



VALIDATION REPORT

XINXIANG TIANJIE BIO-POWER GENERATION
Co., LTD.

HENAN XINXIANG 24MW BIOMASS BASED
COGENERATION PROJECT

Report No: QT-EC0906-08 - 08/322

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Client: XINXIANG TIANJIE BIO-POWER GENERATION CO., LTD.	Client ref.: Mr. LI Yulin
Summary:	☒ positive validation opinion ☐ negative validation opinion
Xinxiang Tianjie Bio-Power Generation Co., Ltd. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project: "Henan Xinxiang 24MW Biomass based Cogeneration Project" with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords) and the relevant decisions by COP/MOP and CDM Executive Board In the course of the pre-validation 9 Corrective Action Requests (CARs) and 10 Clarification Requests (CLs) were raised and successfully closed. The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria. In detail the conclusions can be summarised as follows: - The project is in line with all relevant host country criteria (China) and all relevant UNFCCC requirements for CDM. Project activity approval have been obtained from DNA of China vide the Letter of Approval (HCA) dated 18 Feb. 2009 and DNA of UK vide letter of Approval (LOA) dated 19 October 2009. - The project additionality is sufficiently justified in the PDD. - The monitoring plan is transparent and adequate. - The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated annual emission reductions of 123,858 tCO₂e are most likely to be achieved within the 1st renewable crediting period. The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.	

Report No.: QT-EC0906-08 - 08/322	Subject Group: Climate Protection
Report title: Henan Xinxiang 24MW Biomass based Cogeneration Project	
Work carried out by: Mr. LI Yong Jun Mr. Martin Saalman Mr. LIU Yang	
Final technical review by: Rainer Winter	Local technical review by: LI Yong Jun
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Indexing terms

Climate protection
Kyoto Protocol
CDM
Validation

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Abbreviations

BAU	Business as usual
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CCPG	Central China Power Grid
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CO₂	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
DNA	Designated National Authority
DOE	Designated Operational Entities
EB	CDM Executive Board
EIA	Environmental Impact Assessment
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
PDD	Project Design Document
QC/QA	Quality control/Quality assurance
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual

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1 OBJECTIVE / SCOPE

The purpose of a validation is to have an independent third party assess 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 Marrakech Accords under decision 3/CMP.1
- the annex to the decision;
- subsequent decisions made by COP/MOP & CDM Executive Board and
- other relevant rules, including the host country legislation and sustainability criteria

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 as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of certified emission reductions (CERs).

The validation scope is given as a thorough independent and objective assessment of the project design including especially: the correct application of the methodology, the project's baseline study, additionality justification, local stakeholder commenting process, environmental impacts and monitoring plan, which are included in the PDD and other relevant supporting documents, to ensure that the proposed CDM project activity meets all relevant and applicable CDM criteria.

The information included in the PDD and the supporting documents were reviewed against the requirements as set out by the UNFCCC. The validation team has, based on the requirements in the Validation and Verification Manual^{VVM}, carried out a full assessment of all evidences to assess the compliance of the project with the key areas as outlined in section V.E. and V.F. of the VVM (version 01.2, EB 55).

The validation is based on the information made available to TÜV NORD JI/CDM CP and on the contract conditions. TÜV NORD JI/CDM CP can not be held liable by any entity for making its validation opinion based on any false or misleading information supplied to it during the course of validation.

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

2 GHG PROJECT DESCRIPTION

2.1 Project Characteristics

Essential data of the project is presented in the following Table 2-1.

Table 2-1: Project Characteristics

Item	Data		
Project title	Henan Xinxiang 24MW Biomass based Cogeneration Project		
Project size	☒ Large Scale	☐ Small Scale	
Project Scope (according to UNFCCC sectoral scope numbers for CDM)	☒	1	Energy Industries (renewable- /non-renewable sources)
	☐	2	Energy distribution
	☐	3	Energy demand
	☐	4	Manufacturing industries
	☐	5	Chemical industry
	☐	6	Construction
	☐	7	Transport
	☐	8	Mining/Mineral production
	☐	9	Metal production
	☐	10	Fugitive emissions from fuels (solid, oil and gas)
	☐	11	Fugitive emissions from production and consumption of halocarbons and hexafluoride
	☐	12	Solvents use
	☐	13	Waste handling and disposal
	☐	14	Afforestation and Reforestation
	☐	15	Agriculture
Applied Methodology	ACM0006, Version 10		
Crediting period	☒ Renewable Crediting Period (7 y)	☐ Fixed Crediting Period (10 y)	
Start of crediting period	01/01/2010 or the registration date whichever is later		

2.2 Involved Parties and Project Participants

The following parties to the Kyoto Protocol and project participants are involved in this project activity (Table 2-2).

Table 2-2: Project Parties and project participants

Characteristic	Party	Project Participant
Host party	People's Republic of China	Xinxiang Tianjie Bio-Power Generation Co., Ltd.
Other involved party/ies	UK	Goldman Sachs International

2.3 Project Location

The details of the project location are given in table 2-3:

Table 2-3: Project Location

No.	Project Location
Host Country	People's Republic of China
Region:	Henan Province
Project location address:	Huangli Village, Wucun Town, Huixian County, Xinxiang City
Latitude:	35°19'50"N
Longitude:	113°30'40"E

2.4 Technical Project Description

The technical key data are provided in table 2-4 below

Table 2-4: Technical data of the project activity

Parameter	Unit	
Boiler		
Type		YG-75/3.82-T
Quantity		2
Rated Evaporative Capacity	t/h	75
Rated Steam Temperature	°C	450
Rated Steam Pressure	MPa	3.82
Feed-in Water Temperature	°C	150
Efficiency	%	83
Steam Turbine		
Type		C12-3.43/0.98
Quantity		2
Rated Capacity	MW	12
Rated Speed	r/min	3000
Rated Steam Flow	t/h	75
Inlet Steam Temperature	°C	435
Inlet Steam Pressure	MPa	3.43
Generator		
Type		QF-15-2
Quantity		2
Rated Power	MW	15
Rated voltage	V	6,300
Power factor		0.8
Rated Speed	r/min	3000

3 METHODOLOGY AND VALIDATION SEQUENCE

3.1 Validation Steps

The validation of the project consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the project design document (PDD)
- A desk review of the PDD^{/PDD-1/} submitted by the client and additional supporting documents with the use of customised validation protocol^{/CPM/} according to the Validation and Verification Manual^{/VVM/},
- Validation planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft validation reporting
- Resolution of corrective actions (if any)
- Final validation reporting
- Technical review
- Final approval of the validation.

The sequence of the validation is given in the table 3.1 below:

Table 3.1: Validation sequence

Topic	Time
Assignment of validation	2008-09-01
Submission of PDD for global stakeholder commenting process	2008-09-20
On-site visit	2008-09-23
Draft reporting finalised	2008-12-15
Technical review on draft reporting finalised	2009-01-09
Final reporting finalised	2009-08-21
Technical review on final reporting finalised	2009-10-26

3.2 Contract review

To assure that

- the project falls within the scopes for which accreditation is held,
- the necessary competences to carry out the verification can be provided,
- Impartiality issues are clear and in line with the CDM accreditation requirements

a contract review was carried out before the contract was signed.

3.3 Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities a verification team, consistent of one team leader and 1 additional team members, were appointed. Furthermore also the personnel for the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 3-2 below.

Table 3-2: Involved Personnel

	Name	Company	Function ¹⁾	Qualification Status ²⁾	Sectoral competence	Technical competence	Host country Competence	Controlling competence
☒ Mr. ☐ Ms.	Rainer Winter	TÜV NORD CERT GmbH	TR	SA	X	X	-	X
☒ Mr. ☐ Ms.	LI Yong Jun	TÜV NORD China, Shanghai	TL	A	X	X	X	X
☒ Mr. ☐ Ms.	Martin Saalman	TÜV NORD CERT GmbH	TM	A	X	X	-	X
☒ Mr. ☐ Ms.	Eric Krupp	TÜV NORD CERT GmbH	FA	SA	X	X	-	X
☒ Mr. ☐ Ms.	LIU Yang	TÜV NORD China, Shanghai	TM	T	-	X	X	-

¹⁾ TL : Team Leader; TM : Team Member, TR: Technical review; FA: Final approval

²⁾ GHG Auditor Status: A : Assessor; E : Expert; SA: Senior Assessor; T : Trainee; TE Technical Expert

Certificates of appointment for the above mentioned team members are enclosed in **annex 6** of this report.

3.4 Consideration of Public Stakeholder Comments

Acc. to the modalities and procedures the draft PDD, as received from the project participants, has been made publicly available on the dedicated UNFCCC CDM website prior to the validation activity commenced. Stakeholders have been invited to comment on the PDD within the 30 days public commenting period.

In case comments were received, they are taken into account during the validation process. The comments and the discussion of the same are documented in **annex 5** of this report.

3.5 Validation Protocol

In order to ensure consideration of all relevant assessment criteria, a validation protocol is used. The protocol shows, in a transparent manner, criteria and requirements, means of validation and the results from pre-validating the identified criteria. The validation protocol reflects the generic CDM requirements each CDM project has to meet as well as project specific issues as applicable. The validation protocol serves the following purposes:

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

The validation protocol as described in Figure 1.

Validation Protocol Table A-1: Requirement checklist				
Checklist Item	Validation Team Comment	Reference	Draft Conclusion	Final Conclusion
<i>The checklist items in Table A-1 are linked to the various requirements the project should meet. The checklist is organised in various sections. Each section is then further sub-divided as per the requirements of the topic and the individual project activity.</i>	<i>The section is used to elaborate and discuss the checklist item in detail. It includes the assessment of the validation team and how the assessment was carried out. The reporting requirements of the VVM shall be covered in this section.</i>	<i>Gives reference to the information source on which the assessment is based on</i>	<i>Assessment based on evidence provided if the criterion is fulfilled (OK), or a CAR, CL or FAR (see below) is raised. The assessment refers to the draft validation stage.</i>	<i>In case a corrective action or a clarification the final assessment at the final validation stage is given.</i>

Figure 1: Validation protocol tables

The completed validation protocol is enclosed in **Annex 1** to this report.

3.6 Review of Documents

The published PDD (version 03.2) and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the validation team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

3.7 Follow-up Interviews

The validation team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for CDM.

During validation the validation team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in table 3-3.

Table 3-3: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project proponent representatives /IM01/	- Chronological description of the project activity with documents of key steps of the implementation. - Current status of project design - Scenario prior to the implementation of the project

Interviewed Persons / Entities	Interview topics
	- Technical details of the project realization, project feasibility, designing, power connection, operational life time, monitoring of the project - Host Government Approval - Approval procedures and status - Monitoring and measurement equipment and system. - Financial aspects - Project activity starting date - CDM consideration - Sustainable development issues - Monitoring - Analysis of local stakeholder consultation - Roles & responsibilities of the project participants w.r.t. project management, monitoring and reporting - National Legislation
Project consultant /IM02/	- Editorial issues of the PDD - Procedural aspects - Baseline study and additionality - Details of emissions reduction calculation - Crediting period
Local stakeholders /IM03/	- The environment impact of the project - The legislative aspects of the project - The impact of the project to local people's life - The policy framework of pricing and regulation - Biomass residue availability and price in the local area

A comprehensive list of all interviewed persons is part of section 7 '**References**'.

3.8 Project comparison

The validation team has compared the proposed CDM project activity with similar projects or technology that have similar or comparable characteristics and with similar projects in the host country in order to achieve additional information esp. regarding:

- Project technology
- Additionality issues
- Reasons for reviews, requests for reviews and rejections within the CDM registration process.

3.9 Resolution of Clarification and Corrective Action Requests

3.9.1 Definition

A **Corrective Action Request (CAR)** will be established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence on the project results,
- the requirements deemed relevant for validation of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered by the UNFCCC or that emission reductions would not be able to be verified and certified.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the first verification.

3.9.2 Draft Validation

After reviewing all relevant documents and taken all other relevant information into account, the validation team issues all findings in the course of a draft validation report and hands this report over to the project proponent in order to respond on the issues raised and to revise the project documentation accordingly.

3.9.3 Final Validation

The final validation starts after issuance of the proposed corrective action (CA) of the CARs CLs and FARs by the project proponent. The project proponent has to reply on those and the requests are "closed out" by the validation team in case the response is assessed as sufficient. In case of raised FARs the project proponent has to respond on this, identifying the necessary actions to ensure that the topics raised in this finding are likely to be resolved at the latest during the first verification. The validation team has to assess whether the proposed action is adequate or not.

In case the findings from CARs and CLs cannot be resolved by the project proponent or the proposed action related to the FARs raised cannot be assessed as adequate, no positive validation opinion can be issued by the validation team.

The CAR(s) / CL(s) / FAR(s) are documented in chapter 4.

3.10 Technical review

Before submission of the final validation report a technical review of the whole validation procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the validation opinion and the topic specific assessments as prepared by the validation team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

3.11 Final approval

After successful technical review of the final report an overall (esp. procedural) assessment of the complete validation will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

Only after this step the request for registration can be started (in case of a positive validation opinion).

4 VALIDATION FINDINGS

In the following table the findings from the desk review of the published PDD, visits, interviews and supporting documents are summarised:

Table 4-1: Summary of CARs, CLs and FARs issued

Validation topic ¹⁾	No. of CAR	No. of CL	No. of FAR
General description of project activity (A) - Project specification - Technical project description - Participation - Contribution to sustainable development - PDD editorial aspects - Technology to be employed	2	2	-
Project Baseline, Additionality and Monitoring Plan (B) - Application of the Methodology - Project Boundary - Baseline identification - Calculation of GHG emission reductions Project emissions Baseline emissions Leakage - Additionality determination - Monitoring Methodology - Monitoring Plan - Project management planning	7	4	-
Duration of the Project / Crediting Period (C)	-	2	-
Environmental impacts (D)	-	1	-
Stakeholder Comments (E)	-	1	-
SUM	9	10	-

¹⁾ The letters in brackets refer to the validation protocol

The following tables include all raised CARs, CLs and FARs. For an in depth evaluation of all validation items it should be referred to the validation protocols (see **Annex 1**).

The findings of validation process are summarized in the tables below.

	Finding A1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	At the time of the (pre-) validation the letters of approval of all involved parties are pending (China, UK).		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The Chinese LOA is provided to the DOE, and UK LOA will be applied based on the positive validation opinion.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1.</i>	OK. Checklist A.1.1: The letters of approval of the host country^{/HCA/} and the letter of approval of UK^{/LOA/} have been received from the PP. Checklist A.1.2: The letter of approval of the host country is from NDRC which is listed on the UNFCCC CDM website. The information of approval is available on website of Chinese DNA: http://cdm.ccchina.gov.cn/website/CDM/pdf/Item_new/Item_new4051.pdf Letter of Approval from the sponsor party (UK) was issued from UK DNA, Department of Energy and Climate Change which is listed on UNFCCC CDM website. Checklist A.1.3: The letter of approval of the host country confirms that China is a Party to the Kyoto protocol. The letter of approval of UK confirms that UK is a Party to the Kyoto protocol. Checklist A.1.4: The letter of approval of the host country confirms that the participation is voluntary. LOA of UK also confirms its voluntary participation. Checklist A.1.5: The letter of approval of the host country confirms that the project contributes to the sustainability in the country. Checklist A.1.6: The letter of approvals of both the host country and UK refer to the precise project title in the PDD submitted for registration. Checklist A.1.7: The letters of approval of the host country and UK are unconditional w.r.t. Checklists A.1.3 to A.1.6. Checklist A.1.9: Project participants listed in the PDD are approved by the letter of approval of the host country. UK DNA is approved as project participant in the LOA. Checklist A.1.10: There are no other project participants approved in the letters of approval of the host country and UK but not listed in the PDD. Checklist A.2.1: The host country confirmed in the letter of approval that the project assists it in achieving sustainable development.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements		

Finding A2	
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The following findings w.r.t. editorial aspects have been identified: 1. The description of the project activity in A.2 is inaccurate, the PDD should be revised according to PDD Guideline Version 07. 2. The name of project owner is inconsistent between section A.3. and Annex 1. 3. An inconsistency in the project title between published PDD and final PDD.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	1. The description has been revised in the updated PDD according to PDD Guideline. 2. The inconsistency has been corrected in the updated PDD. 3. The project title used when the project activity was published was "Henan Xinxiang 24MW Bio-based Cogeneration Project". The actual and real translation of the project name is Henan Xinxiang 24MW Biomass based Cogeneration Project as indicated in HCA^{/HCA'}. The slight difference in the name comes from improper translation. After reception of HCA the name as indicated in HCA was applied for consistency and as deemed to be right and exact translation.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	1. Related editorial changes have been made. Hence OK. Checklist A.3.2: The PDD has been duly filled in accordance with the latest version of PDD guidance. 2. Name of project participant is now consistent. Checklist A.1.8 3. When the project activity was published for global stakeholder consultation process, the project title used was "Henan Xinxiang 24MW Bio-based Cogeneration Project". Given the minor change in the project title is mainly due to translation habit and abbreviation, the validation team confirms that both project titles actually indicate to the same project activity as submitted.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

Finding A3	
Classification	☒ CAR ☐ CL ☐ FAR

	Finding A3
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	According to the PDD <i>Guideline (Version 07)</i>, the description of project technology in A.4.3 is insufficient in the following aspects: 1. the technological description of the different scenarios should include information about the equipments based on manufacturer's specifications and industry standards, e.g. load factors and efficiencies. And the monitoring equipments and their location in the systems are of particular interest. 2. technologies of equipments that exist prior to the project should be backed by documented evidences; 3. some parameters of equipments of the project described in the PDD are inconsistent with the Equipment Purchasing Agreement^{/EPA/}, e.g. efficiency of boiler and Rated Steam Flow, and some other key parameters should be provided, such as type and quantity of equipments, rated speed of turbine; Revision to the PDD is required.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The description of project technology in A.4.3 has been supplemented in the updated PDD according to the <i>Guidelines for Completing the PDD (Ver.07)</i>: 1. the technological parameters of the equipments used in this project have been listed in the PDD based on manufacturer's specifications and industry standards, brief characteristics of CCPG have been supplemented in the updated PDD and the relevant information of monitoring equipments has been included; 2. the documented evidence of the existing equipments prior to this project has been provided; 3. all the key parameters of relevant equipments have been provided according to the EPA in the updated PDD.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK, requirements of PDD guideline have been fulfilled. Checklist A.3.2: The PDD has been duly filled in accordance with the latest version of PDD guidance. Checklist A.4.1: The PDD presents a clear description of the project activity which provides a clear understanding of the precise nature of the project activity and the technical aspects of its implementation in A.4.3 of the PDD. The technological description has been cross checked by the project design^{/FSR/} and equipment purchase agreement^{/EPA/}, the description in the PDD is accurate and complete. Checklist A.4.2: The project is a greenfield project with new constructed biomass fired boilers and turbine generator units, an on-site inspection has also been conducted by the DOE to confirm that it is most likely that the project will be implemented according to the project description.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

Finding A4			
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The details of physical location of the project activity should be more clearly and detailed described in A.4.1 of the PDD, i.e. town/community in which the project is located. Besides, more illustrative maps should be provided (not exceed one page).		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The description of physical location of this project has been supplemented in detail, and a more indicative map has been provided in the updated PDD.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK. Checklist B.2.1: The description of physical location of the proposed project is detailed given in A.4.1 of the PDD. The spatial boundary of the project is clearly defined. All information are cross checked against government approval of the project ^{/AFSR/} .		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements		

Finding B1			
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	ACM0002 ("Consolidated methodology electricity generation from biomass residues") should be referred to calculate the grid emission factor.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The methodology ACM0006 has been referred in the updated PDD.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Not yet OK, the version 7 of ACM0002 has expired, the latest approved version of ACM0002 should be referenced.		
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Version 11 of ACM0002 is referenced in the updated PDD.		
DOE Assessment #2 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK. Checklist B.1.2: The referenced CDM methodology ACM0002 is identical with the version available on the UNFCCC website ^{/unfccc/} .		

	Finding B1
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

	Finding B2
Classification	☒ CAR ☐ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The justification of applicability of methodology in B.2 of the PDD should be described in a transparent manner, the documented evidences (e.g. storage period, predominant fuel of proposed project) should be submitted and clearly referred to.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The description of justification of the applicability of the methodology in B.2 has been revised according to the requirement, and relevant documented evidences have been provided.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK. Checklist B.1.3: Each applicability criterion listed in the ACM0006 has been sufficiently justified in the PDD, please see table 5-1 of this report for detail information. Checklist B.1.4: The project is in accordance to every requirement mentioned in all sections of the methodology.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

	Finding B3
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The project boundary should be more clearly defined and the flow diagram of the project boundary should include all the equipments, systems and flows of mass and energy described in A.4.3, and particularly, represent in the diagram the emissions sources and gases included in the project boundary and the monitoring variables. The definition of the type of the biomass residue should be clearly defined in the PDD.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The definition and the flow diagram of project boundary have been revised according to the new guidelines in the updated PDD. Also, a more clear definition of the type to the biomass residues has been provided in the updated PDD.

	Finding B3
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Not yet OK, some of the emission sources such as “on-site fossil fuel and electricity consumption due to the project activity” are not included in the PDD.
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The missing parts of emission sources have been supplemented based on the methodology in the updated PDD.
DOE Assessment #2 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK. Checklist B.2.1: The spatial boundary of the project is clearly defined in the PDD, please see section 5.2.2 of this report for detail information. Checklist B.2.2: All sources and GHGs included in the project boundary are in line with the applied methodology, relevant documents ^{/FSR/} have been reviewed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

	Finding B4
Classification	☒ CAR ☐ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The justification of the exclusions of baseline alternative scenarios P5, P6, H2, H7, H8, B1, B3, B6 and B7, in step 1 of B.4 of the PDD is insufficient and some are unreasonable, more convincing justification and documented evidences are required.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The description of justification of the exclusions has been revised in updated PDD according to the requirement, and relevant evidences have been provided.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Not yet OK, justifications of P5, P6, and H2 are still not clear, a more specific explanation of whether medium temperature and medium pressure turbines and generators adopted by the project activity have an efficiency that is common practice in the relevant industry sector should be provided.
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	A more specific explanation about the elimination of these three alternatives has been supplemented in the updated PDD.

	Finding B4
DOE Assessment #2 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK. Checklist B.3.3: The baseline scenario is identified as the combination of P4, H6 and B1. Checklist B.3.4: The baseline scenario has been determined according to ACM0006, the identification of the most plausible baseline scenario is carried out in accordance with the applied methodology ACM0006. Please refer to table A-2. Checklist B.3.5: All excluded alternatives have been sufficiently justified as not plausible in the PDD. Please see detail information in Annex 2. Checklist B.3.6: The baseline scenario has been determined using conservative assumptions, the choice of the identified baseline scenario is reasonable by validating the key assumptions, calculations and rationales used in the PDD. Please see detail information in Annex 2. Checklist B.3.8: The baseline scenario determination is compatible with the available data and all literature and sources are clearly referenced, the documents and sources referred to in the PDD are correctly quoted and clearly referenced. Please see detail information in Annex 2.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

	Finding B5
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The description of consistency with mandatory applicable laws and regulations regarding H1 is inappropriate, and the determined alternative B3 for use of biomass (the biomass residues are burnt in an uncontrolled manner without utilizing it for energy purposes) is not consistent with applied environment regulations, justification is necessary.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The description of consistency with mandatory applicable laws and regulations regarding to B3 and H1 has been revised in the updated PDD, and relevant justification has been provided with documented evidences.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK. Checklist B.3.7: All relevant policies and circumstances have been identified and correctly considered in the PDD in baseline scenario identification. Checklist B.4.3.3: The alternative B3 does not comply with local regulation^{/NPSB/} which prohibit to burn biomass residues which causes serious air pollution, and therefore it is eliminated from plausible alternatives.

	Finding B5
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

	Finding B6
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	It is required to clarify that the incentive from the CDM was seriously considered in the decision to proceed with the project activity using a timeline of the proposed project activity which includes of events and actions related to project implementation and to achieve CDM registration in detail.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	A more detailed timeline including events and actions related to project implementation and to achieve CDM registration has been added in the updated PDD.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Not yet OK, further clarification how the CDM decision was made in the absence of financial analysis of the project, e.g. the FSR, and whether the project was assessed as financially unattractive at the time of board decision.
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Although there is no particular financial analysis by the time the project owner first planned to construct this project, the relevant researches indicated that the sector of power generation (including cogeneration) by using biomass residues is still an immature industry in China, and the practical experience shows that this kind of project is economically unattractive in general. So the project owner has seriously considered CDM in board decision about the incentive from the revenue of CERs which is the key to profitability of this project and has signed Emission Reduction Purchase Agreement (ERPA) before this project started to construct.

	Finding B6
DOE Assessment #2 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK. Checklist B.4.2.2: The incentive from the CDM was seriously considered and details are given in the PDD. Please see detail information in 5.2.5 of this report. Checklist B.4.2.3: The decision to proceed with the project activity was made by the Board of Directors of the proposed project on 20 Sep. 2007. Checklist B.4.2.6: The CDM has been involved in the whole process of project development. Please see detail information in 5.2.5 of this report. Checklist B.4.2.7: Even before the project started, the project owner signed CDM consulting service contract and ERPA, this shows that the CDM has been seriously involved in the investment decision considering the low financial indicator without CDM. In other words, the project would not have been undertaken without the incentive of the CDM.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

	Finding B7
Classification	☒ CAR ☐ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Several issues w.r.t the assessment of additionality have been raised: 1. the investment analysis part should be included in B.5 of the PDD; 2. there are several key parameters used for IRR calculation^{/IRR/} such as heat price and its VAT rate, and the result of IRR are inconsistent with that of FSR, and some key parameters are not listed in the PDD, such as the period of financial analysis; 3. explanation for the possibility that each variables fluctuate in sensitivity analysis is insufficient, e.g. the influence of O&M cost and heat price were not justified 4. how similar projects are defined should be more clearly explained;

	Finding B7
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	It has been revised in the updated PDD according to the <i>Guidance on the Assessment of Investment Analysis</i> : 1. the investment analysis has been conducted in B.5 in the updated PDD; 2. the heat price and its VAT rate, and other key parameters used for IRR calculation have been rechecked in accordance with FSR, and more detailed calculation sheets have been provided; as the IRR calculation in FSR including the revenue of CERs, it's result is higher than the IRR without CDM shown in PDD; 3. the sensitivity analysis has been supplemented in the updated PDD, including five key factors and their reasonable variations in the critical assumptions: total investment, electricity price, heat price, operating hours and total O&M cost; based on the calculation; the range of variations of the five key factors under which the project IRR will reach the 8% benchmark have been analyzed in the updated PDD respectively, and the result of sensitivity analysis shows that this project is unlikely to be financially attractive in the reasonable variations of the key factors. 4. the relevant geographical area for this project is defined as Henan province, so similar activities to this project activity are defined as biomass-based cogeneration projects that are of similar scale, take place in a comparable environment in Henan province, and this description has been added in the updated PDD.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK. Checklist B.4.4.2: A clear, viewable and unprotected Excel spreadsheet is available to the DOE for the investment calculation and reproducing the result. Checklist B.4.4.8: The input values used in the investment analysis are derived from the FSR which is the basis of the investment decision, the finalization of the FSR and the investment decision were in the same month and therefore the input values are valid and applicable at the time of the investment decision. Please refer to Annex 3 for detail information. Checklist B.4.4.15: The sensitivity analysis has been appropriately done by the project participants. Please refer to Annex 3 for detail assessment. Checklist B.4.6.1: Henan Province is defined as the region for the common practice analysis, it is appropriate for the technology/industry as biomass residue resources vary significantly in different provinces in China and also because of policy framework of China authority. Checklist B.4.6.2: Five projects are found as similar to the project in the defined region, but all the projects have applied CDM. Checklist B.4.6.3: No similar project other than CDM project is identified.

Finding B7	
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

Finding B8			
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The barrier analysis in step 2 of B.4 of the PDD ("investment barrier" and "barrier due to stalk purchase") is unconvincing and inappropriate, such as the claimed "first of its kind", and documented evidences should be provided to demonstrate the alternative scenarios are prevented by the identified barriers.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The description of this step has been revised according to the <i>Combined Tool to Identify the Baseline Scenario and Demonstrate Additionality</i> in updated PDD, technological barrier other than investment barrier is used to eliminate alternative P5, P6 and H2.		
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK, barrier analysis is not used by the project activity to prove additionality, the elimination of alternatives P5, P6 and H2 is assessed as appropriate, please see Annex 2 of the validation report for details. Checklist B.4.5.1: No other barrier is given which have a clear and definable impact on the profitability of the project. Checklist B.4.5.2: Barrier analysis is not used by the project activity to prove that the project activity is additional any more. Checklist B.4.5.3: Barrier analysis is not used by the project activity to prove that the project activity is additional any more.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements		

Finding B9			
Classification	☒ CAR	☐ CL	☐ FAR

	Finding B9
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Several issues w.r.t the explanation of methodological choices and emission reduction calculation in B.6 of the PDD have been raised: 1. it is required to justify how Option B was chosen to calculate $COEF_{i,y}$ in on-site consumption of fossil fuels; 2. $EF_{grid,y}$ should be clearly explained in 1(c) of B.6.1 (CO₂ emission from electricity consumption) in detail; 3. how $EF_{CH_4,BF}$ and its conservativeness factor are calculated should be more detailed explained; 4. CCPG has a net import of 3,028,950MWh from Northwest China Power Grid in 2006, this was not included in calculation of $EF_{electricity,y}$; 5. why simple OM was selected to calculate the operation margin should be justified, and equation (10) should not be included in the OM calculation; 6. deviation applied in BM calculation should be clearly explained and referred to since it is used in the BM calculation; 7. $\epsilon_{BL,boiler}$ and parameters are available at validation should be included in B.6.2; 8. the emission reduction process in B.6.3 of the PDD is not transparent, it must be in accordance with the methodological choices presented in B.6.1 and all parameters used for ex-ante calculation should be correctly defined; The applied methodology and related tools should be followed regarding the problems listed above, and the emission reduction calculation should be explained as transparent as possible so that the process and the result can be reproduced.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	This section has been revised in the updated PDD according to the applied methodology and related tools, and more detailed emission reduction calculation sheets have been provided: 1. how Option B was chosen to calculate $COEF_{i,y}$ in on-site consumption of fossil fuels has been justified in the updated PDD; 2. $EF_{grid,y}$ has been described clearly in the updated PDD; 3. how $EF_{CH_4,BF}$ and its conservativeness factor are calculated have been detailed explained in the updated PDD; 4. the net import of 3,028,950MWh of Central China Power Grid from Northwest China Power Grid in 2006 has been calculated in the total electricity of grid with a emission factor of 0 for conservativeness; 5. why simple OM was selected to calculate the operation margin has been justified and the equation (10) has been deleted in the updated PDD; 6. the deviation applied in BM calculation has been detailed explained in the updated PDD; 7. $\epsilon_{BL,boiler}$ and parameters are available at validation has been included in B.6.2; 8. it has been revised in the updated PDD, the description of emission reduction process in B.6.3 has been revised in accordance with the methodological choices presented in B.6.1 and all necessary parameters.

Finding B9	
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK. Checklist B.5.1: The methodology of ACM0006 has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. Please see detail assessment in 5.2.4 of this report. Checklist B.5.2: Proper justification has been provided (based on the choice of the baseline scenario, context of the project activity and other evidence provided) and whether the correct equations have been used reflecting the relevant methodological choices. The emission reduction calculation has been cross checked with the excel sheet^{ERC} by the validation team and the result are reproduced as correct. Please see detail assessment in 5.2.4 of this report. Checklist B.5.3: All the assumptions and data used by the PP are listed in the PDD including references and sources and are conservatively interpreted in the PDD. Please see detail assessment in 5.2.4 of this report. Checklist B.5.4: All data and parameters which remain fixed throughout the crediting period which are correct and applicable to the project will lead to a conservative estimation of emission reductions. Please see detail assessment in 5.2.4 of this report. Checklist B.5.5: All ex-ante calculation values for monitoring parameters (as defined as per chapter B.7.1) are reasonable, applicable and conservative in the context of the project activity. Please see detail assessment in 5.2.4 of this report. Checklist B.5.6: The emission reductions are real, measurable and give long-term benefits related to the mitigation of climate change. In the course of validation of the baseline determination, monitoring approach, and ER calculation including respective input values have been reviewed. Checklist B.6.3: All equations necessary for ex-post emission reduction calculation have been described clearly in the PDD in accordance with the methodology ACM0006.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

Finding B10			
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Monitored parameters listed in B.7.1 should be in line with requirements of applied methodology and related tools including monitoring and QA/QC procedures. And some parameters are unnecessary to monitor such as EG_{total,y}. Revision to the PDD is required.		

	Finding B10
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The description of the monitored parameters listed in B.7.1 has been revised in line with requirements of applied methodology and related tools including monitoring and QA/QC procedures. It has been revised in the updated PDD. The parameters unnecessary to monitor have been excluded in this section.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK. Checklist B.6.2: The means of monitoring of all parameters contained in the monitoring plan are in accordance with the requirements of the applied methodology ACM0006.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

	Finding B11
Classification	☒ CAR ☐ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The description of the monitoring plan is insufficient: 1. structure and responsibility of project management should be described in a more clear and specific manner; 2. measurement equipments and procedures of monitored parameters that are included in B.7.1 should be in line with requirements of the applied methodology and related tools; 3. document management should be detailed described to meet the requirement of monitoring, and all data collected as part of monitoring should be archived electronically and be kept at least for 2 years after the end of the last crediting period according to the methodology; 4. QA/QC procedures should be clearly described, e.g. calibration to the measurement equipments, training of monitoring personnel, corrective actions and emergency preparedness, and verification of the monitoring results; Revision to the PDD is required.

Finding B11	
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The monitoring plan has been supplemented in the updated PDD: 1. a more detailed and logical management plan has been included in the updated PDD; 2. the description of measurement equipments and procedures of monitored parameters that are included in B.7.1 has been revised in line with requirements of the applied methodology and related tools; 3. a more detailed document management has been provided in the updated PDD according to the relevant requirements of monitoring; 4. the QA/QC procedures has been described more clearly, including training programme, calibration of measuring equipments, data checking, emergency measures and verification of monitoring results.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK. Checklist B.6.4: It is likely that the monitoring arrangements described in the PDD can properly be implemented in the context of the project activity, the described monitoring arrangements are sufficient and realistic to enable a thorough monitoring including back up system, troubleshooting procedures and etc. Checklist B.6.5: The QA/QC procedures are sufficient to ensure the emission reductions achieved from the project activity can be reported ex-post and verified QA/QC provisions such as back up system, troubleshooting procedures, internal review of reported results and training have been considered. Quality Management System provisions such as calibration of equipments have been addressed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

Finding C1	
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	A description of how the starting date has been determined and supportive evidences should be included in C.1.1 of the PDD.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	A description of how the starting date has been determined has been included in C.1.1, and supportive evidences have been provided.

	Finding C1
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Not yet OK, further clarification why the purchase of boiler is the earliest date of project implementation, more relevant documents should be provided as evidences.
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The contract for boiler purchase has been signed on June 18 th 2008, contract for turbine and generator purchase has been signed on June 22 nd 2008, and the contract for construction have been signed on 25 th 2008, so the date of purchase of boiler is the earliest date of project implementation and should be considered as the starting date.
DOE Assessment #2 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK. Checklist C.1: The project starting date is clearly defined and evidenced, it is correct as per the Glossary of CDM terms ^{/GLS/} .
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

	Finding C2
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The starting date of the first crediting period is unreasonable, revision is required.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The starting date of the first crediting period has been revised in the updated PDD based on current status of the project activity.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Not yet OK, the date should be reconsidered as per the CDM project registration cycle.
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	This date has been revised according to the recent status of the project.
DOE Assessment #2 <i>The assessment shall encompass all open issues in annex A-1.</i>	OK. Checklist C.3: The envisaged starting date of the crediting period is realistic, taking into consideration the times needed for validation and registration.

	Finding C2
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

	Finding D1
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The environmental impacts should be described according to the result of approved environmental impacts assessment report ^{/EIA/} in D.1 of the PDD.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The description has been revised in the updated PDD based on the conclusion of EIA.
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK. Checklist D.1.3: An analysis of the environmental impacts of the project activity is sufficiently described in the PDD, and the EIA report of this project has already been approved by local government which indicates the project is in line with the host party environmental legislation. Neither the host party nor the project participants consider that this project will have significant environmental impact.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

	Finding E1
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Detailed information of how the project participant investigated stakeholders' comments should be provided in a transparent manner in E.1 of the PDD.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	How comments by local stakeholders have been invited and compiled has been described more detailed in the updated PDD

	Finding E1
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	OK. Checklist E.2: The local stakeholder consultation process can be assessed as adequate because: • Comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity, have been invited; • The summary of the comments received as provided in the PDD is assessed as complete by checking all the received questionnaires and meeting record; • The project participants have taken due account of any comments received and have described this process in the PDD.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

5 VALIDATION ASSESSMENT SUMMARY

5.1 General Description of the Project Activity

5.1.1 Participation

LOA

Letter of approval for Henan Xinxiang 24MW Biomass based Cogeneration Project project^{/HCA/} has been issued by National Development and Reform Commission of the People's Republic of China which is China's DNA in Feb. 2009, and it has been submitted by the project participants. In the letter of approval, the project titled "Henan Xinxiang 24MW Biomass based Cogeneration Project" complies with the permission requirements and assists China in achieving sustainable development.

Letter of Approval^{/LOA/} from DNA of UK has been issued 19 October 2009 and submitted.

Project Participants

The project participants are Xinxiang Tianjie Bio-Power Generation Co., Ltd. which has been approved by the host country of China which is a Party to the Kyoto Protocol in a letter of approval^{/HCA/}, and Goldman Sachs International is addressed as PP from Annex 1 country. The approval of UK DNA^{/LOA/} has been issued 19 October 2009. The project participants are listed in tabular form in section A.3 of the PDD and this information is consistent with the contact details provided in annex 1 of the PDD. No entities other than those approved as project participants are included in these sections of the PDD. All above information have been checked against host country LOA^{/HCA/}.

5.1.2 Contribution to Sustainable Development

In the letter of approval of the host Party^{/HCA/}, it is confirmed that the proposed CDM project activity complies with the permission requirements provided in the Measures for Operation and Management of Clean Development Mechanism Project in China and assists China in achieving sustainable development

5.1.3 PDD editorial Aspects

The PDD of the project is based on the latest PDD Template (Version 03.2) and complies with the Guidelines for Completing the PDD^{/GCP/} (Version 07).

5.1.4 Technology to be employed

A physical site visit was conducted to confirm that the description of the project design in the PDD reflects the real situation of the proposed CDM project activity, and the technological parameters of main equipments indicated in A.4.3 of the PDD are consistent with the equipment purchase agreement^{/EPA/}. The project activity is still under construction during validation and only parts of facilities have been implemented, and it is estimated by the project participant^{/IMO1/} that the project will be fully completed in 2010. And the heat supply will start as long as the heat distribution network and the proposed project finished construction. The project does not involve alteration of the existing installation or process.

A clear description of the differences between the project scenario and the scenario existing prior to the start of the implementation of the project which is also the baseline scenario is provided in A.2 and A.4.3 of the PDD. The project is a biomass based cogeneration project, and the technology employed is environmentally safe and sound.

5.1.5 Small Scale Projects

The installed capacity of the proposed project is 24MW and is larger than the threshold of 15MW for Type I project. Therefore, the project activity is not small scale.

5.2 Project Baseline, Additionality and Monitoring Plan

5.2.1 Application of the Methodology

The project applies to the consolidated baseline and monitoring methodology ACM0006 "Consolidated methodology electricity generation from biomass residues" (Version 10) which is approved by the CDM Executive Board.

Approved consolidated baseline and monitoring methodology ACM0002: "Consolidated methodology for grid-connected electricity generation from renewable resources", Version 11 and latest version of methodological tools, "Tool to calculate the emission factor for an electricity system" (Version 02), "Combined tool to identify the baseline scenario and demonstrate additionality" (version 02.2), "Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion" (Version 02), and "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01) are applied and referenced in accordance with ACM0006.

The applied methodology and methodological tools are available at UNFCCC website of <http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>.

All the applicability conditions of the methodology ACM0006 are met, the assessment for each applicability criteria is as follows:

Table 5-1: Applicability assessment

No.	Applicability Criteria	Argument by PP	Assessment of the validation team
1	This methodology is applicable to biomass residue fired electricity generation in power and heat plants, including cogeneration plants.	The project a greenfield biomass residue fired cogeneration plant.	☒ passed ☐ not passed ☐ not applicable This point is confirmed by the DOE through on-site visit.
2	No other biomass types than biomass residues are used in the project plant and these biomass residues are the predominant fuel used in the project plant (some fossil fuels may be co-fired);	Fuel fired in this project plants is agricultural stalks and waste wood, no other biomass types are used; these biomass residues are the predominant fuel used in this project plant;	☒ passed ☐ not passed ☐ not applicable The information has been cross checked with documents such as feasibility study ^{/FSR/} , and confirmed by local government ^{/BSR/} .
3	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 biomass residues used in this project are not from a production process;	☒ passed ☐ not passed ☐ not applicable The information has been cross checked with documents such as feasibility study ^{/FSR/} , and confirmed by local government ^{/BSR/} .
4	The biomass residues used by the project facility should not be stored for more than one year;	As the biomass residues used for this project are mainly crop stalks, their collecting frequency is planned to be twice a year for season factor, and the storage period is 4-6 months, less than one year;	☒ passed ☐ not passed ☐ not applicable The information is confirmed by the DOE through on-site inspection to the volume of designed storage. According to most conservative estimation ^{/BSR-3/} conducted by the project owner, the maximum storage capacity can only reach 100,000 tons if to build 25 collection stations with 4,000 tons of capacity. However, the annual consumption of biomass is designed as 176,000 tons. Therefore, it does not make sense to store biomass residues for more than one year.

No.	Applicability Criteria	Argument by PP	Assessment of the validation team
5	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).	Except from transportation and process of the biomass compressing and fragmentation, there is no other biomass preparation process requiring significant energy quantities.	☒ passed ☐ not passed ☐ not applicable The information has been cross checked with the feasibility study ^{/FSR/} .
6	The methodology is only applicable for the combinations of project activities and baseline scenarios identified in Table 2 of ACM0006.	The baseline scenario of this project is identified as Scenario 2 which is listed in Table 2.	☒ passed ☐ not passed ☐ not applicable The identified baseline scenario is Scenario 2 which is one of the applicable combinations.
Opinion of the validation team		☒ the methodology is applicable to the project ☐ the methodology is not applicable	

And the project activity is not expected to result in emissions including project emissions, leakage, and any other significant emissions not addressed by the applied methodology.

5.2.2 Project Boundary

According to applied ACM0006, the spatial extent of the project boundary encompasses the following:

- The power plant at the project site;
- The means for transportation of biomass residues to the project site (e.g. vehicles);
- All power plants connected physically to the electricity system that the CDM project power plant is connected to;
- The site where the biomass residues would have been left for decay or dumped.

The project boundary and the selected sources and gases which are justified for the project activity are identified in B.3 of the PDD.

Through observations of the physical site and equipment used by the project, the DOE confirm that the project boundary of the project includes of the power plant, the means of transportation of biomass residues, all the power plants connects to CCPG and the site where the biomass residues would have been left for decay or dumped. The baseline emission source is CO₂ emissions from electricity generation in fossil fuel fired power plants and heat generation in individual boilers that are displaced

due to the project activity as well as the CH₄ emissions from uncontrolled burning or decay of surplus biomass residues. The project emission sources are CO₂ emissions from off-site transportation of biomass residues and on-site fossil fuel and electricity consumption as well as CH₄ emissions from combustion of biomass residues for electricity and heat generation. There are no other emission sources which are impacted by the project and not addressed by the applied methodology.

5.2.3 Baseline Identification

The DOE confirm that the procedure contained in the methodology to identify the most reasonable baseline scenario has been correctly applied, and the description of baseline identification in the PDD is transparent and verifiable.

According to applied methodology ACM0006, 11 alternatives for power generation, 10 alternatives for heat generation and 8 alternatives for the use of biomass residues which are listed in the methodology have been discussed, and step approach of "Combined tool to identify the baseline scenario and demonstrate additionality" has been applied to establish the baseline scenario. Through elimination of the implausible alternatives, only one combination of baseline scenarios for power, heat and biomass use have been identified, which is scenario (combination of P4, H6 and B1).

As the methodology requires several alternative scenarios to be considered in the identification of the most reasonable baseline scenario, the DOE, based on financial expertise and local and sectoral knowledge, confirm that all scenarios that are considered by the project participants and are supplementary to those required by the methodology, are reasonable in the context of the proposed CDM project activity and that no reasonable alternative scenario has been excluded.

The DOE ensure that the baseline scenario identified is reasonable by validating the assumptions, calculations and rationales used, as described in the PDD, and the documents and sources referred to in the PDD are correctly quoted and interpreted. The information provided in the PDD has been cross checked with other verifiable and credible sources by the DOE.

The DOE ensure that all applicable CDM requirements have been taken into account in the identification of the baseline scenario for the proposed CDM project activity, including "relevant national and/or sectoral policies and circumstances." Drawing on its knowledge of the sector, the DOE confirm that all relevant policies and circumstances have been identified and correctly considered in the PDD, in accordance with the guidance by the CDM Executive Board.

The DOE ensure that the PDD provides a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and the activities that would take place in the absence of the proposed CDM project activity.

The DOE confirms the following:

- (a) All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;

- (b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- (c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- (d) Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
- (e) The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

The baseline for the proposed project activity has been clearly specified with reference to the chosen project category. Please see **Annex 2** for detail information.

5.2.4 Calculation of GHG Emission Reductions

The emission reduction calculation is conducted as per applied methodology ACM0006 and the methodological tool "Tool to calculate the emission factor for an electricity system" and correct equations and parameters have been used accordingly.

According to the methodology ACM0006, the emission reduction ER_y by the project activity during a given year y is the difference between the emission reductions through substitution of electricity generation with fossil fuels ($ER_{electricity,y}$), the emission reductions through substitution of heat generation with fossil fuels ($ER_{heat,y}$), project emissions (PE_y), emissions due to leakage (L_y) and, where this emission source is included in the project boundary and relevant, baseline emissions due to the natural decay or burning of anthropogenic sources of biomass residues ($BE_{biomass,y}$), as follows:

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

Project emissions:

According to methodology ACM0006, project emissions include:

- CO₂ emissions from transportation of biomass residues to the project site (PET_y),
- CO₂ emissions from on-site consumption of fossil fuels due to the project activity ($PEEF_y$),
- CO₂ emissions from consumption of electricity ($PE_{EC,y}$),
- Where this emission source is included in the project boundary and relevant: CH₄ emissions from the combustion of biomass residues ($PE_{Biomass,CH_4,y}$),
- Where waste water from the treatment of biomass residues degrades under anaerobic conditions: CH₄ emissions from waste water ($PE_{WW,CH_4,y}$).

Project emissions are calculated as follows:

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

PET_y is calculated on the basis of distance and the number of trips:

$$PET_y = \frac{\sum_k BF_{T,k,y}}{TL_y} \cdot AVD_y \cdot EF_{km,CO_2,y}$$

Average round trip distance (from and to) between biomass fuel supply sites and the project site of 100km is used for ex-ante calculation, this is conservative according to the feasibility study^{/FSR/} and on-site visit by the validators. And the carbon emission factors for large heavy load transportation truck of IPCC default value of 1.097×10^{-3} tCO₂/km under “uncontrolled” condition which is the most conservative value is used.

PEEF_y is calculated using the *Tool to Calculate Project or Leakage CO₂ Emissions from Fossil Fuel Combustion* with the following equation:

$$PEEF_y = \sum_i FC_{i,j,k} \cdot COEF_{i,y} = \sum_i (FF_{project\ plant,i,y} + FF_{project\ site,i,y}) \cdot NCV_i \cdot EF_{CO_2,FF,i}$$

Fossil fuels used for start-ups and on-site transportation of the biomass residues are considered by the project participants to calculate the emissions due to fossil fuel consumption, $FF_{project\ plant,i,y}$ is estimated as 0.5 ton of diesel and $FF_{project\ site,i,y}$ is estimated as 15 tons of diesel. The NCV (NCV_{diesel}) and the emission factor ($EF_{CO_2,FF,diesel}$) of diesel are 42.652GJ/t and 0.0741tCO₂/GJ, the PEEF_y is calculated as follows:

$$PEEF_y = (FF_{project\ plant,diesel,y} + FF_{project\ site,diesel,y}) \cdot NCV_{diesel} \cdot EF_{CO_2,FF,diesel}$$

PE_{EC,y} is calculated using *Tool to calculate baseline, project and/or leakage emissions from electricity* as follows:

$$PE_{EC,y} = EC_{PJ,y} \times EF_{Grid,y} \times (1 + TD L_y)$$

The on-site electricity consumption attributable to the project activity (EC_{PJ,y}) should include all electricity consumption that is consumed by the project activity (e.g. for mechanical treatment of the biomass), except for auxiliary electricity consumption by the project plant (e.g. for pumps, fans, etc), this is conservatively estimated as 1000MWh which is reasonable. To be clear, the auxiliary electricity consumption to operate the plant is a different conception than the on-site electricity consumption. And it is presumed as 11% of the gross electricity generated before supplied to the grid. The auxiliary consumption is therefore considered during ex-ante estimation of EGY. The grid emission factor is calculated according to the *Tool to Calculate Baseline, Project and/or Leakage Emissions from Electricity Consumption*, in which Scenario A: Electricity consumption from the grid is identified and therefore the latest approved version of the *Tool to calculate the emission factor for an electricity system* is referenced, $EF_{EL,j/k,l,y} = EF_{grid,CM,y}$. $EF_{grid,CM,y}$ is calculated in another step of the PDD as 0.9735 tCO₂e/MWh. The default value of 20% is used for average technical transmission and distribution losses in the regional grid.

Because this source has been included in the project boundary, methane emissions PE_{Biomass,CH₄,y} should be calculated by the following equation in accordance with ACM0006:

$$PE_{Biomass,CH_4,y} = EF_{CH_4,BF} \times \sum_k BF_{k,y} \cdot NCV_k$$

The default CH₄ emission factor of 30 kg/TJ and the conservativeness factor of 1.37 are used, thus a CH₄ emission factor of 41.1 kg/TJ is applied. The net calorific value of maize stalk and waste wood is estimated as 17.79 GJ/t and 15.64 GJ/t respectively which is taken from sample analysis of the project feasibility study^{/FSR/}.

PE_{Biomass,CH₄,y} is calculated as follows:

Methane emissions from waste water treatment (PE_{WW,CH₄,y}) are not included because no waste water from the treatment of biomass residues involved in the project activity degrades under anaerobic conditions.

In sum, the calculation of project emissions in the PDD is reproduced by the validators as accurate.

Emission reductions due to displacement of electricity:

According to ACM0006, emission reductions due to the displacement of electricity are calculated by multiplying the net quantity of increased electricity generated with biomass residues as a result of the project activity (EG_y) with the CO₂ baseline emission factor for the electricity displaced due to the project (EF_{electricity,y}), as follows:

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

And because the power generation capacity of the project plant is 24 MW, and is more than 15 MW, EF_{electricity,y} is equal to EF_{grid,y} which should be calculated as a combined margin (CM), following the guidance in the section "Baselines" in the "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (ACM0002).

The emission factor (EF_{grid,CM,y}) is calculated using the latest version of the "Tool to calculate the emission factor for an electricity system". It is determined ex-ante and calculated as a combined margin (CM), consisting of the weighted average factors of operating margin (EF_{OM}) and build margin (EF_{BM}).

The data source and process of calculation of OM and BM are based on data that is available at the time of submission of the CDM-PDD to the DOE for validation and derived from the *Baseline Emission Factor of Chinese Power Grids in 2008* published by Chinese DNA in Aug. 2008 and revised in Dec. 2008. All data demanded for emission factor calculation are sourced from China Energy Statistical Yearbook (2004~2006), China Electric Power Yearbook (2005~2007), and 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

EF_{OM} and EF_{BM} are calculated as 1.2783 tCO₂e/MWh and 0.6687 tCO₂e/MWh separately, and the weight factors of w_{OM}=0.5, w_{BM}=0.5 have been used and the grid emission factor EF_{grid,CM,y} is calculated as 0.9735 tCO₂e/MWh. This emission coefficient is accurate and conservative compare the official data published by Chinese DNA.

The net electrical generation of the project $EG_{project\ plant,y} = EG_y$ is estimated as 126,709MWh according to the feasibility study^{/FSR/} which is estimated considering the

gross power generation of 142,370 MWh and 11% self-consumption rate. In conclusion, the calculation of $EF_{electricity,y}$ is reproduced by the validators as accurate.

Emission reductions or increases due to displacement of heat

The PP will not claim the emission reductions from heat displacement. Therefore,

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

Baseline emissions due to natural decay or uncontrolled burning of anthropogenic sources of biomass residues:

Baseline emissions due to uncontrolled burning or decay of the biomass residues ($BE_{Biomass,y}$) is determined consistent with the most plausible baseline scenario for the use of the biomass residues (B1) and this source is included in the project boundary.

$BE_{Biomass,y}$ is determined in two Steps:

Because the project applies scenario 2 and the most likely baseline scenario for the use of the biomass residues is either that the biomass residues would be dumped or left to decay under mainly aerobic conditions (B1), hence $BF_{PJ,k,y} = BF_{k,y}$. And corresponding baseline emissions are calculated by multiplying the quantity of biomass residues that would not be used in the absence of the project activity with the net calorific value and an appropriate emission factor, as follows:

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

In accordance with ACM0006, the 0.0027 tCH₄ per ton of biomass of default value for the product of NCV_k and $EF_{burning,CH_4,k,y}$ and the most conservative conservativeness factor of 0.73 are applied. In conclusion, the calculation of $BE_{Biomass,y}$ is reproduced by the validators as accurate.

Leakage:

According to ACM0006, project participants shall demonstrate that the use of the biomass residues does not result in increased fossil fuel consumption elsewhere, and option L2 is selected to demonstrate that there is an abundant surplus of the biomass residue in the region of the project activity which is not utilized.

The geographical boundary of the region is defined to cover a radius of 50km around the project activity.

The surplus of maize stalk and wood waste in the region is demonstrated^{/FSR/} to be 30.45% and 43.87% respectively larger than that are utilized, including the project plant. Therefore leakage emissions have been set to be zero, $L_y = 0$.

In conclusion, the determination of L_y is reproduced by the validators as accurate.

Emission reductions:

In sum, the emission reduction ER_y by the project activity during the year y is:

$$ER_y = ER_{heat,y} + ER_{electricity,y} + BE_{biomass,y} - PE_y - L_y = 123,858 \text{ (tCO}_2\text{e / yr)}$$

The annual GHG emission reductions over the first crediting period are estimated ex-ante as 123,858 tCO₂e.

It is confirmed by the DOE by cross-checking the whole calculation process^{/ERC/} against all referenced data sources and the requirements of applied methodology and methodological tools that:

- a) All data sources and assumptions used by the project are listed and referenced in the PDD, appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions;
- b) All documentation used by project participants as the basis for assumptions and source of data such as China Electric Power Yearbook and feasibility study report is correctly quoted and interpreted in the PDD;
- c) All values used in the PDD are considered reasonable in the context of the proposed CDM project activity;
- d) The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;
- e) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

5.2.5 Additionality Determination

Consideration of CDM in decision making (if project start before validation)

The project start date is defined as 18 June 2008 which is the date of main equipment purchase agreement^{/EPA-1/} according to the PDD. The turbine generator unit purchase contract was signed on 22 June 2008^{/EPA-2/}, and the construction contract^{/PCC/} was signed on 30 June 2008. Therefore, 18 June 2008 is the earliest date of project construction, implementation or real action, and is in line with the "Glossary of CDM terms".

The project is an existing project activity (with a start date before 02 August 2008), and start date is prior to the date of publication of the PDD for global stakeholder consultation which is 20 Sep. 2008.

The CDM has been involved in the project investigation at a very early stage, the project developer learned that the industry is commonly in need of additional financial incentives besides the national policy to encourage renewable energy, and many other biomass based power plants have applied CDM to make the financial indicators exceed the industrial benchmark. Academic research papers which conclude that biomass based power industry faces financial and technological barriers have been referenced by the project developer.

Based on the investigation and in-depth understanding of the industry, the project developer decided to initiate the project together with CDM application on 20th Sep. 2007. In the board meeting, the project was estimated as 2*12MW which can produce 127,000MWh of on-grid electricity and 909,200GJ of heat supply, and therefore can create about 220,000 tCO₂e of emission reductions^{/CMD-2/}.

Soon after the CDM decision, the project developer contracted CDM consulting service in Oct. 2007^{/CDA/}, and signed Emission Reduction Purchase Agreement^{/ERPA/} on 22 Jan. 2008 with Goldman Sachs International.

The feasibility study report^{/FSR/} of the project was finalized on 3 June 2008, in which the project design is fixed as 24MW (two 75t/h biomass boilers and two 12MW turbine generator units), and the total static investment is 187.29 million CNY. The project is designed to supply 126,709MWh of electricity to the grid and 909,200 GJ of district heat. Based on this data the feasibility study report^{/FSR/} calculated the project IRR (after tax) with 5.98% excluding CDM revenue which is lower than the benchmark of 8% as indicated in the *Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects*. The project IRR, the FIRR after tax including CDM revenue is 17.70%. All the key parameters of the project design and financial analysis are largely consistent with the estimation made by the project developer. The project was approved by Henan Development and Reform Commission in Aug. 2008.

The DOE confirms that project participant's prior consideration of the CDM through document reviews and satisfy following requirements of Guidance on the Demonstration and Assessment of Prior Consideration of the CDM (EB49, Annex 22):

- The decision by the Board of Directors as evidence indicates the awareness of the CDM prior to the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project.
- Evidences such as the CDM development agreement and the ERPA indicate that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation.

Application of methodology / methodological tools

The additionality of the project activity was demonstrated and assessed using the latest version of the "Combined tool to identify the baseline scenario and demonstrate additionality" Version 02.2 according to applied methodology ACM0006.

Alternatives

The PDD contains a complete list of all realistic alternatives to the project scenario. In applying Step 1 of the *Combined tool to identify the baseline scenario and demonstrate additionality*, realistic and credible alternatives should be separately determined regarding:

- How **power** would be generated in the absence of the CDM project activity;
- In case of cogeneration projects: how the **heat** would be generated in the absence of the project activity.
- What would happen to the **biomass residues** in the absence of the project activity;

According to ACM0006, for power generation, 11 plausible alternatives have been identified for the project; for heat generation, 10 realistic and credible alternative(s)

have been identified, and 8 credible alternatives have been identified for the use of biomass residues. The DOE considers the list of alternatives to be complete.

The DOE assessed the list of alternatives given in the PDD and ensures that:

- (a) The list of alternatives includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity;
- (b) The list contains all plausible alternatives that the DOE, on the basis of its local and sectoral knowledge, considers to be viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity;
- (c) The identified plausible alternatives comply with all applicable and enforced legislation.

Investment analysis

The step 3 of the latest version of the *Combined tool to identify the baseline scenario and demonstrate additionality*, Version 02.2 was applied in the assessment.

According to the requirements of the tool^{/CT/}, the Step serves to determine which of the alternative scenarios in the short list remaining after Step 2 is the most economically or financially attractive. For this purpose, an investment comparison analysis is conducted for the remaining alternative scenarios after Step 2. If the investment analysis is conclusive, the economically or financially most attractive alternative scenario is considered as the baseline scenario. The financial indicator, such as IRR, most suitable for the project type and decision-making context should be identified. Calculate the suitable financial indicator for all alternative scenarios remaining after Step 2. Include a sensitivity analysis to assess whether the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions.

The combinations remaining after Step 2 are: (P1, H1, B4) and (P4, H6, B1). The scenario of (P1, H1, B4) stands for the proposed project activity not undertaken as a CDM project activity, and the scenario of (P4, H6, B1) is the status-quo situation in the absence of the project activity. The financial indicator most suitable for the project type and decision-making context is identified as project IRR (after tax) which is consistent with the type of benchmark.

The alternative of status-quo situation in the absence of the project activity is the supply of electricity from the grid which is not to be considered an investment, thus benchmark approach is considered appropriate. The 8% of benchmark selected is derived from *Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects* issued by State Power Corporation, it is valid since 2002 and widely used in project economic evaluation in power industry in China.

The project IRR (after tax) is 5.98% without CDM revenue, lower than the benchmark of 8%. Therefore the CDM project activity cannot be considered as financially attractive.

Five parameters are selected for sensitivity analysis: static total investment, O&M costs, operating hours, electricity price, and heat price.

- Static total investment is assessed as reasonable and conservative by compare the project with projects using similar technology in China^{/DPI/}. It is not likely to decrease by 13% considering the increasing labour and material cost in recent years in China.
- O&M costs have great impact on the IRR and are mainly depending on the fuel cost (biomass purchase). According to the study of past trend (2005~2008) made by local government^{/BSR-2/}, the fuel price is very likely to increase. And considering the increasing material price and labour cost in China, it is not likely to reduce O&M cost;
- Operating hours (power load factor) affect both power/heat generation and O&M cost (mainly fuel cost), the expected value (5,932 hours/year at full work load) is already higher than the average level of thermal power plants in the province (Henan) (5,331 hours/year, according to China Electric Power Yearbook 2007 and 5,125 hour/year, according to China Electric Power Yearbook 2008). It is reasonable and conservative considering the higher uncertainty of fuel supply and immature technology compared to coal based power plants, therefore it is unlikely that the full load operation hours will increase by 11% to 6,585 hours/year.
- Electricity tariff of the project has been regulated by NDRC^{/PMP/} as bus-bar on grid tariff of coal fired power plants in Henan Province plus subsidy of 0.25 CNY/kWh for biomass fired power plants for the first 15 years of operation, this is unlikely to get an increased tariff for the project under the policy framework in China. For the time after 15-year operation, the electricity tariff has to be increased by more than 70% compared to the present level so that the IRR can reach the benchmark, this is unlikely to happen because of the past trend shows that accumulated increase rate of electricity tariff can not reach 70% in 15 years.
- Heat price of the project is derived from local Development and Reform Commission, this price is assessed by local price bureau based on local information of heat supply and market situation. Based on local and sectoral knowledge, the validators confirm that the price is convincing and reliable as an input value at the time when the investment decision was made, and it will be approved by local government and is not allowed to increase dramatically under the policy framework in China, this has also confirmed by local government official in form of interview^{/IM03/}. In conclusion, it is not likely to increase by 12% for the IRR to cross the benchmark.

As to the accuracy of financial calculations carried out for any investment analysis, the DOE have:

- a) Conducted a thorough assessment of all parameters and assumptions used in calculating the IRR, and the accuracy and suitability of these parameters are summarized in **Annex 3** using the available evidences and expertise in relevant accounting practices;
- b) Cross-checked the parameters against third-party or publicly available sources, such as governmental statistics and industry yearbook;

- c) Reviewed the feasibility study reports and necessary documents related to the proposed CDM project activity and the project participants;
- d) Assessed the correctness of computations carried out and documented by the project participants by reproducing the IRR calculation in accordance with industrial/local regulations;
- e) Assessed the sensitivity analysis by the project participants and summarized in **Annex 3** to determine under what conditions variations in the result would occur, and the likelihood of these conditions.

The DOE confirm the suitability of any benchmark applied in the investment analysis in that:

- a) IRR was identified as the financial/economic indicator which is suitable for the project type and decision context;
- b) It is ensured that any risk premiums applied in determining the benchmark reflect the risks associated with the project type or activity;
- c) It is reasonable to assume that no investment would be made at a rate of return lower than the benchmark, and the same benchmark is widely applied in electric power industry of China.

Since the project participants rely on values from Feasibility Study Report (FSR) which has been approved by Henan Development and Reform Commission, the DOE ensure that:

- a) The FSR has been the basis of the decision to proceed with the investment in the project, i.e. that the finalization of the FSR^{/FSR/} (3 June 2008) and the investment decision^{/EPA-1/} (18 June 2008) are within the same month, and the gap is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed;
- b) The values used in the PDD and IRR calculation spreadsheet are fully consistent with the FSR;
- c) The input values from the FSR can be confirmed as valid and applicable at the time of the investment decision by cross-checking on the basis of specific local and sectoral expertise, all relevant information are summarized in **Annex 3**.

Furthermore, TÜV NORD compared the proposed project with registered similar projects in China. The result is shown in table below.

Table 5-2: Information of registered CDM projects in China applied ACM0006 and the proposed project^{/unfccc/}

No.	Ref. No.	Project title	Province	Installed capacity (MW)	Technology of the boiler	Operating hours (h)	Auxiliary consumption rate	Biomass price (CNY/ton)	Biomass Types	Data source of biomass price and year
1	778	Hebei Jinzhou 24MW Straw-fired Power Project	Hebei	24.0	Two 75 t/h vibration grate stoker boilers with medium temperature and medium pressure, domestic manufacture	5500	-	190	Corn and wheat straw	FSR, before 2006-03-18
2	811	Shandong Yucheng Xinyuan Biomass Heat & Power Plant Project ("Yucheng Biomass CHP")	Shandong	15.0	Two 75 t/h CFB boilers with medium temperature and medium pressure, domestic manufacture	6000	21%	-	Xylose residue and furfural residue	-
3	825	Henan Luyi 25MW Biomass Cogeneration Project	Henan	25.0	Two 80t/h high temperature and high pressure boilers,	5500	12%	209	Wheat, maize and cotton straws	FSR, before 2006-05-08

					technology introduced from Denmark BWE					
4	819	Zhongjieneng Suqian 2*12MW Biomass Direct Burning Power Plant Project	Jiangsu	24.0	Two 75 t/h vibrating chain type middle temperature and middle pressure CFB boilers, domestic manufacture	6500	15%	300	Wheat and paddy rice straws	FSR, before 2005-12-18
5	820	Zhongjieneng Jurong 2*12MW Biomass Direct Burning Power Plant Project	Jiangsu	24.0	Two 75 t/h vibrating chain type middle temperature and middle pressure CFB boilers, domestic manufacture	6500	15%	300	Residues of paddy rice, rapeseed, wheat and corn	FSR, before 2005-12-20
6	1032	Shandong Shanxian 1*25MW Biomass Power Plant Project	Shandong	25.0	One 130 t/h vibrating chain type high temperature and high pressure boiler, introduced from Denmark BWE	6000	15%	300	Cotton, wheat, paddy rice and maize straw	-

7	1263	Shandong Wudi Biomass Generation Project	Shandong	24.0	Two 75 t/h medium temperature and medium pressure boilers, domestic manufacture	-	-	200	Cotton straw	Straw supply agreement, 2006-03-10
8	1293	Heilongjiang Tanguan Biomass Cogeneration Project	Heilongjiang	24.0	Two 75 t/h medium temperature and medium pressure boilers, domestic manufacture	-	-	150	Maize straw	Straw purchase contract, 2007-03
9	1375	Shandong Gaotang 30MW Biomass Power Generation Project	Shandong	30.0	One 130t/h water-cooling librated boiler with high temperature and high pressure, introduced from Denmark BWE	5500	12%	280	Cotton stalk	Purchase contract with farmers, 2006-11
10	1366	Biomass generation project, in Sheyang county, Jiangsu province, P.R. China	Jiangsu	25.0	One 130t/h water-cooling librated boiler with high temperature	5500	8%	240	Cotton straw	FSR, before 2006-08-10

					and high pressure, introduced from Denmark BWE					
11	1546	Straw generation project in Wei county Hebei province	Hebei	25.0	One 130t/h water-cooling librated boiler with high temperature and high pressure, introduced from Denmark BWE	5500	8%	208.3	Cotton straw	Straw purchase agreement, before 2007-01-31
12	2230	Jiangsu Rudong Biomass Power Generation Project	Jiangsu	25.0	One 110t/h high-temperature high-pressure straw-fired grate-type boiler, domestic manufacture	6975	10%	258.75	Rice, wheat and cotton straw	Supplemental FSR, 2006-08
13	2161	Straw-fired Power Generation Project in Chuzhou District, Huaian City, Jiangsu Province	Jiangsu	33.0	Two 75t/h middle temperature middle pressure straw biomass combustion boilers, domestic	6000	16%	290	Straw from wheat and paddy rice	FSR, 2006-07

					manufacture					
14	2440	Anhui Anqing 30MW Biomass Power Generation Project	Anhui	30.0	Two 75t/h middle-temperature middle-pressure vibrating chain boilers, domestic manufacture	6500	10%	248	paddy stalk	FSR, 2006-11
15	1892	Jiangsu Longyuan Donghai Biomass Power Project	Jiangsu	24.0	Two 75t/h middle temperature and middle pressure vibrating water cooled grate boilers, domestic manufacture	6000	12%	220	Wheat straw, rice straw	PDR, 2006-11
16	2561	Heilongjiang Wangkui 50MW Biomass Cogeneration Project	Heilongjiang	50.0	Two 130t/h high temperature and high pressure boilers, introduced from Denmark BWE	-	-	-	Maize straw	-

17	2563	Jilin Liaoyuan 50MW Level Biomass Cogeneration Project	Jilin	50.0	Two 130t/h high temperature and high pressure boilers, introduced from Denmark BWE	-	-	-	Maize straw	-
		The proposed project	Henan	24.0	Two 75 t/h middle temperature and middle pressure boilers	5932	11%	310	maize stalk and waste wood	FSR, 2008-06

Operating hours

Among these registered biomass power plants applying the methodology ACM0006 in China, the operating hours range within 5500 hours and 6500 hours per year (i.e., five projects with 5500 hours, four projects with 6000 hours and three with 6500 hours). The proposed project with 5932 hours fits the range and is reasonable compared to other projects as well as the thermal power plants.

It is noticed that only PA2230 assumes a quite higher operating hours. By using the generation unit with high temperature and high pressure compared to the medium temperature and medium pressure (i.e., the proposed project), it will achieve higher boiler efficiency and higher thermal efficiency of steam turbine and therefore better performance on operating hours.

Furthermore, as admitted in the validation report of PA2230^{/PA2230/}, page 16, first passage: "The project owner and the designing institute were facing lack of experience in developing such projects. As a result, during the feasibility study phase of the project, the annual operating hours of the project were, to some extent, overestimated. This can be further verified through the actual operation status provided by the project owner."

Meanwhile, according to the electricity sales invoices^{/INV-1/} provided by the project owner, the equivalent annual operating hours (auxiliary electricity consumption assumed as 11%) is about 5430 h, which is about 8.5% lower than the assumption (5932 h) used for investment analysis and decision. It further consolidates the conservativeness of the assumption on annual operating hours used for investment analysis.

Net electricity supplied to the grid and auxiliary consumption

Among the projects listed in Table 5-2, the auxiliary electricity consumption rate varies within 8% and 21%, with an average of 12.9%. The rate of the proposed project is assumed as 11% which is below the average rate. It is also found in the survey conducted by national authorities^{/aecr/} (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%, much higher than thermal power plants. Thus, the auxiliary consumption rate used in the proposed project is considered reasonable.

Since the installed capacity of 24 MW is validated by the equipment purchase contract^{/EPA/}, annual operating hours of 5932 h and the auxiliary consumption rate of 11% are all verified and cross-checked by the validation team, the net electricity supplied to the grid of 126,709 MWh/year and the auxiliary consumption of 11% can be confirmed to be appropriate.

Heat supply to recipients

The project design is based on FSR. The FSR designed the co-generation plant with regard to the heat demand of seven companies within the vicinity of the project activity. The FSR provides by Table 3.2-1 list of each company and their steam demand. According to this the heat demand is 909,200 GJ per year. DOE validated the seven heat supply agreements. As the steam has to be provided 0.98Mpa and 205°C as per FSR page 23 an extraction turbine is used. The corresponding steam will be extracted from the turbine between two stages (different row of blades) to satisfy this demand. This means that the extracted amount of steam is not available for downstream turbine stages to generate electricity. This results in the fact that the higher the steam extraction the lower the remaining mass flow in the downstream turbine stages and therefore subsequently results in lower electricity generation. The prices of electricity is 0.586 CNY/kWh or 162.78 CNY/GJ ($0.586 \text{ CNY/kWh} \times 1\text{h}/3600\text{s} \times 1000\text{k/M} \times 1000\text{M/G} \times \text{Ws/J}$) and the price of heat 29.7 CNY/GJ. From this it is obvious if more steam is extracted to satisfy a higher demand, either for the seven stated recipients or other or further recipients, less power is generated which could be sold. Taking the conversion efficiency of the turbine into account (33.4%) the price for electricity is about 1.8 times higher than that of steam ($162.78 \times 33.4\% / 29.7 = 5.48$) to provide more steam would result in lower total revenue for the project activity. Therefore the DOE considers the design as appropriate and potential revenue for potential additional heat users as sufficiently addressed.

Biomass price

The biomass price listed in Table 5-2 ranges within 150 CNY/ton and 300 CNY/ton. And the proposed project used a little higher price as 310 CNY/ton for investment analysis. Whereas the biomass price is strongly affected by different regions, types and years, it should be noted that the proposed project cannot be directly compared with others.

The biomass price of the proposed project sourced from the FSR is based on solid field survey and reasonable prediction.

For maize stalk

The price for standard coal (29.271 GJ/t) is about 600 CNY/ton (at the time of FSR completion) while the NCV of tested maize stalk sample is 17.79 GJ/t. Considering the NCV factor as well as collection, transportation and storage cost, the price of maize stalk should be no less than 300 CNY/ton theoretically. Meanwhile, the purchase price of wheat stalk for paper production is about 350 CNY/ton (at the time of FSR completion) as reference. As the price of maize stalk is lower than that of wheat stalk, the maize stalk price of the proposed project is determined as 320 CNY/ton.^{/FSR/}

For wood waste

The tested NCV is 15.64 GJ/t for wood waste. Meanwhile, the purchase price of wood waste for plywood production is about 250 CNY/ton (at the time of FSR completion) as reference. Further considering the cost of collection, transportation and storage, the wood waste price of the proposed project is determined as 300 CNY/ton.^{/FSR/}

As maize stalk and waste wood will be used as biomass fuel in the project with equal amount^{/FSR/}, the biomass price used for investment analysis is averaged as 310 CNY/ton.

As the coal price keeps rising in recent year in China, the biomass price also followed the same trend as observed (150 CNY/t in 2005, 200 CNY/t in 2006, 300 CNY/t in 2007) in local area^{/BSR-2/}. This figure is in line with information on the National Development and Reform Commission's (NDRC) website about biomass residual price increasing trend^{/brp/}.

The validation team further checked the biomass residue purchase invoices in Jan 2010^{/INV-2/}. They show that the maize stalk price was 320 CNY/t which is the same as the estimation in FSR and PDD, while the wood waste price was 350 CNY/t which is about 17% higher than the estimation. Therefore, the validation team can verify that the estimated biomass price was determined conservatively in the FSR and investment 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.

According to the FSR of the project, the geographical boundary of the region is defined to cover a radius of 50 km around the project activity. The surplus of maize stalk and waste wood available in the region is demonstrated to be 30.45% and 43.87% respectively larger than the quantity of biomass residues maize stalk and waste wood that are utilized in the region^{/FSR/}, including the project plant. It shows that the supply of biomass residues is far more than demanded and the surplus of both biomass residue types utilized in this project activity is with 30.45% and 43.87% also higher than the required 25% as per methodology. 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 technology of large-scale biomass power generation project is still in the stage of research and project demonstration in China. And the first biomass power generation project in China started operation on 2006-12-01^{/fbpgp/}. Before the implementation of the proposed project, there was no biomass power plant in the local areas to utilize local biomass resource. Therefore, it is reasonable to assume that local biomass

residues would have been left unused in the baseline in the absence of the proposed project.

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^{/IM01/} and local government authority^{/IM03/}. 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, transportation and storage.

As above analysis, the biomass price assumed in the FSR is based on:

- i) intrinsic value as fuel,
- ii) reference price realized in other existed demand (i.e., raw material for paper and plywood production) and
- iii) reasonable cost of collection, transportation and storage.

By further cross-checking the purchase price from actual operation^{/INV-2/}, the purchasing price of the biomass residue assumed in the FSR and investment analysis is confirmed to be reasonable and not contradicted with the baseline scenario of biomass residue.

For more details of the assessment of financial parameters used in investment analysis, please refer to **Annex 3**.

Barrier analysis

Barrier analysis has not been used to demonstrate the additionality of the proposed CDM project activity.

Common practice analysis

The DOE confirm that the proposed CDM project activity is not common practice by the following:

- a) Assessed that the geographical scope (e.g. the defined region of Henan Province) of the common practice analysis is appropriate for the assessment of common practice related to the project activity's technology or industry type. Since a province other than the entire host country is chosen, the DOE assessed the explanation why this region is more appropriate **because of** two reasons: **1**, biomass resources vary greatly in different regions of China; **2**, province is the second administrative level of China after central government and is authorized to execute administrative examination and approval for construction projects considering local regulations^{/gov/};

- b) There are only five operating biomass power projects in Henan Province according to notice issued by NDRC^{/NRETS/}, all of them have applied CDM according to CDM Pipeline^{/cd4cdm/}. In conclusion, no similar activity other than CDM activities to the proposed project activity is identified.

Summary

The DOE assessed and verified the reliability and credibility of all data, rationales, assumptions, justifications and documentation provided by project participants to support the demonstration of additionality by critically assessing the presented evidences using local knowledge and sectoral and financial expertise.

All steps taken and sources of information used are described in sections above by cross-checking the information contained in the PDD on the justification of additionality of the project activity.

In conclusion, the proposed CDM project activity is assessed as additional

5.2.6 Monitoring Methodology

The monitoring plan of the proposed CDM project activity is based on and in compliance with the applied monitoring methodology ACM0006 "Consolidated methodology electricity generation from biomass residues" Version 10.

5.2.7 Monitoring Plan

The DOE applied a two-step process to assessing compliance with the requirements of monitoring plan, as follows:

- a) Compliance of the monitoring plan with the approved methodology:
- (i) Identified the list of parameters required by the selected approved methodology by means of document review;
 - (ii) Confirm that the monitoring plan contains all necessary parameters, that they are clearly described and that the means of monitoring described in the plan complies with the requirements of the applied methodology ACM0006;
- b) Implementation of the plan:
- (i) The monitoring arrangements described in the monitoring plan are feasible within the project design;
 - (ii) The means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified.

As the most likely baseline scenario for biomass residues is scenario B1, the biomass residues would in the absence of the PA be dumped or left to decay under mainly aerobic conditions, project participants assess as part of the monitoring the supply situation for the types of biomass residues used in the project plant. The PA utilizes maize stalk and waste wood. The monitoring plan contains the monitoring of

biomass types maize stalk and waste wood, their quantities, NCVs and moisture content.

The assessment conducted by the DOE is by means of review of the documented procedures, interviews with relevant personnel, project plans and physical inspections of the proposed CDM project activity site.

5.2.8 Project Management Planning

The operational and management structure that the project operator will implement in order to monitor emission reductions was described in the PDD. It clearly indicates the responsibilities for and institutional arrangements for data collection and archiving.

5.2.9 Crediting Period

The project activity will use a renewable crediting period and the length of the first crediting period is 7 years according to the PDD.

The starting date of the 1st renewable crediting period of the proposed CDM project is 01 July 2010 or the date of registration, whichever is later. This is assessed as appropriate.

5.2.10 Environmental Impacts

The project participants have undertaken an analysis of environmental impacts and an environmental impact assessment in accordance with procedures which is required by the host Party of China. Summarized conclusion of the Environmental Impact Assessment Report is described in the PDD.

Project participants have submitted to the DOE documentation on the analysis of the environmental impacts of the project activity^{/EIA/}, there's no transboundary impact and no impacts are considered significant by the project participants or the host Party. The EIA has been approved^{/AEIA/} by Environmental Protection Bureau of Henan Province on 12 June 2008.

5.2.11 Comments by Local Stakeholders

Local stakeholders have been invited by the PPs to comment on the proposed CDM project activity in March 2008 which is prior to the publication of the PDD on the UNFCCC website. Brief description of how comments by local stakeholders have been invited and compiled was presented in the PDD.

The DOE confirm by means of document review and interviews with local stakeholders that:

- a) Comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity have been invited, the representatives of local government and residents/workers at nearest reach were surveyed in form of questionnaire;

- b) The summary of the comments received as provided in the PDD is complete^{/SCD/};
- c) No negative comment that due account need to be taken has been received.

6 VALIDATION OPINION

Xinxiang Tianjie Bio-Power Generation Co., Ltd. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project: "Henan Xinxiang 24MW Biomass based Cogeneration Project" with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords) and the relevant decisions by COP/MOP and CDM Executive Board

In the course of the pre-validation 9 Corrective Action Requests (CARs) and 10 Clarification Requests (CLs) were raised and successfully closed.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (China) and all relevant UNFCCC requirements for CDM. Project activity approval have been obtained from DNA of China vide the Letter of Approval (HCA) dated 18 Feb. 2009. LOA from DNA of UK has been issued 19 October 2009.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 123,858 tCO₂e are most likely to be achieved within the 1st renewable crediting period.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

Shanghai, 2011-07-07



LI Yong Jun
TÜV NORD JI/CDM CP
Validation Team Leader

Essen, 2011-07-07



Rainer Winter
TÜV NORD JI/CDM CP
Final Approval

7 REFERENCES

Table 7-1: Documents provided by the project participant

Reference	Document
/AEIA/	Approval of Environmental Impact Assessment, date: 12/06/2008 (Document No.: Yu Huan Shen [2008] 128#)
/AFSR/	Approval of Feasibility Study Report, date: 13/08/2008 (Document No.: Yu Fa Gai Neng Yuan [2008] 1128#)
/BPR/	Biomass Purchasing Record (samples)
/BSR/	Biomass Study Report 1. Biomass Resources Study Report, date: 20/05/2008, by People's Government of Huixian County; 2. Stalk Price Prediction Analysis Report, date: May 2008, by Development and Reform Commission of Huixian County; 3. Biomass Storage and Transportation Management Method, date: 15/05/2008, by Xinxiang Tianjie Bio-Power Generation Co., Ltd.
/CDA/	CDM Development Agreement, date: 10/10/2007
/CMD/	CDM Management decision 1. Board meeting decision dated 01/09/2007 2. Board meeting decision dated 20/09/2007
/EIA/	Environmental Impact Assessment Report, date: March 2008
/EPA/	Equipment Purchasing Agreement 1. Boiler Purchasing Contract, date: 18/06/2008 2. Turbine Generator Unit Purchasing Contract, date: 22/06/2008
/ERC/	Emission Reduction Calculation spreadsheet date: 2009-10-23 (pending) Emission Reduction Calculation spreadsheet revised after 2 nd incompleteness check, date: 2011-02-28
/ERPA/	Emission Reduction Purchase Agreement, date: 22/01/2008
/ETS/	Equipment Technological Specifications of existing boilers 1. operation statements of the 7 coal fired boilers; 2. technological specifications of the 7 coal fired boilers;
/FSR/	Feasibility Study Report, date: 03/06/2008
/HCA/	Host Country Approval, date: 18/02/2009 (pending)

Reference	Document
/HPE/	Heat price check
/HSA/	Heat supply agreements with 7 end users, date: 17/10/2007
/INV/	Invoice 1. Electricity sales invoice from Jan 2010 to Mar 2010 2. Biomass residues (maize stalk and wood waste) purchase invoice in Jan 2010
/IRR/	IRR Calculation spreadsheet <i>(pending)</i>
/LOA/	UK DNA Approval, date: 19/10/2009 <i>(pending)</i>
/MOC/	Modalities of Communication, date: 15/03/2010
/NPSB/	The Notification of Prohibition of Stalk Burning issued by local government, date: 2008-08-31 (Document No.: Wu Fa [2008] 23#)
/PCC/	Project Construction Contract, date: 30/06/2008
/PDD/	Project Design Document 1. GSP PDD, Version 03.2, date: 17/09/2008 2. Final PDD submitted for registration, Version 07, date: 23/10/2009 3. Final PDD revised after incompleteness check, Version 08, date: 08/06/2010 4. Final PDD revised after 2nd incompleteness check, Version 09, date: 2011-02-28
/PLU/	Preliminary Opinion on Land Use, date: 18/02/2008 (Document No. :Yu Guo Tu Zi Han [2008] 114#)
/SCD/	Stakeholder consultation documentation a) Meeting notice, date: 28/02/2008 b) Meeting record, date: 3 /03/2008 c) Questionnaires & Summary

Table 7-2: Background investigation and assessment documents

Reference	Document
/ACM6/	ACM0006: Consolidated methodology electricity generation from biomass residues (Version 10)

Reference	Document
/ACM2/	ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources (Version 11)
/CES/	China Energy Statistics Yearbook
/CEY/	China Electric Power Yearbook
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/CT/	Combined tool to identify the baseline scenario and demonstrate additionality (Version 02.2)
/DPI/	TÜV Nord Database of Project Information
/EEIFA/	Economic evaluation and influence factors analysis on biomass combustion for power generation, written by Huang Jintao, Wang Xinlei and Xu Tong, published on "Renewable Energy Resources", 2008, Volume 2
/EFC/	Baseline Emission Factors of Regional Grids in China 2008
/GAIA/	Guidance on the Assessment of Investment Analysis (Version 03.1)
/GCP/	UNFCCC: Guidelines for completing CDM-PDD and CDM-NM (Version 07)
/GLS/	Glossary of CDM terms
/IPCC-GP/	IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000
/IPPC-RM/	Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual
/IREA/	Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects
/KP/	Kyoto Protocol (1997)
/MA/	Decision 3/CMP. 1 (Marrakesh – Accords & Annex to decision (17/CP.7))
/NRETS/	Notice of Renewable Energy Tariff Subsidy from Oct. 2007 to June 2008 issued by NDRC, date: 2008-11-11
/PA2230/	Validation Report of Project Activity 'Jiangsu Rudong Biomass Power Generation Project' (Ref. No. 2230)

Reference	Document
/PDD-T/	Project Design Document Form (CDM PDD) - Version 03
/PMP/	Provisional Measures for the Price and Apportioned Cost Management for the Electricity Generation from Renewable Energy Resources, date: 2006-01-04 (Document No.: Fa Gai Jia Ge [2006] 7#)
/SCPN/	State Council Public Notice [2002] No.6, date: 2002-04-15 (Strictly Prohibiting the Installation of Fossil Fuel-fired Power Plant with the Capacity of 135 MW or Below)
/TEC/	Tool to calculate baseline, project and/or leakage emissions from electricity consumption (Ver. 01)
/TFC/	Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion (Ver. 02)
/TEF/	Tool to calculate the emission factor for an electricity system (Ver. 02)
/VVM/	Validation and Verification Manual (Version 01.2, Annex 1; EB 55)

Table 7-3: Websites used

Reference	Link	Organisation
/aecr/	http://www.ndrc.gov.cn/zjgx/t20071123_174054.htm	National Development and Reform Commission
/brp/	http://www.sdpc.gov.cn/zdxm/t20051229_55135.htm	National Development and Reform Commission
/cd4cdm/	www.cd4cdm.org	UNEP Riso Centre
/dna/	http://cdm.ccchina.gov.cn/english/index.asp	National Development and Reform Commission (DNA of China)
/fbpgp/	http://www.ndrc.gov.cn/zdxm/t20061206_97982.htm	National Development and Reform Commission
/gov/	http://english.gov.cn/	The Central People's Government of P. R. China
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications

Reference	Link	Organisation
/unfccc/	http://cdm.unfccc.int	UNFCCC

Table 7-4: List of interviewed persons

Reference	Mol ¹		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms	LI Yulin	Xinxiang Tianjie Bio-Power Generation Co., Ltd / Board Chairman
/IM01/	V	☒ Mr. ☐ Ms	SHANG Weihong	Xinxiang Tianjie Bio-Power Generation Co., Ltd / Chief Engineer
/IM02/	V	☐ Mr. ☒ Ms	GUO Xiaoqing	Xinxiang Tianjie Bio-Power Generation Co., Ltd / Biomass Purchase Dept., Staff
/IM02/	V	☐ Mr. ☒ Ms	Dr. JIANG Dongmei	Dept. Of Environment Sci. & Eng., Tsinghua University / Counsellor
/IM02/	V	☐ Mr. ☒ Ms.	HUANG Shanfeng	Shenzhen Lingquexian Management Consulting Co., Ltd / Project Manager
/IM03/	V	☒ Mr. ☐ Ms	SUN Jiwen	Development and Reform Commission of Huixian County / Deputy manager
/IM04/	T	☒ Mr. ☐ Ms	NIU Shuicheng	Yanguang Hongtai Bio-product Co., Ltd. / Chairman
/IM04/	T	☒ Mr. ☐ Ms	YANG Shiheng	Huixian Zhongzhou Textile Mill / General Manager
/IM04/	T	☒ Mr. ☐ Ms	LIU Guoxin	Huixian Xinyang Textile Mill / Manager
/IM04/	T	☒ Mr. ☐ Ms	LIU Zhishu	Huixian Tengyuan Textile Mill / Manager
/IM04/	T	☒ Mr. ☐ Ms	CHEN Jianguo	Huixian Hengtai Building Material Factory / General Manager

Reference	Mol ¹		Name	Organisation / Function
/IM04/	T	☒ Mr. ☐ Ms	SUN Jinwei	Huixian Huayi Building Material Factory / General Manager
/IM04/	T	☐ Mr. ☒ Ms	ZHU Suping	Huixian Hongchang Building Material Factory / General Manager

¹⁾ Means of Interview: (Telephone, E-Mail, Visit)

ANNEX

- A1:** Validation Protocol
- A2:** Assessment of Baseline Identification
- A3:** Assessment of Financial Parameters
- A4:** Assessment of Barrier analysis
- A5:** Outcome of the GSCP
- A6:** Appointment certificates of the team members

ANNEX 1: VALIDATION PROTOCOL

Table A-1: Requirements Checklist

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
A. General Description of Project Activity				
A.1. Approval <i>The written approval of the parties involved is a mandatory requirement</i>				
A.1.1. Has the project provided written approvals of all parties involved? <i>Indicate whether a letter of approval has been received, with a clear reference to the supporting documentation.</i> <i>Indicate whether this letter was provided to the DOE by the project participants or directly by the DNA</i>	At the time of the (pre-) validation the letters of approval of all involved parties are pending (China, UK).	/HCA/ /LOA/	~~CAR~~ A1	OK
A.1.2. Are the approvals issued from organisations listed as DNAs on the UNFCCC CDM website? <i>Indicate the means of validation employed to assess the authenticity</i>	The DNA of China is National Development and Reform Commission (NDRC). The DNA of UK is Ministry of Climate and Energy. Please refer to CAR A1.	/HCA/ /LOA/ /unfccc/	~~CAR~~ A1	OK
A.1.3. Do the written approvals confirm that the	Please refer to CAR A1.	/HCA/	~~CAR~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
corresponding party is a Party to the Kyoto Protocol?		/LOA/	A1	
A.1.4. Do the written approvals confirm that the participation is voluntary?	Please refer to CAR A1.	/HCA/ /LOA/	~~CAR~~ A1	OK
A.1.5. Does the written approval from the host country confirm that the project contributes to the sustainable development in the country?	Please refer to CAR A1.	/HCA/ /LOA/	~~CAR~~ A1	OK
A.1.6. Do the written approvals refer to the precise project title in the PDD submitted for registration?	Please refer to CAR A1.	/HCA/ /LOA/	~~CAR~~ A1	OK
A.1.7. Are the written approvals unconditional with regard to A.1.3 to A.1.6?	Please refer to CAR A1.	/HCA/ /LOA/	~~CAR~~ A1	OK
A.1.8. Is the information regarding the project participants listed in section A3 and in Annex 1 of the PDD internally consistent to each other?	The information regarding project participants listed in section A3 and in Annex 1 of PDD is inconsistent with each other. Hence CL A2 was raised.	/PDD/	~~CL A2~~	OK
A.1.9. Are all project participants listed in the PDD approved at least by one Party involved? <i>Indicate whether the participation of the project participant(s) has been approved by a Party to the Kyoto Protocol.</i> <i>Describe the means of validation employed to draw this conclusion.</i>	Please refer to CAR A1.	/HCA/ /LOA/	~~CAR~~ A1	OK
A.1.10. Are any other project participants approved but not listed in the PDD?	Please refer to CAR A1.	/HCA/ /LOA/	~~CAR~~ A1	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
A.2. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>				
A.2.1. Has the host country confirmed that the project assists it in achieving sustainable development? <i>Contain a statement confirming whether the letter of approval by the DNA of the host party confirmed the contribution of the project to the sustainable development of the Host Party.</i>	Please refer to CAR A1.	/HCA/ /LOA/	CAR A1	OK
A.2.2. Will the project create other environmental or social benefits than GHG emission reductions? <i>Describe the other positive aspects not related to GHG emission reduction on the environment</i>	The project will create other environmental and social benefits than GHG emission reductions such as: - reduce pollutant emissions by replacing fossil fuel combustion in the CCPG; - increase local farmers' income by purchasing, transportation and storage of biomass residues, and reduce dumping or uncontrolled burning; - ash generated from the project power plant can be used as fertilizer and promote organic farming; - offers job opportunities during the construction and operation period.	/PDD/ /IM01/ /IM03/	OK	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
A.3. PDD editorial aspects <i>The PDD used as a basis for validation shall be prepared in accordance with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website.</i>				
A.3.1. Has the latest version of the PDD form been applied?	The latest version of the CDM-PDD template (version 03) has been applied.	/PDD/ /PDD-T/	OK	OK
A.3.2. Has the PDD been duly filled in accordance with the latest guidance(s)?	The description of the project activity in A.2 which is a brief summary of A.4, and B.3 is incorrect, the PDD should be revised according to PDD Guideline Version 07. According to the PDD <i>Guideline (Version 07)</i>, the description of project technology in A.4.3 is insufficient in the following aspects: 1. the technological description of the different scenarios should include information about the equipments based on manufacturer's specifications and industry standards, e.g. load factors and efficiencies. And the monitoring equipments and their location in the systems are of particular interest. 2. technologies of equipments that exist prior to the project should be backed by documented evidences; 3. some parameters of equipments of the project described in the PDD are inconsistent with the Equipment Purchasing Agreement^{/EPA/}, e.g. efficiency of boiler and	/PDD/ /GCP/ /EPA/ /ETS/	~~GL-A2~~ CAR A3	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
	Rated Steam Flow, and some other key parameters should be provided, such as type and quantity of equipments, rated speed of turbine; Revision to the PDD is required.			
A.4. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/maintenance needs. The DOE should ensure that environmentally safe and sound technology and know-how is used.</i>				
A.4.1. Does the PDD contain a clear, accurate and complete project description? <i>The PDD shall contain a clear description of the project activity which provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation.</i> <i>Pl. consider esp. chapters A.2, A.4.2 and A.4.3 (in case of LSC PDD) for assessment.</i> <i>Describe the process undertaken to validate the accuracy and completeness of the project description.</i> <i>Contain the DOE's opinion on the accuracy and completeness of the project description.</i>	Please refer to CAR A3.	/PDD/ /EPA/ /ETS/	~~CAR~~ A3	OK
A.4.2. Is this description in accordance with the real situation or (in case of greenfield projects) is it	Please refer to CAR A3.	/PDD/ /EPA/	~~CAR~~ A3	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
most likely that the project will be implemented acc to the project description		/ETS/		
A.4.3. In case the project involves alteration of the existing installation or process, is a clear description available regarding the differences between the project and the pre-project situation? <i>Describe the steps taken to validate this issue.</i>	The project is a newly constructed biomass based cogeneration power plant and does not involve alteration of the existing installation or process, which has been confirmed by government approval and site visit by the validation team.	/PDD/ /IM01/ /AFSR/	OK	OK
A.4.4. Does the project design engineering reflect current good practices? <i>Consider the equipment specifications, literature (e.g. EU BREF papers) and professional experiences. Describe the process undertaken to assess the engineering.</i>	The project activity uses two 75t/h biomass fired boilers and 12MW turbine generator units to generate electricity and heat, both the boilers and turbine generator units are manufactured by advantageous domestic suppliers, and reflect current good practices in biomass based cogeneration technology.	/PDD/ /EPA/ /FSR/ /IM01/	OK	OK
A.4.5. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country? <i>Describe the process undertaken to assess the state of the art technology.</i>	The technology applied by the project activity is prevalent in the host country of China and doesn't belong to state of the art technology.	/PDD/ /EPA/ /FSR/ /IM01/	OK	OK
A.4.6. Does the project make provisions for meeting training and maintenance needs?	The training program has been addressed in section B.7.2 in the PDD and the validation team has confirmed the included	/PDD/ /EPA/	OK	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
<i>Describe the process undertaken to assess the maintenance and training needs.</i>	statement during the site visit interview with the technical staff.	/IM01/		
A.5. Small scale project activity <i>It is assessed whether the project qualifies as small-scale CDM project activity</i>				
A.5.1. Does the project qualify as a small scale CDM project activity as defined in decision 4 / CMP.1 annex II? <i>Describe the steps taken to validate this issue.</i>	According to the applied methodology ACM0006 Version 10, this project is a large-scale CDM project activity since its installed capacity is 24MW, thus is not small scale.	/PDD/ /ACM6/ /EPA/	N/A	N/A
A.5.2. Does the project apply one of the approved small scale categories and any methodology and tool referred therein? <i>Describe the steps taken to validate this issue. Check, if applicable the expiry dates of the applied methodology.</i>	-	-	-	-
A.5.3. Is the small scale project activity not a debundled component of a larger project activity? <i>Describe the steps taken to validate this issue. Pl refer to the Compendium of guidance on debundling (EB 36, Annex 27).</i>	-	-	-	-
B. Project Baseline, Additionality and Monitoring Plan				

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
B.1. Application of the Methodology				
B.1.1. Does the project apply an approved and applicable CDM methodology and a valid version thereof? <i>Describe the steps taken to validate this issue.</i>	The project activity applies the approved consolidated methodology ACM0006 (Version 10) which is valid until 4 Dec. 2008. The project meets all applicability criteria given in the applicability section of ACM0006. At the time of publishing the PDD for public comments (i.e. 2008-09-20 version 10 of ACM0006 was valid (from 14 Dec. 2007 to 04 Dec. 2008).	/PDD/ /ACM6/ /ACM2/ /unfccc/	OK	OK
B.1.2. Is the applied CDM methodology identical with the version available on the UNFCCC website? <i>Describe the steps taken to validate this issue.</i>	The applied CDM methodology ACM0006 (Version 10) is identical with the version available on the UNFCCC website. ACM0002 ("Consolidated methodology electricity generation from biomass residues") (Version 11) should be referred to calculate the grid emission factor.	/PDD/ /ACM6/ /ACM2/ /unfccc/	~~CL-B1~~	OK
B.1.3. Are all applicability criteria in the methodology, the applied tools or any other methodology component referred to therein fulfilled? <i>Describe for each applicability criterion listed in the selected approved methodology the steps taken to assess the information contained in the PDD.</i>	According to ACM0006 (Version 10), the methodology is applicable to biomass residue fired electricity generation project activities, including cogeneration plants. The proposed project is applicable since it is an installation of a new biomass residue fired cogeneration plant. The justification of applicability of methodology in B.2 of the PDD should be described in a transparent manner, the documented evidences (e.g. storage period, predominant fuel of proposed project) should be submitted and clearly referred to.	/PDD/ /ACM6/	~~CAR~~ B2	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
project boundary as required in the applied methodology? <i>Provide information on how the validation of the GHGs and sources has been performed either based on reviewed documented evidence or by describing what was observed/viewed during a site visit.</i>		/ACM6/		
B.2.3. In case the methodology allows to choose whether a source and/or gas is to be included, is the choice sufficiently explained and justified? <i>Confirm if the justification provided by the PPs is reasonable, based on assessment of supporting documented evidence provided by the PPs or by onsite observations.</i>	The applied methodology ACM0006 allows choosing whether the source of CH₄ due to <i>Uncontrolled burning or decay of surplus biomass residues</i> and <i>Combustion of biomass residues for electricity and/or heat generation</i> is to be included. According to ACM0006, project participants may decide to include this emission source, where case B1, B2 or B3 has been identified as the most likely baseline scenario for the former choice, and it is justified as B1 is identified as baseline scenario. And this emission source must be included if CH₄ emissions from uncontrolled burning or decay of biomass residues in the baseline scenario are included.	/PDD/ /ACM6/	OK	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
B.3. Baseline Identification <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>				
B.3.1. What possible baseline scenarios have been considered? <i>Fill in all alternatives in table A-2.</i>	According to ACM0006 (Version 10), 9 alternatives for power generation, 8 alternatives for heat generation and 8 alternatives for the use of biomass residues which are listed in the methodology have been considered. Please see detail information in Annex 2.	/PDD/ /ACM6/	OK	OK
B.3.2. Is the list of alternatives complete? <i>Describe how it was validated that all alternatives are plausible and no plausible alternative is excluded from the consideration</i>	☒ All plausible alternative scenarios listed in the approved methodology have been considered. In the course of document review and site visit, it has been validated that no other alternatives which supply comparable outputs and / or services are to be taken into consideration. Thus no plausible scenario has been omitted. ☐ The following alternative scenarios/options have been omitted. Corresponding CAR(s)/CL(s) has /have been issued	/PDD/ /ACM6/	OK	OK
B.3.3. What has been identified as the baseline scenario? <i>Describe the chosen BL scenario</i>	The justification of the exclusions of baseline alternative scenarios P5, P6, H2, H7, H8, B1, B3, B6 and B7, in step 1 of B.4 of the PDD is insufficient and some are unreasonable, more convincing justification and documented evidences are required.	/PDD/ /ACM6/	CAR B4	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
B.3.4. Has the baseline scenario been determined according to the methodology? <i>Describe how it is validated that the identification of the most plausible baseline scenario is carried out in accordance with the applied methodology and applied methodological tools. Please refer to table A-2.</i>	For details of the assessment regarding the evaluation of the baseline scenario pl. refer to table A-2. ☐ The determination has been carried out as per the applied methodology. ☒ The following CARs / CLs have been identified with respect to the selection of the baseline scenario:	/PDD/ /ACM6/	~~CAR~~ B4	OK
B.3.5. Has any plausible alternative scenario been excluded? <i>Describe how it is validated that no plausible alternative scenario has been excluded.</i>	For details of the assessment regarding the evaluation of the baseline scenario pl. refer to table A-2. ☐ No plausible baseline scenario has been excluded. ☒ The following plausible baseline scenarios have been excluded though no adequate justification has been provided for elimination. The following CARs / CLs have been issued:	/PDD/ /ACM6/	~~CAR~~ B4	OK
B.3.6. Has the baseline scenario been determined using conservative assumptions where possible? <i>Describe whether the choice of the identified baseline scenario is reasonable by validating the <u>key assumptions, calculations and rationales</u> used in the PDD. Describe whether these are <u>conservatively interpreted</u> in the PDD.</i>	☒ The baseline scenario has been determined using conservative assumptions where possible. Please refer to comments in table A-2 and sections B.3.2 to B.3.5 above. ☐ The following CARs / CLs have been issued because assumptions used in the baseline determination have been assessed to be not conservative	/PDD/ /ACM6/	~~CAR~~ B4	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
B.3.7. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations? <i>Describe whether the PP has shown that all relevant policies and circumstances have been identified and correctly considered in the PDD in accordance with the guidance by the Board. Pl. consider the guidance EB 22 annex 3 (regarding E+ and E- policies).</i>	The description of consistency with mandatory applicable laws and regulations regarding H1 is inappropriate, and the determined alternative B3 for use of biomass (the biomass residues are burnt in an uncontrolled manner without utilizing it for energy purposes) is not consistent with applied environment regulations, justification is necessary.	/PDD/ /ACM6/ /NPSB/	~~CL-B5~~	OK
B.3.8. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced? <i>Describe whether the documents and sources referred to in the PDD are correctly quoted and clearly referenced.</i>	The baseline scenario of the proposed CDM project activity is prescribed by the approved methodology ACM0006 and no further analysis is required.	/PDD/ /ACM6/	~~GAR~~ B4	OK
B.4. Additionality Determination <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>				
B.4.1. Methodology				
B.4.1.1. Did the additionality justification follow the requirements of the applied methodology and/or methodological tools? <i>Describe how it is validated that additionality justification is carried out in accordance with the applied methodology</i>	According to ACM0006 (Version 10), the additionality of the project activity shall be demonstrated and assessed using the latest version of the "Combined tool to identify the baseline scenario and demonstrate additionality" agreed by the CDM Executive Board, which is available on the UNFCCC CDM website.	/PDD/ /ACM6/ /CT/	~~CL-B1~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
<i>and/or applied methodological tools.</i>	Version 4 of Combined tool to identify the baseline scenario and demonstrate additionality is referred in the PDD; the latest version of additionality tool shall be applied.			
B.4.2. Consideration of CDM before project start				
B.4.2.1. Is the project starting date reported in accordance with the CDM glossary of terms? <i>Describe the steps taken to validate this issue.</i>	The project starting date reported is 18 June 2008 which is the earliest date on which the implementation or construction or real action of this project activity, and it is in accordance with the CDM glossary of terms.	/PDD/ /GLS/ /EPA/ /PCC/	OK	OK
B.4.2.2. In case the project start date is before commencing of validation, was the incentive from the CDM seriously considered and are details given in the PDD? <i>Describe whether the evidence to support such consideration is adequately and transparently described in the PDD.</i>	It is required to clarify that the incentive from the CDM was seriously considered in the decision to proceed with the project activity using an timeline of the proposed project activity which includes of events and actions related to project implementation and to achieve CDM registration in detail.	/PDD/ /CT/ /EPA/ /CMD/ /IM01/	CAR B6	OK
B.4.2.3. How and when was the decision to proceed with the project taken? <i>Describe the steps taken to validate the starting date.</i>	Please also refer to CAR B6.	/PDD/ /CT/ /EPA/ /GLS/ /IM01/	CAR B6	OK
B.4.2.4. Is the project start date consistent with the available evidences? <i>Describe the evidence assessed regarding the prior consideration of the CDM (if necessary). Describe whether</i>	The project start date is consistent with the available evidences such as Equipment Purchasing Agreement ^{/EPA/} .	/PDD/ /GLS/ /EPA/	OK	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
<i>the evidence to support such consideration is adequately and transparently described in the PDD.</i>		/CMD/		
B.4.2.5. Was the decision to proceed with the project taken by a person which has the authority to do so? <i>Describe the steps taken to validate this issue.</i>	The decision to proceed with the project was taken by the Board of Directors of the proposed project which has the authority to do so.	/PDD/ /CMD/ /IM01/	OK	OK
B.4.2.6. How was the CDM involved in the decision making process? <i>Describe the steps taken to validate this issue.</i>	Please refer to CAR B6.	/PDD/ /FSR/ /CMD/ /IM01/	CAR B6	OK
B.4.2.7. Can the CDM involvement in the decision assessed as serious? <i>Describe whether or not the project would have been undertaken without the incentive of the CDM.</i>	Please refer to CAR B6.	/PDD/ /FSR/ /CMD/ /IM01/	CAR B6	OK
B.4.3. Identification of alternatives Step 1 (in case of SSC projects pl. skip steps 1 and 2)				
B.4.3.1. Have all realistic alternatives been identified to the project? <i>Describe whether the list of alternatives is complete. Describe how it is validated that the alternatives are realistic.</i>	Yes, a complete list of four credible alternatives has been identified to the project activity in the PDD according to ACM0006.	/PDD/ /ACM6/	OK	OK
B.4.3.2. Contains the list of alternatives at least the status-quo situation and the project not undertaken as a CDM project?	Yes, the list of alternatives contains the status-quo situation and the project not undertaken as a CDM project. The status-quo situation to the proposed project activity is	/PDD/ /ACM6/	OK	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
<i>Describe the steps taken to validate this issue.</i>	assessed as supply equivalent amount of electricity by the grid, supply heat by coal fired boilers and the biomass residues would be dumped or left to decay under mainly aerobic conditions.			
B.4.3.3. Do all identified alternatives comply with applicable regulation? <i>Describe the steps taken to validate this issue. Refer to the regulations.</i>	Please refer to CL B5.	/PDD/ /FSR/ /gov/	CL-B5	OK
B.4.4. Investment analysis Step 2 <i>In case the investment analysis as per step 2 is chosen to justify the additionality Annex 2 "Assessment of Financial Parameters" has to be used to provide additional details of the calculation parameters..</i>				
B.4.4.1. Is an appropriate analysis method chosen for the project (simple cost analysis, investment comparison analysis or benchmark analysis)? <i>Describe why the selected analysis method is appropriate under consideration of potential revenues and costs, potential project alternatives and potential available benchmark values.</i>	Benchmark analysis is selected and deemed to be appropriate, simple cost analysis is not applicable because the project activity generates electricity sales revenues other than CDM related economic benefits. The alternative to the project activity is the supply of electricity from a grid which is not to be considered an investment, thus benchmark approach is considered appropriate.	/PDD/	OK	OK
B.4.4.2. Is a clear, viewable and unprotected Excel spreadsheet available for the investment calculation? <i>Describe the steps taken to validate this issue.</i>	There're some problems exist in assessment of additionality: 1. the investment analysis part should be included in B.5 of the PDD; 2. there are several key parameters used for IRR calculation ^{/IRR/} such as heat price and its VAT rate, and	/PDD/ /IRR/ /FSR/ /GAIA/	~~CAR~~ B7	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
	the result of IRR are inconsistent with that of FSR, and some key parameters are not listed in the PDD, such as the period of financial analysis; 3. explanation for the possibility that each variables fluctuate in sensitivity analysis is insufficient, e.g. the influence of O&M cost and heat price were not justified 4. how similar projects are defined should be more clearly explained;			
B.4.4.3. Does the period chosen for the investment analysis reflect the technical lifetime of the project activity or in case a shorter period is chosen, is the fair value of the project activity's assets at the end of the investment analysis period (as a cash inflow) included? <i>Describe how the technical lifetime / period chosen for calculating financial parameter(s) is reviewed and which documents were utilised in the course of review. Describe furthermore the approach used to check the inclusion of a potential fair value.</i>	Yes, the period chosen for the investment analysis is 20 years and it reflects the technical lifetime of the project activity^{/FSR/}. The project IRR calculations reflects the period of expected operation of the underlying project activity (technical lifetime) and therefore fair value is not applicable to the project. Documents such as FSR, equipment technical agreement^{/EPA/} and IRR calculation were utilised in the course of review and are assessed appropriate regarding the 20 years of assessment period.	/PDD/ /GAIA/ /IRR/ /FSR/	OK	OK
B.4.4.4. Is the fair value calculated in accordance with local accounting regulations (where available) or international best practice? <i>State the accounting regulations applied for calculating the fair value and describe why these are applicable under the project specific circumstances. Describe potential mismatches between regulations and the approach applied</i>	The project IRR calculations reflects the period of expected operation of the underlying project activity (technical lifetime) and therefore neither fair value nor book value need to be considered to the project.	/PDD/ /GAIA/ /IRR/	OK	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
<i>for calculating the fair value.</i>				
B.4.4.5. Is the book value as well as the expectation of the potential profit or loss included in the fair value calculation?	The project IRR calculations reflects the period of expected operation of the underlying project activity (technical lifetime) and therefore neither fair value nor book value need to be considered to the project.	/PDD/ /GAIA/ /IRR/	OK	OK
B.4.4.6. Are depreciation and other non-cash related items added back to net profits for the purpose to calculate the financial indicator?	The depreciation has been added back to net profits in the last year for the purpose to calculate the financial indicator.	/PDD/ /IRR/ /FSR/	OK	OK
B.4.4.7. Is taxation excluded in the investment analysis or is the benchmark intended for post tax comparisons?	The benchmark is a post tax indicator, this is stipulated in the applied Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects ^{/IREA/} .	/PDD/ /IREA/	OK	OK
B.4.4.8. Were the input values used in the investment analysis valid and applicable at the time of the investment decision?	Refer to CAR B7.	/PDD/ /IRR/ /GAIA/	~~CAR~~ B7	OK
B.4.4.9. In case of project IRR: Are the costs of financing expenditures (loan repayments and interests) excluded from the calculation of project IRR?	All financing expenditures such as loan repayments and interests are excluded from the cash out of project IRR calculation. This is checked by reproducing the IRR.	/PDD/ /IRR/	OK	OK
B.4.4.10. In case of equity IRR: Is the part of the investment costs, which is financed by equity considered as net cash outflow and is the part financed by debt excluded in net cash outflow?	Not applicable since project IRR rather than equity IRR is selected by the proposed project.	/PDD/	N/A	N/A

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
B.4.4.11. Is the type of benchmark chosen appropriate for the type of IRR calculated (e.g. local commercial lending rates or weighted average costs of capital for project IRR; required/expected returns on equity for equity IRR)?	The type of benchmark chosen is project IRR (post tax), it is appropriate for the type of IRR calculated.	/PDD/ /IRR/ /IREA/	OK	OK
B.4.4.12. Is the benchmark value suitable for the project activity?	The benchmark is suitable for the project as the project is a cogeneration project which belongs to power industry.	/PDD/ /IRR/	OK	OK
B.4.4.13. In case of internal benchmark: Is it ensured that the project cannot be developed by other developers than the PP?	Internal company benchmark is not applied in the project activity.	/PDD/	N/A	N/A
B.4.4.14. Was the benchmark consistently used in the past for similar projects with similar risks?	The applied IRR benchmark of 8% is widely used in power industry of China.	/PDD/ /IREA/	OK	OK
B.4.4.15. Was sensitivity analysis appropriately done by the project participants? Pl. assess and determine under what conditions variations in the result would occur and likelihood of these conditions.	Please refer to CAR B7.	/PDD/ /GAIA/	~~CAR~~ B7	OK
B.4.5. Barrier analysis Step 3 or SSC additionality assessment				
B.4.5.1. Are there any barriers given which have a clear and definable impact on the profitability of the project?	The barrier analysis in step 2 of B.4 of the PDD ("investment barrier" and "barrier due to stalk purchase") is unconvincing and inappropriate, such as the claimed "first of its kind", and documented evidences should be provided to demonstrate	/PDD/ /CT/	~~CAR~~ B8	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
	the alternative scenarios are prevented by the identified barriers.			
B.4.5.2. How is it justified and evidenced that the barriers given in the PDD are real?	Please refer to CAR B8.	/PDD/ /CT/	~~CAR~~ B8	OK
B.4.5.3. How is it justified that one or a set of real barriers prevent(s) the implementation of the project activity?	Please refer to CAR B8.	/PDD/ /CT/	~~CAR~~ B8	OK
B.4.6. Common practice analysis Step 4 (in case of SSC projects skip this step)				
B.4.6.1. Is the defined region for the common practice analysis appropriate for the technology/industry type?	Refer to CAR B7.	/PDD/ /CT/	~~CAR~~ B7	OK
B.4.6.2. To what extent similar projects have been undertaken in the relevant region?	Refer to CAR B7.	/PDD/ /CT/	~~CAR~~ B7	OK
B.4.6.3. In case similar projects are identified, are there any key differences between the proposed project and existing or ongoing projects and what kind of differences are observed?	Refer to CAR B7.	/PDD/ /CT/	~~CAR~~ B7	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
B.5. Ex-Ante Calculation of GHG Emission Reductions <i>It is assessed whether the ex-ante calculations of project emissions, baseline emissions, leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified. Furthermore calculation of emission reductions shall be assessed.</i>				
B.5.1. Are the equations applied correctly according to the applied approved methodology? <i>Describe clearly the steps taken to assess whether the methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions.</i>	☐ The equations applied for calculation are correctly applied according to the approved methodology. ☒ The following mistakes have been identified in this context: Several issues have been raised w.r.t the explanation of methodological choices and emission reduction calculation in B.6 of the PDD: 1. it is required to justify how Option B was chosen to calculate $COEF_{i,y}$ in on-site consumption of fossil fuels; 2. $EF_{grid,y}$ should be clearly explained in 1(c) of B.6.1 (CO₂ emission from electricity consumption) in detail; 3. how $EF_{CH_4,BF}$ and its conservativeness factor are calculated should be more detailed explained; 4. CCPG has a net import of 3,028,950MWh from Northwest China Power Grid in 2006, this was not included in calculation of $EF_{electricity,y}$; 5. why simple OM was selected to calculate the operation margin should be justified, and equation (10) should not	/PDD/ /ERC/ /ACM6/ /TEF/	CAR B9	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
	be included in the OM calculation; 6. deviation applied in BM calculation should be clearly explained and referred to since it is used in the BM calculation; 7. $\epsilon_{BL,boiler}$ and parameters are available at validation should be included in B.6.2; 8. the emission reduction process in B.6.3 of the PDD is not transparent, it must be in accordance with the methodological choices presented in B.6.1 and all necessary parameters either monitored or not; The applied methodology and related tools should be followed regarding the problems listed above, and the emission reduction calculation should be explained as transparent as possible so that the process and the result can be reproduced.			
B.5.2. In case the methodology allows for different methodological choices, are the equations applied properly justified and have they been used reflecting the other methodological choices (i.e. baseline identification)? <i>Describe whether proper justification has been provided (based on the choice of the baseline scenario, context of the project activity and other evidence provided) and whether the correct equations have been used reflecting the relevant methodological choices.</i>	Refer to CAR B9.	/PDD/ /ERC/ /ACM6/	~~CAR~~ B9	OK
B.5.3. Have conservative assumptions been used when calculating the project emissions?	Refer to CAR B9.	/PDD/ /ERC/	~~CAR~~ B9	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
<i>Describe clearly the steps taken to assess whether all the assumptions and data used by the PP are listed in the PDD including references and sources and are conservatively interpreted in the PDD.</i>		/ACM6/		
B.5.4. Are all data and parameters which remain fixed throughout the crediting period correct, applicable to the project and will lead to a conservative estimation of emission reductions? <i>Describe clearly the steps taken to assess whether the values used for the fixed parameters are considered reasonable, correct and applicable in the context of the project activity. Check esp. chapter 6.2 of the PDD.</i>	Refer to CAR B9.	/PDD/ /ERC/ /ACM6/	~~CAR~~ B9	OK
B.5.5. Are all ex-ante calculation values for monitoring parameters (as defined as per chapter B.7.1) reasonable? <i>Describe clearly the steps taken to assess whether the values used for the monitoring parameters are considered reasonable, applicable and conservative in the context of the project activity</i>	☐ All "Values of data to be applied for the purpose of calculating expected emissions reductions" are considered to be reasonable, applicable and conservative. ☒ The following mistakes have been identified in this context: Please refer to CAR B9.	/PDD/ /ERC/ /ACM6/	~~CAR~~ B9	OK
B.5.6. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change. <i>Describe the steps taken to validate this issue.</i>	Please refer to CAR B9.	/PDD/ /ERC/ /ACM6/	~~CAR~~ B9	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
B.6. Monitoring of Emission Reductions <i>It is assessed whether the monitoring plan is appropriate for the project activity and in line with the applied methodology.</i>				
B.6.1. Are all monitoring parameters required by the applied methodology contained in the monitoring plan? <i>Assess whether all applicable parameters listed in the methodology are included in the monitoring plan.</i> <i>Pl. check further whether the selection of parameters not to be monitored (section B.6.2) is appropriate and in line with the applied methodology.</i> <i>In case of different approaches can be chosen acc. to the methodology assess whether the selection of parameters is justified and correct.</i>	All monitoring parameters required by the applied methodology ACM0006 are contained in the monitoring plan, and the selection of parameters not to be monitored (section B.6.2) is appropriate and in line with the applied methodology, parameters related with non-selected methodological choices are not included.	/PDD/ /ACM6/	OK	OK
B.6.2. Are the means of monitoring of all parameters contained in the monitoring plan in accordance with the requirements of the applied methodology? <i>Assess whether the provided information for all parameters w.r.t.</i> d) <i>Label (name of the data / parameter)</i> e) <i>data unit</i> f) <i>description</i>	Monitored parameters listed in B.7.1 should be in line with requirements of applied methodology and related tools including monitoring and QA/QC procedures. And some parameters are unnecessary to monitor such as $EG_{total,y}$. Revision to the PDD is required.	/PDD/ /ACM6/	~~CAR~~ ~~B10~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
g) <i>source of data</i> h) <i>measurement equipment / method / procedure</i> i) <i>monitoring frequency</i> j) <i>QA/QC procedures</i> <i>are appropriately described and in compliance with the requirements of the methodology.</i>				
B.6.3. Have all equations necessary for ex-post emission reduction calculation been described clearly and in line with the methodology? <i>Check whether all necessary equations have been provided in the PDD. Pl. consider that ex-post and ex-ante calculations might be different.</i> <i>Please consider that additional equations might be necessary to calculate auxiliary parameters.</i>	Please refer to CAR B9.	/PDD/ /ACM6/	~~CAR~~ B9	OK
B.6.4. Is it likely that the monitoring arrangements described in the PDD can properly be implemented in the context of the project activity? <i>Assess whether the described monitoring arrangements are sufficient and realistic to enable a thorough monitoring. Pl. consider also special monitoring conditions, e.g. downtimes of monitoring equipment etc.</i>	The description of the monitoring plan is insufficient: 1. structure and responsibility of project management should be described in a more clear and specific manner; 2. measurement equipments and procedures of monitored parameters that are included in B.7.1 should be in line with requirements of the applied methodology and related tools; 3. document management should be detailed described to meet the requirement of monitoring, and all data collected as part of monitoring should be archived electronically and be kept at least for 2 years after the	/PDD/ /ACM6/	~~CAR~~ B11	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
	end of the last crediting period according to the methodology; 4. QA/QC procedures should be clearly described, e.g. calibration to the measurement equipments, training of monitoring personnel, corrective actions and emergency preparedness, and verification of the monitoring results; Revision to the PDD is required.			
B.6.5. Are the QA/QC procedures appropriate sufficient to ensure the emission reductions achieved from the project activit can be reported ex-post and verified? <i>Please consider the description given in section B.7.2. Describe which QA/QC provisions are considered. Address Quality Management System provisions, calibration and maintenance of equipment. Address further any review procedures.</i>	Refer to CAR B11.	/PDD/ /ACM6/	~~CAR~~ ~~B11~~	OK
B.6.6. Are procedures identified for data management? <i>Check whether appropriate provisions are considered for data management including responsibilities, what records to keep, storage area of records and how to process performance documentation</i> <i>Check further the data archiving provisions for the project activity and ensure that provisions are made to archive data for the whole crediting period + 2 years.</i>	Refer to CAR B11.	/PDD/ /ACM6/	~~CAR~~ ~~B11~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>				

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
C.1. Is the project's starting date clearly defined and evidenced? <i>Check whether the starting date is correct. Apply the definition of the project starting date as per the "Glossary of CDM terms".</i>	A description of how the starting date has been determined and supportive evidences should be included in C.1.1 of the PDD.	/PDD/ /GLS/ /EPA/ /PCC/	~~CL-C1~~	OK
C.2. Is the project's operational lifetime clearly defined and evidenced? <i>Check whether the project lifetime is correctly defined. Consider the guidance on the assessment of investment analysis (annex to the additionality tool).</i> <i>Check in case of phased implementation this has been reflected throughout the whole PDD incl. the financial assessment, if applicable.</i>	The operational lifetime of the project activity is clearly stated as 20 years in the PDD, it reflects the technical lifetime of the project activity ^{/FSR/} ..	/PDD/ /EPA/ /FSR/	OK	OK
C.3. Is the start of the crediting period clearly defined and reasonable? <i>Check whether the envisaged starting date of the crediting period is realistic, taking into consideration the times needed for validation and registration.</i>	The starting date of the first crediting period is unreasonable, revision is required.	/PDD/ /unfccc/	~~CL-C2~~	OK
D. Environmental Impacts <i>Documentation on the analysis of the environmental</i>				

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
<i>impacts will be assessed, and if deemed significant, an EIA should be provided to the DOE.</i>				
D.1.1. Are there any Host Party requirements for an Environmental Impact Assessment (EIA)? <i>Check the host party regulations, regarding EIA.</i>	The host party (China) requests an Environmental Impact Assessment (EIA) for construction project activities.	/EIA/ /gov/ /IM01/	OK	OK
D.1.2. In case an Environmental Impact Assessment (EIA) is requested by the host party, has it been carried out and if applicable duly approved? <i>Check the EIA and its approval, if applicable.</i>	The Environmental Impact Assessment ^{/EIA/} has been carried out and been approved by local government ^{/AEIA/} .	/EIA/ /AEIA/	OK	OK
D.1.3. Has an analysis of the environmental impacts of the project activity been sufficiently described and in line with the host party environmental legislation? <i>Check the PDD (section D). Check whether the project will create any adverse environmental effects.</i> <i>Check the relevant national environmental legislation.</i>	The environmental impacts should be described according to the result of approved environmental impacts assessment report ^{/EIA/} in D.1 of the PDD.	/EIA/ /AEIA/	CL-D1	OK
D.1.4. Are transboundary environmental impacts considered in the analysis? <i>Check the documents and local official sources / expertise regarding transboundary environmental impacts.</i>	No transboundary environmental impact is considered in the analysis of the proposed project.	/EIA/ /AEIA/	OK	OK
E. Stakeholder Comments <i>The DOE should ensure that stakeholder comments</i>				

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (Means and results of assessment)	Ref.	Draft Concl.	Final Concl.
<i>have been invited with appropriate media and that due account has been taken of any comments received.</i>				
E.1. Have relevant local stakeholders been invited to consultation prior to the publication of the PDD? <i>Check by means of document review and interviews with local stakeholders if and when a local stakeholder consultation process has been carried out.</i>	Yes, relevant local stakeholders have been invited to consultation in July 2007 and this is prior to the publication of the PDD.	/PDD/ /SCD/ /IM03/	OK	OK
E.2. Can the local stakeholder consultation process be assessed as adequate? <i>Describe what assessment steps have been undertaken to assess the adequacy of the stakeholder consultation process. Give a final opinion on the adequacy.</i> <i>Please consider the following requirements in this context:</i> <i>(a) Comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity, have been invited;</i> <i>(b) The summary of the comments received as provided in the PDD is complete;</i> <i>(c) The project participants have taken due account of any comments received and have described this process in the PDD.</i>	Detailed information of how the project participant investigated stakeholders' comments should be provided in a transparent manner in E.1 of the PDD.	/PDD/ /SCD/ /IM03/	~~GL-E1~~	OK

ANNEX 2: ASSESSMENT OF BASELINE IDENTIFICATION

Table A-2: Assessment of Baseline Identification

☐	Baseline is not identified
☐	Baseline is prescribed by the approved methodology
☒	Assessment of baseline see below

Baseline Alternatives identified	Inline with the Methodology?	Eliminated	Reasons for elimination / non-elimination from list of alternatives	Evidence used	DOE Assessment	
					Appropriateness of elimination	Assessment of validation team (results and means of assessment)
P1 This project activity not undertaken as a CDM project activity.	☒	☒	This alternative is economically unattractive.	/IRR/ /FSR/	☒	The alternative is excluded in Step 3 of the applied <i>Combined tool to identify the baseline scenario and demonstrate additionality</i> because the financial indicator of the project is lower than the industrial benchmark and therefore is not financially attractive.
P2 The continuation of power generation in an existing biomass residue fired power plant at the project site, in the same configuration, without retrofitting and fired with the same type of biomass residues as (co-)fired in the project activity.	☒	☒	There are no existing biomass fired power plants at the project site	/FSR/	☒	The justification for elimination is sufficient, the information has been confirmed through site inspection.

P3 The generation of power in an existing captive power plant, using only fossil fuels.	☒	☒	There are no fossil fuel fired captive power plants around the project site	/FSR/	☒	The justification for elimination is sufficient, the information has been confirmed through site inspection.
P4 The generation of power in the grid.	☒	☐	This alternative is plausible and realistic.	/FSR/	☐	Not eliminated.
P5 The installation of a new biomass residue fired power plant, fired with the same type and with the same annual amount of biomass residues as the project activity, but with a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the project plant and therefore with a lower power output than in the project case.	☒	☒	This alternative is prevented by technological barriers.	/EEFIA/	☒	This alternative is not feasible because the suggested installation is a modern system which is typical for such biomass projects in China. Please see table 5-2 in the report. Lower efficiency would result in lower output and therefore is not economical as concluded by sectoral experts in published academic paper ^{/EEIFA/} .
P6 The installation of a new biomass residue fired power plant that is fired with the same type but with a higher annual amount of biomass residues as the project activity and that has a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the project activity, therefore, the power output is the same as in the project case.	☒	☒	This alternative is prevented by technological barriers.	/EEFIA/	☒	This alternative is not feasible because the suggested installation is a modern system which is typical for such biomass projects in China. Please see table 5-2 in the report. Lower efficiency would result in lower output and therefore is not economical as concluded by sectoral experts in published academic paper ^{/EEIFA/} .

P7 The retrofitting of an existing biomass residue fired power, fired with the same type and with the same annual amount of biomass residues as the project activity, but with a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the project plant and therefore with a lower power output than in the project case.	☒	☒	There are no existing biomass fired power plants around the project site	/FSR/	☒	The justification for elimination is sufficient, the information has been confirmed through site inspection.
P8 The retrofitting of an existing biomass residue fired power that is fired with the same type but with a higher annual amount of biomass residues as the project activity and that has a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the project activity.	☒	☒	There are no existing biomass fired power plants around the project site	/FSR/	☒	The justification for elimination is sufficient, the information has been confirmed through site inspection.
P9 The installation of a new fossil fuel fired captive power plant at the project site.	☒	☒	This alternative is not compliance with mandatory applicable laws and regulations.	/SCPN/	☒	Chinese government has published a regulation ^{/SCPN/} in 2002 to prohibit constructing new fossil fuel power plants with capacity below 135MW
P10 The installation of a new single- (using only biomass residues) or co-fired (using a mix of biomass residues and	☒	☒	Other types of biomass residues would be insufficient or result higher amount of usage. And it is not economically attractive for project	/BSR/ /FSR/ /PMP/ /CES/	☒	The proposed project will utilize all available local biomass residues (maize stalk and waste wood) according to the project design. As stated in the Biomass Resource Study Report ^{/BSR,2/} and Feasibility Study

fossil fuels) cogeneration plant with the same rated power capacity as the project activity power and heat plant, but that is fired with a different type and/or quantity of fuels (biomass residues and/or fossil fuels). The annual amount of biomass residue used in the baseline scenario is lower than used in the project activity.			owner to install a co-fired power plant.			Report ^{/FSR/} , there are wheat stalk, soybean stalk, oil plant stalk and other stalk and wood available in the local area. The amount of soybean stalk, oil plant stalk and other stalk is too small to support the biomass residue consumption of the proposed project all alone as according to Biomass study and FSR the amount of soy bean stalk is only 7,312 tons and that of oil plant 58,343 tons, other stalk 30,000 tons. The project activity demands about 176,160 tons of maize stalks (88,080 t) and waste wood (88,080 t) of NCV 17.79 and 15.64 GJ/t.
P11 The generation of power in an existing fossil fuel fired cogeneration plant co-fired with biomass residues, at the project site.	☒	☒	There is no existing fossil fuel fired cogeneration plant co-fired with biomass residues around the project site.	/FSR/	☒	The justification for elimination is sufficient, the information has been confirmed through site inspection.
H1 The proposed project activity not undertaken as a CDM project activity.	☒	☒	This alternative is economically unattractive.	/IRR/ /FSR/	☒	The alternative is excluded in Step 3 of the applied <i>Combined tool to identify the baseline scenario and demonstrate additionality</i> because the financial indicator of the project is lower than the industrial benchmark and therefore is not financially attractive.
H2 The proposed project activity (installation of a cogeneration power plant), fired with the same type of biomass residues but with a different efficiency of heat generation (e.g. an efficiency that is common practice in the relevant industry sector).	☒	☒	This alternative is prevented by technological barriers.	-	☒	The justification for elimination by technological barriers is sufficient, because the technology of biomass power cogeneration is still at its immature status, and the suggested installation is already a modern system which is typical for such new projects. Technology of significant different heat efficiency is not common practice in the industry sector in China. Sufficient references have been provided for validation (see footnote 24, 25 and 26 of section B.5. of CDM-PDD).
H3 The generation of heat in an existing captive cogeneration plant, using	☒	☒	There is no existing captive cogeneration plant at the project site.	/FSR/	☒	The justification for elimination is sufficient, the information has been confirmed through site inspection.

only fossil fuels.						
H4 The generation of heat in boilers using the same type of biomass residues.	☒	☒	There is no other existing biomass-based boiler at the project site prior to this project.	/FSR/	☒	The justification for elimination is sufficient. The information has been confirmed through site inspection.
H5 The continuation of heat generation in an existing biomass residue fired cogeneration plant at the project site, in the same configuration, without retrofitting and fired with the same type of biomass residues as in the project activity.	☒	☒	There is no other existing biomass residue fired cogeneration plant at the project site.	/FSR/	☒	The justification for elimination is sufficient, the information has been confirmed through site inspection.
H6 The generation of heat in boilers using fossil fuels	☒	☐	Seven coal-fired boilers were used for heat generation prior to the implementation of this project, thus this alternative is a realistic alternative.	/FSR/ /ETS/		Not eliminated. For the baseline alternative of heat, the current situation and the existing actual emissions is seven individual small coal fired boilers which belonged to seven independent owners. This is identified in the Feasibility Study Report^{/FSR/} and therefore considered at the project planning stage. The seven heat users are confirmed through site visit and interview with project owner^{/IM01/}, heat users^{/IM04/} and local government officer^{/IM03/}. It is further confirmed by checking the Heat Supply Agreement signed between the owners of the 7 existing boilers and the project owner^{/HSA/}. Other less carbon intensive fossil fuel (i.e., oil and gas) are not as cost-effective as coal used in the 7 existing boilers when considering fuel price vs. NCV. (see footnote 3 of section B.5. of CDM-PDD). As the methodology ACM0006 version 10 stipulates, the type and capacity of the 7 existing boilers, types and

						quantities of fuels^{/ETS/} have been used in the boilers during the most recent three years prior to the start of the project activity are documented in Table 2 and Table 3 of CDM-PDD. The forecasted baseline emissions claimed from heat are considered conservative as they are based on actual average demand by the identified heat users and fuel used. The amount of energy (heat) delivered will be monitored directly, therefore the forecasted baseline emissions will not affect the actual calculation of emission reductions. As documented in Table 2 and Table 3 of CDM-PDD, the residual life of the boilers displaced in the baseline is sufficiently large to cover the first crediting period that they will not be replaced anyway on its own. Also as declared by the owners of the 7 existing boilers^{/ETS/}, once the heat distribution network and the proposed project are completed, the 7 existing boilers will stop operation as the heat will be supplied by the proposed project. The PDD limits the monitoring of heat to the 7 identified users of heat. The 7 users of heat from the project activity are the 7 companies as stated in Table 2 and Table 3 of CDM-PP. And the steam will be monitored at the 7 identified users' end. Any emission reduction on heat beyond the 7 heat users will not be claimed.
H7 The use of heat from external sources, such as district heat.	☒	☒	There is no other external source of heat existing at the project site.	/FSR/	☒	The justification for elimination is sufficient. The information has been confirmed through site inspection.
H8 Other heat generation technologies	☒	☒	There is no other heat generation technologies applied at the project site.	/FSR/	☒	The 7 identified users are all in industrial production, which require a huge amount of qualified steam. Other heat generation technologies or resources (e.g. heat pumps or solar energy) could not supply equivalent

						amount of heat that could meet the quality nor the quantity of the process heat needed as generated by this project in current situation.
H9 The installation of a new single- (using only biomass residues) or co-fired (using a mix of biomass residues and fossil fuels) power and heat plant with the same rated power capacity as the project activity power and heat plant, but that is fired with a different type and/or quantity of fuels (biomass residues and/or fossil fuels). The annual amount of biomass residue used in the baseline scenario is lower than that used in the project activity.	☒	☒	Other types of biomass residues would be insufficient or result higher amount of usage. And it is not economically attractive for project owner to install a co-fired power plant.	/BSR/ /FSR/ /PMP/ /CES/	☒	The proposed project will utilize all available local biomass residues (maize stalk and waste wood) according to the project design. As stated in the Biomass Resource Study Report^{/BSR,2/} and Feasibility Study Report^{/FSR/}, there are wheat stalk, soybean stalk, oil plant stalk and other stalk and wood available in the local area. The amount of soybean stalk, oil plant stalk and other stalk is too small to support the biomass residue consumption of the proposed project all alone as according to Biomass study and FSR the amount of soy bean stalk is only 7,312 tons and that of oil plant and other stalk 58,343 tons. The project activity demands about 176,160 tons of maize stalks (88,080 t) and waste wood (88,080 t) of NCV 17.79 and 15.64 GJ/t. The wheat stalk has lower NCV^{/CES/} than the maize stalk and wood waste used by the project and thus will result in higher usage. Therefore, a new single fired cogeneration plant with a different type of fuels is not realistic. Chinese government has published a regulation^{/PMP/} in 2006 w.r.t. guidelines of tariff for biomass power plants. It shows that co-fired power plant (using a mix of biomass residues and fossil fuel) whose energy consumption from fossil fuel exceeds 20% will be treated as a normal thermal power plant and cannot enjoy the subsidy (0.25 CNY/kWh). For the proposed project, the subsidy accounts for about 43% of the overall tariff (0.586 CNY/kWh) as a renewable energy project. Thus, co-fired cogeneration plant is not financially attractive.
H10 The generation of power in an existing fossil	☒	☒	There is no existing fossil fuel fired cogeneration plant co-fired with	/FSR/	☒	The justification for elimination is sufficient. The information has been confirmed through site inspection.

fuel fired cogeneration plant co-fired with biomass residues, at the project site.			biomass residues around the project site.			
B1 The biomass residues are dumped or left to decay under mainly aerobic conditions, this applies, for example, to dumping and decay of biomass residues on fields.	☒	☐	The biomass residues used in this project are surplus, and the demand for these biomass residues is not expected to increase significantly by other sources in foreseeable future, so it is credible these biomass residues will be left unused (dumped or left to decay) around the project site without this project	/BSR/		Not eliminated. That the biomass residues are dumped or left to decay under mainly aerobic conditions is considered as common practice for disposing of biomass residues within the project area. The common practice for disposing biomass residues dumped or left to decay mainly under aerobic condition is also confirmed by checking the Biomass Resources Study Report^{/BSR,1/} and Stalk Price Prediction Analysis Report^{/BSR,2/}. Both of which are finished by local government authority, which are considered with adequate channel and resource of local living and production condition. The Feasibility Study Report^{/FSR/} was also reviewed to confirm the local biomass residues are dumped or left to decay under mainly aerobic conditions. The FSR was completed by consulting with local government officials from Development and Reform Commission, Environmental Protection Bureau and etc., who are with local background and sectional knowledge. It was further validated by onsite observation, interviewing local official from Huixian County Development and Reform Commission^{/IM03/}. There are no mandatory laws and regulation to prohibit the disposing of biomass residues dumped or left to decay. Thus B1 can be considered as a possible alternative. For the issue w.r.t. the biomass residues are either dumped or left decay in the absence of the project activity and at the same time carry a purchase price as applied in the investment analysis, please refer to section 5.2.5 (with subtitle "Biomass price") of the report.

B2 The biomass residues are dumped or left to decay under clearly anaerobic conditions, this applies, for example, to deep landfills with more than 5 meters, and it does not apply to biomass residues that are stock-piled or left to decay on fields.	☒	☒	If the biomass residues are dumped or left to decay under clearly anaerobic conditions, the biomass residues must be covered with sand or soil, and thus certain investment is unavoidable. As a result, alternative B2 is economically less attractive and not a realistic alternative compared with B1.	/FSR/	☒	By on-site assessment and interviewing local official from Huixian County Development and Reform Commission ^{/IM03/} , the validation team confirms that the biomass residues are either dumped on fields or burnt in an uncontrolled manner without utilizing it for energy purposes. No biomass residue is left in landfill. The biomass residues in the absence of the proposed project activity are left to decay under mainly aerobic conditions. The common practice for disposing biomass residues dumped or left to decay mainly under aerobic condition is also confirmed by checking the Biomass Resources Study Report ^{/BSR,1/} and Stalk Price Prediction Analysis Report ^{/BSR,2/} . Therefore, the scenario B2 is not reasonable or feasible.
B3 The biomass residues are burnt in an uncontrolled manner without utilizing it for energy purposes.	☒	☒	This alternative is not compliance with mandatory applicable laws and regulations.	/NPSB/	☒	Burning biomass residues is strictly forbidden by local regulation ^{/NPSB/} because uncontrolled burning had caused serious air pollution in the area, this regulation has been emphasized after harvest every year, and those who burn biomass residue in the field will be heavily fined.
B4 The biomass residues are used for heat and/or electricity generation at the project site.	☒	☒	This alternative is economically unattractive.	/IRR/	☒	The alternative is excluded in Step 3 of the applied <i>Combined tool to identify the baseline scenario and demonstrate additionality</i> because the financial indicator of the project is lower than the industrial benchmark and therefore is not financially attractive.
B5 The biomass residues are used for power generation, including cogeneration, in other existing or new grid-connected power plants.	☒	☒	Power generation (including cogeneration) using biomass residues is not a common practice in China, and there is no other power plant or cogeneration plant using biomass residues around the project site.	/FSR/	☒	There is no other biomass-fired power plant in local area
B6 The biomass residues are used for heat generation in other existing or new	☒	☒	The biomass residues used in this project are surplus, and the demand for these biomass residues is not	/FSR/	☒	There is no other biomass-fired power plant in local area and it is regulated ^{/IM03/} that no two biomass based power plants can be approved within 100km.

boilers at other sites.			expected to increase significantly by other sources in foreseeable future, therefore, this alternative is not a realistic baseline alternative.			
B7 The biomass residues are used for other energy purposes, such as the generation of biofuels.	☒	☒	The biomass residues used in this project are surplus, and the demand for these biomass residues is not expected to increase significantly by other sources in foreseeable future, therefore, this alternative is not a realistic baseline alternative.	/FSR/	☒	It is unlikely that any biofuel could be made out of the biomass residues used in the project considering the types and quantity of biomass residues.
B8 The biomass residues are used for non-energy purposes, e.g. as fertilizer or as feedstock in processes.	☒	☒	The biomass residues used in this project are surplus, and the demand for these biomass residues is not expected to increase significantly by other sources in foreseeable future, therefore, this alternative is not a realistic baseline alternative.	/FSR/	☒	The biomass residues used in the project are mainly from agricultural activities, maize stalk and waste wood, there is a large surplus of unused biomass in the region and therefore no conflict of usage would occur (see leakage justification in section B.6.1 of the PDD).

ANNEX 3: ASSESSMENT OF FINANCIAL PARAMETERS

Table A-3: Assessment of Financial Parameters

☐	No financial parameters are used for additionality justification						
☒	Assessment of all financial parameters see below						
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT		
					Correctness of value applied	Appropriateness of information source	Comment
Total investment static	18,729	10 ⁴ CNY	Feasibility Study Report / page129	/FSR/	☒	☒	The unit cost of the proposed project is 7803 CNY/kW. According to TÜV NORD's internal statistical data of biomass power plants in China^{/DPI/}, the total investment of biomass power projects is from 9271 to 12913 CNY/kW, and the average level of total investment of biomass power projects is 10642 CNY/kW. Total investment of the proposed project is far below the average level, therefore is assessed as reasonable and conservative. Considering the increasing material price and labor cost in China during the recent years, it is not likely to decrease total investment up to 13% so that the IRR can exceed the benchmark. It is also confirmed by the validation team that the total static investment doesn't include the

							cost of steam pipelines and the other associated costs due to transportation of the steam to the end users.
Operating hours	5932	h	Feasibility Study Report / table 2	/FSR/	☒	☒	The annual utilization hour is calculated as 5932 hours, and equivalent power load factor is 0.677 (5932 hours divided by 8760 hours which is one whole year). According to TÜV NORD's internal statistical data of biomass power plants in China^{DPI}, the full load operation hours of biomass power projects is from 4840 to 6250 hours, and the average level is 5427 hours. Full load operation hours of the proposed project is within the typical range of similar projects and well below the average level, therefore is assessed as reasonable and conservative. Among the registered biomass power plants applying the methodology ACM0006 in China as indicated in table 5-2 above, the operating hours range within 5500 hours and 6500 hours per year (i.e., five projects with 5500 hours, four projects with 6000 hours and three with 6500 hours). The proposed project with 5932 hours fits the range and is reasonable compared to other projects as well as the thermal power plants. It is noticed that only PA2230 assumes a quite higher operating hours. By using the generation unit with high temperature and high pressure compared to the medium temperature and medium pressure (i.e., the proposed project), it will achieve higher boiler

							efficiency and higher thermal efficiency of steam turbine and therefore better performance on operating hours. Furthermore, as admitted in the validation report of PA2230^{/PA2230/}, page 16, first passage: "The project owner and the designing institute were facing lack of experience in developing such projects. As a result, during the feasibility study phase of the project, the annual operating hours of the project were, to some extent, overestimated. This can be further verified through the actual operation status provided by the project owner." Meanwhile, according to the electricity sales invoices^{/INV-1/} provided by the project owner, the equivalent annual operating hours (auxiliary electricity consumption assumed as 11%) is about 5430 h, which is about 8.5% lower than the assumption (5932 h) used for investment analysis and decision. It further consolidates the conservativeness of the assumption on annual operating hours used for investment analysis. The plant load factor of 0.677 defined ex-ante in the CDM-PDD is verified by the DOE that it is in line with the following: (a) The plant load factor is determined by a third party design institute (Zhengzhou Design and Research Institute of Coal Industry) which was contracted by the project participants; (b) The plant load factor has been provided to the government while applying the project activity
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							for implementation approval ^{/AFSR/} . Furthermore, the average power generation has to increase by 11% to 6585 utilization hours for the whole lifetime of 20 years for the IRR to exceed benchmark. This is very unlikely to happen considering the stated and the uncertainty of biomass supply and immature technology. In sum, it is confirmed by the DOE that the input value of operating hours is valid and conservative at the time of investment analysis and an 11% increase to the utilization hours is not likely to happen.
Net electricity supplied to the grid	126,707	MWh	Feasibility Study Report / page132	/FSR/	☒	☒	The annual gross power generation is calculated as installed capacity multiplied with annual operating hours (24 MW x 5,932 Oh/a = 142,368 MWh). And the auxiliary consumption rate is assumed as 11% in the FSR. It is assessed as appropriate compared with other similar registered projects in China ^{/unfccc/} (8%-21%, average of 12.9%) and survey conducted by national authorities ^{/aecd/} . Therefore, the net electricity supplied to the grid is calculated as 126,707 MWh (142,368 MWh x (100%-11%) = 126,707 MWh).
Electricity tariff (VAT Incl.)	0.586	CNY/kWh	Feasibility Study Report / page 130	/FSR/ /PMP/	☒	☒	The tariff is prescribed by NDRC in the policy ^{/PMP/} <i>Provisional Measures for the Price and Apportioned Cost Management for the Electricity Generation from Renewable Energy Resources</i> which issued and put into force in

							2006, it is regulated that tariff for biomass residue fired power plants should apply the bus-bar on grid tariff of coal fired power plants in Henan Province plus subsidy of 0.25 CNY/kWh for biomass fired power plants for the first 15 years of operation, and for the latter operation years there will be no subsidy any more. For the proposed project activity, the tariff for the first 15 years is 0.336 CNY/kWh (the bus-bar on grid tariff of coal fired power plants in Henan Province in 2005) plus 0.25 CNY/kWh of subsidy, and the tariff for the latter five years is 0.369 CNY/kWh (the bus-bar on grid tariff of coal fired power plants in Henan Province in 2008). According to the Chinese policy framework, the policy will be applied to the project with little possibilities of variation in the future. The only variation exists in the bus-bar on grid tariff of coal fired power plants in Henan Province after the first 15 years. It is calculated that the IRR can only cross the benchmark when the value increase by 70% to higher than 0.6 CNY/kWh, this is not likely to happen under the current policy and economy variations. In conclusion, electricity tariff is not likely a factor that would lead the IRR to cross the benchmark.
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Annual heat supplied to users	909,200	GJ	Feasibility Study Report / page 23	/FSR/ /HSA/ /ETS/	☒	☒	The annual heat supplied to users is estimated in the FSR based on the thermal load of 7 identified users^{/HSA/} which are confirmed by the validation team. Page 21 of FSR, table 3.2-1 provides a list of seven companies and their heat demand. Further the DOE can confirm that 7 heat supply agreements^{/HSA/} have been signed between the project owner and corresponding seven heat users. The names of the seven users in the seven agreements are consistent with the names as stated in the corresponding FSR of the project activity. It is further confirmed by interviewing the heat users^{/IMO4/}. Also considering the feature of industrial heat users, several corrective coefficients are involved in the design, such as simultaneous utilization factor, heat network efficiency, enthalpy reduction coefficient. According to the historical fuel consumption of these 7 would-be displaced boilers, the heat demand in 2008 was about 902,322 GJ^{/ETS-1/}. Therefore, the value of annual heat supplied to the users estimated in the FSR is assessed appropriate compared with historical and actual heat demand. The heat generation is designed based on the historical heat demand of seven identified users. The equipment was purchased based on this project design^{/FSR/}. The annual heat generation relied on the equipments performance with fixed technical specification
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							and will have a limited output as designed. The heat generation will first meet the needs from the seven users. In case of abnormal condition, the heat demand in the seven identified users may reduce due to decline of productivity caused by economic downturn and other additional heat users are introduced. Firstly, additional users will not be counted for the emission reductions calculation. Secondly, the total annual heat supply will not increase due to additional users as the maximum output is ex ante designed. The PP will not receive additional revenues from heat than expected as the total amount of supply and the heat price are not likely to change. Besides according to Table 4 of PDD an extraction turbine is installed. The rated extraction amount is 25 t/h (2x25 t/h = 50 t/h) and maximum extraction amount of 75 t/h each of the two turbines (Table 4 PDD). This fits the average demand of the seven users as per FSR page 22 of 51 t/h from April till November and 57.1 t/h from December till March^{/FSR/}. To this heat design and extraction design the related power generation is determined and calculated. As an extraction turbine is installed, the amount extracted is not available for power generation in the subsequent stages from the extraction point. Meaning the more steam is extracted, heat delivered to the seven users or whatever additional users, this is not available anymore for power generation. Therefore if more heat would be delivered to the recipients than the design amount of 909,200 GJ less power would be generated than the stated net
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							126,041 MWh/yr. The price for power is 0.586 CNY/kWh or 162.78 CNY/GJ (0.586 CNY/kWh x 1000 k/M x 1000 M/G x 1h/3600s, knowing $Ws = J$) and the price of heat is 29.7 CNY/GJ and taking the conversion efficiency of the turbine into account (33.4%) the price for electricity is about 1.8 times higher than that of steam ($162.78 \times 33.4\% / 29.7 = 5.48$) to provide more steam would result in lower total revenue for the project activity it is obvious that it would be more attractive to the PO to generate power over heat. Or the other way round, if more steam than designed would be extracted and more heat delivered, as stated less power would be generated and the annual revenue from heat and power would be less than the designed and applied for financial calculation.
Heat price (VAT Incl.)	29.7	CNY/GJ	Feasibility Study Report / table 2	/FSR/ /PMP/	☒	☒	The heat price is derived from local Development and Reform Commission, it is assessed by local price bureau based on local information of heat supply and market situation. According to TÜV NORD's internal statistical data of biomass power plants in Henan Province^{/DPI/}, the heat price of cogeneration projects is from 17 to 26 CNY/GJ, and the average level is 23.3 CNY/GJ. Heat price of the proposed project is above the typical range of similar projects and higher than the average level, therefore is assessed as conservative. According to the Chinese policy framework, the price which issued by local government will

							be the most likely to be applied to the project, and significant increase for the next 20 years can not be expected under the current policy and economy variations. And it will not likely to change either due to introduction of additional heat users under abnormal circumstances as analyzed above. In conclusion, heat price is not likely a factor that would lead the IRR to cross the benchmark.
Annual O&M costs	6541	10 ⁴ CNY	Feasibility Study Report / page 130	/FSR/	☒	☒	The O&M consists of fuel cost, water cost, material cost, repair cost, salary & welfare fee, and other cost. The fuel cost count for more than 80% of total operation cost, it is calculated as the quantity of annual fuel consumption multiply the price, i.e. 176,160 t/yr * 310 CNY = 54.61 million CNY/yr. Water cost is calculated as follows: 117.6 * 10⁴ t (recycled water from coal mine) * 1.2 CNY/t + 5.8 * 10⁴ t (underground water) * 1.7 CNY/t = 1.51 million CNY/yr. Material cost and other cost are calculated as 6.25 and 16 CNY/MWh separately; The repair cost amounts to 2.5% of fixed assets, and keep the same rate through out the project lifetime. The salary is calculated as the number of

							employees (96) multiplied with the average annual salary of 14,000 CNY per person and the welfare fee (52% of salary) is calculated in accordance with policy in the host county. All the above parameters are calculated in compliance with the requirements defined in the <i>Economy Evaluation Method and Parameter for Constructing Projects</i> issued by NDRC and Construction Ministry of China. The IRR will reach the benchmark when annual O&M cost decrease by 4.5%, however, it is assessed that the situation is not likely to happen. Based on comprehensive investigation to the supply and demand of biomass residues in the local area, the research conducted by local government^{/BSR-2/} shows a very clear price increase trend of biomass residues. The study is from government origin and is convincing and reliable as the government holds the most comprehensive and accurate historical data, and to apply the current price of 310 CNY/t for all the 20 years in the future is conservative. To conclude, the O&M cost is not likely to decrease by 4.5% since the fuel cost which takes 83.5% of total O&M cost is estimated conservatively, and if fix the fuel cost, then the other parts need to decrease by more than 25% for the IRR to cross the benchmark which is not likely to happen.
Income tax	25	%	Feasibility Study Report / page 131	/FSR/	☒	☒	The value is derived from <i>Enterprise Income Tax Law of the People's Republic of China</i>

							(promulgated on Document <i>Order of the President of the People's Republic of China</i> (No. 63) on March 16, 2007) which is effective since Jan. 1, 2008. The FSR of the proposed project was finalized in June 2008. Therefore the tax rate is applicable at the time of the FSR making and the investment decision.
Value added tax (VAT) for electricity	17	%	Feasibility Study Report / page 131	/FSR/	☒	☒	The value is derived from the national policy <i>Interim Regulation of the People's Republic of China on Value Added Tax</i> issued by the State Council on Dec. 1993 and revised in Nov. 2008.
Value added tax (VAT) for heat	13	%	Feasibility Study Report / page 131	/FSR/	☒	☒	The value is derived from the national policy <i>Interim Regulation of the People's Republic of China on Value Added Tax</i> issued by the State Council on Dec. 1993 and revised in Nov. 2008.
City maintenance & construction tax	5	%	Feasibility Study Report / page 131	/FSR/	☒	☒	5% of VAT, the value is derived from the <i>Interim Regulations on City Maintenance and Construction Tax of the People's Republic of China</i> (promulgated on Document [1985] No. 19 of the State Council on Feb. 8, 1985). The tax rate is mandatory and applicable since 1985.
Educational surtax	3	%	Feasibility Study Report / page 131	/FSR/	☒	☒	3% of VAT, the value is derived from the document <i>Decision of the State Council on Amending the Interim Provisions on the Collection of Educational Surcharges</i> (promulgated on Document <i>Order of the State Council No. 448</i> on August 20, 2005) which is effective since 2005.
Depreciation period	15	year	Feasibility Study Report / page 130	/FSR/	☒	☒	The value is in line with <i>Provisional Regulations of the People's Republic of China On Enterprises Income Tax</i> issued by State

							Council and effective from 1st Jan. 1994 to 1st Jan. 2008. It is also in line with the successive law of <i>Enterprise Income Tax Law of the People's Republic of China</i> which is effective since Jan. 1, 2008. The rate is evaluated as integrated and applicable.
Residue value	3	%	Feasibility Study Report / page 130	/FSR/	☒	☒	The value is in line with <i>Provisional Regulations of the People's Republic of China On Enterprises Income Tax</i> issued by State Council and effective from 1st Jan. 1994 to 1st Jan. 2008. It is also in line with the successive law of <i>Enterprise Income Tax Law of the People's Republic of China</i> which is effective since Jan. 1, 2008. The 3% of residue value of the project activity assets has been included as a cash inflow in the final year at the end of the assessment period.
Project Lifetime	20	year	Feasibility Study Report / table 2	/FSR/	☒	☒	The value is in line with the project design in the feasibility study.
Benchmark	8	%	Interim Rules on Economic Assessment of Electric Engineering Retrofit Projects	/IREA/	☒	☒	The benchmark of 8% is widely applied in power industry of China.

ANNEX 4: ASSESSMENT OF BARRIER ANALYSIS

Table A-4: Assessment of Barrier Analysis

☒	No barrier parameters are used for additionality justification			
☐	Assessment of barriers see below			
Kind of Barrier (invest, tech, other)	Description of Barrier	Evidence used	Assessment of validation team	
			Appropriateness of information source	Explanation of final result
			☒	
			☒	
			☒	
			☒	
			☒	
			☒	
			☒	
			☒	

ANNEX 5: OUTCOME OF THE GSCP

Table A-5: Outcome of the Global Stakeholder Consultation Process

☒	No comments were received during the global stakeholder consultation period					
☐	Comments were received during the global stakeholder consultation period. The comments (in unedited form) and the consideration/response of the validation team are presented below:					
Comment No.:	Comment by:	Inserted on:	Subject	Comment ^{*)}	Response validation team ^{*)}	Conclusion (incl. CARs CLs or FARs)

^{*)} In case clarifications have been requested by the validation team corresponding rows shall be added

The project title used for global stakeholder consultation process was “Henan Xinxiang 24MW Bio-based Cogeneration Project”. Considering minor change on translation and abbreviation, it is considered as indicating the same project activity submitted for registration.

ANNEX 6: APPOINTMENT CERTIFICATES OF TEAM MEMBERS

 CERTIFICATE OF APPOINTMENT Mr. Dipl.-Ing. Eric Krupp born on 1971-06-25 satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as TÜV NORD JI/CDM Senior Assessor The present appointment will terminate on 2010-07-05 Certification registration No. 06 05 01 - 017 Essen, 2007-07-06  Head of TÜV NORD JI/CDM Certification Program of TÜV NORD CERT GmbH	 CERTIFICATE OF APPOINTMENT Mr. Dipl.-Ing. Rainer Winter born on 1963-02-21 satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as TÜV NORD JI/CDM Senior Assessor The present appointment will terminate on 2010-07-05 Certification registration No. 04 02 154-03 Essen, 2007-07-06  Deputy of TÜV NORD JI/CDM Certification Program of TÜV NORD CERT GmbH	 CERTIFICATE OF APPOINTMENT Mr. Yong Jun Li born on 1974-03-03 satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as TÜV NORD JI/CDM Assessor The present appointment will terminate on 2010-02-15 Certification registration No. 06 05 01 - 39 Essen, 2007-06-27  Head of TÜV NORD JI/CDM Certification Program of TÜV NORD CERT GmbH	 CERTIFICATE OF APPOINTMENT Mr. Martin Saalmann born on 1976-02-23 satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as TÜV NORD JI/CDM Assessor For the following scopes: 1, 2, 3, 4, 7, 13, 15 The present appointment will terminate on 2011-11-19 Certification registration No. 08 11 01 - 22 Essen, 2008-11-20  Head of TÜV NORD JI/CDM Certification Program of TÜV NORD CERT GmbH
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