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# VALIDATION REPORT

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Captive power generation  
through waste heat recovery  
system in a steel plant in Jinan  
City, China

REPORT No. 2007-9109  
REVISION No. 01



## VALIDATION REPORT

Date of first issue: 2007-03-01	Project No.: 86026302
Approved by: Michael Lehmann Technical Director	Organisational unit: DNV Certification As, International Climate Change Services
Client: Nippon Steel Corporation	Client ref.: Teruo Okazaki

DET NORSKE VERITAS  
CERTIFICATION AS

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**Project Name:** Captive power generation through waste heat recovery system in a steel plant in Jinan City, China

**Country:** China

**Methodology:** ACM0004

**Version:** 02

**GHG reducing Measure/Technology:** Waste heat recovery for coke quenching.

**ER estimate:** 167 055 tCO<sub>2</sub>e/year in average for 10 years.

**Size**

☒ Large Scale

☐ Small Scale

**Validation Phases:**

☒ Desk Review

☒ Follow up interviews

☒ Resolution of outstanding issues

**Validation Status**

☐ Corrective Actions Requested

☐ Clarifications Requested

☒ Full Approval and submission for registration

☐ Rejected

In summary, it is DNV's opinion that the "Captive power generation through waste heat recovery system in a steel plant in Jinan City, China" project as described in the project design document version 4 dated 3 March 2008, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodology ACM0004 version 2. Hence, DNV requests the registration of the project as a CDM project.

Report No.: 2007-9109	Date of this revision: 2008-03-04	Rev. No. 01
Report title: Captive power generation through waste heat recovery system in a steel plant in Jinan City, China in China		
Work carried out by: Akira Sekine, Mindy Yue, Michael Lehmann		
Work verified by: Hendrik W. Brinks		

**Key words:**

Climate Change

Kyoto Protocol

Validation

Clean Development Mechanism

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### Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDQ	Coke Dry Quench
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH <sub>4</sub>	Methane
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
JIGANG	Jinan Iron & Steel Group Corporation
MP	Monitoring Plan
NSC	Nippon Steel Corporation
N <sub>2</sub> O	Nitrous oxide
OM	Operating Margine
ROA	Return of assets




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Appendix A: Validation Protocol

Appendix B: Certificates of Competence

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### 1 EXECUTIVE SUMMARY – VALIDATION OPINION

*Det Norske Veritas Certification AS (DNV) has performed a validation of the “Captive power generation through waste heat recovery system in a steel plant in Jinan City, China” project. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host Party criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.*

*The validation consisted of the following three phases: i) a desk review of the project design, baseline and monitoring plan (November 2006), ii) follow-up interviews with project stakeholders (November 2006) and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion in March 2008.*

*The host Party is China and the Annex I Party is Japan. Both countries fulfil the participation criteria and have approved the project and authorized the project participants. The DNA of China confirmed that the project assists in achieving sustainable development.*

*The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards China*

*The project consists of the installation of waste heat recovery and power generation measures (coke dry quenching system: CDQ) at the existing coke manufacturing facility of the Jinan Iron and Steel Group Corporation steel plant in Jinan City. The power to be generated by the project activity displaces the part of the power being used by the steel plant and supplied from the North China Power Grid. The baseline emissions are the amount of CO<sub>2</sub> due to fossil power plants supplying power to the North China Power Grid.*

*The project correctly applies the approved baseline and monitoring methodology ACM0004 version 02. The determination of the baseline is well elaborated, transparent and sufficiently supported with facts. The selected baseline scenario, i.e. the continuation of the current situation, where there will be no installation of CDQ is reasonable for the fixed 10 year crediting period. Moreover, the technical barriers analysis and common practice analysis of CDQs installed in China demonstrate that project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.*

*The monitoring plan is in line with the approved monitoring methodology ACM0004 version 02. The monitoring plan makes sufficient provision for monitoring relevant baseline emission indicators. Detailed responsibilities and authorities for project management, monitoring and reporting and QA/QC procedures have also been envisaged.*

*The ex-ante GHG emission estimations are calculated and documented in a complete and transparent manner. The algorithm and methodologies for accounting GHG emissions are appropriate and the total emission reductions from the project are estimated to be on the average 167 055 tCO<sub>2</sub>e per year over the selected 10 year crediting period.*

*The project is not expected to create any adverse environmental impacts. The Environmental Impact Assessment Report regarding the project had been submitted to the local environmental authority and it was approved on 18 October 2004.*



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*In summary, it is DNV's opinion that the "Captive power generation through waste heat recovery system in a steel plant in Jinan City, China" project, as described in the PDD version 4 dated 3 March 2008, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0004 version 2. DNV thus requests the registration of the project as a CDM project activity.*

## 2 INTRODUCTION

Nippon Steel Corporation (NSC) has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the "Captive power generation through waste heat recovery system in a steel plant in Jinan City, China" project (hereafter called "the project"). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board.

### 2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

### 2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0004. The validation team has, based on the recommendations in the Validation and Verification Manual, employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

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### 3 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design documents
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

#### 3.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the validation:

- /1/ Nippon Steel Corporation, CDM-PDD of “Captive power generation through waste heat recovery system in a steel plant in Jinan, China”, Version 1, 9 November 2006.
- /2/ Nippon Steel Corporation, CDM-PDD of “Captive power generation through waste heat recovery system in a steel plant in Jinan, China”, Version 4, 6 February 2008.
- /3/ International Emission Trading Association (IETA) & the World Bank’s Prototype Carbon Fund (PCF): *Validation and Verification Manual*.  
<http://www.ieta.org/ieta/www/pages/index.php?IdSitePage=200>
- /4/ National Development and Reform Commission of the People’s Republic of China, Letter of approval on CDM, 26 August 2007.
- /5/ The Liaison Committee for the Utilization of the Kyoto Mechanisms (Japan), Letter of approval on CDM, 9 February 2007.
- /6/ ACM0004 version 02, “Consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation”.
- /7/ ACM0002, version 06, “Consolidated baseline methodology for grid connected electricity generation from renewable sources”.
- /8/ Tool for demonstration and assessment of additionality (Version 03).
- /9/ Jinan City Environmental Authority, Letter of approval on EIA, 18 October 2004.
- /10/ JIGANG, the list of participants of stakeholder meeting.
- /11/ The Editorial Board of China Steel Year Book of China Steel and Iron Association, China Steel Year Book 2005, December 2005.
- /12/ Nippon Steel Corporation, Recently installed CDQ in China, September 2005.
- /13/ Shougang Design Institute / Nippon Steel Corporation / Beijing China-Japan Joint Environmental engineering Co., Ltd., Construction Design Contract of Jinan XinYing Coking Co., Ltd. 150 t/h CDQ, 3 March 2005.
- /14/ JIGANG, the minutes of formal proceeding for 150 t/h CDQ construction, 26 August 2004.
- /15/ The State Council office’s directive on prohibiting construction of coal-fired plants with installed capacity of less than 135 MW, 2002.



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- /16/ National Development and Reform Commission, Development Policy of Steel Industry, 8 July 2005.
- /17/ Nippon Steel Corporation & Nippon Steel Engineering Corporation & JIGANG, Engineering Provision Agreement, 11 May 2005
- /18/ JIGANG, Investment Plan Year 2005, 31 December 2005 (achievement)

### 3.2 Follow-up Interviews with Project Stakeholders

	Date	Name	Organization	Topic
/19/	2006-11-16	Naohito Soma	Nippon Steel Engineering Co., Ltd.	<ul style="list-style-type: none"> <li>➤ CDQ technology</li> <li>➤ Common technology in Chinese coke industry</li> <li>➤ Government initiative on CDQ</li> <li>➤ Monitoring plan and management system</li> <li>➤ Investment policy</li> <li>➤ Stakeholder consultation</li> </ul>
/20/	2006-11-16	Tatsushi Henmi	Pacific Consultants Co., Ltd.	same as above
/21/	2006-11-16	Chen Qixiang	Jinan Iron & Steel Co., Ltd.	<ul style="list-style-type: none"> <li>➤ Environmental improvement</li> <li>➤ EIA approval status</li> <li>➤ Investment policy</li> <li>➤ Stakeholder consultation</li> </ul>

### 3.3 Resolution of Outstanding Issues

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

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

The validation protocol consists of two tables. The different columns in these tables are described in the figure below. The completed validation protocol for the "Captive power generation through waste heat recovery system in a steel plant in Jinan City, China" project is enclosed in Appendix A to this report.





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Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

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

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

### 3.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical reviews were performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

### 3.5 Validation Team

<i>Role/Qualification</i>	<i>Last Name</i>	<i>First Name</i>	<i>Country</i>
Team Leader/CDM Validator	Sekine	Akira	Japan
CDM Validator	Yue	Mindy	China
Sector Expert	Lehmann	Michael	Norway
Technical Reviewer	Brinks	Hendrik	Norway

The qualification of each individual validation team member is detailed in Appendix B to this report.

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

  

<b>Validation Protocol Table 2: Requirement checklist</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
<i>The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>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.</i>	<i>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.</i>	<i>This is either acceptable based on evidence provided (<b>OK</b>), or a <b>corrective action request (CAR)</b> due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.</i>

  

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

**Figure 1: Validation protocol tables**



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### 4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

#### 4.1 Participation Requirements

The project participant of the non-Annex I Party People's Republic of China is Jinan Iron and Steel Group Corporation (JIGANG). The Government of the Peoples' Republic of China ratified the Kyoto Protocol on 30 August 2002 and designated National Development and Reform Commission (NCRC) as the DNA. The project has received the approval of the DNA of China on 26 August 2007.

The project participant of the Annex I Party Japan is Nippon Steel Corporation. The Government of Japan ratified the Kyoto Protocol on 4 June 2002 and designated the Liaison Committee for Utilisation of the Kyoto Mechanism as the DNA. The project has received the approval of the DNA of Japan on 9 February 2007.

The project does not involve any public funding and the validation did not reveal any information indicating that the project can be seen as a diversion of official development assistance (ODA) funding towards China.

#### 4.2 Project Design

Nippon Steel Corporation (NSC) is the largest steel manufacture in Japan having eight large scale iron/steel plants with high energy efficiency by means of several kinds of waste heat recovery system, i.e. coke dry quenching. Jinan Iron and Steel Group Corporation (JIGANG) is a major steel manufacturer located in Jinan City, Shangdong Province, People's Republic of China.

Through a coke manufacturing process, red-hot coke of approximately 1000°C coming out of coke oven is quenched by conventional water spraying. The coke dry quenching system (CDQ) was developed aiming to recover waste heat during the quenching process by means of using inert gas (nitrogen) as a cooling media and used to generate steam in a boiler instead of applying a water quenching system (wet quenching).

JIGANG had installed the first set of two CDQ at No. 1 to 4 coke ovens introducing other foreign technology in 1999. However, it had faced malfunctions due to its improper installation. JIGANG thus rebuilt most of the CDQ equipment. However, the facility had worked at only less than 70% of the specified capacity.

The proposed CDM project activity will recover waste heat from red-hot coke produced from No. 6 and No. 7 coke ovens and utilize the heat for electricity generation. The operation of this CDQ was expected to commence by the end of 2007.

The steam turbine generator has a generation capacity of 25 MW and is expected to generate 176 778 MWh annually. The electricity will be supplied to the project participant's premise to displace the power supplied from the North China Power Grid (NCPG). In determining the net quantity of electricity supplied to the grid, the project participants considered the electricity required for the waste heat recovery and steam generation, i.e. blower of CDQ, boiler feed water plant and tail gas treatment unit.



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No. 6 and 7 coke ovens are located few kilometres from No. 1 to 4 coke ovens and they have been operated independently. Hence, the CDQs implemented by the project activity are not affecting the operation of the CDQs installed in 1999.

The project is expected to contribute to sustainable development of P.R. China by improvement of the environment through reduction of dust and SO<sub>2</sub> emissions and water consumption caused by the coke manufacturing process. The proposed project activity is also expected to provide ten times more employment opportunities than the conventional wet quench system. The contribution to sustainability development of the host Party was confirmed through the issuance of approval by the DNA of P.R. China.

An operational lifetime of the project is supposed to be 15 years and the project participants have chosen a “fixed crediting period” of 10 years.

The starting date of the project activity defined in the PDD is of 3 March 2005 is the contract date for the general design agreement.

The starting date of the crediting period is 1 June 2008 or the date of registration, whichever the later.

### 4.3 Baseline Determination

The project applies the approved baseline methodology ACM0004 version 02, “Consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation”. The project meets the methodology’s applicability criteria:

- a) The project activity generates electricity from waste heat. The current practice is water spraying of coke for cooling and this energy is currently not utilized.
- b) It displaces electricity generation with fossil fuel in the electricity grid;
- c) No fuel switch is done in the process, where the waste heat is produced, after the implementation of the project activity

Baseline emissions consist of the CO<sub>2</sub> emissions from the fossil fuel fired power plants connected to the North China Power Grid. The combined margin is used to determine the baseline emission factor as described in ACM0002 version 06.

The possible alternate scenarios in the absence of the proposed project activity are compared and discussed based on ACM0004 as follows:

- Option (a): The proposed project activity not undertaken as a CDM project activity;
- Option (b): Import of electricity from the grid;
- Option (c): Existing or new captive power generation on-site using fossil fuel or renewable sources;
- Option (d): A mix of option (b) and (c)
- Option (e): Other use of the waste heat and waste gas
- Option (f): The continuation of the current situation.

Among the above six options option (a) was considered to be unavailable for technical reason (refer to section 4.4). Option (c) and (d) using fossil fuel are not possible because of regulatory restrictions on fossil fuel power plants below 135 MW /15/. Besides, the prohibitive regulation on fossil fuel based generation, renewable energy sources, e.g. hydro, wind, are not available at the project location. Option (e) is not possible since no other

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technologies are readily available than the project to utilize the heat. Option (f) is excluded as it is already included in Option (b). Option (b) is the current practice and selected as the most likely scenario.

The system boundaries are summarised presented as follows:

	GHGs involved	Description
Baseline emissions	CO <sub>2</sub>	Emissions from producing an equivalent amount of electricity by power plants connected to the North China Power Grid
Project emissions	None	No fossil fuel combustion
Leakage	None	No leakage needs be considered

### 4.4 Additionality

The additionality of the project has been demonstrated using the latest “Tool for the demonstration and assessment of additionality (version 03)”.

*Step 1 - Identification of alternatives to the project activity consist with current laws and regulations*

Among the aforementioned six scenarios, all options other than option (c) and (d) are in line with the current Chinese regulations. However, (e) and (f) are not considered realistic alternatives for reasons mentioned in Section 4.3. Alternative (a) and (b) were considered as below.

*Step 2 - Investment analysis*

This step was not selected.

*Step 3 – Barrier analysis*

Investment barriers and the technical barriers have been used to demonstrate additionality.

#### Investment barrier

JIGANG is currently operating a wet coke quenching process at its coke manufacturing process, and this meets the environmental and industrial requirement of P.R. China. On the other hand, the iron/steel industry has to expand its capacity corresponding to the rapid demand growth in China. Due to the above reason, the steel/coke manufacturing companies prioritize investments aiming for capacity expansion and not for waste heat recovery. In addition JIGANG installed a different type of CDQ system in 1999, but this CDQ system. did not function according to the specified performance. The management of JIGANG is therefore more reluctant to invest in CDQ due to the perceived risks involved.

The continuation of the current situation does not face a similar barrier.

The above investment barrier will be alleviated by Nippon Steel Corporation having committed to procure all CERs to be generated by the project activity.

#### Technological barrier

Although CDQ systems are implemented in some coke plants in China, those CDQ systems are implemented with the government initiative to introduce state of the art technology in the Chinese steel/coke industry. Also the CDQs installed at JIGANG in 1999 were a part of national energy saving demonstration project. The project's CDQ technology of the advanced

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type is a thoroughly new technology for China and needs more than forty specially trained personnel to operate. NSC will provide this training as a technology provider with broad experience of CDQ as stated in the agreement regarding the provision of engineering including training, among Nippon Steel Corporation, Nippon Steel Engineering and JIGANG on 11 May 2005 /17/. Hence, the project faces a technological barrier which is overcome through the involvement of NSC as part of the CDM project activity.

### *Step 4 - Common practice analysis*

Through the study conducted by the project participants based on the statistics of Chinese Iron and Steel Association (CISA) and Nippon Steel Engineering Corporation, the diffusion rate of CDQ technology is estimated at around 5-6% (as coke processed by CDQ / coke production) and leveling between 1999 and 2004, and decreased from 8.2% to 5.2% (as coke processed by CDQ / coke used in iron & steel industry). The growth ratio of the CDQ capacity during the period is quite low compared with the capacity expansion of the steel/coke industry. CDQ is currently representing common practice only in Japan, Korea and some former Soviet Union countries. This explanation seems reasonable to support the project's additionality. The supporting information regarding the existing CDQs in China had strengthened the explanation /11/, /12/.

The construction of the CDQ started on 11 November 2006 and the general contract of CDQ design among Shougang Design Institute, Nippon Steel and Beijing China-Japan Joint Environmental Engineering was agreed on 3 March 2005. Since validation only started in November 2006, the validation team investigated and confirmed that CDM benefits were seriously considered when making the decision to proceed with the project activity. The formal proceedings of the Board of Directors of Jinan Iron and Steel Corporation dated 26 August 2004 /13/, /14/ stated that they decided to invest in CDQ as a CDM.

In conclusion, the project is confirmed not to be a likely baseline scenario and the emission reductions are hence additional to what would have happened in the absence of the project.

## **4.5 Monitoring**

The project applies the approved monitoring methodology ACM0004, Version 02 "Consolidated monitoring methodology". The project meets the methodology's applicability criteria as described in this report Sec. 4.3.

### **4.5.1 Parameters determined ex-ante**

The grid emission factor used for baseline emission calculation is determined based on ACM0002 version 06 and the latest data publicly available by the DNA of China on 9 August 2007. Some data referring to IPCC 2006 default values used in the DNA data were corrected properly in the PDD.

The *ex-ante* baseline emission factor remains fixed during the entire crediting period.

### **4.5.2 Parameters monitored ex-post**

The electricity to be supplied to the industrial facilities in the project participant's premise is determined by subtracting the self consumption of the CDQ from the electricity generated. The electricity consumed by CDQ operation is clearly described in the PDD, section B.6.3.



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### 4.5.3 Management system and quality assurance

The General Manager, Measurement Management Department is responsible for the entire monitoring process. The necessary procedures for monitoring and reporting were addressed and described in the PDD as follow:

- The retention time of the data obtained.
- The measurement equipment to be used.
- The measurement intervals.
- The maintenance and calibration intervals of monitoring equipment.
- The archiving of the data monitored.
- The environmental monitoring required.

### 4.6 Estimate of GHG Emissions

The formulas and calculations for GHG emission calculations are described in a transparent manner in the PDD, Sec. B.6.3. The assumptions used in the calculations are realistic. The calculations in the PDD were confirmed.

### 4.7 Environmental Impacts

The project activities are not expected the adverse environmental effect but improve the air quality as dust and SO<sub>2</sub> are captured by the project activities. The feasibility study of the project activity had been concluded and the EIA approval was obtained in 18 October 2004 from the Government of Jinan City /9/.

No environmental monitoring is currently required.

### 4.8 Comments by Local Stakeholders

During the site visit, local stakeholder from the community has been interviewed. The interviews confirmed that local stakeholders were consulted and the local stakeholders support the project and that no modifications to the project design were thus necessary.

The meeting details were presented during the site-visit. The notification to the community and the summary of the comments received were verified to be appropriate by interviewing the participants of the stakeholder meeting /10/.

### 4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 9 November 2006 was made publicly available on DNV's climate change website ([http://www.dnv.com/focus/climate\\_change/Projects/ProjectDetails.asp?ProjectId=844](http://www.dnv.com/focus/climate_change/Projects/ProjectDetails.asp?ProjectId=844)) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 11 November 2006 to 10 December 2006.

One comment was received on 17 November 2006 and is given (in unedited form) in the below text box.

**Comment by:** Yang Qingqinq, Green Life Association

☒ Accredited NGO

☐ Party

☐ Stakeholder

**Inserted On:** 2006-11-17

**Subject:** common practice

**Comment:**





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According to the tenth five year plan in China, 60% the steel plant with larger than 1 million tons steel production can be equipped with CDQ.

Till year 2005, 30% of coke production in China are from CDQ.

Actually CDQ is a mature technology and common practice in China. Can you say all those CDQ projects are based on CDM?

Also, the statement that the project faces financial barrier is not true. the project owner is a public listed company with profit at 1.2 billion RMB in 2005 (from its 2005 annual report

<http://www.jigang.com.cn/luyan/upload/uploadfiles/11d1def534ea1be01f0c54110aa52790078000.pdf>) profit at the third quarter 2006 is 0.87 billion RMB

Meanwhile, IRR of the project owner's operation is 7.01% (<http://www.jigang.com.cn/luyan/upload/uploadfiles/11d1def534ea1be0ba9e8610ea29a69138000.pdf>), while the CDQ project has much higher IRR. it's not true that the project owner won't do the project because its main operation (steel production expansion) will obstacle the CDQ project.

More, the CDQ project in year 2004 was invested 8 million RMB, while the return from the project is 53 million RMB. (2004 annual report <http://www.jigang.com.cn/en/luyan/upload/uploadfiles/11d1def534ea1be0601bd710986ec08427f7c.pdf>) with such return rate, I don't think any barrier can obstacle the project implementation.

DNV considered the comment by requesting the following clarifications from the project participants:

Comment 1: The possible prevalence of CDQ in Chinese steel plants should be discussed considering the tenth five year plan in China.

Comment 2: The prevalence of CDQ in 2005 should be discussed.

Comment 3: The CDQ existing currently in China should be explained.

Comment 4: The scale and the operating result of the host company are not considered to link with the investment barrier directly. However the project participants need to clarify it.

Comment 5: "It is not correct that the IRR of the project owner's operation is 7.01% and 7.01 if the ROA. Although ROA can not be compared with the project IRR, the project participants should clarify this considering the comment received.

Comment 6: The comment received is inconsistent with the description in the PDD. It needs be clarified and evidenced in the PDD.

The project participants had responded to the comments received by revising the PDD and by providing the responses summarized below:

### Common practice analysis and prevalence of CDQ

Despite the tenth Five Year Plan of China stating that the potential diffusion rate of CDQ is 60%, the actual diffusion rate is approximately 10% only. This is sufficiently evidenced by the literature presented by the PP and the PPs' own analyses. More than ten CDQ processes





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## VALIDATION REPORT

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were developed or under development after 2005 as CDM projects. There are several non-CDQ projects and all of them are “national project”, “AIJ”, “environmental demonstration project” or “ODA funded”, and were not “business as usual”.

### Investment barriers

Regardless of the scale and/or operating results of a company, the project participant “JIGANG” is a listed company and shall seek for financial profit and capacity expansion under the current market situation. Large upfront payment, past experience of unreliable CDQ process and the investment priority on capacity expansion are investment barriers for CDQ for which there is no mandatory requirement.

### Investment analysis

The financial indicator which the stakeholder referred in the website of the PP is ROA and not IRR. They can not be directly compared.

### Cost performance of CDQ

The investment referred by the stakeholder comment was for repairing the existing CDQ process, and the return referred was not attained in a single year but over 20 years. Thus it is not correct that the stakeholder pointed out that the CDQ in year 2004 8 million RMB was invested, while the return from the project was 53 million RMB.

The above descriptions were general in the recent iron and steel industry in China. Besides it was verified through reviewing the annual investment plan of JIGANG that the company has been seeking for very rapid growth of production capacity and the investment for energy efficiency and/or recovery is only 3.5% of total investment /18/.

In DNV’s opinion the PP addressed the comments raised by the stakeholder properly, and the responses of the PP are deemed reasonable.

## **APPENDIX A**

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### **CDM VALIDATION PROTOCOL**

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

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

Requirement	Reference	Conclusion
<b>About additionality</b>		
Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	<del>Not yet concluded</del> OK
<b>About forecast emission reductions and environmental impacts</b>		
The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	<del>Not yet concluded</del> OK
<b>For large-scale projects only</b>		
Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	<del>Not yet concluded</del> OK
<b>About stakeholder involvement</b>		
Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	<del>Not yet concluded</del> OK
Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
<b>Other</b>		
The baseline and monitoring methodology shall be previously approved by the CDM	CDM Modalities and Procedures §37e	OK

Requirement	Reference	Conclusion
Executive Board.		
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.	CDM Modalities and Procedures §45c,d	OK
The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	<del>Not yet concluded</del> OK

Table 2: Requirements Checklist

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<b>A. General Description of Project Activity</b> <i>The project design is assessed.</i>					
<b>A.1. Project Boundaries</b> <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial boundaries (geographical) clearly defined?	/1/ /19/ /20/ /21/	DR I	The project is located adjacent to the existing coke ovens of Jinan Iron and Steel Group Corporation (JIGANG). The coke plant is located in Jinan City, Shangdong Province of the P.R. of China.	-	OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/ /19/ /20/ /21/	DR I	The auxiliary equipment of CDQ units consuming electricity, i.e. boiler feed water unit and turbine generator are not clearly described in the PDD.	<del>CL1</del>	OK
<b>A.2. Participation Requirements</b> <i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.</i>					
A.2.1. Which Parties and project participants are participating in the project?	/1/	DR	The participating non-Annex I Party is P.R. China.  The participating Annex I Party is Japan.	-	OK
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants	/1/ /5/	DR	The DNA of Japan had issued the letter of approval for the project activity and	<del>CAR 1</del>	OK

\* MoV = Means of Verification, DR= Document Review, I= Interview

<b>CHECKLIST QUESTION</b> * MoV = Means of Verification, DR= Document Review, I= Interview	<b>Ref.</b>	<b>MoV*</b>	<b>COMMENTS</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
been authorized by an involved Party?			authorized Nippon Steel Corporation on 9 February 2007. The DNA of China has issued letter of approval dated 26 August 2007.		
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1/ /4/	DR	China is a Party to the Kyoto Protocol and has ratified it on 30 August 2002 and has designated the “National Develop and Reform Commission of the People’s Republic of China” as the national authority for CDM projects.  Japan is a Party to the Kyoto Protocol and has ratified it on 4 June 2002 and has designated “the Liason Committee for the Utilization of the Kyoto Mechanisms” as the national authority for CDM projects.	-	OK
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/	DR	No public funding is involved in the project activity.	-	OK
<b>A.3. Technology to be employed</b> <i>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.</i>					
A.3.1. Does the project design engineering reflect current good practices?	/1/	DR	Yes, the project design of the coke dry quenching equipment represents good practice commonly applied in the Annex I	-	OK

<b>CHECKLIST QUESTION</b> * MoV = Means of Verification, DR= Document Review, I= Interview		<b>Ref.</b>	<b>MoV*</b>	<b>COMMENTS</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
				Party.		
A.3.2. 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?		/1/ /19/	DR I	The technology is not commonly used in the countries other than Japan and Korea. There are some CDQ processes in China however the prevalence is not clearly explained in the PDD.	<del>CL-2</del>	OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?		/1/ /17/ /19/ /20/	DR I	The project participant of Annex I Party has a comprehensive knowledge for operation and maintenance of the equipment and is to provide necessary engineering and training according to the agreement on 11 May 2005 among the participants.	-	OK
<b>A.4. Contribution to Sustainable Development</b> <i>The project's contribution to sustainable development is assessed.</i>						
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?		/1/	DR I	The DNA of China has not yet the letter of approval.	<del>CAR-1</del>	OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?		/1/ /19/ /20/ /21/	DR I	The displacement of the current open system with the project closed system is expected to contribute to reduction of atmospheric pollutants. Also, the CDQ facilities create employment opportunity as it requires ten times more operators than those of the conventional wet quench process.	-	OK
<b>B. Project Baseline</b> <i>The validation of the project baseline establishes whether the</i>						

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CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
<b>B.1. Baseline Methodology</b> <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Does the project apply an approved methodology and the correct version thereof?	/1/ /4/ /5/	DR	The following two approved methodologies of the corrective version are applied. ACM0004, version 02, "Consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation" was applied. ACM0002, version 06, "Consolidated baseline methodology for grid connected electricity generation from renewable sources" was applied.	-	OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/ /4/ /5/	DR	The baseline meets the following applicability criteria as mentioned in the approved baseline methodology ACM0004 / version 02: <ul style="list-style-type: none"><li>- The project is aiming to displace electricity generation with fossil fuels in the electricity grid with the power to be generated by the thermal energy recovered from coke dry quenching process.</li><li>- No fuel switch is done in the process after the implementation of the project activities.</li></ul>	-	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			ACM0002 is required by ACM0004.		
<b>B.2. Baseline Scenario Determination</b> <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>					
B.2.1. What is the baseline scenario?	/1/ /4/ /5/	DR	The baseline scenario of the project activity is “continuation of the current practice” which is “to consume the electricity supplied from the provincial grid”.	-	OK
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/ /4/	DR	As requested by ACM0004, six alternative scenarios are compared and discussed. a) The proposed project activity not undertaken s a CDM project activity b) Import of electricity from the grid c) Existing or new captive power generation on-site using fossil fuel d) A mix of option (b) and (c9 e) Other uses of the waste heat f) The continuation of the current situation, whether this is captive or grid-based power supply	-	OK
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/ /4/ /6/ /15/	DR	The “Option (b): import of electricity from the grid” is selected. Option (c) and (d): building captive power generation plant smaller than 135 MW is not allowed by the Chinese regulation and thus	-	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			they were excluded. Option (e): other uses of the waste heat is possible from the legislative view point however there is no available technology for capture and utilization of waste heat from coke oven except CDQ thus it was excluded. Option (f): it includes option (b).		
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	Yes.	-	OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /16/	DR I	There is a national policy to promote energy efficiency measures e.g. CDQ, TRT in the steel/coke industry in China. It is mandatory for the plants which newly construct blast furnaces after July 2005.  Jinan Iron and Steel Group Corporation had decided the investment for CDQ as a CDM project in March 2005 without any new blast furnace construction. Thus the policy is not relevant to the project activity.	-	OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /11/ /12/	DR	All data and literature used for baseline scenario determination are clearly referenced in the PDD.	-	OK
B.2.7. Have the major risks to the baseline been identified?	/1/	DR	There are no specific risks to the baseline.	-	OK
<b>B.3. Additionality Determination</b>  <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>					

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CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.3.1. Is the project additionality assessed according to the methodology?	/1/ /11/ /12/ /16/ /19/ /20/	DR I	<p>The project applied “Tool for demonstration and assessment of additionality (Version 02)”.</p> <p>“Step 3a. “Investment barriers” and “Technical barriers” are selected to apply.</p> <p><u>Investment barrier</u></p> <p>Normally the amount of CDQ investment is one third of a new coke plant facility and thirty times of a conventional wet quenching system. Jinan Iron and Steel Corporation (JIGANG) has tripled its crude iron manufacturing capacity since 2000, thus they has focused on low cost wet quenching process during this period. The trend is still continuing.</p> <p>Moreover, JIGANG had undergone the great disappointment of another CDQ installation project since 1999 as the facility had not performed well due to frequent malfunction despite the extra retrieval conducted.</p> <p>The explanation for the investment barrier is deemed reasonable accordingly.</p> <p>Operation cost comparison between CDQ and a conventional wet quench needs be discussed.</p> <p><u>Technical barrier</u></p> <p>This type of CDQ technology depends on totally the project participant, Nippon Steel Corporation (NSC), e.g. facility design,</p>	<del>CL3</del>	OK

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CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			construction, operation, maintenance and training. They are not available in China without NSC and the technical barrier claimed is reasonable accordingly. <u>Common practice analysis</u> The CDQ currently operating in China need be explained how they had overcome the barriers demonstrated here. According to the tenth five year plan in China, 60% of the steel plant with larger than one million tons annual steel production can be equipped with CDQ. Thus “Step 4. Common practice analysis” is sufficiently justified and supported by evidence.	<del>CL 4</del>	
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/	DR	Same as CL 3/4.	<del>CL 3/4</del>	OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	Same as CL 3/4.	<del>CL 3/4</del>	OK
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/ /13/ /14/	DR	The construction of the CDQ has started on 11 November 2006 and the design contract was agreed on 3 March 2005. The board members of JIGANG had formally agreed to start the CDQ installation as a CDM project on 26 August 2004.	-	OK
<b>B.4. Calculation of GHG Emission Reductions – Project emissions</b>					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>						
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?		/1/	DR	As this is the grid connected waste heat recovery and power generation project and no auxiliary is to be used, the project emission need not be considered.	-	OK
<b>B.5. Calculation of GHG Emission Reductions – Baseline emissions</b> <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>						
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?		/1/	DR	The calculations of the emission reductions are described in the PDD in a complete and transparent manner however there are some miscalculation.  The selection of ex-ante or ex-post vintage data for OM calculation needs be clarified in the PDD.	<del>CL5</del>  <del>CL6</del>	OK
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?		/1/	DR	The grid emission factor used for baseline emission calculation is determined based on ACM0002 version 06 however the data should be updated at the time of registration request using the latest publicly available data.	<del>CL7</del>	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR		There is no uncertainty in the baseline emission estimates expected.	-	OK
<b>B.6. Calculation of GHG Emission Reductions – Leakage</b> <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>						
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR		No leakage needs be considered.	-	OK
<b>B.7. Emission Reductions</b> <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>						
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR		Yes.	-	OK
<b>B.8. Monitoring Methodology</b> <i>It is assessed whether the project applies an appropriate baseline methodology.</i>						
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/	DR		As section B.7.1 of the PDD format is not for ex-ante calculation. The section needs be corrected accordingly.	<del>CAR-2</del>	OK
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity,	/1/	DR		The retention period of the data monitored is not clearly described.	<del>CL-8</del>	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
whichever occurs later?						
<b>B.9. Monitoring of Project Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>						
B.9.1. 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?		/1/	DR	Yes the monitoring plan envisages monitoring of various parameters as per the ACM0004 / Version 02.	-	OK
B.9.2. Are the choices of project GHG indicators reasonable and conservative?		/1/	DR	Yes	-	OK
B.9.3. Is the measurement <i>method</i> clearly stated for each GHG value to be monitored and deemed appropriate?		/1/	DR	The quantities of electricity to be generated by the CDQ and to be consumed by CDQ are to be monitored by the power meters.	-	OK
B.9.4. Is the measurement <i>equipment</i> described and deemed appropriate?		/1/	DR	The measurement equipment is not clearly stated.	<del>CL-9</del>	OK
B.9.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?		/1/	DR	The measurement accuracy is not addressed. However the electricity to be exported to the grid is to be cross-checked with the trading document and it is deemed appropriate.	-	OK
B.9.6. Is the measurement <i>interval</i> identified and deemed appropriate?		/1/	DR	The measurement interval is not addressed.	<del>CL-10</del>	OK
B.9.7. Is the <i>registration, monitoring, measurement and reporting</i> procedure defined?		/1/	DR	General Manager of Measurement Management Department, JIGANG is responsible for entire monitoring. All data are	-	OK



CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				to be measured, monitored and reported by the department and reviewed by JIGANG/NSC jointly.		
B.9.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR		The authority and responsibility of QA/QC are defined however the maintenance and the intervals of calibration are not clearly described.	<del>CL 11</del>	OK
B.9.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR		The archiving of monitored data are not clearly described.	<del>CL 12</del>	OK
<b>B.10. Monitoring of Baseline Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i>						
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR		CO <sub>2</sub> emission factor of the grid shall be re-calculated annually according to the applied monitoring methodology, ACM0004 / Version 02, otherwise it should be clearly documented that the ex-ante baseline data is applied. Same as B.5.1 and 5.2.	<del>CL 6/7</del>	OK
B.10. 2. Are the choices of baseline GHG indicators reasonable and conservative?	/1/	DR		Yes.	-	OK
B.10.3. Is the measurement <i>method</i> clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR		The baseline indicators are to be obtained from the published data.	-	OK
B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate?	/1/	DR		Same as the above.	-	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.10.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?		/1/	DR	Same as the above.	-	OK
B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?		/1/	DR	The measurement intervals for baseline data are not clearly identified. Same as B.10.1.	<del>CL-6/7</del>	OK
B.10.7. Is the <i>registration, monitoring, measurement and reporting</i> procedure defined?		/1/	DR	General Manager of Measurement Management Department, JIGANG is responsible for entire monitoring. All data are to be measured, monitored and reported by the department and reviewed by JIGANG/NSC jointly.	-	OK
B.10.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?		/1/	DR	The baseline indicators are to be obtained from the published data.	-	OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)		/1/	DR	The baseline indicators are to be obtained from the published data.	-	OK
<b>B.11. Monitoring of Leakage</b> <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>						
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?		/1/	DR	There are no specific leakage effects to be considered for this project activity as per ACM0004 / Version 02.	-	OK
<b>B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts</b> <i>It is assessed whether choices of indicators are reasonable</i>						

<b>CHECKLIST QUESTION</b> * MoV = Means of Verification, DR= Document Review, I= Interview	<b>Ref.</b>	<b>MoV*</b>	<b>COMMENTS</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
<i>and complete to monitor sustainable performance over time.</i>					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR	There are no specific significant environmental impacts expected from this project activity. The monitoring methodology ACM0004 / Version 02 does not require the monitoring of specific sustainable development indicators. Environmental monitoring required by the local government should be clarified in the PDD.	<del>CL 13</del>	OK
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	Same as the above.	<del>CL 13</del>	OK
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	Same as the above.	<del>CL 13</del>	OK
<b>B.13. Project Management Planning</b> <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
B.13.1. Is the authority and responsibility of overall project management clearly described?	/1/	DR	General Manager of Measurement Management Department, JIGANG is responsible for entire project management. All data are to be measured, monitored and reported by the department and reviewed by JIGANG/NSC jointly.	-	OK
B.13.2. Are procedures identified for training of monitoring personnel?	/1/	DR	Procedures have not been envisaged and systematically linked to the management	<del>CAR 3</del>	OK

<b>CHECKLIST QUESTION</b> * MoV = Means of Verification, DR= Document Review, I= Interview	<b>Ref.</b>	<b>MoV*</b>	<b>COMMENTS</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
			system procedures implemented.		
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	Same as the above.	<del>CAR-3</del>	OK
B.13.4. Are procedures identified for review of reported results/data?	/1/	DR	Same as the above.	<del>CAR-3</del>	OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	Same as the above.	<del>CAR-3</del>	OK
<b>C. Duration of the Project/ Crediting Period</b> <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1. Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/	DR	The project's starting date is 3 March 2005 and the operational life time is 15 years.	-	OK
C.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR	The PPs selected the fixed crediting period of 10 years starting 1 June 2008 and is reasonable.	-	OK
<b>D. Environmental Impacts</b> <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
D.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /9/	DR	The following environmental impacts had been analysed: - Dust and air pollutants - Water consumption - Odour	-	OK
D.2 Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /9/	DR	The EIA approval was obtained in 18 October 2004 from the Government of Jinan	-	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			City.		
D.3. Will the project create any adverse environmental effects?	/1/ /9/	DR	No adverse environmental effects are expected.	-	OK
D.4. Are transboundary environmental impacts considered in the analysis?	/1/ /9/	DR	No adverse environmental effects are expected.	-	OK
D.5. Have identified environmental impacts been addressed in the project design?	/1/ /9/	DR	No adverse environmental effects are expected.	-	OK
D.6. Does the project comply with environmental legislation in the host country?	/1/ /7/ /9/	DR	The project activity was formally approved by the environmental authority. -Same as D.2.-	-	OK
<b>E. Stakeholder Comments</b> <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>					
E.1. Have relevant stakeholders been consulted?	/1/	DR	The local stakeholder meeting was conducted on 16 June 2006.	-	OK
E.2. Have appropriate media been used to invite comments by local stakeholders?	/1/ /10/	DR	The local stakeholders had been invited by means of the public announcements placed on bulletin boards in the communities around the project site.  It was confirmed through the interview with the local stakeholders.	-	OK
E.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?	/1/	DR	The requirement of the China regarding stakeholder consultation is not clearly described in the PDD.	<del>CL 14</del>	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.4. Is a summary of the stakeholder comments received provided?	/1/	DR	The comments raised were summarised into the three issues in the PDD below: <ul style="list-style-type: none"><li>- Land acquisition for construction</li><li>- Impacts to the surrounding environment</li><li>- Impact to water resources of the area</li></ul> It was confirmed through the stakeholder interviews that all comments raised were properly addressed.	-	OK
E.5. Has due account been taken of any stakeholder comments received?	/1/	DR	Same as the above.	-	OK

**Table 3: Resolution of Corrective Action and Clarification Requests**

<b>Draft report clarifications and corrective action requests by validation team</b>	<b>Ref. to checklist question in table 2</b>	<b>Summary of project owner response</b>	<b>Validation team conclusion</b>
<b>CAR.1:</b> The DNA of China has not yet the letter of approval.	A.2.2.	The DNA of China had issued the letter of approval on 10 September 2007.	OK
<b>CAR.2:</b> The formats of B.6.2 and B.7.1 are incorrect. The section needs be corrected accordingly.	B.8.1.	The PDD will be revised reflecting the DNV comment.	OK B.6.2 and B.7.1 were revised appropriately.
<b>CAR.3:</b> Procedures have not been envisaged and systematically linked to the management system procedures implemented.	B.13.2. – 5.	The PDD will be revised reflecting the DNV comment.	OK The procedures necessary for monitoring and reporting are addressed properly.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<b>CL 1.</b> The auxiliary equipment of CDQ units consuming electricity, i.e. boiler feed water unit and turbine generator are not clearly described in the PDD, B.7.1.	A.1.2.	The PDD will be revised reflecting the DNV comment.	OK The auxiliary equipment necessary for CDQ operation are described in the PDD, B.6.3.
<b>CL 2.</b> There are some CDQ processes in China however the prevalence is not clearly explained in the PDD.	A.3.2.	The PDD will be revised reflecting the DNV comment.	OK The prevalence of CDQ process in China is described in the PDD and documents supporting this information were provided /11/, /12/.
<b>CL 3.</b> Operation cost comparison between CDQ and a conventional wet quench is not a “investment barrier” but “investment analysis”.	B.3.1 – 3.	“Operation cost comparison” was irrelevant to investment barrier discussion and was thus deleted.	OK
<b>CL 4.</b> For the CDQs currently operating in China it needs to be explained how they had overcome the barriers demonstrated here. According to the tenth five year plan in China, 60% of the steel plant with larger than one million tons annual steel production can be equipped with CDQ. Thus “Step 4. Common practice analysis” is not sufficiently justified and supported by evidenced.	B.3.1 – 3.	The PDD will be revised reflecting the DNV comment.	OK When the PP made the decision of CDQ investment, its prevalence rate was less than 10 % despite the tenth five year plan of China. It was evidenced by means of the literature, China Steel Year Book 2005 /11/, /12/.
<b>CL 5.</b> The calculations of the emission reductions are described in the PDD in a complete and transparent manner. However there are some miscalculation.	B.5.1.	The PDD will be corrected reflecting the DNV comment.	OK The numbers re-calculated are confirmed to be correct.



<b>Draft report clarifications and corrective action requests by validation team</b>	<b>Ref. to checklist question in table 2</b>	<b>Summary of project owner response</b>	<b>Validation team conclusion</b>
<b>CL 6.</b> The selection of ex-ante or ex-post vintage data for OM calculation needs be clarified in the PDD.	B.5.1.	The PDD will be revised reflecting the DNV comment.	OK It was clearly described in the PDD, B.6.2 and Annex 3.
<b>CL 7.</b> The grid emission factor used for baseline emission calculation is determined based on ACM0002 version 06. However the data should be updated at the time of registration request using the latest publicly available data.	B.5.2.	The PDD will be updated reflecting the DNV comment.	OK The CEF was updated referring the latest available data of 9 August 2007.
<b>CL 8.</b> The retention period of the data monitored is not clearly defined.	B.8.2.	The PDD will be revised reflecting the DNV comment.	OK The data retention period are described in the PDD, B.7.1 properly.
<b>CL 9.</b> The measurement equipment is not clearly stated.	B.9.4.	The PDD will be revised reflecting the DNV comment.	OK Two power meters are to be used for determine the baseline emissions.
<b>CL 10.</b> The measurement interval is not addressed.	B.9.6.	The PDD will be revised reflecting the DNV comment.	OK The measurement intervals are described in the PDD, B.7.1.
<b>CL 11.</b> The authority and responsibility of QA/QC are defined however the maintenance and the intervals of calibration are not clearly described.	B.9.8.	The PDD will be revised reflecting the DNV comment.	OK They are described properly in the PDD, B.7.1.
<b>CL 12.</b> The archiving of data monitored is not clearly described.	B.9.9	The PDD will be revised reflecting the DNV comment.	OK They are described properly in the PDD, B.7.1.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<b>CL 13.</b> Environmental monitoring required by the local government should be clarified in the PDD.	B.12.1 – 3.	The PDD will be revised reflecting the DNV comment.	OK No environmental monitoring are required currently. It is clearly described in the PDD, D.2.
<b>CL 14.</b> The requirement of the China regarding stakeholder consultation is not clearly described in the PDD.	E.3.	The PDD will be revised reflecting the DNV comment.	OK The stakeholder consultation is required as a part of EIA in China. It is described clearly in the PDD, E.1.

## **APPENDIX B**

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### **CERTIFICATES OF COMPETENCE**



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## CERTIFICATE OF COMPETENCE

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***Akira Sekine***

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

<b><i>GHG Auditor:</i></b>	Yes		
<b><i>CDM Validator:</i></b>	Yes	<b><i>JI Validator:</i></b>	--
<b><i>CDM Verifier:</i></b>	Yes	<b><i>JI Verifier:</i></b>	--
<b><i>Industry Sector Expert for Sectoral Scope(s):</i></b>	--		

Høvik, 30 October 2007

*Michael Lehmann*

Michael Lehmann

*Technical Director, International Climate Change Services*



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## CERTIFICATE OF COMPETENCE

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***Mindy (Ming) Yue***

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

<b><i>GHG Auditor:</i></b>	Yes		
<b><i>CDM Validator:</i></b>	Yes	<b><i>JI Validator:</i></b>	--
<b><i>CDM Verifier:</i></b>	--	<b><i>JI Verifier:</i></b>	--
<b><i>Industry Sector Expert for Sectoral Scope(s):</i></b>	--		

Høvik, 5 January 2007

Einar Telnes  
*Director, International Climate Change Services*

Michael Lehmann  
*Technical Director*



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## CERTIFICATE OF COMPETENCE

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***Hendrik Brinks***

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

<b><i>GHG Auditor:</i></b>	Yes		
<b><i>CDM Validator:</i></b>	Yes	<b><i>JI Validator:</i></b>	--
<b><i>CDM Verifier:</i></b>	--	<b><i>JI Verifier:</i></b>	--
<b><i>Industry Sector Expert for Sectoral Scope(s):</i></b>	Sectoral scope 1, 2, 3 & 12		
<b><i>Technical Reviewer for (group of) methodologies:</i></b>			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS- III.I	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	ACM0006, AM0007, AM0015, AM0036, AM0042	Yes
ACM0004, ACM0012	Yes		

Høvik, 30 October 2007

*Michael Lehmann*

Michael Lehmann

*Technical Director, International Climate Change Services*



## CERTIFICATE OF COMPETENCE

***Michael Lehmann***

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

<b>GHG Auditor:</b>	Yes		
<b>CDM Validator:</b>	Yes	<b>JI Validator:</b>	Yes
<b>CDM Verifier:</b>	Yes	<b>JI Verifier:</b>	Yes
<b>Industry Sector Expert for Sectoral Scope(s):</b>	Sectoral scope 1, 2, 3		
<b>Technical Reviewer for (group of) methodologies:</b>			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0030	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0031	Yes
ACM0004, ACM0012	Yes	AM0032	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0035	Yes
ACM0007	Yes	AM0038	Yes
ACM0008	Yes	AM0041	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0034	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	AM0043	
AM0009, AM0037	Yes	AM0046	
AM0013, AM0022, AM0025, AM0039, AMS- III.H, AMS-III.I	Yes	AM0047	
AM0014	Yes	AMS-II.A-F, AM0044	Yes
AM0017	Yes	AMS-III.A	Yes
AM0018	Yes	AMS-III.E, AMS-III.F	Yes
AM0020	Yes		
AM0021, AM0028, AM0034, AM0051	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

**Einar Telnes**  
Director, International Climate Change Services

**Michael Lehmann**  
Technical Director