updated every year of the crediting period as part of the monitoring plan so as to reflect the actual use of biomass residues in the project scenario - Net calorific value of biomass residues of category n in year y: It should be monitored at least every six months, taking at least three samples for each measurement. - Quantity of electricity generated and self-consumed in year y: Continuous monitoring, and at least monthly recording	PDD /5/ ACM0018, version 2.0 /35/	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	- Type and weight of fossil fuels consumed if any in year y: • Mass or volume unit per year • GJ per mass or volume unit • Weighted average CO_2 emission factor of fuel type i in year y - Transportation information for biomass residues in year y: • Average round trip distance (from and to) between biomass fuel supply sites and the project site/ • Number of truck trips for the transportation of biomass - Moisture content of the biomass residues: Measurements shall be carried out at reputed laboratories and according to relevant international standards.		
B.5.6 Does the monitoring plan defined in the PDD, contain all necessary parameters required for calculating '*project emissions*' in line with the methodology?	Project emissions are as following after exclusion of $PE_{BR,y}$ (emissions from the combustion of biomass residues during the year y) and $PE_{WW,y}$ (emissions from wastewater generated from the treatment of biomass residues in year y): i) project emissions from on-site consumption of fossil fuel by the project, ii) project emissions from consumption of electricity and iii) project	PDD /5/ ACM0018, version 2.0 /35/	~~CAR 6~~ ~~CL 8~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
	emissions from transportation of biomass residues: $PE_y = PE_{FF,y} + PE_{EL,y} + PE_{TR,y}$ As for monitoring the quantity of the total biomass fuel combusted, the calibration frequency and entity to perform the calibration of weight meters, is not stated in PDD. What is the approach of monitoring to assure that no fossil fuels will be co-fired along with biomass in the operation of the proposed project, in case of unavailability period of biomass or for better operating conditions. Further clarification is requested regarding as follows: • The monitoring measure and procedure for off-site electricity use in the collection stations ($EG_{offsite,y}$). • The measurement procedures and monitoring frequency for the return trip road distance between the origin and destination of freight transportation activity ($D_{f,m}$). • The monitoring frequency for the total mass of freight transported in freight transportation activity ($FR_{f,m}$). • The monitoring frequency for the quantity of fossil fuel combusted in process ($FC_{i,j,y}$).		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	• The QA/QC procedures to be applied to the weighted average net calorific value of the fossil fuel type ($NCV_{i,y}$). • The accuracy of monitoring meters and relevant installation standard complied with.		
B.5.7 Does the monitoring plan defined in the PDD, contain all necessary parameters required for calculating '*leakage emissions*' in line with the methodology?	In line with the applied baseline and monitoring methodology, ACM00018, version 2.0, the potential source of leakage for this project activity is an increase in emissions from fossil fuel combustion or other sources due to diversion of biomass residues from other uses to the project plant as a result of the project activity. And the baseline scenarios for which potential leakage is relevant are B5, B6, B7 and B8. However, based on PJRCES's assessment, the baseline scenario for biomass use in the absence of proposed project activity have been identified B1. Hence, in line with the methodology, no leakage emissions have to be considered for the proposed project activity. Further, PP has also carried out an assessment for the biomass availability in the region. It was confirmed that biomass supply / demand situation in Guzhen County, through reviewing the FSR /6/ that total quantity of rice straw, peanut straw, maize straw and wood residue residue available	PDD /5/ ACM0018, version 2.0 /35/	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	within 50 kilometers is 2,382,000 tonnes annually, far exceeding the consumption of all the biomass residues from the area including the proposed project. Quantity of total available biomass residues is to be monitored in a way from the public survey documentation in the region.		
B.5.8 Has the feasibility of the monitoring arrangements within the project design been confirmed through interviews and physical visits to the site, where required?	The feasibility of the monitoring plan was discussed during site visit.	PDD /5/ ACM0018, version 2.0 /35/	~~CL 8~~
B.5.9 The implementation of the monitoring plan, quality assurance and quality control procedures are verifiable	Monitoring plan has clearly defined implementation of each parameter monitoring and assures the quality control and procedures which can be verifiable at time of verification. The monitoring and recording of the required parameters will be carried out by trained personnel who will be managed on day to day basis by a CDM Manager. Overall responsibility of the project management lies with the Board of National Guzhen Bio Energy Co., Ltd. Some of the procedures required for proper project management include procedures for (a) addressing erroneous data measurements, (b) registration, monitoring, measurement and reporting, (c) handling of day-to-day records, (d)	PDD /5/ ACM0018, version 2.0 /35/ DL/T448-2000	~~CL 8~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
	training of monitoring personnel, (e) handling of emergencies situations, (f) internal review of monitoring data, and (g) corrective actions. These procedures have been defined in the final version of the PDD and will be implemented prior to the start of the project activity.		
C. Crediting Period			
1.1 Has the start date of the project activity been defined in line with the latest EB guidance? What has been defined as the start date of the project activity?	The contract date of purchase contract of main equipment, which is 28 March 2010, has been defined as date of the start date of the project activity. The milestones (such as major equipment contract, construction, commissioning and full operation) of the project activity have to be included in the PDD. The notification letter to EB about the intention to seek CDM status submitted on 26 September 2010. Nevertheless, this notificaiton was not shown on UNFCCC website. Thus, further justification was needed to supplement that the CDM has been seriously considered in the decision to implement the project activity.	PDD /5/ ACM0018, version 2.0 /35/ Contracts	~~CL 4~~ ~~CAR 2~~
1.2 Has a crediting period been clearly defined in the PDD?	The crediting period has been defined as the selected 7 year crediting period. The crediting start date is not feasible in terms of request of registration.	PDD /5/	~~CAR 7~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
D. Local stakeholder consultation			
D.1 Have all relevant stakeholders been identified for the project activity?	All relevant stakeholders' have been identified for the project activity. These were checked during the site visit and interviews.	PDD /5/ Local Stakeholder Meeting Documents and questionnaire /22/	OK
D.2 What means have been used for the inviting comments from the stakeholders?	The PP has questionnaires as an approach to collect the comments from the local stakeholders. PJRCES has reviewed these documents and found them in line.	PDD /5/ Local Stakeholder Meeting Documents and questionnaire /22/	OK
D.3 Does the PDD include a summary of the comments received from the stakeholders?	The PDD summarizes the comments received during the stakeholder consultation. This was checked during site visit.	PDD /5/ Local Stakeholder Meeting Documents and questionnaire /22/	OK
D.4 Has a report on the due account taken of any comments received been described clearly in the PDD?	The appropriateness of the response and necessary actions taken by the PP to the comments raised by the PP were discussed with stakeholders during site visit and interviews and PJRCES observes that these are adequate.	PDD /5/ Local Stakeholder Meeting Documents and questionnaire /22/	OK
E. Environmental impacts Assessment			
E.1 Have the project participants undertaken an analysis of environmental impacts and if the host country requires and environmental?	Environmental Impact Assessment (EIA) of the project activity has been conducted by Anhui Institute of Environmental Science in accordance with the Law of the People's Republic of China	EIA and its approval /7/	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	on Evaluation of Environmental Impact /68/ in October 2009 /7/. The EIA of the proposed project has been officially approved by Anhui Environment Protection Bureau on 11 December 2009 /7/.		
E.2 Does the project create any adverse environmental effects? Have the same been recorded in the PDD?	The project activity does not have any adverse environmental impact. This was further checked during site visit and interviews.	EIA and its approval /7/	OK
E.3 Does the project comply with environmental legislation in the host country?	The project activity complies with the local environmental legislation.	PDD /5/ EIA and its approval /7/	OK

Table 3: Resolution of issues identified in table 2 of the validation protocol

Draft report clarification requests, corrective action requests and forward action request	*Ref. to the section of the table 2 above*	*Summary of project owner response*	*Validation team conclusion*
CAR 1 **Letter of Approval** The PP is requested to provide the Letter of Approval (LoA) from Annex I.	A.2.1 A.2.2 A.2.3	The LOA was provided.	OK CAR 1 is closed.
CAR 2 **Project Implementation** The milestones (such as major equipment contract, construction, commissioning and full operation) of the project activity have to be included in the PDD.	B.3.2	The relevant milestones have been added in the revised PDD.	OK The major milestones have been added in the revised PDD. CAR 2 is closed.
CAR 3 Financial Parameters In Section B.4 of the PDD, biomass price and O&M cost are other key financial parameters, to be listed for transparency. The IRR result with CER revenues should be documented in the PDD.	B.3.2 IX	Biomass price and O&M cost have been listed in Section B.4 of the revised PDD. The IRR result with CER revenues has also been documented in the revised PDD.	OK The O&M cost and biomass residue price have been incorporated in the revised PDD. And also IRR result with CER revenues is in revised PDD.

			CAR 3 is closed.
CAR 4 **Sensitivity Analysis** Biomass residue price as another key parameter contributing to more than 20% of the cost, should be included in sensitivity analysis. As per "*Guidelines on the assessment of investment analysis"*, range of variations for each parameter should be up to reach the benchmark and assess in details for the likelihood of that not to happen.	B.3.5	The biomass residue price as another key parameter has been included in the sensitivity analysis in the revised PDD. The range of variations for each parameter up to reach the benchmark have been calculated and listed in the revised PDD, and the likelihood of that not to happen has been assessed and analyzed in the revised PDD.	OK Sensitivity analysis has been performed as per guidance as to the point that range of variations for each parameter up to reach the benchmark have been calculated and listed in the revised PDD, and the likelihood of that not to happen has been assessed and analyzed in the revised PDD. The biomass residue price is another factor to impact on the sensitivity analysis, which is added in revised PDD. CAR 4 is closed.
CAR 5 Common practice The common practice of *Guidelines on common practice*, version 2.0, was not correctly interpreted in the PDD, as the PP proposed the following: -After searching from public & available sources, the number	B.3.3	These have been corrected in the revised PDD according to Guidelines on common practice, version 2.0.	OK The correction is now acceptable to validation after reviewing the revised PDD. **CAR 5** is closed.

N_{all}=0.			
CAR 6 **Monitoring** The PP is request to clarify the following information missing in the monitoring plan: As per methodology, If more than one type of biomass fuel is consumed, each shall be monitored separately. As for monitoring the quantity of the total biomass fuel combusted, the calibration frequency and entity to perform the calibration of weight meters, is not stated in PDD. $EG_{offsite,y}$ should be another parameter to be monitored.	B.5.6	Each type of biomass is monitored separately. Information on the calibration frequency and entity to perform the calibration of weight meters has been added in PDD version 02.0. As stated in the PDD, biomass residue will be transported directly to the power plant, so there will be no electricity use off-site, there is no need to monitor this parameter.	OK It was checked again that those contents have been in the original PDD. There is no electricity use for off-site, confirmed from interviewing. CAR 6 is closed.
CAR 7 **Crediting start date** The crediting start date is not feasible in terms of request of registration.	C.1.2	The start date of the crediting period has been revised to be 1 Nov. 2012.	OK Changed to 1 November 2012, which is feasible now.

			CAR 7 is closed.
CL 1 **Project Design** It was stated in the PDD GSC version 01.1 that the capacity of biomass combustion boiler equipped for the project was of 130t/d. However, according to the approved FSR, the consumption of biomass residues is of 130t/hour. Clarification is needed for the gross electricity generated and in-house auxiliary power consumption share of the total electricity generated.	A.1.1	The capacity of 130t/d was a typo mistake, and the capacity of 130t/hour in the approved FSR is correct. The PDD has been revised accordingly. The FSR of the Project was completed by State Power Economic Research Institute which owns Class-A qualification, and the FSR was approved by Anhui Energy Bureau. Therefore the FSR is a reliable data source. In the FSR, the operating hour of the Project is 7000 hours. Comparing the operation hour with all the biomass power generation projects that have been registered as CDM projects, which range from 5500-7000 hours, the operating hour of the Project is reasonable and conservative. The gross electricity generated equals the installed capacity times the operating hours	OK The capacity of boiler with 130t/d was corrected to right 130t/h. In order to validate the operating hours of 7,000 reported in the PDD, PJRCES has assessed the followings: - Annex 11 to the CDM-EB 48th meeting report /41/ gives guidelines for validation of plant load factor for renewable energy projects. One option is to use plant load factor provided to the government while applying the project activity for approval. Since the PLF has been specified in the FSR /6/ and considering that FSR has been approved by Anhui Energy Bureau, hence, the PLF of the project activity complies with the requirements of the CDM regulation. The estimated electricity generation used in the PDD is in line with

		(i.e.=30MW*7000 hours=210,000MWh). The in-house auxiliary power consumption rate in the FSR was designed to be 11% for the project, and this is within the range from 8% to 16% of the in-house auxiliary power consumption rates of all the biomass power generation projects that have been registered as CDM projects. Therefore, the in-house auxiliary power consumption rate of the Project is reasonable.	the government approved FSR /6/. - Comparing with the operating hour reported for other similar registered biomass projects in the China, the operating hours of the proposed project (7,000 hours) were found to be at the higher end of the range (5,500 – 7,000 hours) of other similar projects, shown in *TABLE 7–[THE INPUT PARAMETERS COMPARISON BETWEEN ANHUI GUZHEN BIOMASS GENERATION PROJECT AND REGISTERED CDM PROJECTS IN CHINA]*. Hence, it is concluded by PJRCES that the assumed operating hours applied in the investment analysis is reasonable and acceptable. *Auxiliary consumption* For the projects listed in *TABLE 7–[THE INPUT PARAMETERS COMPARISON BETWEEN ANHUI GUZHEN BIOMASS GENERATION PROJECT AND REGISTERED CDM PROJECTS*

			IN CHINA], the auxiliary electricity consumption rate varies from 8% to 16%, with an average of 11.7%. The rate of the proposed project is assumed as 11.0% which is lower than the average rate. It is also found in the survey conducted by national authorities' /57/ (i.e., Energy Bureau of NDRC, Ministry of Finance and State Electricity Regulatory Commission) that the auxiliary electricity consumption rate of biomass power plant reaches to 12%. Thus, the auxiliary consumption rate used in the proposed project is considered reasonable. CL 1 is closed.
CL 2 **Applicability Criteria** What is the commitment from the project owner, to use only rice straw, peanut straw, maize straw and wood residue as fuel, in the case of other biomass types available in the area.	B.1.2	As described in the FSR, although there may be other biomass types available in the area, considering the stability and security of plant operation, the boiler adaptation on the biomass types and the collectability of the biomass types, finally rice straw, maize straw, peanut	OK In line with the applied baseline and monitoring methodology, ACM00018, version 2.0, the potential source of leakage for this project activity is an increase in emissions from fossil fuel combustion or other sources due to

PP cannot add any new biomass types other than that described in the PDD, or there is a change of project design else. More evidence is sought regarding that the biomass residues used by the project facility will not be stored for more than one year.		straw and wood residues are used as fuel for the project. The biomass types were determined and confirmed after deep investigation and research in the FSR preparation, therefore it is hard to change or add any new biomass type than that described in the PDD. The project will consume 310,000t biomass residues to generate electricity per year. The biomass residues storage capacity of the project is about 50,000t, which is 16% of annual biomass residues consumption. Therefore, the biomass residues used by the Project will not be stored for more than one year.	diversion of biomass residues from other uses to the project plant as a result of the project activity. And the baseline scenarios for which potential leakage is relevant are B5, B6, B7 and B8. However, based on PJRCES's assessment, the baseline scenario for biomass use in the absence of proposed project activity have been identified B1. Hence, in line with the methodology, no leakage emissions have to be considered for the proposed project activity. Further, PP has also carried out an assessment for the biomass availability in the region. It was confirmed that biomass supply / demand situation in Guzhen County, through reviewing the FSR /6/ that total quantity of rice straw, peanut straw, maize straw and wood residue residue available within 50 kilometers is 2,382,000 tonnes annually, far exceeding the consumption of all the biomass residues from the area including the proposed project. The selected biomass type (rice straw, peanut straw, maize straw and wood residue) as stated in approved FSR is sufficient in the vinicity of 50 km to feed

			the proposed project, thus PP will not change to other biomass residue types in the real implementation. In interwiewing the PP and also from the physical visit, it is confirmed that the on-site storage capacity can only hold for 16% of the all yearly usage. This demonstrates that the storage period will not last more than 1 year. Another aspect is that the biomass residue providers would prefer to provide the biomass residues harvested within the current year for the view point of economic reason (newly harvested residues have more weight than that of storage). CL 2 is closed.
CL 3 **Alternatives** Clarification is requested for the local/regional policy concerning the biomass residue in the baseline scenario, B3: Whether there is an existing regulatory to ban "The biomass residues are	B.2.2	1. According to the *Notice about Prohibiting to Burn Agricultural Straw in an Uncontrolled Manner was issued by Ministry of Agriculture of the People's Republic of China on 14/06/2007*, Scenario B3 isn't consistent with mandatory applicable laws and regulations. Therefore, the	OK o Scenario B3 is correctly excluded, due to the prevailing policy of *Notice about Prohibiting to Burn Agricultural Straw in an Uncontrolled*

burnt in an uncontrolled manner without utilizing it for energy purposes." For excluding the scenario B6, it is explained in the PDD GSC version 01.1 that "the surplus biomass residues will not be used in other existing or new boilers", however, it is not relevant to the explanation about "the other energy purposes of the biomass residues" as indicated in the scenario B6. For excluding the scenario B7, the explanation in the PDD GSC version 01.1 is not relevant to the statement about biomass residues used for non-energy purposes in the scenario B7. Further explanation is requested.		alternative scenario B3 is excluded in the revised PDD. 2. The raw materials for generation of bio-fuels in China now are mainly food crops, wasted cooking oil/fat and oil plants, and the technology of utilizing the biomass residues used in the Project to generate bio-fuels is not mature and of high cost. There is no project that produces or uses biomass for other energy purposes at the project site. Therefore, these surplus biomass residues will not be used for other energy purposes. Therefore, B6 is excluded. It has been corrected in PDD version 02.0. 3. Prior to the Project, only small quantity of biomass residues are used, leaving the large number of biomass residues dumped to decay or burnt in an uncontrolled manner, so the abandoned biomass residues utilized in the Project will not be used for non-energy purposes in the absence of this project.	*Manner was issued by Ministry of Agriculture of the People's Republic of China.* o In the area the project locates, after confirming from the local governmental officers, there is no utilisation of biomass for other energy purposes. Thus the B6 is correctly excluded. o The biomass residue prior to the proposed project, is not used for non-energy purposes in the absence of this project, excluding this scenario. CL 3 is closed.

		Therefore, B7 is excluded.	
CL 4 Serious consideration of CDM The notification letter to EB about the intention to seek CDM status submitted on 26 September 2010. Nevertheless, this notificaiton was not shown on UNFCCC website. Thus, further justification was needed to supplement that the CDM has been seriously considered in the decision to implement the project activity.	B.3.2 C.1.1	The Project starting date is 28/03/2010. The notification letter has been sent to China DNA on 20/05/2010, and approved by China DNA on 23/06/2010. The project owner also submitted the notification letter to UNFCCC secretariat on 26/09/2010, but due to the network problem between the UNFCCC secretariat and the project owner, the email hasn't been received by UNFCCC secretariat. Therefore, this notification hasn't been shown on UNFCCC website. The project owner sent an email to UNFCCC secretariat to ask about the status on 26/10/2011, but no response was received still due to the network problem. On 29/11/2011, the buyer sent an email to UNFCCC secretariat to enquire about this type of issue. The UNFCCC	OK The project adopts 28 March 2010 /14/ as start date, which is before GSC date (3 March 2012), and PP had notified both Chinese DNA and UNFCCC on 20 May 2010 and 26 September 2010 /12/ respectively. For notification to Chinese DNA, the confirmation letter was released on 20 May 2010 /11/. The submission request of notification to UNFCCC was not shown on the list of UNFCCC web as anticipated. Thus PP continued this efforts to ask the status of this request of submission of notification and request for confirmaiton of proir CDM consideration e-mail exchanges are as following: • Chen Fang of National Guzhen

		secretariat replied that the secretariat is not in a position to retroactively date the notification forms, and the validating DOE is responsible for verifying that the project was submitted within the required submission time frame. As described above, although the notification is not shown in UNFCCC website, the Project has obeyed the guideline to submit the notification letter to both China DNA and UNFCCC secretariat, which shows that he CDM has been seriously considered in the decision to implement the project activity. Relavant email records have been provided to DOE for verification. The subsequent communication emails with the UNFCCC are also provided to DOE for demonstration of the serious consideration of CDM.	Bio Energy Co., Ltd, asking the status of notificaion of original notificaiton on 26 October 2011 /13/, with no response. • Crystal Cui of EDF Trading Limited, email sent out on 29 November 2011 and response from UNFCCC on 2 December 2011. As per Para 107 of VVS: PJRCES can confirm by referring to the list of prior consideration notifications /11//12/ from the UNFCCC website and communication between the project proponent, the secretariat /13/ and the host Party DNA regarding the commencement of a new project activity, that such notifications and further actions (communication mail with UNFCCC secretariats) has been provided by the project participants within 180 days of the project activity start date (28 March 2010 /14/), PJRCES

			can determine that the CDM was seriously considered in the decision to implement the project activity. PJRCES has assessed the reliability and authenticity of such communications, at the same time through interviewing. **CL 4** is closed.
CL 5 Input Parameter In order to further support of the relevance of input values used for the investment analysis in the PDD, further clarification is requested regarding as follows: • The supportive evidences for the choosing auxiliary electricity consumption rate applied to estimate the net electricity supplied to the grid. • The applicability of investment cost applied to the project	B.3.4 V, VII, VIII	The FSR of the Project was completed by State Power Economic Research Institute which owns Class-A qualification, and the FSR was approved by Anhui Energy Bureau. Therefore the FSR is a reliable data source. 1. In the FSR, the operating hour of the Project is 7000 hours. Comparing the operation hour with all the biomass power generation projects that have been registered as CDM projects, which range from 5500-7000 hours, the operating	OK o The auxiliary electricity consumption rate was performed by State Power Economic Research Institute, accredited as Class-A qualification, and FSR was approved by Anhui Energy Bureau. o It can be seen from *TABLE 7–[THE INPUT PARAMETERS COMPARISON BETWEEN ANHUI GUZHEN BIOMASS GENERATION PROJECT AND REGISTERED CDM PROJECTS IN CHINA]* above that the investment

• The applicability of electricity tariff applied to the project activity, given that a regulatory policy regarding on-grid tariff of electricity generation from agroforestry biomass residues was issued by National Development and Reform Commission on 18 July 2010. • The applicability of the average biomass residues price applied to the project activity and the suitability of biomass residue price escalation, if applicable. • The reasonability of O&M cost and its component expenditure such as the water consumption, material		hour of the Project is reasonable and conservative. The gross electricity generated equals the installed capacity times the operating hours (i.e. =30MW*7000 hours=210,000MWh). The in-house auxiliary power consumption rate in the FSR was designed to be 11% for the project, and this is within the range from 8% to 16% of the in-house auxiliary power consumption rates of all the biomass power generation projects that have been registered as CDM projects. Therefore, the in-house auxiliary power consumption rate of the Project is reasonable. 2. The total investment of the project is 292.8464 million RMB which is from the	cost per kW for the proposed project is 9,761 RMB/kW, which is in the middle of range of the investment costs per kW (5,719 RMB/kW to 13,430 RMB/kW) for other registered CDM biomass power projects in China. This shows that the investment assumed in the FSR /6/ is reasonable and appropriate at the time decision making. o The static investment cost was cross checked against actual contracts signed and PO's financial closure report of equipment and construction for Anhui Guzhen Biomass Generation Project /78/. The actual contracts signed total to 297.59, which is larger than the static investment cost (292.8464 million RMB in the FSR /6/). o PJRCES was able to confirm that

fee, water fee, miscellaneous cost, maintenance rate, etc. • Whether selling ash can be considered as revenue in the investment analysis, provided that the ash can possibly be used produce the fertilizer to the local farmers? • More evidence is sought on the suitability of different VAT rates (e.g. biomass VAT, water VAT, repair VAT and material VAT) and the relevant VAT favorable policy applied in the project activity if applicable.		approved FSR. The total signed project contracts value is already 297.59 million RMB, which is higher than the FSR estimation, thus the total investment in the FSR is reasonable and conservative. 3. During the FSR preparation period, the policies and documents for renewable energy were referred to. According to *Trial Measures for the Administration of Renewable Energy Power Price and Cost-sharing* (Fagaijiage [2006]No.7), the tariff of renewable energy project would be 0.25RMB/kWh (including VAT) higher than the standard tariff for thermal power projects, and the standard tariff for thermal power projects in Anhui Province was 0.371RMB/kWh	the electricity tariff of the project (0.621 RMB/kWh including VAT) indicated in the FSR /6/ and PDD is consistent; and this tariff is the latest available tariff before the FSR was finalized in August 2009 and got approved on 17 March 2010. Also Anhui Price Bureau approved the tariff for Anhui Guzhen Biomass Generation Project on 28 June 2010 /27/ in the way as stated above. Afterwards, on 18 July 2010, another tariff regulation, in the purpose to address the worsening economic barrier faced by the biomass power plant developer was advocated. This new released policy called *Notice regarding On-grid Tariff of Electricity Generation from Agroforestry Biomass Residues* /56/, regulating that the on-grid tariff of generation from

		(including VAT). Given above, the tariff of the Project was estimated as 0.621RMB/kWh in the FSR. Therefore the tariff in the FSR is reasonable and appropriate at the time of compiling the FSR and at the time of making decision by the Board on the Project. In order to cover some cost of the increasing purchasing price of the biomass residue to increase the income of the local farmer, the National Development and Reform Commission on 18/07/2010 issued the *Notice regarding On-grid Tariff of Electricity Generation from Agroforestry Biomass Residues*, regulating that the on-grid tariff of generation from agroforestry biomass residues is fixed to be 0.75RMB/kWh (including VAT). The tariff is increased as	agroforestry biomass residues is fixed to be 0.75RMB/kWh (including VAT) without any escalation. It is to be noted that this new tariff policy of 18 July 2010 came later on and was not available to the PP at the time of decision taken for the project. Hence as per guidance 6 of EB62 annex 05, this new tariff need not be taken into account for the investment analysis. But just as a cross check, this higher tariff of 0.75 RMB/kWh was applied and it was found that, the IRR of the proposed project is 6.04%, which is still lower than the benchmark of 8%. o The biomass price listed in Table 7–[The Input Parameters Comparison between Anhui Guzhen Biomass Generation Project and Registered CDM

		the biomass residue price is increased, so the increased tariff has little impact on the Project IRR. If the tariff of 0.75 RMB/kWh (including VAT) is adopted, the IRR of the Project will still not reach the benchmark of 8% even based on the biomass residue price in the FSR, but not the higher actual purchasing price. 4. The Biomass residue price in the FSR was 270 RMB/ton (excluding VAT) and was 305 RMB/ton (including VAT), however the actual purchase prices of the Project ranges from 330 to 375 RMB/ton, much higher than the estimated price in the FSR. Considering that the biomass price is based on the labor cost, collection cost, transportation cost and pre-	Projects in China] ranges within 195 RMB/tonne and 335 RMB/tonne, with an exception of 401 RMB/tonne (excl. VAT) (No. 3102). And the proposed project used biomass price to be 270 RMB/tonne (excl. VAT) for investment analysis, which is in the the general range. The actual purchase invoices of the biomass residues are also checked by the validation team and it is confirmed that the actual purchase price is higher than the PDD design. So the biomass price in PDD design is conservertive. o The project O&M costs were compared with data reported for similar registered CDM projects in China as referring to Table 7– [The Input Parameters Comparison between Anhui

		treatment cost, it is obvious that the price of biomass fuel increases now and will keeping increasing in the future, as the Chinese economy is experiencing a relatively high inflation in recent years, both Producer Price Index (PPI) and employee payrolls increase fast. Therefore, the biomass residue price in FSR is reasonable and conservative. 5. The O&M cost and its component expenditure used in the Project IRR calculation are all from the FSR which is reliable. The component expenditures of the Project are also compared with counterpart values of all the biomass power generation projects that have been registered as CDM projects, and all component	Guzhen Biomass Generation Project and Registered CDM Projects in China] above. The range of O&M cost (incl. biomass cost) per kwh was found to be in a range of 0.272 to 0.544 RMB/kWh. With O&M cost (incl. biomass cost) per kwh for the proposed project being 0.475 RMB/kWh, it is a in the normal range of the similiar registered biomass projects in China. o The major solid waste generate by the proposed project are the ash from the boilers. The ash has high potassium and phosphorous content and can be served as good fertilizer for agriculture /6/. All the ash will be used as fertilizer in local farmland, which will realize the comprehensive utilization. And this ash as fertilizer was taken

		expenditures of the Project fall into the ranges of the counterpart values. The O&M cost/power generation of the project is 0.475 RMB/kWh, which is in the range of 0.272 to 0.544 RMB/kWh for other registered CDM biomass power projects in China. Therefore, the O&M cost of the Project is reasonable. Therefore, the O&M cost and its component expenditure of the Project is reasonable and credible. 6. The ash derived from the Project will be freely delivered to the local farmers as fertilizer and no revenue will be provided to the project owner, which is same way of ash-dealing with other biomass-combustion power plant in China. Therefore, there is no revenue from the ash	away by the transportation agent, who does not claim for the transportation fee from National Guzhen Bio Energy Co., Ltd. PJRCES has verified that the VAT used in the investment analysis and the PDD is according to the FSR /6/. The applicable VAT for material and electricity was selected as of 17%, which was confirmed to be in line with Provisional Regulations on Value Added Tax of the People's Republic of China issued on 10 November 2008 and effective since 01 January 2009 /60/ until now. The biomass VAT of 13% and water VAT of 6% are determined according to Notice on Low VAT Rate and Simple Taxation Methods for Some Kinds of Goods /61/. Therefore, the selected VAT is in accordance with the regulation in force at the time of the investment decision (8

		included in the investment analysis. 7. The material VAT and electricity VAT of 17% are determined according to *Provisional Regulations of the People's Republic of China On Value Added Tax* issued by State Council on 10/11/2008 [1] . The biomass VAT of 13% and water VAT of 6% are determined according to *Notice on Low VAT Rate and Simple Taxation Methods for Some Kinds of Goods* issued by Ministry of Finance and State Administration of Taxation on 19/01/2009[2] . The application of deductible input VAT is according to *Provisional Regulations of the People's*	December 2009 /10/). **CL 5** is closed.

[1] http://www.gov.cn/zwgk/2008-11/14/content_1149516.htm.
[2] http://www.chinatax.gov.cn/n8136506/n8136593/n8137537/n8138502/8786685.html

		Republic of China On Value Added Tax issued by State Council on 10/11/2008 and *Notification on Several Issues regarding National Wise Implementation of the VAT Reform* issued by Ministry of Finance and State Administration of Taxation on 19/12/2008[3]. The application of VAT return is according to *Notice about Policies regarding the Value Added Tax on Products Made through Comprehensive Utilization of Resources and Other Products* issued by Ministry of Finance and the State Administration of Taxation on 09/12/2008[4].	

[3] http://www.chinatax.gov.cn/n8136506/n8136593/n8137537/n8138502/8745403.html.
[4] http://www.js-n-tax.gov.cn/Page/StatuteDetail.aspx?StatuteID=8931

CL 6 **Baseline Emissions** According to the PDD GSC version 01.1, the data of operating margin emission factor ($EF_{grid,OM,y}$) was referred to the *2011 Baseline Emission Factors for Regional Power Grid in China*, while it was stated in the page 24 that the build margin emission factor ($EF_{grid,BM,y}$) was referred to the *2010 Baseline Emission Factors for Regional Power Grid in China*. Further explanation is requested on the inconsistence of vintage data. The inconsistency for the combined emission factor applied in PDD, 0.76905 or 0.74945 tCO_2e/MWh?	B.4.1.2	The data of operating margin emission factor ($EF_{grid,OM,y}$) and the build margin emission factor ($EF_{grid,BM,y}$) should both be referred to *2011 Baseline Emission Factors for Regional Power Grid in China*. It was a typo mistake in the PDD GSC version 01.1 and has been rectified in the revised PDD. The combined emission factor should be 0.74945tCO_2e/MWh, which is corrected in the revised PDD.	OK It was checked that data of operating margin emission factor ($EF_{grid,OM,y}$) and the build margin emission factor ($EF_{grid,BM,y}$) were all sourced from *2011 Baseline Emission Factors for Regional Power Grid in China*. This is the most recently available data before the PDD webhosted. The typos are corrected in the PDD version 02. CL 6 is closed.
CL 7 **Project emissions** When defining TDL_y, A term "BRSTS" comes up, what is the meaning for "BRSTS"	B.4.2.1	It was a typo mistake and has been deleted in the revised PDD.	OK The typo has been deleted in revised PDD. CL 7is closed.

CL 8 **Monitoring** What is the approach of monitoring to assure that no fossil fuels will be co-fired along with biomass in the operation of the proposed project, in case of unavailability period of biomass or for better operating conditions. Further clarification is requested regarding as follows: • The monitoring measure and procedure for off-site electricity use in the collection stations ($EG_{offsite,y}$). • The measurement procedures and monitoring frequency for the return trip road distance between the origin and destination of freight transportation activity ($D_{f,m}$).	B.5.6 B.5.8 B.5.9	1. The boiler is designed to be a pure biomass residue fuel boiler and can't be co-fired with fossil fuels, or the boiler will be damaged. In case of unavailability period of biomass residue, the plant will stop operation. 2. There will be no off-site collection stations for the Project. The biomass residue will be transported directly to the project plant site where they are processed and stored. The electricity consumption at project plant site has been monitored in the parameter of $EF_{PJ,aux,y}$. 3. the measurement procedures and monitoring frequency for the return trip road distance between the origin and destination of freight transportation activity ($D_{f,m}$) have been added in the revised PDD. 4. The monitoring frequency for the total mass of freight transported in freight transportation activity ($FR_{f,m}$) have been added in the revised PDD.	OK ➢ By checking the specification of boiler contract /16/, it can be confirmed that the boiler is also designed to be a pure biomass residue fuel boiler and can't be co-fired with fossil fuels, or the boiler will be damaged. After interviewing with PP, at the situation of unavailability period of biomass residue, the plant will stop operation. ➢ For off-site electricity, this part was deleted to accommodate to the real situation, with no off-site collection stations for the Project as the biomass residue will be transported directly to the project plant site. ➢ procedures and monitoring frequency for the return trip road distance between the origin and destination of freight transportation

• The monitoring frequency for the total mass of freight transported in freight transportation activity ($FR_{f,m}$). • The QA/QC procedures to be applied to the weighted average net calorific value of the fossil fuel type ($NCV_{i,y}$). • The accuracy of monitoring meters and relevant installation standard complied with.		5. for the net calorific value of the fossil fuel type ($NCV_{i,y}$), the value in the 2006 IPCC which is more conservative is used instead of the national default value. In this case, no QA/QC procedures is required in the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" as IPCC is a reliable data source. 6. the accuracy of meters are at least 1.0, which is compliant with *Technical administrative code of electric energy metering DL/T 448-2000*.	activity ($D_{f,m}$) have been added in the revised PDD. ➢ monitoring frequency for the total mass of freight transported in freight transportation activity ($FR_{f,m}$) was added in the revised PDD. ➢ net calorific value of the fossil fuel type ($NCV_{i,y}$) was sourced from IPCC 2006, which is conservative, to replace the national default value. ➢ The accuracy of the monitoring meters are in compliance with relevant standards. CL 8 is closed.

APPENDIX B
Curriculum Vitae of validaton team

Name: *Zhang Xiaojun Johnsen*
Role: Validator/verifier and team leader
Competency Profile: holds a Master Degree in Metallurgical Physical Chemistry and obtained his MBA in project management. Also he majored in Chemistry, which involves organic, inorganic, structure and analysis chemistry as bachelor degree. He has an overall experience of 26 years. Johnsen had an overall experience of 4 years in glass manufacturing industry covering production, energy efficiency improvement and commissioning. Later on he gained combined experience of more than 15 years in the iron and steel industry, while he worked as researcher and management personnel in Central Iron and Steel Institute, the sector covering the refractory, iron & steel, waste heat recovery, solid waste disposal, waste fuel treatment, waste energy efficiency and relevant environmental affairs. His experience also covers the fields of environmental management, resource conservation and cleaner production in various manufacturing and metallurgical industries. He has also gained the experience in Management System Audits such as ISO 9001, ISO 14001 standards in various industrial sectors for more than 3 years for industrial plants. Johnsen has experience of more than 4 years in validation and verification of numerous CDM projects from his current and previous companies (PJRCES and DNV). Over the years, he has worked in over 80 projects in China and internationally, in various sectors including Renewable Energy (biomass, hydro & wind energy projects), Waste heat recovery projects, Raw material substitution projects in the cement sector, Blended cement projects, Coal Mine Methane projects (CMM) and biodiesel projects. He has experience in working in wide range of standards – regulated and voluntary markets. For financial analysis and investment, he has gained the relevant knowledge through his MBA course; and through the feasibility case study in the iron and steel sector while he worked as management personnel, he gradually gained concerted experience in cost accounting, financial analysis and investment input parameter assessment. His qualification, industrial and investment experience and experience in CDM demonstrate him sufficient sectoral competence in “Glass”, “Iron and Steel” and “Energy Generation from Renewable Energy Sources”.

‼ ***REF TE_Person \h * MERGEFORMAT*** ¶***Chandra Mohan***: A Chemical Engineer with a Masters Degree in Business Administration. Experience of over 30 years in Chemical and allied industries. Was associated right from inception, with a number of chemical, packaging and power industries and acquired exceptional skills in project management and implementation.

Over the last decade has been associated closely with biomass based power generation especially gasifier based power plants. Has worked on biomass gasifier for over a decade and constantly updated with close co-operation

from IISc, Bangalore. Has tied up with IIT Madras for development of Solar Parabolic dishes for process heating and cooling applications.

Professional achievements

Developed for the fist time in the country technology for cold pressed castor oil saving millions of Dollars in foreign exchange
Instrumental in successful implementation of the first 1MW biomass gasifier based grid-linked power plant Arashi HiTech Bio Power (P) Ltd. by absorbing the technology, design and engineering and providing a dynamic interface between the technology suppliers and the project promoters
Successfully registered the first biomass gasifier based power plant under the Clean Development Mechanism (CDM) with the UNFCCC
Instrumental in implementation of the largest operating biomass gasifier based power plant with a capacity of 1.5 MW for captive application- Beach Minerals Company

Name: *S. Sathis Kumar*
Role: Technical Reviewer/Sector expert
Competency Profile: Sathis Kumar holds a Bachelor's degree in Mechanical Engineering and a Post Graduate Diploma in Energy Management. He has a total experience of around ten years after graduation. Prior to entering the CDM field he worked as Assistant Director in the Energy Management division of National Productivity Council (NPC), an autonomous organization under Ministry of Industry and Commerce, Government of India. In NPC he was actively involved in energy audit studies, preparing project reports, feasibility reports, reference manuals for various training programmes & workshops. As an Energy Auditor he was responsible for carrying out a detailed energy audit studies in buildings and industries, quantifying energy consumption and establishing base line energy information, doing energy and material balance, performing efficiency evaluation of energy & utility systems, comparing energy norms with existing energy consumption levels, etc. He is a Certified Energy Auditor by Bureau of Energy Efficiency, Government of India. He is also a Certified Measurement and Verification Professional (CMVP) by Efficiency Evaluation Organization (EVO) and has also completed the advanced Lead Auditor training for ISO 14001 approved by IEMA. He has around 4.5 years of experience in validation and verification of CDM projects. He has worked in more than fifty CDM projects (in his previous company-SGS) from both India and abroad and has experience of handling projects in different sectoral scopes like 1, 4, 11, 13 and 15. He was an approved expert in SGS for the technical areas of 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- Wind and Hydro), TA 2.1 Electricity distribution, TA 2.2 Heat distribution, TA 3.1 Energy Demand.

His sufficient sectoral competence in Energy Industries (renewable / non-renewable sources), Energy Distribution, Energy Demand and Energy Efficiency is sufficiently demonstrated through his educational qualification and work experience.