TÜV Rheinland Japan Ltd.
TÜV Rheinland Group

VALIDATION REPORT

JIANGSU QINGSHI CEMENT PLANT'S LOW TEMPERATURE WASTE HEAT POWER GENERATION PROJECT

P.R. CHINA

REPORT NO. 01 997 9105041082
NO. 03

CDM Validation Report Template
Version 3.0, December 2003

VALIDATION REPORT

Date of first issue: 2007-May-22	Project No.: 01 997 9105041082	*TÜV Rheinland Japan Ltd.* Shin Yokohama Daini Center Bldg., 3-19-5, Shin Yokohama Kohoku-ku, Yokohama 222-0033
Approved by: Dr Manfred Brinkmann	Organisational unit: System Certification Group, Industrial Engineering Services	
Client: Jiangsu Qingshi Cement Co., Ltd.	Client ref.: C/o Mr. Donghui Ying	Certificate Number: 01 997 9105041082

Executive Summary:

The audit team of the DOE TÜV Rheinland Japan Ltd. (TÜV Rheinland) has carried out the validation of the planned "Jiangsu Qingshi Cement Plant's Low Temperature Waste Heat Power Generation Project " (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 03 of 12 March 2007)
- Public stakeholder comment process (6 April 2007 ~ 5 May 2007)
- On-site visit with stakeholder interviews (May 7~9, 2007)
- 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 Letter of Approval (LoA) of voluntary participation, including confirmation by China's DNA, that the project assists them in achieving sustainable development, has been received.

Annex I party is identified as Marubeni Corporation of Japan, and the LoA has been received.

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. TUV Rheinland requests the registration of the proposed project activity as CDM project activity.

Report No.: 01 997 9105041082	Subject Group: Environment & Energy
Report title: Jiangsu Qingshi Cement Plant's Low Temperature Waste Heat Power Generation Project	
Work carried out by: • Roy Fan • Waikwok Wong	
Work verified by: • Dr. Manfred Brinkmann	

Date of this revision: 2008-January-11	Rev. No.: 03	Number pages 69

Indexing terms

Climate Change
Kyoto Protocol
Large Scale Project Validation
Clean Development Mechanism
Landfill Gas Project Activities

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Abbreviations

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AF	Adjustment Factor
AM	Approved Methodology
ACM	Approved Consolidated Methodology
CAR	Corrective Action Request
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
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
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

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Conversion Factors and Definitions

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None

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VALIDATION REPORT

Table of Contents ***Page***

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1 INTRODUCTION

Jiangsu Qingshi Cement Co., Ltd. (Qingshi) has commissioned the DOE TÜV Rheinland to validate the "Jiangsu Qingshi Cement Plant's Low Temperature Waste Heat Power Generation Project." (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. 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

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- 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
- Evaluation of global and local stakeholders comments received
- 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, 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 Project is located at Hufu Town, Yixing City, Jiangsu Province of P.R. China. The project utilizes the waste heat resources from rotating kilns of the existing 1000t/d, 2000t/d

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and 5000t/d new type non-slurry cement production lines by construction of two sets of pure low temperature waste heat power generators of a total installed capacity of 13.5MW. The electricity generated from the proposed project will be entirely used to substitute about 90.08GWh per year of the power currently used by the power plant from the East China Power Grid, which would otherwise be generated from fossil-fuel fired power plants. The expected GHG emission reductions of the proposed project is 81,491 tCO_2e annually over the next 21 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 “Jiangsu Qingshi Cement Plant’s Low Temperature Waste Heat Power Generation Project” is enclosed in Appendix A to this report.

Figure 1 Validation protocol tables

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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".*

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2.1 Review of Documents

The Project Design Document (PDD), Version 5 of 10 January 2008 submitted by Jiangsu Qingshi Cement Co. Ltd. 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 5 of the Validation Report.

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2.2 Follow-up Interviews

During 7th ~ 9th May 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 Hufu Town, Yixing 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:

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Table 1 Interview topics

Interviewed organisation	Interview topics
Jiangsu Qingshi Cement 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
Productivity Centre of Jiangsu Province	➢ 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
Jiangsu, Hufu Town, Yixing City, 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 current PDD which was made public for the global stakeholder process.

A revised version of the PDD, has 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 revised project design document (Version 5 of PDD of 10 January 2008) 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 utilizes the waste heat resources from rotating kilns of the existing 1000t/d, 2000t/d and 5000t/d new type non-slurry cement production lines, by construction of two sets of pure low temperature waste heat power plant of a total installed capacity of 13.5MW. The power from the 1000t/d and 2000t/d cement production lines and will have a generation capacity of 6MW, whereas for the 5000t/d one a generation capacity of 7.5MW will be produced. The project is still under construction and the trial run is expected to be conducted in August 2007.

The generated power will be used to substitute about 90.08GWh annually of the power used by the cement plant from East China Power Grid, which would otherwise be generated from fossil-fuel fired power plants. The expected GHG emission reductions of the proposed project is 81,491 tCO2e annually over a renewable 7x3 crediting period of the next 21 years.

The project design engineering reflects current good practice with employment of the new type non-slurry cement production lines, which has substantially lower environmental impacts comparing with traditional cement production plants, and the utilisation of waste heat for power generation which is considered to be at the forefront of the cement industry. This practice and technology is new and advanced in China, based on domestic technology with local designer as Tiangjin Cement Design & Research Institute (TCDRI), with other equipments from local suppliers.

During the site visit the project location could be clearly identified according to the co-ordinates given in the PDD.

Consideration of revenues from carbon emission reductions and CDM by the Qingshi has been demonstrated by records of Production Department's meeting of Qingshi on 10 February 2006. A stakeholders consultation in form of a symposium was carried out on 12 March 2006 as mentioned in Section E of the PDD. The Feasibility Study Report was completed in November 2006 and the main equipments bidding was started in October 2006.

The validation did not reveal any information that indicates that the project can be seen as

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a diversion of ODA funding towards China, which is confirmed by the officer of Hufu Town's Peoples Government during the site stakeholder interview.

During the stakeholder interview with Qingshi management representatives, it is confirmed that Qingshi is responsible for organising the necessary training for the operation, maintenance and monitoring. The audit team has been able to confirm that Qingshi has organized the necessary training by sending 23 nos. of staff to other power plants for a training of 40 days, and recruit experienced staff from other power plant before the project commissioning.

The Operation and Maintenance Manual was available for inspection during the site visit.

The project is considered to be contributed to sustainable development, by utilisation of waste heat from the cement making process, considered as a kind of renewable energy resource, for the generation of electricity that would be have been provided by fossil-fired power; by creating more job opportunities; and by leading the technological development of waste heat utilization, which is confirmed by the audit team as a pioneer project in Jiangsu. 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 LoA by the DNA of China, the National Development and Reform Commission (NDRC) has been received. The Annex I Party involved, namely Japan, was identified. The LoA is also received.

The starting date of the project activity is 8th March 2007 as indicated in section C.1.1 of the PDD, which is the start date of construction of the project activity. The project is scheduled for a completion in November 2007. A crediting period of 7x3 years is selected and the starting date of the first crediting date is 1st January 2008.

The expected operational lifetime of the project activity is 21 years as indicated in section C.1.2. of the PDD. Comparing with the stated 21 years crediting period, the life of the facilities is the same as the crediting period.

3.1.2 Findings

CAR01: The LoA from DNA of P.R.China is not available for inspection. The project proponent has to obtain a written approval for the project from the DNA of the P.R. China in English language, which shall contain all required CDM elements in the letter as defined by UNFCCC.

Response: The LoA from China is received. The LoA from Japan is also received.

The CAR is therefore resolved and closed.

CAR02: The location maps should be in English.

Response: The maps are amended. The CAR is therefore resolved.

CL01: Please detail the actual power generation process with reference to the cement production process, preferably with a process flow diagram. Technical information such as

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the efficiency of the steam turbine and generators should be presented.
Response: The PDD is revised giving more useful technical information about the plan to help the understanding of the plant. The CL is therefore closed.

CL02: What is the power deficit of the project? Please demonstrate that all the power generated in the project activity is used within the project as described in the PDD.

Response: As showed in ***electricity invoices***, the total electricity that the project in 2006 is 164,977,280 kWh (An estimated 200,000,000 kWh electricity will be needed in 2007), and the total net electricity from waste heat recovery generation is 90,080,000 kWh. So still there is a big shortage. So all the power generated will be used within the project. Invoices are also provided for checking.

The CAR is therefore resolved.

CL03: What is the history of the project? Please state the date of construction of the project and operation with supporting information.

Response: The construction date of the project is on 08.03.2007 as showed in the ***construction start report;*** the operation of the project is expected to be in the beginning of September.

The CL is resolved and closed.

CL04: Training and maintenance needs are not 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. maintenance checklists for the plant staff. 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.

Response: Training and maintenance is addressed in PDD page 16, Technical barriers. The *staff training contract and staff training plan* is submitted for information.

The CL is 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 for generation of electricity and adheres to the Sectoral Scope 1 that it represents.

The power generated by the project plant will be used in the production facilities within the Qingshi, or would in the absence of the project activity be purchased from the grid. ECG 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 cement making facilities of the Qingshi are existing facilities. The applicability conditions are met by the project activity.

The validation team has checked the FSR and confirmed that the technical design requires the implementation (incl. construction and operation) of this proposed project not influencing the normal production of the existing actual cement production line. In the connection of the new facilities, it is further stipulated that the Waste Heat Boiler is installed at the gas outlet of the Suspension Pre-heater (SP) after the preheating is completed.

The validation team has checked the physical parameters of the waste gases that are currently being emitted to the atmosphere from the cement production lines (which have been adopted for the design of the project), and confirmed that identical set of parameters have been implemented in the actual project. This is confirmed by checking the Boiler Supply Agreement entered into between the project proponent and the Hangzhou Boiler Company.

The validation team confirmed during the site visit the following:

1. as in the pre-project scenario, all the waste gas leaving the rotary kiln is first directed into the Suspension Pre-heater (SP) and only then into the waste heat recovery unit "SP boiler". Thus a diversion of waste heat is physically not possible either.
2. the project was being implemented with the gas pipe connection clearly observed to be utilizing the waste heat after the preheating process of the SP, as shown in site photos presented in Annex 4a.
3. in the pre-project scenario, where active cooling of materials by means of water and cooling fans were employed, there has been not utilization of heat emanating from the Air Quenching Cooler (AQC) except pre-heating of combustion air, which is unchanged, thus a diversion of waste heat from that facility is not possible.

Furthermore, a potential diversion of waste heat was discussed during technical review and the following were confirmed and presented in the Validation Report:

The project owner might be tempted to increase specific fuel consumption in order to enhance the electricity output. However, this is neither technically possible without affecting the production process and product quality, nor economically reasonable for the following reasons:

1. If the amount of fuel is increased, the temperature inside the rotary kiln would increase and this would lead to cohesiveness of the raw material, blocking up the calciners in the SP.. As a result, the production of cement would be adversely affected.

2. The waste heat from low temperature waste gas takes only about 30% of the total waste heat of the whole cement production system. This is quite different from professional fuel using electricity power plant, which has a much higher efficiency (about 65% in China and 85% in advanced countries for coal–based boiler (see http://www.shanke.cn/a/23196/archives/2007/28033.shtml). Under this situation, it would not be economically meaningful for the project owner to burn more fuel for electricity generation purpose.

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3. The boiler used here in cement waste heat project is "waste heat boiler", which is different from the professional boiler (Coal-based boiler) used in common thermal power plant. The waste heat boiler can only use waste heat for energy purpose but the "Coal-based boiler" can use additional fuel for energy purpose.

Furthermore, according to Paper titled *"Discuss on Cement Waste Heat Utilization for Power Generation"* (http://www.ccement.com/news/2007/4-11/C16144705.htm), it is concluded that if the project owner tends to reduce the amount of waste heat for preheating, the thermal efficiency of the power station will also be reduced. Considering both electricity per ton of clinker and thermal efficiency of the power station, the preheating process has the same impact on power generation. That means that the preheating of raw material is absolutely necessary and the part of heat using for preheating can not be reduced for electricity generation purpose.

Based on the above, the validation team concludes and confirms that the project activity will not lead to a diversion of waste heat from use in the preheating process.

As per ACM0004: "Consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation"/Version 02, the baseline scenario should be selected from an evaluation of all potential realistic and credible alternatives. As stipulated by the methodology, the PDD has identified the following alternatives to the project activity:

Alternative 1 – The proposed project activity not undertaken as a CDM project activity;

Alternative 2 – Import of electricity from the grid;

Alternative 3 – Existing or new captive power generation on-site, using other energy sources than waste heat and/or gas, such as coal, diesel, natural gas, hydro, wind, etc;

Alternative 4 – A mix of option (2) & (3), in which case the mix of grid and captive power should be specified;

Alternative 5 – Other uses of the waste heat and waste gas.

These alternatives are described in a transparent manner in the PDD and only Alternative 2 was considered feasible and could be realistic. The audit team has verified the justification for the barriers faced by the alternatives and is described as follows:-

Alternative 1 – The audit team has checked up with the IRR calculation and observed in the spreadsheet that a project IRR of 8.22% shall be resulted from the proposed project without CDM income. While the benchmark IRR for construction material industry is 12.0% (according to "Inform on Economic Assessment method and parameter of Construction Projects"), the project could not demonstrate its financial attractiveness to the investor. Please refer to Section 3.2.3 of the Validation Report for details.

Alternative 2 – There is no barrier in legal, financial, technical or any other aspects.

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Alternative 3 – Development of other renewable energy source in Jiangsu Province is very limited. According to the China Electric Power Yearbook 2006, it is noted the wind and hydro resource is so scarce that it counts for only less than 1% of the overall electricity generation in Jiangsu Province, where the majority of energy source remains the fossil fuel. The main reasons include the comparatively high investment cost for wind projects and the inadequacy of practically exploitable hydro resource in Jiangsu Province.

For construction of fossil fuel power plants, it is prohibited by the <Notice on strictly prohibiting the installation of thermal power units with capacity of 135MW or below> released by State Council on 15th April 2002 (Ref. No.: GuoBanFaMingDian [2002] (6)) and <Temporary rules on construction management of small-scale thermal power units> released by State Council in August 1997 for strictly controlling the construction of thermal power plants with capacity under 100MW.

It is also confirmed by the local government officials from Yixing Economy and Trade Commission (Mr. Tielin Zhang, Officer) and Yixing Power Supply Bureau (Mr. Xuguang Wang, Customer Manager) during stakeholder interview and is concurred by the validation team that development of other energy sources is not feasible due to the lack of energy resources as mentioned above.

Alternative 4 – This alternative is a mix of Alternative (2) & (3), in which case the mix of grid and captive power should be specified. Due to the regulatory restriction for prohibiting the construction of thermal power plants in China (see Alternative 3 above), this alternative 4 is therefore not feasible.

Alternative 5 – In the conventional cement production line, only part of the waste heat generated from the cement production process would be used to heat the raw materials in the SP and the majority would simply be emitted into ambient atmosphere. The proposed project further utilized this surplus waste heat after heating the raw materials for power generation, where as revealed in the FSR, there is no other way for utilization of this surplus waste heat other than direct emitting into ambient air. This is confirmed by the audit team during on-site visit and stakeholder interview that there is no demand on heating by utilization of waste heat for the neighbor domestic and industrial users. This alternative is therefore not feasible.

The only plausible baseline scenario then remains to import electricity from the grid, i.e. Alternative 2, in which the power output equivalent to the proposed project generates would be supplied by ECPG (East China Power Grid) to which the proposed project is

connected. This alternative does not face any prohibitive barrier and is therefore accepted as baseline scenario. According to the China Electric Power Yearbook 2006, ECPG is itself currently importing electricity from another power gird, i.e. Central China Power Grid (CCPG). In Year 2005, the imported electricity from CCPG contributes approximately 22% to the overall power generation in ECPG.

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Deleted: As per ACM0004/Version 02, the PDD has identified the following baseline scenarios to the project activity:
1) The proposed project activity not undertaken as a CDM project activity;
2) Import of electricity from the grid;
3) Existing or new captive power generation on-site, using other energy sources than waste heat and/or gas, such as coal, diesel, natural gas, hydro, wind, etc;
4) A mix of options 2) and 3), in which case the mix of grid and captive power should be specified;
5) Other uses of the waste heat and waste gas.
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.
It is also noted during the site visit that no other use of waste gas is envisaged at this point other than power generation, due to remote locations of residential houses and that there are little industry around the Qingshi facilities.

3.2.2 Findings:

CL05: Please provide supporting to demonstrate that there are no wind or hydro power resources in Jiangsu as mentioned in Alternative No.3.

Response: The PDD is updated with details justifying that wind or hydro power are not viable baseline scenarios. The CL is therefore resolved.

3.2.3 Additionality of the Project Activity

The additionality of the project activity is determined with the application of various steps of the 'Tools for Demonstration and Assessment of Additionality, version 3' approved by the EB.

An analysis of the application of the 'Tools" is given in the following paragraphs.

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

Alternatives 1 and 2 have 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 2 Investment Analysis

The project proponent selects the benchmark analysis (Option III of Step 2 of "Tool for the demonstration and assessment of additionality") for conducting the investment analysis. The validation team considers this selection appropriate because the proposed project would indirectly generate revenue stream through displacement of electricity purchased from the provincial grid at a higher price.

Deleted: The PDD has demonstrated that the proposed project activity itself would not be a likely baseline scenario. The "simple cost analysis" (Option I) of all the above alternatives as well as "investment comparison analysis" (Option II) were not used, because the different scenarios are not comparable with these tools and hence render these options not applicable. Therefore the "benchmark analysis" (Option III) is adopted in the PDD which is considered appropriate.

During validation the assessment team has reviewed the source of the 12% benchmark quoted in the PDD ("Inform on Economic Assessment Method and Parameter of Construction Projects – version 3"). The document provides the financial benchmark for capital construction projects including the cement industry, which is categorized under construction materials industry in China. This reference document was compiled by a group of sectoral experts*, and approved by both NDRC and MOC for application in China.

* Including representatives from the National Development & Reform Commission (NDRC), Ministry of Construction (MOC), China International Engineering Consulting Corporation (CIECC), Chemical Industry Design & Planning Institute, Chinese Academy of Social Sciences, China Construction Bank, Beijing Huazhi Boyu Engineering Consulting Corporation, Tongji University, Tsinghua University, General Research Institute for Nonferrous Metals (GRINM), Ministry of Communications, Beijing Shangshan Yilan Technological Consulting Corporation

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According to the news report on the "Review Meeting on Inform on Economic Assessment Method and Parameter of Construction Projects – version 3" (http://www.risn.org.cn/jjp/file/003.htm), the "Inform on Economic Assessment Method and Parameter of Construction Projects – version 3" had been subjected to a rigorous censoring of 150 representatives of NDRC, MOC, major banks in China, big state owned companies, sectoral experts and design companies, etc, which agreed the validity and application of the document unanimously.

It is therefore considered that the document is the most suitable reference for providing the financial benchmarks for the economic assessment concerning the respective industries in China, and is considered to be the most suitable guideline for determine the financial indicators for the project.

The project owner (Jiangsu Qingshi Cement Co. Ltd.) is focused on the business of cement production only, with no previous investments in waste heat utilization for power generation. Given that and considering the project serves for captive electricity production and not export of electricity, the application of the 12% benchmark for cement industry is deemed appropriate (rather than a benchmark for commercial power generation).

Based on the above reasons, the validation team hence accepts the 12% benchmark for the cement industry as the most suitable indicator for assessment of the financial viability of this project activity.

Deleted: The benchmark analysis shows that without the revenue from CDM, the project IRR would be 8.22 %, which is below the benchmark of 12 % as defined within the "*Inform on Economic Assessment Method and Parameter of Construction Projects*", the financial benchmark rate of return (after tax) of Chinese building materials industries accounts in P.R. China. Hence the project cannot be considered as financially viable.

The key inputs values of the investment analysis in PDD are principally based on "Chapter 8 – Economic Analysis" of the FSR, which is prepared by Tianjin Cement Industry Institute Co., Ltd (http://www.tcdri.com.cn/), a leading government-approved Design Institute in China since it's establishment in 1953 that has been responsible for the development and implementation of the first waste heat recovery project from cement plant in China. The FSR was duly subjected to review and approval by the Jiangsu Economic and Trade Commission (E&TC). The DOE can confirm, after checking the relevant document, that the FSR has been approved by the local government, and is the official document after it has been approved, and therefore the data of the FSR is credible.

The following is an excerpts extracted from the FSR and presents the guideline documents adopted for the investment analysis which demonstrates that the inputs values adopted for the investment analysis are in accordance with appropriate guidelines and best available market information:

1. Construction and Installation works: in accordance with《Budget for Power Construction Works》published by China Power Enterprises Association, with adjustments to the present price level of Jiangsu Province;
2. Price of Equipments: In accordance with《Summary Price Collection of Machine Equipments Costs in Engineering Construction》, and adjusted based on actual costs of other similar projects.
3. Price of Material: Based on actual price of local market.
4. Equipments transportation costs: based on a rate of 3.5% of the costs of the equipments.
5. Others: in accordance with《Budgeting Management System and Regulation for the

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Power Industry Fundamental Construction》, with adjustments against actual situation.

The sources of data for the various key inputs values applied are presented below:

Item	Data & Source in Feasibility Report	Remarks on Validation of Parameters
Installed capacity:	13.5MW (Chapter 8)	1.Power from 1,000 t/d & 2,000 t/d cement production lines = 6MW 2.Power from 5,000 t/d cement production lines = 7.5MW 3.Total power =13.5MW Confirmed by site inspection, i.e. checking on equipments' identity plates and equipment supply contracts)
Estimated annual grid-electricity:	90.08GWh (Chapter 8)	Net annual electricity supply based on 7,200 operating hours of per year: 6MW – 36.43GWh 7.5MW – 53.65GWh Calculation of the estimated net electricity : 36.43+53.65 = 90.08GWh The annual operation hours of 7,200 hrs are considered reasonable, which is close to the reported 8,000 annual operating hours of the cement production lines (based on a historic plant availability of 92% of the cement plant achieved in recent years by the project owner), with some reasonable allowance provided for the potential shutdowns of the power plants due to lack of operating experience, and for plant maintenance.
Project lifetime:	21yrs (Chapter 8)	This consists of 1 year of construction phase and 20 years of operation phase. This is considered reasonable for new power equipment installation, and the fact that the cement production lines are also newly built with an expected service life of approximately 25 years, with the earliest of 1000 t/d line in operation since 2001.
Total investment:	RMB 99.62 million Yuan	Feasibility Report(Chapter 8) (Confirmed by interview with the top management of project owner during on-site visit that the overall investment would even go beyond RMB $100 million due to the increasing raw material prices and labour costs, and by checking of invoices.)

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Prospective pool purchase price:	RMB 0.342Yuan/kWh (excluding VAT) (Chapter 8)	Based on the latest announced "Notice about adjust electricity purchase price of East China Power Grid" from NDRC" (No.FaiGaiJiaGe 2006 1230); http://www.ndrc.gov.cn/zcfb/zcfbtz/tz2006/t20060630_75077.htm, the current tariff is RMB 0.332 Yuan/kWh, which is similar to the estimated tariff adopted in the financial analysis.
Tax:	Income tax rate is 33%; value added tax rate is 17%, city construction maintenance tax is 7% of VAT, education appended fee is 4% of VAT (Chapter 8)	The applied tax rates are in line with the existing tax laws in China.
Operational cost:	0.27 yuan/kWh(6MW), 0.274 yuan/kWh(7.5MW) (Chapter 8)	The operational cost is calculated based on raw material consumption, labour costs (salary & welfare), maintenance and repair expenses, etc, which does not include the initial investment costs, in accordance with the above FSR mentioned principles. All parameters were checked against the FSR (details in IRR table) and confirmed to be applied correctly. The operating costs were further reviewed during site interview with the project owner, where it is reported that the operational cost would be even higher than those predicted in the FSR due to the increasing raw material prices and labour costs.

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A sensitivity analysis is carried out and presented in the PDD which demonstrates that the project activity is unlikely to be financially viable under reasonable variations in the critical assumptions. The calculation worksheets and the parameters used for the IRR calculation have been checked are confirmed to be valid.

Step 3 Barrier Analysis

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

Investment barriers

The audit team confirms that the project developer is not a large enterprise during the site visit, and agrees that it is very difficult for small and medium size private enterprises to finance from banks and other channels, as reported in the PDD. The audit team also

confirms that the project developer is engaged in the building industry only and has little experience in power generation, which therefore increases the investment risks.

Technological barriers

The PDD reports the technical difficulties due to the application of the relatively new technology with little track record in operation within China. Also it is confirmed that Qingshi is lacking of relevant operating and maintenance experience in power generation, as the technology represents a new business area of the Qingshi Group which requires engagement of new technical staff members for operation and maintenance of the plant.

Barriers due to prevailing practice

Not applied.

Step 4 Common Practice Analysis

The audit team agrees that it is not a common practice for the cement making industry to invest power generation, especially in the area of retrofitting waste heat recovery system to existing facilities. The audit team has checked and verified the information stated in the PDD. It is confirmed by the Jiangsu Provincial Economic and Trade Commission (JPETC) that out of the 279 cement companies in the Jiangsu Province, there are less than 1% of companies applying the utilisation of waste heat, with 2 projects of similar scale only. These projects are also confirmed by the JPETC to be in the application of the CDM funding.

The application of 'Tools for demonstration and assessment of additionality' suggests that the project activity is not a likely baseline scenario and hence the emission reductions from the project is considered additional.

3.2.4 Findings:

CL06: Please re-submit the IRR calculation worksheet with a clear indication of sources of data for checking. It is mentioned that the benchmark Internal Rate of Return (IRR after tax) for the construction industry is 12%. Please provide relevant source of information or calculation for review.

Response: The IRR calculation worksheet are received. Details are showed in the book ***Economic Assessment method and parameter of Construction Projects***. And "building materials industries accounts for 12%" can be found in ***page 202***. IRR calculation worksheet is form TCDRI (Tianjin Cement Design & Research Institute). Details are showed in the feasibility report of the project.

The CL is resolved and closed.

CL07: Please provide appropriate evidence supporting the common practice arguments presented in the PDD.

Responses: The project "Jiangsu Henglai Building Materials Co. Ltd" can be found in the

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following China DNA website (http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1282.pdf), the other project, the "Zhonglian Julong Cement Co. Ltd"- information can be found in the following UNFCCC website (http://cdm.unfccc.int/Projects/Validation/DB/XMK60RVVULIX0O18721IZHCTCAPAFY/view.html). The other ones, the "Yixing Tiansheng Cement Co. Ltd and Jiangsu Leida Co. Ltd"— the CDM Service Contracts are provided. As for the other projects mentioned in the Common Practice, they are just in the process of CDM negotiation, so no official evidence can be provided. The PDD is amended.

As the projects are CDM projects and are in the process of validation, it demonstrates that CDM is required for development of similar projects. The CL is therefore resolved and closed.

CL08: The "Tool for Demonstration and Assessment of Additionality" has been updated in the 29th meeting of the Executive Board. Please consider to use in the PDD.

Response: The PDD is revised.

The CL is therefore resolved and closed.

CL09: Regarding the claim for technological barrier, rather than stating generally some barriers due to lack of operating experience, please state clearly the actual technological barriers.

Response: The PDD is revised with better substantiations on the technological barriers.

The CL is therefore resolved and closed.

CL10: Please note that the income for selling of CERs would not be able to cover the construction costs on-time, due to the fact that selling of CERs can be achieved only after power is generated from the plant after construction. Please review the validity of the statement.

Response: With CDM revenue, the project owner can have a higher IRR 14.37%, for this reason , the project owner made the decision to invest on waste heat recovery project .And because of the additional revenue and the higher IRR, the bank provided loan to the project owner. With loan from bank, the project owner can cover the construction costs on-time. The number of loan from bank is showed in the feasibility report of the project.(8.1 investment estimate).

The CL is resolved.

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

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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 has made provisions for monitoring the GHG emissions reduction due to the project activity.

The project activity will not generate any project emission nor leakage in accordance with the approved methodology. Therefore monitoring of project emission and leakage is not required.

Monitoring of GHG emission reduction is based on measuring the net quantity of electricity supplied to the Qingshi 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 and data management procedures are also suitably described in the PDD.

3.3.2 Findings

CL11: The staff organisation chart in the PDD should be in English only. Also the monitoring organisation is described in general and does not provide a clear description of their responsibilities, and the procedures for monitoring and reporting of data collected. Please clarify.

Response: The PDD is amended with the Chinese text removed. The CL is therefore closed.

CL12: Please state clearly how the electricity generated and consumed by the power plant is measured and calculated, preferably with the assistance of a flow chart and formulae, showing clearly the actual locations of the ammeters and how the net electricity generated by the power plant is calculated.

Response: The PDD is amended with the required information. The CL is therefore closed.

CL13: Specific procedures identified for training of monitoring personnel should be developed and provided for review.

Response: Specific procedures for the monitoring personnel are identified in the training course. With 20 days for operation knowledge study and another 20 days for operation practice. Name list is showed in ***staff training plan.***

There CL is resolved and closed.

3.4 Calculation of GHG Emissions

3.4.1 Discussion

The project boundary of the project activity includes the waste gas / heat source, the power generating equipments (steam turbine and generator), the cement plant and the ECG.

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Regarding the calculation of project emissions, the PDD has stated that no auxiliary fuels will be used and hence the emission is zero. This is verified by the audit team during the on-site inspection.

As confirmed by the management representative of Qingshi, there is little benefit to increase the quantity of electricity by increasing the amount of waste gas through more coal consumption, owing to the following reasons:

- A constant temperature within the calciner, which is the final part of the material preheater before the raw materials are entering the cement clinker, is critical to ensure the quality of the cement, and can allow very little variation (i.e. between 860^{o}C to 880^{o}C). The unnecessary increase of the temperature of the calciner by increasing the quantity of coal consumption, will not only result in poorer quality of the cement, but may also lead to blocking of the raw materials within the calciner, which may render the whole cement-making non-functional.
- The energy content of the waste gas from the cement plant typically represents only about 30% of the heat of the whole cement production system, which is significantly lower than direct incineration of coal when compares with dedicated coal-fired power plant (typically ~85%). Therefore the costs for additional fuels, when compare with the revenue generated by selling of additional electricity, will be significantly higher and hence not financially viable.
- The audit team has checked the FSR with regards to the selection of the capacities of the waste heat boilers, the associated steam turbines, and hence the design of the whole waste heat recovery system. According to the FSR, the calculated power generating capacities are 5,500kW and 8,100kW respectively. These capacities are matched by the selection of two steam turbines of 6MW and 7.5MW as presented in the PDD. As the working ranges of the stream turbines are typically within 40% to 110% of their design loads, it is evident that the steam turbines are already selected for the optimal working conditions of the cement plant. As a result, it is considered that the opportunities for increasing the heat (and hence steam) to increase the power generation by increase consumption of coal would impose substantial risks to the operation of the steam turbines and hence the whole power generation system, which is not viable.

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 ECG is adopted, 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, which is considered appropriate.

The calculations have been checked by the audit team and confirmed to be correctly carried out.

3.4.2 Findings

CL13: Please clarify the application status of the set of emission factors published by

NDRC.

Response: Projects adopting these data are recently registered, hence it is considered that the data is acceptable. The CL is closed.

CL14: Please note that the IPCC guidelines has been updated in 2006.

Response: The latest IPCC data is used. The CL is closed.

3.5 Environmental Impacts

3.5.1 Discussion

The environmental impacts of the project have been reported in the PDD, Section D. It is reported 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 Provincial Environmental Protection Bureau on 30 April 2006.

In addition, no significant environmental impacts were identified during the on site assessment as the project is located inside the existing facilities which is located very remote from nearby sensitive receivers. This is further confirmed by the interviewing with representative of local Environmental Protection Bureau during the site interview that no environmental complaint was received.

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. A stakeholder meeting was organised by Qingshi with participants invited through notices adhered to public notice boards and government offices. A meeting minutes was prepared and the comments were summarised and recorded. 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

Nil

3.7 Comments by Parties, Stakeholders and NGOs

TÜV Rheinland has published the PDD on UNFCCC website from 6th April 2007 ~ 5th May 2007. No comment was received on the project activity.

3.7.1 Findings:

Nil

4 VALIDATION OPINION

The DOE TÜV Rheinland Japan Ltd. (TÜV Rheinland) has carried out the validation of the planned "Jiangsu Qingshi Cement Plant's Low Temperature Waste Heat Power Generation 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 03 of 12 March 2007)
- Public stakeholder comment process (6 April 2007 ~ 5 May 2007)
- On-site visit with stakeholder interviews (May 7~9, 2007)
- Issue of checklist with corrective action requests (CARs) and clarification requests (CLs) and the draft validation report & protocol
- Desk review of revised PDD
- Review of proposed corrections and clarifications
- Issue of the final validation report & protocol

The Letter of Approval (LoA) of voluntary participation, including confirmation by China's DNA, that the project assists them in achieving sustainable development, has been received. Annex I party is identified as Marubeni Corporation of Japan, and the LoA has received.

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.

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 estimated amount of emission reductions of 81,491 tCO_2e per year. This subject will be closely monitored during project verification phase.

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.

5 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 Feasibility Study Report (FSR). Tiangjin Cement Design & Research Institute. November 2006.

3 Greenhouse Gas Calculation Worksheets

4 Environmental Impact Assessment Report (EIA) Report. Jiangsu Province Environmental Science Institute. 10 March 006.

5 NDRC, Letter of Approval from the DNA of the P.R. China

6 Bulletin about confirming baseline emission factor of regional power grid in China. Office of National Coordination Committee on Climate Change , National Development and Reform Commission (NDRC) of China (DNA of China) on Dec. 15th, 2006.

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.	Certification Letter about No Official Development Assistance to Jiangsu Qingshi Cement Co., Ltd about the Development of the Low Temperature Waste Heat Generation Project. HuFu Town Government. 9 May 2007.

7. Jiangsu Qingshi Cement Co. Ltd, 12th March 2006, Low Temperature Waste Heat Power Generation Project, Minutes of Meeting with Stakeholders

8. Jiangsu Qingshi Cement Co. Ltd, 10th February 2006, Production Department Minutes of Meeting. About Development of Waste Heat of Generation Power Plant as CDM project.

9. Jiangsu Province Economic Trade Commission, 17th June 2006, Su Economic Trade Environment Recourse Document [2006] No.114, Letter of Approval about Jiangsu Qingshi Cement Co. Ltd Low Temperature Waste Heat Power Generation Project .

10. Jiangsu Province Economic Trade Commission, 22nd November 2006, Su Economic Trade Environment Recourse Document [2006] No.228, Letter of Approval about Jiangsu Qingshi Cement Co. Ltd. Low Temperature Waste Heat Power Generation Project, Installation Changes from 4.5MW to 6MW.

11. Jiangsu Province Environmental Protection Bureau, 30th April 2006, Approval of the Environment Impact Report of Jiangsu Qingshi Cement Co. Ltd. Low Temperature Waste Heat Power Generation Project.

12. Jiangsu Province Environmental Protection Bureau, 5th December 2006, Approval of the Supplementary Environment Impact Report of Jiangsu Qingshi Cement Co. Ltd. Low Temperature Waste Heat Power Generation Project

13. Jiangsu Qingshi Cement Co. Ltd, 10th August 2006, Minutes of Meeting about Decision of Establishing of CDM Management Team.

14. Jiangsu Qingshi Cement Co. Ltd and Marubeni Corporation, 18th December 2008, CER Purchase Agreement.

15. Jiangsu Qingshi Cement Co. Ltd, 21st October 2006, Waste Heat Power Generation Equipment Purchase Contract.

16. Jiangsu Qingshi Cement Co. Ltd and Hangzhou Boiler Group Co., Ltd, 20th October 2006, Boiler Purchase Contract.

17. Cement Low Temperature Waste Heat Boiler Performance Test Report of the 5000t/d Hangzhou Boiler Group Co., Ltd., by the Shanghai Power Equipment Research Institute. November 2005.

18. Jiangsu Qingshi Cement Co. Ltd. Organization Structure

19. Hangzhou Boiler Group Co., Ltd, November 2006, Waste Heat Boiler Tending Document.

20. Bank of China – Yixing Hufu Office, Loan Intent Letter to Jiangsu Qingshi Cement Co. Ltd for Low Temperature Waste Heat Power Generation Project, with Consideration of CDM Development as part of the Revenue.

21. Hangzhou Boiler Group Co., Ltd, Manufacture License, No.20102012, Design License of Special Equipment.

22. Jiangsu Qingshi Cement Co. Ltd and Jiangsu Province Grid Company Yixing Power Supply Company, High Voltage Power Supply Agreement, 24th April 2006.

23. Boiler Product Safety Properties Quality Certificate for Hangzhou Boiler Group Co. Ltd, 11th April 2007.

24. Jiangsu Qingshi Cement Co. Ltd and Changxing Meishan Zhongsheng Building Materials Co. Ltd, 25th April 2007, Pure Low Temperature Power Generation Technology Training Agreement.

25. Product Installation Manual. Hangzhou Boiler Group Co. Ltd

26. News on Possible Selling of Carbon Emission Reductions Internationally from Power Generated from Low Temperature Waste Heat from Cement Plants - China Building Materials Daily, 8 February 2006. No. 4239.

27. Loan Receipts from Bank of China.

28. GHZB1-1999, Environmental quality standard for surface water,

29. GB9078-1996, Air quality emission standard for industry oven

30. GB3095-1996, Ambient air quality standard

31. GB16297-1996, Integrated emission standard of air pollutants

32. GB14554-93, Odour pollutants emission standard

33. China Electric Power Yearbook 2004

34. China Electric Power Yearbook 2005

35. China Electric Power Yearbook 2006

36. China Energy Statistical Yearbook 2004. China Statistics Press

37. China Energy Statistical Yearbook 2005. China Statistics Press

38. China Energy Statistical Yearbook 2006. China Statistics Press

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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.	Mr Donghui Ying	Jiangsu Qingshi Cement Co. Ltd.	General Manager
2.	Mr Shuchun Duan	Jiangsu Qingshi Cement Co. Ltd.	Production Manager
3.	Mr Bohong Shen	Jiangsu Qingshi Cement Co. Ltd.	Electrical Engineer
4.	Mr Jianfen Zhao	Jiangsu Qingshi Cement Co. Ltd.	Office Manager
5.	Ms Mingtao Zhang	Productivity Centre of Jiangsu Province	Department Director
6.	Mr Jieming Xu	Productivity Centre of Jiangsu Province	Director Assistant
7.	Mr Jianping Duan	Productivity Centre of Jiangsu Province	Project Co-ordinator
8.	Mr. Tielin Zhang	Yixing Economic and Trade Commission	Officer
9.	Mr. Weicheng Shi	Yixing Environmental Protection Bureau	Chief Engineer
10.	Mr. Yuejun Ying	Bank of China – Yixing Hufu Office	Account Manager
11.	Mr. Xuguang Wang	East China Power Grid Company – Yixing Power Supply Company	Customer Manager
12.	Mr. Hua'an Zhang	Hufu Town government Economic and Trade Center	Officer
13.	Mr. Shunzhi Lu	Not Applicable	Local Resident
14.	Ms. Huifen Wang	Not Applicable	Local Resident
15.	Ms. Liping Chen	Not Applicable	Local Resident

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.

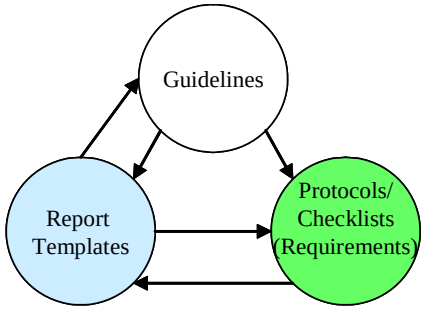

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

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 Japan 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	~~CAR01~~ The LoA is not received yet.	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	~~CAR01~~	
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 according to the Company Financial Report, dated 31 March 2007. 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 Japan's DNA is the Liaison Committee for Utlisation of Kyoto Mechanisms.
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 Japan has ratified the Kyoto Protocol on 4 June 2002.
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 first EIA report has been approved by the Jiangsu Environmental Protection Bureau

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.			in 30 April 2006 which has a reported output of 4.5 MW & 7.5 MW. The supplementary EIA Report was approved by the Jiangsu EPB with 6 MW & 7.5 MW on . 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 April 6 to May 5, 2007. No comments was received.
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	Marrakech Accords, CDM Modalities, §47	OK	Table 2, Section B.2.

REQUIREMENT	Reference	CONCLUSION	Cross Reference / Comment
majeure			
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	~~**CAR02:**~~ The location maps should be in English.	The PDD is in conformance with version 03.1. of the CDM PDD (in affect as of 28 July 2006).

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 cement plant of Jiangsu Qingshi Cement Co. Ltd in Hufu Town, Yixing City, Jiangsu Province.	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 2 sets of power plants consisting of 6 waste heat recovery boilers, 2 steam turbine of 6 MW and 7.5 MW, 2 electricity generators of 6 MW and 7.5 MW and power transmission system 110 / 10 kV, connected in parallel with East China Grid.		
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 is used.*					

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
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 from boilers of rotating kilns, described in the project design documentation. This practice and technology is new and advanced in China, based on domestic technology with local designer as Tiangjin Cement Design & Research Institute (TCDRI), and equipments from local suppliers.	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 (low-temperature, low-pressure) technologies and steam turbine (condensing type) technologies. The utilization of waste heat of boilers from rotating kilns for power generation is not common in China and is the “first of its kind” waste heat CDM projects in Jiangsu province. The boilers are produced by the Hangzhou Boiler Group Co., Ltd. The boiler testing report is available for inspection by the audit team. The project is still under construction and the trial run is expected to be conducted in August 2007. **CL 01:** Please detail the actual power generation process with reference to the cement production process, preferably with a process flow diagram. Technical information such as the efficiency of	~~CL 01, CL 02, CL 03~~	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			the steam turbine and generators should be presented. **CL02**: What is the power deficit of the project? Please demonstrate that all the power generated in the project activity is used within the project as described in the PDD. **CL03:** What is the history of the project? Please state the date of construction of the project and operation with supporting information.		
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 as this is a relatively new technology.	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 is different from 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. Jiangsu Qingshi Cement 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	PDD	DR	Training and maintenance needs are not	~~CL 04~~	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
maintenance needs?	OSV	I	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. maintenance checklists for the plant staff. **CL 04** 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 been provided. 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	OK	OK

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			construction and operation of the project activity local human resources or companies will be employed respectively subcontracted. The PDD states the generation of ~ 32 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 the cement industry and Jiangsu 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	OK	OK

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.			existing approved baseline methodologies, most applicable for this project, that is a waste heat based power generation project. The PDD responds convincingly to each of the applicability criteria which are outlined in the baseline methodology.		
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 is demonstrated in a transparent manner. The baseline scenario is the atmospheric release of the waste heat without utilization for captive power generation and at the same time the import of the necessary equivalent of electricity from East 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	Yes.	OK	OK
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. The baseline determination takes the actual amount of waste heat available to evaluate the amount of electricity that can be generated.	OK	OK
B.2.4. Does the baseline scenario sufficiently take into account	PDD	DR	Yes. All the current relevant national and/or	OK	OK

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relevant national and/or sectoral policies, macro-economic trends and political aspirations?			sectoral policies in China were considered. China has no mandatory policies or laws which require the utilization of waste heat.		
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: • The proposed project activity not undertaken as a CDM project activity • BAU: Import of equivalent electricity from the grid and release of waste gas into the atmosphere • Power generation with equivalent installed capacity using fossil fuels or other energy sources • A mix of options “Electricity import from the grid” and “Fossil fuel based power plant or other energy sources”. • Other uses of the waste heat	~~CL05~~	OK

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			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. **CL05** Please provide supporting to demonstrate that there are no wind or hydro power resources in Jiangsu as mentioned in Alternative No.3.		
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. Only one alternative baseline scenario is selected and hence economic analysis to select the most plausible alternative is not necessary. An investment analysis using “Benchmark Analysis Method” has been applied. The IRR of	~~CL 6-11~~	OK

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			the project activity without CDM revenue is 8.22% which is lower than the benchmark value of 12% for the industry. **CL06** Please re-submit the IRR calculation worksheet with a clear indication of sources of data for checking. It is mentioned that the benchmark Internal Rate of Return (IRR after tax) for the construction industry is 12%. Please provide relevant source of information or calculation for review. **CL07** Please provide appropriate evidence supporting the common practice arguments presented in the PDD. **CL08** The "Tool for Demonstration and Assessment of Additionality" has been updated in the 29th meeting of the Executive Board. Please consider to use in the PDD. **CL09** Regarding the claim for technological barrier, rather than stating generally some barriers due to lack of operating experience, please state clearly the actual technological barriers. **CL10** Please note that the income for selling of CERs		

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			would not be able to cover the construction costs on-time, due to the fact that selling of CERs can be achieved only after power is generated from the plant after construction. Please review the validity of the statement.		
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 7x3 years.	OK	OK
B.2.9. Is all literature and sources clearly referenced?	PDD	DR I	Yes.	OK	OK
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 end 2007. The operational lifetime is defined as 21 years which is considered reasonable as the technology applied is a new technology.		
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 7x3 years.	OK	OK

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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. The description of the organisation, monitoring	~~CL11 & 12~~	OK

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			and reporting in the PDD is described. The requested procedure and documentation and responsibilities assignation is in preparation and will be ensured by Jiangsu Qingshi Cement Co., Ltd. , supported by the CDM consultant. **CL11** The staff organisation chart in the PDD should be in English only. Also the monitoring organisation is described in general and does not provide a clear description of their responsibilities, and the procedures for monitoring and reporting of data collected. Please clarify. **CL12** Please state clearly how the electricity generated and consumed by the power plant is measured and calculated, preferably with the assistance of a flow chart and formulae, showing clearly the actual locations of the ammeters and how the net electricity generated by the power plant is calculated.		
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	PDD	DR I	Yes	OK	OK
D.2. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
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 cement production process.	~~CL 11~~	OK
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.*					

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
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 archiving of all relevant data necessary for determining baseline emissions during the crediting period?	PDD	DR I	The enclosed tables are in compliance with the latest versions of the applied monitoring methodologies. 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 captive 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	~~CL 11 & 12~~	OK

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			review of reported results / data according to the applied methodology will be part of the monitoring management.		
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 CO_2 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 East 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 through the local state environmental protection	OK	OK

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			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 Jiangsu Qingshi Cement 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. The authority and responsibility of the project management, in the form of a CDM Team, has been drawn up in August 2006 and shown to the audit team.	~~CL11~~	OK
D.6.2. Is the authority and responsibility for registration,	PDD	DR	Jiangsu Qingshi Cement Co., Ltd. with	~~CL 11~~	OK

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monitoring, measurement and reporting clearly described?	OSV		assistance of the CDM consultant has also the responsibility for the tasks related to monitoring. The respective procedures seem not to be clearly defined.		
D.6.3. Are procedures identified for training of monitoring personnel?	PDD OSV	DR I	Specific training to the local employees regarding monitoring is not identified. CL013 Specific procedures identified for training of monitoring personnel should be developed and provided for review.	~~CL013~~	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
D.6.5. Are procedures identified for calibration of monitoring equipment?	PDD OSV	DR I	Yes, such procedures are written in the PDD and is expected to 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

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
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 applied methodology will be part of the monitoring management. A CDM manual, to be prepared by the project proponent, covering all these issues, would be beneficial.	OK	OK
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

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
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 are considered as negligible. Transportation of waste gas to waste heat boilers does not involve any new installation and hence power, but would not require the facility for cooling, which currently use to reduce the temperature of waste gas before it's release to the atmosphere. Waste heat reused on-site prior to apply for power generation would not be affected as the power facility uses the waste heat after all the cement process has been completed.		
E.1.2. Are the GHG calculations documented in a complete and	PDD	DR	The project does not envisage any additional	~~CL14~~	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
transparent manner?			GHG emissions. Calculations and their derivative formulas for any additional occurring emissions can be referenced to IPPC standards, if necessary. **CL14** Please clarify the application status of the set of emission factors published by NDRC.		
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.	~~CL 14~~	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	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			ACM0004. 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	OK	OK

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
			waste heat conversion from the feasibility study 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.		
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.	OK	OK
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. **CL15** The IPCC data has been updated in 2006. Please consider.	~~CL15~~	OK
E.4. Emission Reductions					

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
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 81,491 tCO2 equivalent on the average. The project applies conservative and sound assumptions. The final emission reductions will be the result from the ex-post measurements, which will be annually verified by a DOE.	OK	OK
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	The EIA Report has been approved by the Provincial Environmental Protection Bureau in 2006.	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

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl.	Final Concl.
F.1.4. Are transboundary environmental impacts considered in the analysis?	PDD OSV	DR I	No transboundary environmental impacts to other regions or countries have been identified.	OK	OK
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 Provincial Environmental Protection Administration of China.	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	A stakeholder consultation process is not mandatory in China. However, the project proponent has organised a symposium with attendance from various stakeholders, and 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 April 6 to May 5, 2007. No comments were received during the mentioned period.	OK	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 LoA from DNA of P.R.China is not available for inspection. The project proponent has to obtain a written approval for the project from the DNA of the P.R. China in English language, which shall contain all required CDM elements in the letter as defined by UNFCCC.	Table 1, No.2	The LoA from China is received. The LoA from Japan is also received.	The CAR is therefore resolved and closed.

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. 2: The location maps should be in English.	Table 1, No.17	The maps are amended.	The CAR is therefore resolved and closed.
Clarification Request No.1: Please detail the actual power generation process with reference to the cement production process, preferably with a process flow diagram. Technical information such as the efficiency of the steam turbine and generators should be presented.	Table 2, A2.2	The PDD is revised giving more useful technical information about the plan to help the understanding of the plant.	The CAR is therefore resolved and closed.
Clarification Request No.2: What is the power deficit of the project? Please demonstrate that all the power generated in the project activity is used within the project as described in the PDD.	Table 2, A2.2	As showed in ***electricity invoices***, the total electricity that the project in 2006 is 164,977,280 kWh (An estimated 200,000,000 kWh electricity will be needed in 2007), and the total net electricity from waste heat recovery generation is 90,080,000 kWh. So still there is a big shortage. So all the power generated will be used within the project. Invoices are also provided for checking.	The CAR is therefore resolved and closed.
Clarification Request No.3: What is the history of the project? Please state the date of construction of the project and operation with supporting information.	Table 2, A2.2	The construction date of the project is on 08.03.2007 as showed in the ***construction start report;*** the operation of the project is expected to be in the beginning of September.	The CAR is therefore resolved and closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in	Summary of project owner response	Validation team conclusion
Clarification Request No.4: Training and maintenance needs are not 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. maintenance checklists for the plant staff. 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.	Table 2, A2.5	Training and maintenance is addressed in PDD page 16, Technical barriers. The *staff training contract and staff training plan* is submitted for information.	The CAR is therefore resolved and closed.
Clarification Request No.5: Please provide supporting to demonstrate that there are no wind or hydro power resources in Jiangsu as mentioned in Alternative No.3.	Table 2, B2.6	The PDD is updated with details justifying that wind or hydro power are not viable baseline scenarios.	The CAR is therefore resolved and closed.
Clarification Request No.6: Please re-submit the IRR calculation worksheet with a clear indication of sources of data for checking. It is mentioned that the benchmark Internal Rate of Return (IRR after tax) for the construction industry is 12%. Please provide relevant source of information or calculation for review.	Table 2, B2.7	The IRR calculation worksheet are received. Details are showed in the book ***Economic Assessment method and parameter of Construction Projects***. And "building materials industries accounts for 12%" can be found in ***page 202***. IRR calculation worksheet is form TCDRI (Tianjin Cement Design & Research Institute). Details are showed in the feasibility report of the project.	The CAR is therefore resolved and closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in	Summary of project owner response	Validation team conclusion
Clarification Request No.7: Please provide appropriate evidence supporting the common practice arguments presented in the PDD.	Table 2, B2.7	The project "Jiangsu Henglai Building Materials Co. Ltd" can be found in the following China DNA website (http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1282. pdf), the other project, the "Zhonglian Julong Cement Co. Ltd"- information can be found in the following UNFCCC website (http://cdm.unfccc.int/Projects/Validation/DB/XMK60RVVULIX0O18721IZHCTCAPAFY/view.html). The other ones, the "Yixing Tiansheng Cement Co. Ltd and Jiangsu Leida Co. Ltd"— the CDM Service Contracts are provided. As for the other projects mentioned in the Common Practice, they are just in the process of CDM negotiation, so no official evidence can be provided. The PDD is amended.	As the projects are CDM projects and are in the process of validation, it demonstrates that CDM is required for development of similar projects. The CAR is therefore resolved and closed.
Clarification Request No.8: The "Tool for Demonstration and Assessment of Additionality" has been updated in the 29th meeting of the Executive Board. Please consider to use in the PDD.	Table 2, B2.7	The PDD is revised.	The CAR is therefore resolved and closed.
Clarification Request No.9:	Table 2,	The PDD is revised with better substantiations on the technological	The CAR 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
Regarding the claim for technological barrier, rather than stating generally some barriers due to lack of operating experience, please state clearly the actual technological barriers.	B2.7	barriers.	closed.
Clarification Request No.10: Please note that the income for selling of CERs would not be able to cover the construction costs on-time, due to the fact that selling of CERs can be achieved only after power is generated from the plant after construction. Please review the validity of the statement.	Table 2, B2.7	With CDM revenue, the project owner can have a higher IRR 14.37%, for this reason , the project owner made the decision to invest on waste heat recovery project .And because of the additional revenue and the higher IRR, the bank provided loan to the project owner. With loan from bank, the project owner can cover the construction costs on-time. The number of loan from bank is showed in *t*he feasibility report of the project.(8.1 investment estimate).	The CAR is therefore resolved and closed.
Clarification Request No.11: The staff organisation chart in the PDD should be in English only. Also the monitoring organisation is described in general and does not provide a clear description of their responsibilities, and the procedures for monitoring and reporting of data collected. Please clarify.	Table 2, D1.3	The PDD is amended with the Chinese text removed.	The CAR is therefore resolved and closed.
Clarification Request No.12: Please state clearly how the electricity	Table 12, D1.3	The PDD is amended with the required information.	The CAR is therefore resolved and closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in	Summary of project owner response	Validation team conclusion
generated and consumed by the power plant is measured and calculated, preferably with the assistance of a flow chart and formulae, showing clearly the actual locations of the ammeters and how the net electricity generated by the power plant is calculated.			
Clarification Request No.13: Specific procedures identified for training of monitoring personnel should be developed and provided for review.	Table 2, D	**:** Specific procedures for the monitoring personnel are identified in the training course. With 20 days for operation knowledge study and another 20 days for operation practice. Name list is showed in ***staff training plan.***	The CAR is therefore resolved and closed.
Clarification Request No.14: Please clarify the application status of the set of emission factors published by NDRC.	Table 2, E1.2	Projects adopting these data are recently registered, hence it is considered that the data is acceptable.	The CAR is therefore resolved and closed.
Clarification Request No.15: Please note that the IPCC guidelines has been updated in 2006.	Table 2, B3.6	The latest IPCC data is used.	The CAR is therefore resolved and closed.