TÜV Rheinland Japan Ltd -
TÜV Rheinland Group

VALIDATION REPORT

WASTE HEAT POWER GENERATION PROJECT AT HUNAN ANSHI XINGYUAN POWER GENERATION CO., LTD. P.R. CHINA

Report No. 01 997 9105039098
NO. 03

CDM Validation Report Template
Version 3.0, December 2003

VALIDATION REPORT

Date of first issue: 2007-March-22	Project No.: 01 997 9105039098	*TÜV Rheinland Japan Ltd.* Shin Yokohama Daini Center Bldg., 3-19-5, Shin Yokohama Kohoku-ku, Yokohama 222-0033
Approved by: Manfred Brinkmann	Organisational unit: System Certification Group, Industrial Engineering Services	
Client: Beijing Changjia Investment Co., Ltd.	Client ref.: C/o Mr. Wang Donglei, Executive Director	Certificate Number: 01 997 9105039098

Executive Summary:

The audit team of DOE TÜV Rheinland Japan Ltd., TÜV Rheinland Group (TÜV Rheinland) has carried out the validation of the "Waste Heat Power Generation Project at Hunan Anshi Xingyuan Power Generation Co., Ltd." (project) in the P.R. China on the basis of UNFCCC criteria for CDM projects according to Article 12 of the Kyoto Protocol, and subsequent decisions of the CDM Executive Board with regard to CDM modalities and procedures and the application of approved methodologies. The validation report and the validation protocol are summarizing the findings of the validation. The validation was executed in the following steps:

- Desk review of preliminary PDD (version 02 of December, 2006)
- Public stakeholder comment process (18 December 2006 ~ 16 January 2007)
- On-site visit with stakeholder interviews (January 22~24, 2007)
- Issue of checklist with corrective action requests (CARs) and clarification requests (CLs) and the draft validation report & protocol
- Desk review of revised PDD (version 05 of June 2007))
- Review of proposed corrections and clarifications

This report summarizes the results of the document review, background investigation, follow-up interviews with local stakeholders and the staff at the project site during the visit to the project. This process enabled the team to conduct a risk-based review of material issues with impact on future claims of the emission reduction from the project activity. The concerns thereof, in the form of draft validation findings have been registered in the Validation Protocol.

The Approval Letter of voluntary participation, including confirmation by China's DNA, that the project assists them in achieving sustainable development, has been received at 17th January 2007. The project activity is a bi-lateral CDM project, with Vitol S.A of Switzerland identified as Annex I party with the LoA issued on 22 January 2007.

In the opinion of TÜV Rheinland the project meets all relevant UNFCCC requirements of the CDM and is able to fulfil all relevant host country criteria. Therefore TUV Rheinland requests the registration of the proposed project activity as CDM project activity.

Report No.: 01 997 9105039098	Subject Group: Environment & Energy
Report title: Validation Report - Waste Heat Power Generation Project at Hunan Anshi Xingyuan Power Generation Co., Ltd.	
Work carried out by: • Kurt Seidel • Darshak Metha • Roy Fan • Waikwok Wong	
Work verified by: • Dr. Manfred Brinkmann	

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Indexing terms

Climate Change
Kyoto Protocol
Large Scale Project Validation
Clean Development Mechanism
Waste Gas / Heat Project Activities

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VALIDATION REPORT

Abbreviations

Explain any abbreviations that have been used in the report here.

AF	Adjustment Factor
AM	Approved Methodology
ACM	Approved Consolidated Methodology
CAR	Corrective Action Request
CCPG	Central China Power Grid
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CHP	Combined Heat and Power Generation
CL	Clarification Request
CO2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EA	Economic Analysis
EB	Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reduction
ERPA	Emission Reduction Purchase Agreement
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse Gas
GWh	Giga Watt Hours
GWP	Global Warming Potential
HAE	Hunan Anshi Enterprise Co., Ltd
HAXPG	Hunan Anshi Xingyuan Power Generation Co., Ltd.
I	Interview
IETA	International Emissions Trading Organisation
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
kW	Kilo Watt
kWh	Kilo Watt Hours
LoA	Letter of Approval
LoI	Letter of Intent
LSTHC	Local Stakeholder Consultation
LXCC	Loudi Xingxing Coking Co., Ltd.
MoV	Means of Verification
MW	Mega Watt
MWh	Mega Watt Hours
NGO	Non Government Organisation
NPV	Net Present Value
ODA	Official Development Assistance
OSV	On Site Visit
PDD	Project Design Document
QC	Quality Control
QA	Quality Assurance
SItC	Supplier Information to Client
t	Tonne
UNFCCC	United Nations Framework Convention on Climate Change

Conversion Factors and Definitions

Insert and describe any conversion factors used in the report here. In addition, define any specific terminology used in the report.

None

Table of Contents *Page*

1 INTRODUCTION

Beijing Changjia Investment Co., Ltd. has commissioned the DOE – TÜV Rheinland Japan Ltd, TÜV Rheinland Group to validate the "Waste heat power generation project at Hunan Anshi Xingyuan Power Generation Co., Ltd." (hereafter called "the Project") in the People's Republic of China. The following sections and protocols summarized the findings of the validation of the project. The validation was performed on the basis of the UNFCCC criteria for CDM projects and the criteria for the consistent operation of the project activity including a correct execution of the monitoring and reporting works.

The validation team consists of the following personal:

Team Member	Role in the Project	Affiliations of Team Members	Title / Qualifications
Mr. Roy Fan	Team Leader	TUV Rheinland Hong Kong Ltd.	CDM Project Manager, BSc, MSc
Mr. Wai Kwok, Wong	CDM Auditor	TUV Rheinland Hong Kong Ltd.	CDM Project Engineer, BEng, MSc
Mr. Kurt Seidel	CDM Auditor	TÜV Immissionsschutz und Energiesysteme GmbH, Germany	Senior Expert, MSc
Mr. Darshak Mehta	CDM Auditor	TUV Rheinland India Ltd.	GHG Auditor, MEng
Dr Manfred Brinkmann	Internal Reviewer	TUV Rheinland Japan Ltd.	CDM Programme Manager, PhD

1.1 Objective

The purpose of the validation is to provide an independent, third party assessment, based on evidences provided by the project proponents and other relevant stakeholders, to confirm that the project meets the relevant criteria as CDM project.

This Validation Report is representing the findings of the validation exercise along with the methodology applied for validation, compliance of the project with the requirements of

- Kyoto Protocol
- Modalities and procedures for a clean development mechanism (COP Decision 17/CP.7)
- Guidelines issued by UNFCCC for validation of the project
- IETA/PCF Validation and Verification Manual v 4.0

It has checked

- Format of the documents as required by UNFCCC
- Additionality of the project
- Criteria for sustainable development by the host country (China)
- Baseline of the project

- GHG Emission accounting practice
- The criteria of the CDM eligibility by the host country (China)
- Project Feasibility Study Report (FSR)
- Stakeholder Survey (STHS)
- Environmental Impact Assessment (EIA) Report

The audit team of TÜV Rheinland Group has applied the above criteria and the applied approved baseline and monitoring methodologies.

1.2 Scope

The validation scope has been defined as an independent and objective review of PDD, which is detailed as follows:

- Review of the PDD for purpose of publishing the PDD exclusive of confidential data.
- Publication of the PDD without confidential data.
- Collection of comments of global stakeholders.
- Desk review of relevant project information.
- On site visit.
- On visit project documents review and inspection.
- Validation of the proposed CDM project activity prior to submission of the validation report to the Executive Board as part of the registration process.

The Validation Report referred to the Validation and Verification Manual in preparation and has been prepared as per the CDM report template (Version of December 03) published by IETA. TÜV employed a risk-based approach to validation, focusing on the identification of significant risks for project implementation and reduction in greenhouse gases, used as a basis for assessing the project baseline scenario and the claimed emission reductions from the project.

To ensure transparency in arriving at its Clarification and Corrective Action Requests, TÜV Rheinland has performed background research on the applied technology, alternate calculations based on the data procurement and/or availability of the accountable and key parameters of validation as referenced in the project PDD. These considerations are the emission factors in the baseline scenario and demonstration of additionality of the proposed CDM project.

1.3 GHG Project Description

The Waste Heat Power Generation Project at Hunan Anshi Xingyuan Power Generation Co., Ltd. (HAXPG) is to be implemented in Loudi City at Hunan Province in southeast China. The waste gas is generated from the 300,000 tpa new clean type coke oven. The proposed project is to recover and utilize the sensible heat of the waste gas from the coke oven to generate electricity. Part of the generated electricity will be used by Hunan Anshi Enterprise Co., Ltd (HAE) and its affiliate companies. The rest part of the generated electricity will be sold to the Central China Power grid (CCPG). Two 35t/h waste heat

recovery boilers will be setup which are connected to the coke oven by means of a 2.5m x 3m underground channel with refractory lining. The 70t/h steam produced by the boilers would be fed to a 12MW steam turbine generator for power generation. The electricity generated from the proposed project is originally expected to substitute about 91,400MWh, now revised to be only 53,300 MWh of the power from CCPG annually which would otherwise be generated from fossil-fuel fired power plants. The expected GHG emission reductions of the proposed project is a revised amount 51,360 CO_2 per annum for a chosen crediting period of 10 years.

2 METHODOLOGY

The validation consists of the following three phases:

i. A desk review of the project design documentation

ii. Follow-up interviews with project stakeholders including an on-site assessment

iii. The resolution of outstanding issues and the issuance of the validation report and opinion

In order to ensure transparency, the validation protocol of the Validation and Verification Manual was applied and customized for CDM projects of Sectoral Scope 1.

The protocol shows, in a transparent manner first of all the specific requirements, how to verify them, means of verification, and finally the concluding results from the validation of the identified requirements.

The validation protocol therefore has the following functions:

- It organises, details and clarifies the requirements, which the CDM project is expected to meet;
- It ensures a transparent validation process where the verifier will document how he has validated a particular requirement, and finally it shows the concluding result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1. The completed validation protocol for the “Waste Heat Power Generation Project at Hunan Anshi Xingyuan Power Generation Co., Ltd.” is enclosed in Appendix A to this report.

Figure 1 Validation protocol tables

Validation Protocol Table 1: Mandatory Requirements			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.*

Validation Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below). **Clarification** is used when the validation team has identified a need for further clarification.*

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

2.1 Review of Documents

The Project Design Document (PDD), Version 2 of December 2006 and the updated versions, submitted by Beijing Changjia Investment Co., Ltd. on behalf of the project owner was assessed by TÜV Rheinland. Additional background documents related to the project design and baseline calculations as well as monitoring plan were reviewed. Additional supporting documents were reviewed during the on site assessment. These references are listed at Section 4 of the Report.

2.2 Follow-up Interviews

During 22nd ~ 24th January 2007, TÜV Rheinland has performed personal interviews with representatives of the project developer, CDM consultant and local stakeholders at the project site of the power plant at Loudi City in order to confirm and to resolve issues identified in the document review. The main topics of the interviews were (1) local stakeholder consultation process, (2) permits and approvals, (3) status of project implementation and (4) status of preparation of the training for the local staff and the monitoring plan. Details of the topics are listed in Table 1 below:

Table 1 Interview topics

Interviewed organisation	Interview topics
Hunan Anshi Xingyuan Power Generation Co., Ltd.	➢ Project design ➢ Project related legal issues ➢ Technical equipment ➢ Sustainable development issues ➢ Additionality ➢ Crediting period ➢ Monitoring plan ➢ Training history ➢ Management system ➢ Environmental impacts ➢ Stakeholder process ➢ Approval by the host country
Beijing Changjia Investment Co., Ltd	➢ Project design ➢ Technical equipment ➢ Sustainable development issues ➢ Baseline determination ➢ Additionality ➢ Crediting period ➢ Monitoring plan ➢ Management system ➢ Environmental impacts ➢ Stakeholder process ➢ Approval by the host country
Hunan Loudi Municipality & Local Community	➢ Project design ➢ Project related legal issues ➢ Project status ➢ Sustainable development issues ➢ Environmental impacts ➢ Stakeholder process ➢ Issues affecting the local community ➢ Approval by the local EPB

2.3 Clarification and Corrective Action Requests

The objective of this phase of the validation will be to resolve any requests for corrective actions and clarification and any other outstanding issues, identified during the validation, which needed to be clarified prior to TÜV Rheinland's positive conclusion on the project design.

To guarantee the transparency of the validation process, the concerns raised are documented as summary in table 3 of the validation protocol (Annex A to this validation report). The above Corrective Action Requests (CAR) and Clarification Requests (CL) were identified and presented to the project proponent. This will result besides of an action plan of the project developer for the further project preparation also in a revision of the published PDD, version 2 of December 2006, which was made public for the global stakeholder process.

Revised versions of the PDD, up to the latest version 4 dated November 07, have been submitted to the audit team for final validation, which is based on this first validation report and the issued corrective action requests and clarification requests.

3 VALIDATION FINDINGS

The findings of the validation, related to the updated PDD (Version 4 of November 2007) are summarized in the following sections. The requirements, the means of verification and the concluding results are documented in more detail in the validation protocol in Appendix A.

3.1 Project Design

3.1.1 Discussion

According to the PDD and Feasibility Study Report (FSR), the project utilise the energy from the waste gas which is generated from the 300,000 tpa new clean type coke oven constructed in 2004 by the Loudi Xingxing Coke Co., Ltd. (LXCC). The LXCC is established in 1995 with an area of 20 hectares. HAXPG then proceeded to implement the project in 2005 with an aim to recover and utilize the heat from the waste gas to generate electricity. On 1 May 2006, the 3 days' trial run of the Project was completed and approved to be meeting relevant national installation requirements (GB50273 & GB50255) by the Loudi Power Bureau, the construction company and the project owner and transferred to the project owner.

The waste gas is generated from the coke oven at a designed flow rate of 160,800 Nm³/h and a designed temperature of 950^{o} – 1050^{o}C. The waste heat is recovered by a fair of 35t/h waste heat recovery boilers which is fed to a 12MW steam turbine generator for power generation. The project utilise waste heat boilers generated from Linyi Boiler Factory which is a specialist boiler maker in China.

During the site visit the project location could be clearly identified according to the PDD.

Official Development Assistance

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards China.

Power Purchase & Waste Gas Supply Agreements

The Power Purchase Agreement (PPA) between Hunan Loudi Power Corporation and HAXPG, dated at April 2006, has been shown to the audit team during the site visit.

The Waste Gas Supply Agreement (WGSA) between LXCC and HAXPG, date at 20th July 2005, has been shown to the audit team during the site visit. It is stated that LXCC will supply the waste gas to HAXPG for 30 years without charges, under the condition that HAXPG cannot request LXCC to change the production method and schedule to supply adequate waste gas for power generation.

Staff Qualifications & Training

During the interviewing with HAXPG management representative by the audit team, HAXPG is responsible for organising the necessary training for the operation, maintenance and monitoring. The audit team has been able to confirm that the HAXPG has organized the necessary training (example: sent to other power plants and recruit experienced staff from other power plant) before the project commissioning. The management and the operating staff members have been trained and approved by General Administration of Quality Supervision Inspection and Quarantine of the People's Republic of China.

Operation & Maintenance

The Operation and Maintenance Manual was available for inspection during the site visit. Also the technical staff members of the major facilities have obtained relevant qualifications issued by the General Administration of Quality Supervision Inspection and Quarantine of the People's Republic of China.

Conceptualisation of CDM for the Project

Consideration of CDM by the HAXPG has demonstrated by records of internal meeting attended by senior management of HAXPG to minimise the risks for the project (An hui ji [2005]12, 14th March, 2005, Hunan Anshi Co., Ltd.,).

Contribution to Sustainable Development

The project is considered to be contributed to sustainable development, by utilisation of waste heat from the new type clean coke oven, considered as a kind of renewable energy resource, for the generation of electricity that would be have been provided by fossil-fired power, and by leading the technological development of waste heat utilization, which is confirmed by the audit team as a pioneer project and first of it's kind in Hunan. In the absence of the proposed project, the waste gas would be directly released to the atmosphere without being utilized and thus the sensible heat would be wasted.

The above is supported by the DNA of China, the National Development and Reform Commission (NDRC) which has granted the project activity host party approval, through letter, No. 205, dated 17th January 2007.

While granting host country approval, DNA of China assesses the project activities, and notes that:

1. The project activity complies with the permission requirements provided for in the Measures for Operation and Management of Clean Development Mechanism Project in China, and assists China in achieving sustainable development.
2. The project participant is authorized as China's participant to voluntarily participate in and carry out the project.

Thus, having been granted the host country approval it is concluded that the project activity meets the above-mentioned host country criteria.

The project is a bi-lateral project with the LoA of the Annex I Party involved, namely Switzerland, was issued on 22nd of January, 2007.

Starting date, Crediting Period and Life time of the project activity

The starting date of the project activity is 14th March 2005 as indicated in section C.1.1 of

the PDD.

According to the PDD, a fixed crediting period of 10 years is selected. The proposed crediting period of the project activity starts from 1st April 2007 as indicated in section C.2.2.1. of the draft PDD (version 2 of December 2006), but is revised to 1 December 2007 or after the project is registered in the revised PDD (version 4 of December 07).

The expected operational lifetime of the project activity is 30 years as indicated in section C.1.2. of the PDD. Comparing with the stated 10 years crediting period, the life of the facilities are longer than the crediting period.

3.1.2 Findings

CAR1: The location map should have English heading and titles.

Responses: The PDD was updated with English heading and title for the location map. The CAR is therefore resolved and closed.

CL01: Please clarify the data sources for power plant generation and should include a process flow chart with an unambiguous reference to each of the figures provided. The assumptions made for the calculations are too general and not enough project specific (e.g. average load factor) and therefore are not re-traceable with regards to the availability risk statements (e.g. reduced temperature of waste heat of 800ºC compared to design temperature of 950~1050ºC).

Responses: According to the feasibility study of the proposed project, the estimated annual net electricity supply of the project is expected to be 91.4 GWh. However, due to the barriers mentioned in Section B.5 of the PDD, the actual electricity net supply of the project in the first 12 months after commissioning was only 53.3 GWh. In order to be conservative, the actual annual net power supply of 53.3 GWh is used to estimate the expected emission reductions.

The CL is resolved and closed.

CL02: According to Methodology ACM0004 (version 2), *"For the particular case of generating units, supplied by waste gas and by other fuels, when the direct measurement of the electricity generated by using the waste gas is not possible"* the flow rate of waste gas has to be measured and record continuously and logged on hourly basis. Please clarify.

Responses: Since the proposed project uses the waste heat contained in the waste gas instead of the combustion of the waste gas for power generation, it is not necessary to measure the flow rate of the waste gas. Besides, the methodology ACM0004 also does not require the measurement of the waste gas flow rate for waste heat project.

The CL is resolved and closed.

CL03: Please clarify the start date of crediting period as according to the current schedule, registration of the project prior to 1st April seems impossible.

Responses: PDD has been revised. If the registration date of the project is later than the

stated date, the starting date of the crediting period will be the registration date of the project.

The CL is resolved and closed.

CL04: Please clarify the staff training plan (e.g. sent to other power plants for training purpose.) in order to overcome the technical difficulties as stated in the PDD.

Responses: New staff members were sent to other power plants for training before the commissioning of the proposed project. The training agreement between the project owner and the trainer (Thermal Power Plant of Hunan Jinxin Chemical Co., Ltd.) is provided.

The CL is resolved and closed.

CL05: Please explain why under the WGSA between LXCC and HAXPG, there is no charges for the waste gas supplied to HAXPG for 30 years by the LXCC.

Responses: For LXCC, the high temperature waste gas has no commercial value and they have been releasing the waste gas directly to the atmosphere since the coking plant was commissioned. On the other hand, if they charge for the waste gas, they would take the obligations to guarantee the parameters of the waste gas, which they don't want to and actually can't do.

The CL is resolved and closed.

CL06: Please clarify the approval status of the project's trial run.

Responses: The trial run was approved by the local power administration according to the national standards GB50273 and GB50255. The certificate with the chops of the Loudi Power Bureau, the construction company and the project owner is attached.

The CL is therefore resolved and closed.

3.2 Baseline and Additionality

3.2.1 Discussion

The project activity is applying ACM0004/Version 02 'Consolidated baseline methodology for waste gas and/or heat for power generation' for the project activity. The project activity is an electricity generation project in an industrial facility and based on utilization of waste heat of the gases for generation of electricity and adheres to the Sectoral Scope 1 that it represents.

The methodology applies to project activities that generate electricity from waste heat in coke production facility. The power generated by the project pant is fed into the grid or would in the absence of the project activity be purchased from the grid. CCPG is dominated by the fossil fuel which is indicated by the China Energy Statistic yearbook (2002~2004). No fuel switch is done in the process and the LXCC is an existing facility. The applicability conditions are met by the project activity.

As per ACM0004/Version 02, the PDD has identified the following baseline scenarios to

the project activity:

Alternative 1 The proposed project activity not undertaken as a CDM project activity;
Alternative 2 Import of equivalent electricity from the Grid;
Alternative 3 Construct a new captive power plant with equivalent installed capacity using other energy sources than waste heat, such as coal, diesel, natural gas, hydro, wind etc;
Alternative 4 A mix of Options (2) and (3);
Alternative 5 Other uses of the waste heat.

These alternatives are described in a transparent manner in the PDD and are considered as sensible alternatives.

The audit team accepted the justifications provided in the PDD, with further evidence received during site visit and interviews with local stakeholders, that only Alternative 2 does not face any prohibitive barrier and be accepted as the baseline scenario.

In addition, the audit team has been able to confirm with the local Environmental Bureau that there is no legal requirement to emit the high temperature waste gas to the atmosphere in China. According to site interview with local stakeholders, the existing coke and steel factories neighbouring to the project site are all emitting their waste gases directly to the atmosphere without utilization, as a common practice.

Furthermore, it is also noted during the site visit that no other use of waste heat is envisaged at this point other than waste heat power generation, due to remote locations of residential houses and that the nearby industry are coke or steel-making plants with little demand for surplus waste heat.

3.2.2 Findings:

Nil

Additionality of the Project Activity

The additionality of the project activity is determined with the application of Steps 1, 3, 4 & 5 of the 'Tools for Demonstration and Assessment of Additionality, version 3' approved by the EB. The Investment Analysis (Step 2) of the Tool has not been applied.

An analysis of the application of the 'Tools for Demonstration and Assessment of Additionality' is given in the following paragraphs.

Step 1 Identification of alternatives to the project activity consistent with current laws and regulations

Alternative 2 has been selected as the only plausible baseline scenario with each of the other identified alternatives facing prohibitive barriers.

All the selected alternatives are in compliance with the existing laws and regulations of China. These alternatives are giving same service as the project activity.

Step 3 Barrier Analysis

The PDD has described the following barriers pertinent to the implementation of the project activity:

Investment barrier

The audit team concur with the barrier claimed in the PDD that the banks and financial

institutions did not respond favourably to the HAXPG's application for loans to implement project activity. This is supported by the fact that there is only a loan of only RMB 20 million received from the banks on 26 May 2006 (i.e. after the project is built), against a total investment of over RMB 50 million. Also it is accepted that it is not common for a coke-making company to invest in power generation.

Barriers due to uncertain waste gas supply

The PDD reported that the supply of waste gas from LXCC is out of HAXPG's control. The audit team has reviewed the gas supply contract between LXCC and HAXPG, and confirmed that HAXPG is not allowed to interfere with the coke production process of the LXCC to improve the quantity and quality of waste heat for power generation. The lack of the ability to control the supply of waste gas means the risk to turbine operation would persist. Consideration of this principal risk and incentives from CDM by the project proponent has been demonstrated by records of internal meeting attended by senior management of HAXPG on 14th March 2005. The audit team therefore concurred that consideration of CDM and hence it's revenue from selling of CERs, has been the key reason which helped the project proponent to move ahead and implement the project despite the claimed barrier.

Technological barrier

The audit team has confirmed that the Anshi Group and the HAXPG are local establishments in Hunan Province and has no involvement or experience in power generation industry before. As the project involves the new technology of usage of waste heat to generate the electricity, HAXPG does not possess relevant management and operation experiences and expertise to effectively implement the project. As a result, the HAXPG needs to employ new staff from other power stations and have to send their staff to training in order to allow a successful implementation and operation of the project.
Based on the collected operational data, the audit team has been able to confirm that the actual waste gas temperature reaching the waste heat boilers (600 ºC) is significantly lower than the expected boiler designed temperature (900ºC) and has a high seasonal fluctuations, which results in the generation of steam with substantially lower temperature than the original design values. This will not only reduce the electricity generated, and will also increase the operation and maintenance risks, especially the risk related to operation of steam turbine, hence may increase the number of down-time and decrease the expected service life-time of the plant. According to site observation, additional remediation works by enhancing the insulation of underground gas tunnel is underway to reduce the heat loss during the gas transportation.

Barriers due to prevailing practice

The audit team confirms that the project activity is the "first of its kind" waste heat based power generation of the new clean type coke oven in Hunan province. This is further supported by the Chemical Engineering Design College of Shanxi Province (CEDSP), which has issued a letter on 28th December 2006 to confirm that HAXPG is the only company in Hunan Province to utilise the CEDSP new type clean coke oven technology.

Sub-step 3 b Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except in the proposed project activity)

It is concurred that selected baseline scenario - "Import of electricity from the grid" does not face the same technological barriers that are faced by the project activity.

The PDD has indicated that there is no mandatory legal binding on HAXPG to implement the project activity of the waste heat utilization and emission. During the interviewing with officers of Loudi Environmental Protection Bureau and Loudi Economic Commission, both of them clarified that there is no mandatory legal requirement for utilisation of waste heat from coke making to generate power.

Step 4 Common Practice Analysis

Sub-step 4.a Analyse other activities similar to the project activity

The revised PDD has included the results of a survey of coke making industry in Hunan Province, and reported that the project activity is the only waste heat based power generation of the new clean type coke oven project in Hunan. This is further supported by the Chemical Engineering Design College of Shanxi Province (CEDSP), which has issued a letter on 28th December 2006 to confirm that HAXPG is the only company in Hunan Province to utilise the CEDSP new type clean coke oven technology.

Sub-step 4.b Discuss any similar Alternatives that are occurring

As discussed, in sub-step 4.a above, the HAXPG project activity is a unique activity in Hunan province by using a clean type coke oven of waste heat recovery.

Application of 'Tools for demonstration and analysis of additionality' suggests that the project activity is additional.

Findings:

CL07: HAXPG needs to clarify the following with respect to additionality

1. HAXPG should consider to adopt the latest version of 'Tools for Demonstration and Assessment of Additionality' approved by CDM EB.
2. HAXPG should further substantiate the barrier analysis for the proposed project activity. All barriers shall be substantiated by transparent and documented evidence.
3. Please specify if step 2 is not to be chosen by the project proponent. It should be mentioned in the PDD with justifications.

Responses:

1. PDD updated with the latest version of "Tools for Demonstration and Assessment of Additionality".
2. An article from the "Shanxi Science and Technology" is attached, which has a conclusion that the clean type coke oven has many problems to be solved because of its short application time in China. The daily report of the power plant is also attached to show that the waste gas temperature is much lower than the estimation in the feasibility study. Another article from "East China Power" is provided which concluded that running the turbine under low steam parameters can do harm to the equipment and endanger the safe operation of the turbine.
3. PDD updated.

The CL is resolved and closed.

CL08: Please provide appropriate evidence suggesting the common practice in the area.

Responses: A survey was taken for the coking industry of Hunan Province with the finding that LXCC is the only company that owns the new clean type coke oven. See updated PDD.

The CL is resolved and closed.

CL9: As per methodology (Page 3, paragraph above additionality), selection of baseline scenario is economically most attractive scenario. An appropriate scenario should be the one, which presents economically most attractive scenario. No such economic/financial analysis is present in the CDM PDD (December 2006) while selecting the scenario for the proposed project activity.

Responses: According to the methodology ACM0004, baseline options that:

- do not comply with legal and regulatory requirements; or
- depend on key resources such as fuels, materials or technology that are not available at the project site

should be excluded. After the above criteria are applied, the alternative 3, 4 and 5 can be excluded. Among the remaining two alternatives, alternative 1 faces prohibitive barriers, so only alternative 2 is left. This is why no economic analysis is used for the determination of the baseline scenario.

The CL is resolved and closed.

CL10: Please submit the evidence to prove the investment barrier that the banks and financial institutions did not respond favourably to the project.

Responses: After the application for a loan was submitted to the bank, although the bank explained for many times orally to the project owner that they see the project as a high risk project and do not want issue the loan, they never give a written reply to the project owner. The bank only issued the loan after the project was commissioned. Supporting document was submitted to the audit team.

The CL is resolved and closed.

CL11: It is mentioned that there are technical barriers because the temperature of waste gas reaching the waste heat boilers is both lower than the designed value, and has a high variation. Please provide supporting information to show temperature variation and supplement why the temperature fluctuation would provide a risk to the operation of the power plant.

Responses: Actual production data are provided to the validation team. The data shows that the difference between the highest and lowest waste gas temperature in a certain month is in a range of 50-130 degree C. The variation of the waste gas temperature would immediately result in the fluctuation of the temperature and pressure of the steam generated by the boilers. The steam parameters are critical to the turbine operation. According to the operation manual of the turbine, the steam temperature should be in the range of 400-460 degree C and the steam pressure in the range of 2.8-3.9 MPa. The actual production data after the project was commissioned give a steam temperature range of 305-435 degree C and a steam pressure range of 2.05-3.5 MPa, which means the turbine would

lose part of its generation capacity when the steam parameters are low and even need to be shut down when the parameters are low enough.

The audit team has reviewed the provided Operation Manual, the characteristics of typical turbine, the impact to turbine operation under the prevailing low temperature operating conditions, and has sought expert advice from a local boiler expert; and confirmed that the existence of the technical barriers when the waste gas temperature cannot reach a certain minimum values. The CL is therefore resolved and closed.

3.3 Monitoring Plan

3.3.1 Discussion

The project activity is applying the Approved Consolidated Monitoring Methodology ACM0004 / Version 02 'Consolidated monitoring methodology for waste gas and/or heat for power generation' for the project activity. Applicability criteria of the monitoring methodology to the project activity are met as noted in Section 3.2.

The PDD (December 2006) has made provisions for monitoring the GHG emissions reduction due to the project activity. It is noted that incomplete GHG monitoring parameters are identified at B.7.7 of the PDD (December 2006).

The project activity will not generate any project emission. Therefore monitoring of project emission is not required.

Monitoring of GHG emission reduction is based on measuring the net quantity of electricity supplied to the Grid and Anshi Group which is transparently presented in the PDD.

The management team for monitoring of the project is clearly identified in the PDD. The audit team has reviewed the qualifications of the management team and confirmed they are suitable for carrying out the work.

The QA/QC procedures are also suitably described in the revised PDD.

3.3.2 Findings

CAR02: The enclosed tables in the PDD are different from the latest versions of the applied monitoring methodologies. Relevant Quality Control (QA) and Quality Assurance (QC) procedures measures are not described sufficiently, and the relevant table listing the parameters to be monitored is missing. Please specify in the PDD the measurement methods and procedures, including a specification with acceptable industry standards or national or international standards to be applied, which measurement equipment is used, how the measurement is undertaken, which calibration procedures are applied, what is the accuracy of the measurement method, who is the responsible person / entity that should undertake the measurements and what is the measurement interval.
Moreover, a description of the QA/QC procedures (if any) that should be applied, including the uncertainty level of data and measurement devices applied.
Responses: PDD updated.

The CL is resolved and closed.

CL12: The monitoring plan, as documented in the PDD Section B.7 and Annex 4, shall contain according to the applied methodology also the measurement of the own electricity consumption, e.g. throughout separate electricity meter, etc. (with an own ID number). Also the monitoring plan shall contain all requested parameters and also the related QA/QC measures, which includes also details on calibration of monitoring equipments.

Responses: The methodology requires the monitoring of the net electricity generation from the proposed project. The specific features of the proposed project makes it difficult to measure the own electricity consumption via a separate meter, but the parameters monitored will be enough to calculate the "net electricity generation" of the project. See updated PDD.

The CL is resolved and closed.

CL13:

The procedures covering roles, allocation of responsibilities and authorities for carrying out monitoring, measurement and reporting of the complete monitoring plan needs to be submitted to the validation team. These procedures should also cover retention period for records. Also procedures for calibration of monitoring equipments and corrective actions as well for internal actions and internal audits should be defined. The monitoring plan should also include the uncertainty levels, methods and associated accuracy level of measurement devices and calibration proceedings to be used for various parameters, see under the relevant EB 23 decision.

Responses: A detailed CDM monitoring plan is provided to the validation team.

The audit team has reviewed the CDM monitoring plan and confirmed that it has contained the necessary procedural information. The CL is therefore resolved and closed.

3.4 Calculation of GHG Emissions

3.4.1 Discussion

The project boundary of the project activity includes the waste heat source, the power generating equipments (waste heat recovery boiler, and steam turbine generator), the Anshi Group and the CCPG.

Regarding the calculation of project emissions, the PDD has adequately demonstrated the no auxiliary fuels will be used and hence the emission is zero.

No leakage is considered in the applied Methodology and hence can be assumed as zero.

Regarding the calculation of Baseline Emissions, it is calculated based on grid power displaced by the project activity in accordance with the ACM002. A combined margin emission coefficient for the CCPG, derived from the weighted average of *ex-ante* calculated Operating and Build Margins emission factors on the basis of the publicly released calculations by the DNA of China - NDRC, except the utilisation of the values from the 2006 IPCC Guidelines rather than the 1996 IPCC Guidelines.

Based on the actual operational data, due to the barriers mentioned in Section B.5, the actual electricity net supply of the project in the first 12 months after commissioning was only 53.3 GWh against the expected 91.4GWh from the FSR. Accordingly, the project is

expected to reduce a revised GHG emissions by 51,360 tCO_2e annually in comparison to the original estimated value of 88,073 tCO_2e. During the years from 2007 to 2017, the GHG emissions would be reduced by 513,600 tCO_2e.

3.4.2 Findings

CL14: Please clarify the value and source of the selected energy efficiency of the waste heat recovery boiler in the PDD.

Responses: The boiler efficiency is from the equipment procurement contract between the project owner and the boiler manufacturer.

The CL is resolved and closed.

CL15: Please clarify the application status of the set of emission factors published by NDRC.

Responses: There is no information released from NDRC regarding the acceptance status by CDM EB. But the method used by NDRC is based on EB's reply to the request for clarification on the use of approved methodology AM0005 (replaced by ACM0002 already) in China.

2006 IPCC Guidelines default values for carbon emission factor and oxidation factor are used to replace the Revised 1996 IPCC values used in the NDRC calculation for the proposed project.

The CL is resolved and closed.

CL16: Please clarify in the PDD which of the following Alternative for calculation of the emission factor, according to approved methodology ACM0002, the project proponent intends to use:

- Ex-ante determination 100 % according to the applied methodology
- Ex-post determination annually 100 % according to the applied methodology in the first crediting period; estimation of the emission factor ex-ante in a conservative manner
- Requesting deviation to the approved methodology prior to submission of registration

Responses: PDD revised to show clearly that the project uses Ex-ante determination 100 % according to the applied methodology.

The CL is resolved and closed.

3.5 Environmental Impacts

3.5.1 Discussion

The environmental impacts of the project have been reported in the PDD, Section D. The project activity is not expected to cause any significant environmental impacts. The environmental impacts of the project were sufficiently assessed by means of an

Environmental Impact Assessment (EIA) Study. The EIA Report, has been presented and approved by the China State Environmental Protection Administration in 18th October 2006.

In addition, no significant environmental impacts were identified during the on site assessment. This is further confirmed by the interviewing with representative of local Environmental Protection Bureau during the site interview that no environmental complaint was received.

On a voluntary basis a public consultation was organised for the project preparation, after the project was approved by the relevant public authorities. All the relevant permits for construction and operation were issued prior to the start of the construction work of the full scale project.

3.5.2 Findings

Nil

3.6 Comments by Local Stakeholders

3.6.1 Discussion

Although it is not a formal requirement by the current legislation of the host country, a stakeholder consultation process has been carried out with a survey summary available for review by the audit team. The processes by which comments from local stakeholders have been invited and compiled, has been described within Section E of the PDD. Furthermore, during the on site visit, representatives from the local community were interviewed. In general, the interviewees show adequate understanding of the nature of the project and agreed that the project would benefit the environment, society and economic development. The response is overall supportive.

3.6.2 Findings

CL17: HAXPG needs to clarify the negative comments at section E.2. of the PDD with respect to noise and air pollution. What were the comments? How were these comments considered?

Responses: Measures recommended in the EIA report were taken to mitigate the possible impact on the local environment, which will satisfactorily accommodate the stakeholders' concerns regarding noises. The monitoring report issued by the local environmental monitoring station on 12 September 2006 (Lou Huan Jian 2006 No.14) confirmed that all the pollutant emissions of the plant, including waste water, dust and noise, are within the applicable national standards.

The CL is resolved and closed.

3.7 Comments by Parties, Stakeholders and NGOs

TÜV Rheinland has published the PDD on UNFCCC website from 18th December 2006 ~ 16th January 2007. No comment was received on the project activity.

2.7.1 Findings:

Nil

4 VALIDATION OPINION

The audit team of DOE TÜV Rheinland Japan Ltd., TÜV Rheinland Group, TÜV Rheinland Group (TÜV Rheinland) has carried out the validation of the planned "Waste heat power generation project at Hunan Anshi Xingyuan Power Generation Co., Ltd." in the P.R. China on the basis of UNFCCC criteria for CDM projects according to Article 12 of the Kyoto Protocol and subsequent decisions of the CDM Executive Board with regard to CDM modalities and procedures and the application of approved methodologies. The validation report and the validation protocol are summarizing the findings of the validation.

The validation was executed in the following steps:

- Desk review of preliminary PDD (version 1 of December, 2006)
- Public stakeholder comment process (18th December 2006 ~ 16th January 2007)
- On-site visit with stakeholder interviews (22nd January 2006 ~ 24th January 2006)
- Issue of checklist with corrective action requests (CARs) and clarification requests (CLs) and the draft validation report & protocol
- Desk review of revised PDD (new version)
- Review of proposed corrections and clarifications
- Issue of the final validation report & protocol

The project is confirmed by China's DNA which has been issued the Letter of Approval (LoA) at 17th January 2007. The LoA indicated the project assists them in achieving sustainable development.
The project activity is a bilateral CDM-project, with Switzerland being identified as the Annex I party and the LoA is inspected.
By displacing fossil fuel-based electricity with electricity generated from the waste heat, the project results in reduction of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the barriers demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the revised estimated amount of emission reductions of 51,360 tCO_2e. This subject shall be closely monitored during project verification.

The validation has revealed that the procedures for monitoring and reporting are sufficiently developed. The mentioned CDM manual and other relative working procedures mentioned in the PDD are completed and available for the audit team. Such procedures are considered as important in order to reduce the risk for emission reductions not being

verified and certified. The project proponent has resolved all Clarification Requests and Corrective Action Requests as stated in the first Validation Report and the Validation Protocol. This has resulted in a revision of the project design document.

In the opinion of TÜV Rheinland the project meets all relevant UNFCCC requirements of the CDM and is able to fulfil all relevant host country criteria. Therefore TUV Rheinland requests the registration of the project as a CDM project activity.

The validation is based on the information made available to us and the engagement conditions detailed in this report.

REFERENCES

Category 1 Documents:

Documents provided by the Client that relate directly to the GHG components of the project

1 Project Design Document (PDD)
2 Annexes to the Project Design Document
3 Public Comment Survey
4 Environmental Impact Assessment Report (EIA)
5 NDRC, 17th January 2007, Number 205, Letter of Approval of the DNA of the P.R. China

Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents

List	Book Title
1	International Emission Trading Association (IETA): VVM – Validation and Verification Manual
2	Approved Baseline Methodology ACM0004 “Consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation”
3	Approved Monitoring Methodology ACM0004 “Consolidated monitoring methodology for waste gas and/or heat and/or pressure for power generation”
4	Approved Baseline Methodology ACM0002 “Consolidated Baseline Methodology for Grid-Connected Electricity Generation from Renewable Sources”
5	Approved Monitoring Methodology ACM0002“Consolidated Baseline Methodology for Grid-Connected Electricity Generation from Renewable Sources”
6	Hunan Loudi Power Corporation and Hunan Anshi Xingyuan Power Generation Co., Ltd., April, 2006, Power Purchase Agreement
7	Hunan Anshi Enterprise Group, 14th March 2005, An hui ji [2005] Number 12, About preparation of waste heat power generation power plant construction’s meeting minute

8	LXCC and HAXPG, 20th July 2005, Coke oven waste heat supply agreement
9	Huan Shi Ji Long Certified Public Accountants Co., Ltd., 28th September 2006, Shi Ji Long shen Zi [2006] Number S-39, HAXGP audit report
10	HAXPG and Vitol S.A, 9th October 2006, CDM Emission Reductions Purchase Agreement
11	Hunan Loudi Environmental Protection Bureau, 18th October 2006, About HAXPG uses coke oven waste heat to generate the power and relates to environmental protection situation approval
12	Loudi Environmental Monitoring Station, 12th September 2006, Lou huan jian zi [2006] Number 14, Loudi key industry pollution environmental protection monitoring report.
13	HAXPG and Hunan Province Power Company, April 2006, Power Purchase Agreement
14	Loudi Economic Commission, 29th August 2005, [2005] number 81, The reply of feasibility report About HAXPG uses coke oven gas with waste heat power generation engineering change project.
15	Hunan Province Environmental Protection Bureau, 28th August 2003, Xiang huan ping [2003] number 53, The review of the EIA report of LXCC coke oven's waste gas gasify project.
16	Hunan Province Environmental Protection Bureau, 10th September 2003, Approval about LXCC 600 thousands tones coke oven's engineering design change
17	HAXPG Training manual, schedule and record
18	GHZB1-1999, Environmental quality standard for surface water,
19	GB9078-1996, Air quality emission standard for industry oven
20	GB3095-1996, Ambient air quality standard
21	GB16297-1996, Integrated emission standard of air pollutants
22	GB14554-93, Odour pollutants emission standard
23	24th August 2005, Coke oven air pollutants emission standard
24	HAXPG, 30th December 2006, Equipment maintenance record information
25	HAXPG, Special equipment usage permit and operator permits

Persons interviewed:

List persons interviewed during the validation, or persons contributed with other information that are not included in the documents listed above.

No.	Name	Company Name	Title
1	Cui Hongwei	Beijing Changjia Investment Co., Ltd	Project Manager
2	Liu Zhiyong	Changsha Engineering and Research of NONFERROUS METALLURGY	Assistant Manager
3	Xiong Buyun	Hunan Anshi Xingyuan Fadian Co., Ltd.	Engineer Supervisor
4	Tan Jianzhong	HAXGP	General Manager
5	Zhu Yuanxiong	Hunan Loudi Economic and Trade Commission	Officer
6	Liang Hongri	Hunan Loudi Environmental Protection Bureau	Chief Engineer
7	Yan Guojun	Nan Yang Village	Government Officer
8	Zhang Junzhong	N/A	Farmer and temporary worker
9	Liu Haozhong	Loudi Power Company	Assistant supervisor
10	Mr. Hang	Lodui Street Administration	Assistant officer
11	Feng Zhidong	Loudi Xingxing Coking Co., Ltd	General Manager

APPENDIX A

CDM VALIDATION PROTOCOL

Introduction

This document contains a generic Validation Protocol for CDM projects, which must be seen in conjunction with the *Validation and Verification Guidelines* and the *Validation Report Template*.

This validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet; and
- It ensures a transparent validation process by inducing the validator to document how a particular requirement has been validated and which conclusions have been reached;

This protocol contains two tables with generic requirements for validation projects. Table 1 shows the requirements that the GHG emission reduction project will be validated against. Table 2 consists of a checklist with validation questions related to one or more of the requirements in Table 1. The checklist questions may not be applicable for all investors, and should not be viewed as mandatory for all projects. Where a finding is issued, a corrective action request or clarification request are stated. The resolution and final conclusions of these requests should be described in Table 3 of this protocol.

Before this generic validation protocol can be applied to validate a specific project, the validator must review and adjust/amend the protocol to make it applicable to individual project characteristics and circumstances as well as individual investor criteria. The application of the validator's professional judgement and technical expertise should ensure that checklist amendments cover all necessary specific project requirements that have impact on project performance and acceptance of the project. Given the above, the checklist part of the protocol is neither exhaustive nor prescriptive.

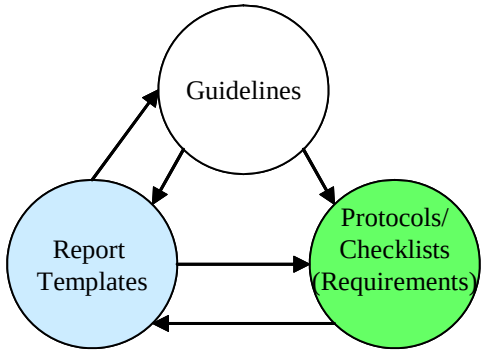

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

REQUIREMENT	Reference	CONCLUSION	Cross Reference / Comment
1. Assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	OK	Table 2, Section E.4. As participating Annex I Party has Switzerland been identified.
2. Assist non-Annex I Parties in achieving sustainable development and the project has obtained confirmation by the host country that the project assists in achieving sustainable development	Kyoto Protocol Art. 12.2, Marrakesh Accords, CDM Modalities §40a	OK	OK
3. Assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK	Table 2, Section E.4.1. The project assists the P.R. China in contributing to the ultimative objective of the UNFCCC.
4. The project has the written approval of voluntary participation from the designated national authorities of each party involved	Kyoto Protocol Art. 12.5a, Marrakesh Accords, CDM Modalities §40a	OK	OK
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of	Kyoto Protocol Art. 12.5c, Marrakesh Accords, CDM Modalities §43	OK	Table 2, Section B.2.

REQUIREMENT	Reference	CONCLUSION	Cross Reference / Comment
the registered CDM project activity			
7. Potential public funding for the project from Parties in Annex I is not a diversion of official development assistance	Marrakech Accords	OK	The review of documents did not reveal any information indicating, that ODA is used for the project financing of the waste heat based power project. No diversion of ODA occurs. The project has been proposed as a bilateral project.
8. Parties participating in the CDM shall designate a national authority for the CDM	Marrakech Accords, CDM Modalities §29	OK	The host country, the P.R. China has a DNA, namely the National Development and Reform Commission of the People's Republic of China. The participating Annex I Party Switzerland's DNA is the Federal Office for the Environment FOEN, Climate Unit.
9. The host country and also the participating Annex I country shall be a Party to the Kyoto Protocol	Marrakech Accords, CDM Modalities §30	OK	The host country of the project P.R. China has ratified the Kyoto Protocol on August 30, 2002. The involved Annex I country Switzerland has ratified the Kyoto Protocol on July 9, 2003.
10. Comments by local stakeholders are invited, a summary of these provided and how due account was taken of any comments received	Marrakech Accords, CDM Modalities §37b	OK	Table 2, Section G.1.4. A summary of the local stakeholder process has been provided within the PDD under chapter E.
11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, has been	Marrakech Accords, CDM Modalities §37c	OK	Table 2, Section A.2.2., F.1.1. The EIA has been approved by the

REQUIREMENT	Reference	CONCLUSION	Cross Reference / Comment
submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party has been carried out.			Environmental Protection Bureau. A short summary of the environmental impacts has been provided within the PDD under chapter D.
12. Baseline and monitoring methodology is previously approved by the CDM Methodology Panel	Marrakech Accords, CDM Modalities §37e	OK	Table 2, Section B.1.1. and D. 1.1.
13. Provisions for monitoring, verification and reporting are in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	Marrakech Accords, CDM Modalities §37f	OK	Table 2, Section D
14. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	Marrakech Accords, CDM Modalities, §40	OK	The PDD has been published directly on the UNFCCC website for a period of 30 days, from December 12 to January 16, 2006. No comments were received so far.
15. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Marrakech Accords, CDM Modalities, §45c,d	OK	Table 2, Section B.2.
16. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, CDM Modalities, §47	OK	Table 2, Section B.2.

REQUIREMENT	Reference	CONCLUSION	Cross Reference / Comment
17. The project design document is in conformance with the UNFCCC CDM-PDD format. Has all required information been provided ?	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	**CAR 1** The location map should have English heading and titles.	The PDD is in conformance with version 03.1. of the CDM PDD (in affect as of: 28 July 2006). The PDD is updated. OK.

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity *The project design is assessed.*					
A.1. Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	PDD	DR I	The project spatial boundaries have been defined and are described in chapter A.2, A.4 (incl. a map) of the PDD. The project is situated in the coke-oven plant of Hunan Anshi Group in Loudi City.	OK	OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	PDD	DR I	The project boundaries are defined. The project system's boundaries are limited to the main equipments of the power plant: two waste heat recovery boilers a 35 t/h (3.82 MPa, 450°C, 85 % efficiency), steam turbine of 12 MW, electricity generator 12 MW (6.3 kV, 97 % efficiency) and power transmission system 6.3 / 110 kV, connected with Central China Power Grid.	OK	OK
A.1.3. Is the project category suitably defined?	PDD	DR	The project belongs to sectoral scope 1 – energy industries.	OK	OK
A.2. Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how*					

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
is used.					
A.2.1. Does the project design engineering reflect current good practices?	PDD OSV	DR I	The project design engineering reflects basically good practices through the use of the sensible waste heat of the flue gases from a clean type coke oven, which contains mainly CO_2 and N_2 and does not contain any volatiles and has no calorific value, described in the project design documentation. This practice and technology is new and advanced in China, based on domestic technology.	OK	OK
A.2.2. 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?	PDD OSV	DR I	The project makes use of existing domestic waste heat recovery boiler (mid-temperature, mid-pressure) technologies and steam turbine (condensing type) technologies. The utilization of waste heat of the waste gas from coke oven process for power generation is not common in China and is the first of its kind in Hunan province. **CL 1:** Please clarify the data sources for power plant generation and should include a process flow chart with an unambiguous reference to each of the figures provided. The assumptions made for the calculations are too general and not enough project specific (e.g. average load factor) and therefore are not re-traceable with regards to the availability risk statements (e.g. reduced	CL 1 & 5	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			temperature of waste heat of 800ºC compared to design temperature of 950~1050ºC). **CL 5** Please clarify the approval status of the project's trial run.		
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	PDD	DR I	The project is not likely to be replaced by other more efficient technologies at least within the crediting period.	OK	OK
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	PDD OSV	DR I	Yes, the project requires initial training for operation and maintenance, because the core business of the project developer and future operator Anshi Group is different than generation of power from waste heat. These capabilities will be transferred to the project developer and power plant operator through the technology supplier, with expertise and references of similar energy projects at other locations. Hunan Anshi Xingyuan Generation Co., Ltd. is responsible for organising the necessary training for the operation, maintenance and monitoring.	OK	OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	PDD OSV	DR I	Yes. Training and maintenance needs have been addressed in the PDD. The project proponent is required to develop adequate procedures identifying the training and maintenance needs and provide documentation for the same, e.g.	CL 4	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			maintenance checklists for the plant staff. **CL 4** Please clarify the staff training plan (e.g. sent to other power plants for training purpose.) in order to overcome the technical difficulties as stated in the PDD.		
A.3. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	PDD OSV	DR I	Yes, according to the information given in the PDD the project is in line with relevant legislation in China.	OK	OK
A.3.2. Is the project in line with host-country specific CDM requirements?	PDD	DR	Evidence of host country approval of the DNA of China has not been provided yet. So far the project can be seen to be in line with the host country specific requirements and priorities for CDM.	OK	OK
A.3.3. Is the project in line with sustainable development policies of the host country?	PDD	DR	By using waste heat , which belongs to the priority category of energy efficiency measures, the project is in line with current sustainable development priorities in China.	OK	OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	PDD OSV	DR I	The project activity will also improve environmental and health related conditions by reducing GHG emissions and other pollutions through the use of waste gas. During the construction and operation of the project activity local human resources or companies will be employed respectively subcontracted. The PDD	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			states the generation of ~ fifty permanent jobs during the operation stage. The project's containing technology transfer and improvement in technology and the training of the operational and maintenance staff will enhance the capacity of people in Loudi City and Hunan province to apply environmentally sound technologies.		
B. Project Baseline *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
B.1. Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
B1.1. Is the baseline methodology previously approved by the CDM Methodology Panel?	PDD	DR	Yes. The project is applying the approved baseline methodology ACM0004 "Consolidated Baseline Methodology for Waste Gas and / or Heat and / or Pressure for Power Generation", which uses also the build margin and operational margin approach from ACM0002"Consolidated methodology for grid-connected electricity generation from renewable sources".	OK	OK
B1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified? .	PDD	DR	Yes. The use of the approved baseline methodologies are considered to be, out of the existing approved baseline methodologies, most applicable for this project, that is a waste heat based power generation project.	CL 2	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			The PDD responds convincingly to each of the applicability criteria which are outlined in the baseline methodology. **CL 2** According to Methodology ACM0004 (version 2), "*For the particular case of generating units, supplied by waste gas and by other fuels, when the direct measurement of the electricity generated by using the waste gas is not possible"* the flow rate of waste gas has to be measured and record continuously and logged on hourly basis. Please clarify.		
B.2. Baseline Determination *The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.*					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	PDD	DR I	Yes. The application of the chosen baseline methodology could be demonstrated in a transparent manner. The baseline scenario is the atmospheric release of the waste gas without utilization for captive power generation and at the same time the import of the necessary equivalent of electricity from Central China Power Grid, which is mainly based on fossil fuels.	OK	OK
B.2.2. Has the baseline been determined using conservative assumptions where possible?	PDD	DR I	The emission reductions of the project will be achieved by using zero emission waste heat for power generation. The baseline scenario	CL 16	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			assumes, that the energy mix emission factor of the combined margin of the Central China Power Grid, calculated according to ACM0002 would otherwise continuously be used during the crediting period. The methodology ACM0004 requests also the deduction of the project emissions from the emission reductions caused by own electricity consumption respectively other start up – fuels. **CL 16:** The validation team has to be informed, which option of approved methodology ACM0002 with regard to the emission factor the project proponent intends to use: • Ex-ante determination 100 % according to the applied methodology • Ex-post determination annually 100 % according to the applied methodology in the first crediting period; estimation of the emission factor ex-ante in a conservative manner • Requesting deviation to the approved methodology prior to submission of registration in accordance with DNA respectively UNFCCC CDM EB guidance		
B.2.3. Has the baseline been established on a project-specific basis?	PDD	DR	Yes, the baseline methodology is applied taking into account project specific circumstances.	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			The baseline determination takes the actual amount of waste heat available in the waste gas to evaluate the amount of electricity that can be generated. This approach could be used also for other similar projects in China with similar characteristics.		
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	PDD	DR	Yes. All the current relevant national and/or sectoral policies in China were considered. China has no mandatory policies or laws which require the utilization of waste heat.	OK	OK
B.2.5. Is the baseline determination compatible with the available data?	PDD	DR I	Yes. The baseline scenario is supported by available data from China Grids Baseline Emission Factors Bulletin, published by the Office of National Coordination Committee on Climate Change under the DNA of China, the National Development and Reform Commission. The combined emission factor has been determined using the Central China Power Grid.	OK	OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	PDD	DR I	Yes, see B.2.1. In the absence of the proposed project activity, five other alternatives have been identified: • BAU: Import of equivalent electricity from the grid and release of waste gas into the atmosphere • The proposed project activity not undertaken as a CDM project activity	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			• Power generation with equivalent installed capacity using fossil fuels • A mix of options "Electricity import from the grid" and "Fossil fuel based power plant". • Other uses of the waste heat The only plausible baseline scenario remains the business as usual scenario, which would mean a continuation of the release of waste gas into the atmosphere without any utilization and at the same time the import of equivalent electricity from the grid.		
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario (e.g. through demonstrating investment barriers, technology barriers, barriers to prevailing practices, and/or other barriers or through quantitative evidence that the project would otherwise not be implemented)?	PDD EA	DR I	The project proponents have applied the comprehensive additionality tool for large-scale projects with its components for identification of alternatives, barrier analysis and common practice analysis, see also PDD, chapter B.5. (Additionality). Finally it can be stated, that the revenues generated from the sale of CERs is the main driver and will enable the project participants to go ahead with the project implementation inspite of the described technical, financial, common practice and barriers connected with the waste gas parameters, in case of a successful registration of the project activity at UNFCCC. **CL 6** Please explain why under the WGSA between	CL 6 - 11	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			LXCC and HAXPG, there is no charges for the waste gas supplied to HAXPG for 30 years by the LXCC. **CL 7** HAXPG needs to clarify the following with respect to additionality 1. HAXPG should consider to adopt the latest version of 'Tools for Demonstration and Assessment of Additionality' approved by CDM EB. HAXPG should further substantiate the barrier analysis for the proposed project activity. All barriers shall be substantiated by transparent and documented evidence. **CL 8** Please provide appropriate evidence suggesting the common practice in the area. **CL 9** As per methodology (Page 3, paragraph above additionality), selection of baseline scenario is economically most attractive scenario. An appropriate scenario should be the one, which presents economically most attractive scenario. No such economic/financial analysis is present in the CDM PDD (December 2006) while selecting the scenario for the proposed project activity.		

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			CL 10 Please submit the evidence to prove the investment barrier that the banks and financial institutions did not respond favourably to the project. **CL 11** It is mentioned that there are technical barriers because the temperature of waste gas reaching the waste heat boilers is both lower than the designed value, and has a high variation. Please provide supporting information to show temperature variation and supplement why the temperature fluctuation would provide a risk to the operation of the power plant.		
B.2.8. Have the major risks to the baseline been identified?	PDD OSV	DR I	The baseline is based on statistical data, which are transparent. No major baseline risks are foreseen, since the power generated will be directly measured and the emission factor is fixed ex-ante for the selected crediting period of 10 years.	OK	OK
B.2.9. Is all literature and sources clearly referenced?	PDD	DR I	References for literature and data sources are provided in general. **CL 1** A clear documentation of the data sources with an unambiguous reference to each of the figures provided should be given in order to allow a verification. In this context the assumptions made for the calculations are too general and not	CL 1	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			enough project specific (e.g. average load factor, working hours) and therefore are not re-traceable with regard to the availability risk statements (e.g. reduced temperature of waste heat of 800 °C compared to design temperature of 950 – 1050 °C).		
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	PDD	DR I	The starting date is expected in the first half of 2007 and the full operation of the power plant will be possible in the second half of 2007, after the optimization of the waste heat recovery system is secured. The crediting period can only start after the project is registered and the project activity is fully implemented with all facilities including measurement and monitoring equipment. **CL 3** Please clarify the start date of crediting period as according to the current schedule, registration of the project prior to 1st April seems impossible.	CL 3	OK
C.1.2. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two x 7 years or fixed crediting period of max. 10 years)?	PDD	DR	Yes. The crediting period is a fixed crediting period of one time 10 years.	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
D. Monitoring Plan *The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).*					
D.1. Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
D.1.1. Is the monitoring methodology previously approved by the CDM Methodology Panel?	PDD	DR I	Yes, approved monitoring methodology ACM 0004, which is an integral part of the applied baseline methodology ACM0004, that has been used in the project in connection with the large-scale baseline and monitoring methodology ACM0002 is applied.	OK	OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	PDD	DR I	The above mentioned monitoring methodologies are the most applicable for this project, see PDD. The GHG emission reductions will be obtained through direct measurement according to the approved monitoring methodologies.	OK	OK
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	PDD	DR I	Yes, see also B 2.1. and D 4.1., detailed monitoring arrangements and procedures according to the used monitoring plan will be applied during the periodic verification process. Given the nature of the project, the updated description of the monitoring and reporting in the PDD is deemed sufficient. The requested procedure and documentation and	**CAR 2**	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			responsibilities assignation is in preparation and will be ensured by Hunan Anshi Xingyuan Power Generation Co., Ltd., supported by the CDM consultant. **CAR 2** Please specify the measurement methods and procedures, including a specification which accepted industry standards or national or international standards will be applied, which measurement equipment is used, how the measurement is undertaken, which calibration procedures are applied, what is the accuracy of the measurement method, who is the responsible person / entity that should undertake the measurements and what is the measurement interval. - A description of the QA/QC procedures (if any) that should be applied, including the uncertainty level of data and measurement devices applied. - Where relevant: any further comment. Provide any relevant further background documentation in Annex 4. The creation and application of a CDM manual, covering all issues with regard to the implementation of the monitoring plan would be recommendable.		
D.1.4. Is the discussion and selection of the monitoring	PDD	DR	Yes	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
methodology transparent?		I			
D.2. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	PDD	DR	The monitoring methodology provides a detailed description of the primary parameters to be monitored during the crediting period. The methodology ACM0004/ACM0002 requests also the deduction of the project emissions from the emission reductions caused by own electricity consumption respectively other start up – fuels. The audit team has confirmed that no start up or auxiliary fuels is used under the consideration of failure or emergency situations of waste heat supply from coke oven process. **CL 12** The monitoring plan, as documented in the PDD Section B.7 and Annex 4, shall contain according to the applied methodology also the measurement of the own electricity consumption, e.g. throughout separate electricity meter, etc. (with an own ID number). Also the monitoring plan shall contain all requested parameters and also the related QA/QC measures, which includes also details on calibration of monitoring equipments.	CL 12	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
D.2.2. Are the choices of project GHG indicators reasonable?	PDD	DR	CO_2 is the only GHG indicator that needs to be accounted for, which is in compliance with the applied methodologies.	OK	OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	PDD	DR	Yes. All emissions data will be based on direct measurement of electricity.	OK	OK
D.2.4. Will the indicators give opportunity for real measurements of achieved emission reductions?	PDD	DR	The parameters to be monitored are measurable respectively and will be calculated (baseline emissions) based on accurate data sets.	OK	OK
D.2.5. Will the indicators enable comparison of project data and performance over time?	PDD	DR	Idem	OK	OK
D.3. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	PDD	DR	Leakage determination is not required by ACM0004. There are no sources for leakage.	OK	OK
D.3.2. Have relevant indicators for GHG leakage been included?	PDD	DR	See above in D.3.1.	OK	OK
D.3.3. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	PDD	DR	Idem	OK	OK
D.3.4. Will it be possible to monitor the specified GHG leakage indicators?	PDD	DR	Idem	OK	OK
D.4. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.4.1. Does the monitoring plan provide for the collection and	PDD	DR	The enclosed tables are in compliance with the latest versions of the applied monitoring	CL 12	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
archiving of all relevant data necessary for determining baseline emissions during the crediting period?		I	methodologies. QA/QC measures are not described sufficiently, the relevant table is missing. The monitoring plan and further related documentation will be the basis and guideline for the practical procedures of the collection and archiving of the requested data. The final numbers of CERs will depend on the annual utilizes waste heat converted into electricity and finally supplied as net electricity into the Central China Power Grid after deduction of own consumption, which will be measured. Since the emission factor of the replaced electricity of the grid is defined ex-ante, yearly calculation of the emission factor will not be required. The appropriate procedures and measures for review of reported results / data according to the applied methodology will be part of the monitoring management. **CL12** It has to be confirmed, that the monitoring plan, as documented in the PDD, section B.7 and Annex 4, according to the applied methodologies contains all requested parameters, the monitoring frequency and also the related QA/QC measures, which includes		

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			also calibration. The creation and application of a CDM manual would be recommendable and should be shortly described within the PDD in Annex 4 including a list of contents.		
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	PDD	DR	Yes, the choice made is reasonable and state of the art for the monitoring of the quantity of electricity, which results in the CO2 emissions, which is the final baseline indicator to be monitored.	OK	OK
D.4.3. Will it be possible to monitor the specified baseline indicators?	PDD	DR	Yes, on a regular basis according to the monitoring plan and the procedures defined. The CO_2 emissions from the baseline can be directly calculated from the ex-ante defined emission factor of the Central China Power Grid and the amount of electricity displaced. It will be possible to monitor this indicator, because it is based on key measured parameters for daily operation.	OK	OK
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	PDD	DR	No, as a monitoring of such data is not requested by the applied monitoring methodologies of ACM 0004 and ACM0002. Additional environmental monitoring of the project implementation will be carried out	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			through the local state environmental protection department, which is not part of the monitoring plan for GHG emission reduction evaluation. The Chinese DNA does not ask for inclusion of sustainable development indicators in the monitoring plan of the project.		
D.5.2. Is the choice of indicators for sustainability development (social, environmental, economic) reasonable?	PDD	DR	Idem	OK	OK
D.5.3. Will it be possible to monitor the specified sustainable development indicators?	PDD	DR	Idem	OK	OK
D.5.4. Are the sustainable development indicators in line with stated national priorities in the Host Country?	PDD	DR	Idem	OK	OK
D.6. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
D.6.1. Is the authority and responsibility of project management clearly described?	PDD OSV	DR I	The project developer Hunan Anshi Xingyuan Power Generation Co., Ltd., supported by the CDM consultant and the technology suppliers are responsible for the whole project management and supervision with regard to project operation, monitoring and reporting, which includes the implementation of the details of the monitoring plan according to above monitoring methodologies. Since the plant is a new installation, the authority and responsibility of the project management is not	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			yet drawn up clearly.		
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	PDD OSV	DR	Hunan Anshi Xingyuan Power Generation Co., Ltd. with assistance of the CDM consultant has also the responsibility for the tasks related to monitoring. The respective procedures seem not to be clearly defined. **CL 13** The procedures covering roles, allocation of responsibilities and authorities for carrying out monitoring, measurement and reporting of the complete monitoring plan needs to be submitted to the validation team. These procedures should also cover retention period for records. Also procedures for calibration of monitoring equipments and corrective actions as well for internal actions and internal audits should be defined. The monitoring plan should also include the uncertainty levels, methods and associated accuracy level of measurement devices and calibration proceedings to be used for various parameters, see under the relevant EB 23 decision.	CL 13	OK
D.6.3. Are procedures identified for training of monitoring personnel?	PDD OSV	DR I	Training will be provided to the local employees as necessary and will be part of the commis-sioning.	OK	OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	PDD OSV	DR I	According to the project design such emissions are not expected to occur.	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
D.6.5. Are procedures identified for calibration of monitoring equipment?	PDD OSV	DR I	Yes, such procedures will be developed and adopted to the planned project according to the monitoring plan under guidance of the technology suppliers and the CDM consultant and will be also an integral part of the monitoring management.	OK	OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	PDD OSV	DR I	Idem. The specific training for predictive maintenance will be also adopted to the planned project. Specific checklists and procedures will be defined for maintenance of equipments and installations including minimization of heat losses and leak prevention according to best available techniques as part of the commissioning.	OK	OK
D.6.7. Are procedures identified for monitoring, measurements and reporting?	PDD OSV	DR I	Yes. Procedures are identified. The implementation of the measures will be part of the monitoring management.	OK	OK
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	PDD OSV	DR I	Idem, according to applied monitoring methodology and monitoring management. The implementation of day to day record keeping has to be demonstrated after the plant becomes operational.	OK	OK
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	PDD OSV	DR I	This issue was identified as well as counter measures to be implemented as part of the monitoring management.	OK	OK
D.6.10. Are procedures identified for review of reported results/data?	PDD OSV	DR I	The appropriate procedures and measures for review of reported results/data according to the	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			applied methodology will be part of the monitoring management. A CDM manual, covering all these issues, would be beneficial.		
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	PDD OSV	DR I	Idem	OK	OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	PDD OSV	DR I	Idem	OK	OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	PDD OSV	DR I	Idem	OK	OK
E. Calculation of GHG Emissions by Source *It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.*					
E.1. Predicted Project GHG Emissions *The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.*					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	PDD	DR	All relevant main GHG emissions are considered through the application of the methodologies. The project itself does not generate any emissions. During construction will occur additional emissions resulting from transportation, which		OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			are considered as negligible. **CL 12** It has to be confirmed, that the monitoring plan, as documented in the PDD, section B.7 and Annex 4, will contain according to the applied methodology also the measurement / estimation of the own electricity consumption and of other fuels, e.g. throughout separate electricity meter, etc. (with an own ID number).	CL 12	
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	PDD	DR	The project does not envisage any additional GHG emissions. Calculations and their derivative formulas for any additional occurring emissions can be referenced to IPPC standards, if necessary. **CAR 2** A clear documentation of the data sources with an unambiguous reference to each of the figures provided should be given in order to allow a verification. In this context the assumptions made for the calculations are too general and not enough project specific (e.g. average load factor, working hours) and therefore are not re-traceable with regard to the availability risk statements (e.g. reduced temperature of waste heat of 800 °C compared to design temperature of 950 – 1050 °C).	CAR 2	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	PDD	DR	Idem The emission factor for the grid is calculated ex-ante from DNA data and other sources in a conservative manner. A review of the actual production data has resulted in a reduction of CERs from an original estimated value of 88,073 tCO_2e to 51,360 tCO2e annually. **CL15** Please clarify the application status of the set of emission factors published by NDRC.	CL 15	OK
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	PDD	DR	No major uncertainties are foreseen.	OK	OK
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	PDD	DR	Yes, CO_2 is according to the applied methodologies the only GHG that needs to be accounted for, which has been taken care of within the project evaluation.	OK	OK
E.2. Leakage *It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.*					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	PDD	DR	There are no emission sources as leakages within and outside the project boundaries Leakage calculation is not required under ACM0004.	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			Moreover, no used energy generating equipment from another project activity and also no waste gas from other users is transferred to the project activity, which could be also interpreted as leakage.		
E.2.2. Have these leakage effects been properly accounted for in calculations?	PDD	DR	Idem	OK	OK
E.2.3. Does the methodology for calculating leakage comply with existing good practice?	PDD	DR	Idem	OK	OK
E.2.4. Are the calculations documented in a complete and transparent manner?	PDD	DR	Idem	OK	OK
E.2.5. Have conservative assumptions been used when calculating leakage?	PDD	DR	Idem	OK	OK
E.2.6. Are uncertainties in the leakage estimates properly addressed?	PDD	DR	Idem	OK	OK
E.3. Baseline Emissions *The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.*					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	PDD	DR I	Yes.the baseline indicators selected are relevant and transparent. The ex-ante estimation of emission reductions is based on the calculations of the planned electricity generation and relevant waste heat conversion from the feasibility study	CAR 2	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			report based on conservative assumptions for the emission factor of the electricity grid. Besides of this already conservative estimation, the actual emission reductions will be directly measured, resulting in the actual CERs, that have to be annually verified by another DOE. **CAR2** A clear documentation of the data sources with an unambiguous reference to each of the figures provided should be given in order to allow a verification. In this context the assumptions made for the calculations are too general and not enough project specific (e.g. average load factor, working hours) and therefore are not re-traceable with regard to the availability risk statements (e.g. reduced temperature of waste heat of 800 °C compared to design temperature of 950 – 1050 °C).		
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	PDD	DR I	Yes, the baseline boundaries are with the power plant and the equipments. All possible sources of emission have been taken into account.	OK	OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	PDD	DR I	Yes. The calculations are transparently documented. All formulas are described and derivative inputs appropriately referenced. However, some further clarification and corrective action, is requested. **CL 12**	CL 12	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			It has to be confirmed, that the monitoring plan, as documented in the PDD, section B.7 and Annex 4, will contain according to the applied methodology also the measurement / estimation of the own electricity consumption and of other fuels, e.g. throughout separate electricity meter, etc. (with an own ID number).		
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	PDD	DR I	Yes. The calculations assumptions have been done in a conservative manner, with using accepted international sources.	OK	OK
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	PDD	DR I	Yes	OK	OK
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	PDD	DR I	Yes. The baseline emissions were calculated according to ACM 0004 and ACM0002. No project emissions are foreseen.	OK	OK
E.4. Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	PDD	DR I	Yes. The calculation results in annual emission reductions of 86,323 tCO_2 equivalent on the average. The project applies conservative and sound assumptions. The final emission reductions will be the result from the ex-post	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			measurements, which will be annually verified by a DOE.		
F. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	PDD OSV	DR I	Yes. The environmental impacts have been sufficiently described and assessed in the PDD, Section D.	OK	OK
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	PDD OSV	DR I	See F.1.1.	OK	OK
F.1.3. Will the project create any adverse environmental effects?	PDD OSV	DR I	No significant negative impacts are anticipated from the project. Positive effects are predominating like reduction of GHG emissions, reduction of pollutants, production of environmentally friendly electricity, generation of local added value, local employment during construction and operation, sustainable development effects.	OK	OK
F.1.4. Are transboundary environmental impacts considered in	PDD	DR	No transboundary environmental impacts to	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
the analysis?	OSV	I	other regions or countries have been identified.		
F.1.5. Have identified environmental impacts been addressed in the project design?	PDD OSV	DR I	Environmental impacts have been identified in the PDD within section D, a further assessment and evaluation is necessary, even no significant environmental impacts are expected.	OK	OK
F.1.6. Does the project comply with environmental legislation in the host country?	PDD OSV	DR I	The project activity which will be implemented on an already approved site for power plant construction, has been received an environmental impact assessment, which was approved by the State Environmental Protection Administration of China, that means by Environmental Bureau of Hunan province and Loudi City.	OK	OK
G. Stakeholder Comments *The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.*					
G.1.1. Have relevant stakeholders been consulted?	PDD STHC	DR I	The process by which comments by local stakeholders have been invited and compiled, has been described within section E of the PDD.	OK	OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	PDD STHC	DR I	See G.1.1.	OK	OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	PDD STHC	DR I	Yes, it is described in the PDD under chapter E.	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
G.1.4. Is a summary of the stakeholder comments received provided?	PDD STH C	DR I	See G.1.3.	OK	OK
G.1.5. Has due account been taken of any stakeholder comments received?	PDD STH C	DR I	The PDD has been published directly on the UNFCCC website for a period of 30 days, from December 18 to January 16, 2006. No comments were received during the mentioned period. **CL 17** HAXPG needs to clarify the negative comments at section E.2. of the PDD with respect to noise and air pollution. What were the comments? How were these comments considered?	**CL 17**	OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in	Summary of project owner response	Validation team conclusion
Corrective Action Request No. 1: The location map should have English heading and titles.	Table 1, No. 17	The PDD was updated with English heading and title for the location map.	OK
Corrective Action Request No. 2:	Table 2,	PDD updated.	OK

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in	Summary of project owner response	Validation team conclusion
The enclosed tables in the PDD are different from the latest versions of the applied monitoring methodologies. Relevant Quality Control (QA) and Quality Assurance (QC) procedures measures are not described sufficiently, and the relevant table listing the parameters to be monitored is missing. Please specify in the PDD the measurement methods and procedures, including a specification with acceptable industry standards or national or international standards to be applied, which measurement equipment is used, how the measurement is undertaken, which calibration procedures are applied, what is the accuracy of the measurement method, who is the responsible person / entity that should undertake the measurements and what is the measurement interval. Moreover, a description of the QA/QC procedures (if any) that should be applied, including the uncertainty level of data and measurement devices applied.	D1.2, E1.2		
Clarification Request No.1: Please clarify the data sources for power plant generation and should include a process flow chart with an unambiguous reference to each of the figures provided. The assumptions	Table 2, A2.2	According to the feasibility study of the proposed project, the estimated annual net electricity supply of the project is expected to be 91.4 GWh. However, due to the barriers mentioned in Section	OK

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in	Summary of project owner response	Validation team conclusion
made for the calculations are too general and not enough project specific (e.g. average load factor) and therefore are not re-traceable with regards to the availability risk statements (e.g. reduced temperature of waste heat of 800ºC compared to design temperature of 950~1050ºC).		B.5 of the PDD, the actual electricity net supply of the project in the first 12 months after commissioning was only 53.3 GWh. In order to be conservative, the actual annual net power supply of 53.3 GWh is used to estimate the expected emission reductions.	
Clarification Request No.2: According to Methodology ACM0004 (version 2), "*For the particular case of generating units, supplied by waste gas and by other fuels, when the direct measurement of the electricity generated by using the waste gas is not possible"* the flow rate of waste gas has to be measured and record continuously and logged on hourly basis. Please clarify.	Table 2, B1.2	Since the proposed project uses the waste heat contained in the waste gas instead of the combustion of the waste gas for power generation, it is not necessary to measure the flow rate of the waste gas. Besides, the methodology ACM0004 also does not require the measurement of the waste gas flow rate for waste heat project.	OK
Clarification Request No.3: Please clarify the start date of crediting period as according to the current schedule, registration of the project prior to 1st April seems impossible.	Table 2, C1.1	PDD has been revised. If the registration date of the project is later than the stated date, the starting date of the crediting period will be the registration date of the project.	OK
Clarification Request No.4: Please clarify the staff training plan (e.g. sent	Table 2, A2.5	New staff were sent to other power plants for training before the commissioning of the proposed project.	OK

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in	Summary of project owner response	Validation team conclusion
to other power plants for training purpose.) in order to overcome the technical difficulties as stated in the PDD.		The training agreement between the project owner and the trainer (Thermal Power Plant of Hunan Jinxin Chemical Co., Ltd.) is provided.	
Clarification Request No.5: Please explain why under the WGSA between LXCC and HAXPG, there is no charges for the waste gas supplied to HAXPG for 30 years by the LXCC.	Table 2, A2.2	For LXCC, the high temperature waste gas has no commercial value and they have been releasing the waste gas directly to the atmosphere since the coking plant was commissioned. On the other hand, if they charge for the waste gas, they would take the obligations to guarantee the parameters of the waste gas, which they don't want to and actually can't do.	OK
Clarification Request No.6: Please clarify the approval status of the project's trial run.	Table 2, B2.7	The trial run was approved by the local power administration according to the national standards GB50273 and GB50255. The certificate with the chops of the Loudi Power Bureau, the construction company and the project owner is attached.	OK
Clarification Request No.7: HAXPG needs to clarify the following with respect to additionality 1. HAXPG should consider to adopt the latest version of 'Tools for	Table 2, B2.7	1. PDD updated with the latest version of "Tools for Demonstration and Assessment of Additionality". 4. An article from the "Shanxi Science and Technology" is attached, which has a conclusion that the clean type	OK

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in	Summary of project owner response	Validation team conclusion
Demonstration and Assessment of Additionality' approved by CDM EB. 2. HAXPG should further substantiate the barrier analysis for the proposed project activity. All barriers shall be substantiated by transparent and documented evidence. 3. Please specify if step 2 is not to be chosen by the project proponent. It should be mentioned in the PDD with justifications.		coke oven has many problems to be solved because of its short application time in China. The daily report of the power plant is also attached to show that the waste gas temperature is much lower than the estimation in the feasibility study. Another article from "East China Power" is provided which concluded that running the turbine under low steam parameters can do harm to the equipment and endanger the safe operation of the turbine. 5. PDD updated.	
Clarification Request No.8: Please provide appropriate evidence suggesting the common practice in the area.	Table 2, B2.7	A survey was taken for the coking industry of Hunan Province with the finding that LXCC is the only company that owns the new clean type coke oven. See updated PDD.	OK
Clarification Request No.9: As per methodology (Page 3, paragraph above additionality), selection of baseline scenario is economically most attractive scenario. An appropriate scenario should be the one, which presents economically most attractive scenario. No such economic/financial analysis	Table 2, B2.7	According to the methodology ACM0004, baseline options that: · do not comply with legal and regulatory requirements; or · depend on key resources such as fuels, materials or technology that are not available at the project site	OK

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in	Summary of project owner response	Validation team conclusion
is present in the CDM PDD (December 2006) while selecting the scenario for the proposed project activity.		should be excluded. After the above criteria are applied, the alternative 3, 4 and 5 can be excluded. Among the remaining two alternatives, alternative 1 faces prohibitive barriers, so only alternative 2 is left. This is why no economic analysis is used for the determination of the baseline scenario.	
Clarification Request No.10: Please submit the evidence to prove the investment barrier that the banks and financial institutions did not respond favourably to the project.	Table 2, B2.7	After the application for a loan was submitted to the bank, although the bank explained for many times orally to the project owner that they see the project as a high risk project and do not want issue the loan, they never give a written reply to the project owner. The bank only issued the loan after the project was commissioned. Supporting document was submitted to the audit team.	The claim is supported by the fact that there is only a loan of only RMB 20 million received from the banks on 26 May 2006 (i.e. after the project is built), against a total investment of over RMB 50 million. The CL is therefore resolved and closed.
Clarification Request No.11: It is mentioned that there are technical barriers because the temperature of waste gas reaching the waste heat boilers is both lower than the designed value, and has a high variation. Please provide supporting information to show temperature variation and supplement why the temperature	Table 2, B2.7	Actual production data are provided to the validation team. The data shows that the difference between the highest and lowest waste gas temperature in a certain month is in a range of 50-130 degree C. The variation of the waste gas temperature would immediately result in the fluctuation of the temperature and	The audit team has reviewed the provided operation manual and the characteristics of typical turbine, and confirmed that the existence of the technical barriers when the waste gas temperature cannot reach a certain minimum values. The CL is therefore resolved and

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in	Summary of project owner response	Validation team conclusion
fluctuation would provide a risk to the operation of the power plant.		pressure of the steam generated by the boilers. The steam parameters are critical to the turbine operation. According to the operation manual of the turbine, the steam temperature should be in the range of 400-460 degree C and the steam pressure in the range of 2.8-3.9 MPa. The actual production data after the project was commissioned give a steam temperature range of 305-435 degree C and a steam pressure range of 2.05-3.5 MPa, which means the turbine would lose part of its generation capacity when the steam parameters are low and even need to be shut down when the parameters are low enough.	closed.
Clarification Request No.12: The monitoring plan, as documented in the PDD Section B.7 and Annex 4, shall contain according to the applied methodology also the measurement of the own electricity consumption, e.g. throughout separate electricity meter, etc. (with an own ID number). Also the monitoring plan shall contain all requested parameters and also the related QA/QC measures, which includes also	Table 12, D2.1, D4.1	The methodology requires the monitoring of the net electricity generation from the proposed project. The specific features of the proposed project makes it difficult to measure the own electricity consumption via a separate meter, but the parameters monitored will be enough to calculate the "net electricity generation" of the project.	OK

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in	Summary of project owner response	Validation team conclusion
details on calibration of monitoring equipments.			
Clarification Request No.13: The procedures covering roles, allocation of responsibilities and authorities for carrying out monitoring, measurement and reporting of the complete monitoring plan needs to be submitted to the validation team. These procedures should also cover retention period for records. Also procedures for calibration of monitoring equipments and corrective actions as well for internal actions and internal audits should be defined. The monitoring plan should also include the uncertainty levels, methods and associated accuracy level of measurement devices and calibration proceedings to be used for various parameters, see under the relevant EB 23 decision.	Table 2, D6.2	A detailed CDM monitoring plan is provided to the validation team.	The audit team has reviewed the CDM monitoring plan and confirmed that it has contained the necessary procedural information. The CL is therefore resolved and closed.
Clarification Request No.14: Please clarify the value and source of the selected energy efficiency of the waste heat recovery boiler in the PDD.	Table 2, B2.7	The boiler efficiency is from the equipment procurement contract between the project owner and the boiler manufacturer.	OK
Clarification Request No.15: Please clarify the application status of the set	Table 2, E.1.3	There is no information released from NDRC regarding the acceptance status	OK

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in	Summary of project owner response	Validation team conclusion
of emission factors published by NDRC.		by CDM EB. But the method used by NDRC is based on EB's reply to the request for clarification on the use of approved methodology AM0005 (replaced by ACM0002 already) in China. 2006 IPCC Guidelines default values for carbon emission factor and oxidation factor are used to replace the Revised 1996 IPCC values used in the NDRC calculation for the proposed project.	
Clarification Request No.16: Please clarify in the PDD which of the following Alternative for calculation of the emission factor, according to approved methodology ACM0002, the project proponent intends to use: • Ex-ante determination 100 % according to the applied methodology • Ex-post determination annually 100 % according to the applied methodology in the first crediting period; estimation of the emission factor ex-ante in a conservative manner	Table 2, B2.2	PDD revised to show clearly that the project uses Ex-ante determination 100 % according to the applied methodology. The CL is resolved and closed.	OK

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in	Summary of project owner response	Validation team conclusion
• Requesting deviation to the approved methodology prior to submission of registration			
Clarification Request No.17: HAXPG needs to clarify the negative comments at section E.2. of the PDD with respect to noise and air pollution. What were the comments? How were these comments considered?	Table 2, G1.5	Measures recommended in the EIA report were taken to mitigate the possible impact on the local environment, which will satisfactorily accommodate the stakeholders' concerns regarding noises. The monitoring report issued by the local environmental monitoring station on 12 September 2006 (Lou Huan Jian 2006 No.14) confirmed that all the pollutant emissions of the plant, including waste water, dust and noise, are within the applicable national standards.	OK