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# VALIDATION REPORT

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POWER GENERATION FROM  
COKING WASTE HEAT  
UTILIZATION PROJECT AT  
TAIYUAN GANGYUAN COKING &  
CHEMICALS Co., LTD IN CHINA

REPORT No. 2007-0500

REVISION No. 01



# VALIDATION REPORT

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Client: <b>EEA Fund Management Ltd.</b>	Client ref.: <b>Des Godson</b>

**Project Name:** Power generation from coking waste heat utilization project at Taiyuan Gangyuan Coking & Chemicals Co., Ltd in China

**Country:** China

**Methodology:** ACM0004

**Version:** 02

**GHG reducing Measure:** Waste heat recovery from the coking process for power generation

**ER estimate:** 176 645 tCO<sub>2</sub>e per year

**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 "Power generation from coking waste heat utilization project at Taiyuan Gangyuan Coking & Chemicals Co., Ltd in China" project as described in the PDD version 7 of 15 February 2008, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology ACM0004 version 2. DNV thus requests the registration of the project as a CDM project.

Report No.: <b>2007-0500</b>	Date of this revision: <b>2008-02-28</b>	Rev. No. <b>01</b>
Report title: <b>Power generation from coking waste heat utilization project at Taiyuan Gangyuan Coking &amp; Chemicals Co., Ltd in China</b>		
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Key words:

**Validation**

**Climate Change**

**Kyoto Protocol**

**Clean Development Mechanism**

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### Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
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
DRC	Development and Reform Committee
EB	Executive Board
GHG	Greenhouse gas(es)
GWh	Giga Watt Hour
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate on Return
kWh	Kilo Watt hour
MW	Mega Watt
MP	Monitoring Plan
NCPG	North China Power Grid
N <sub>2</sub> O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change




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Appendix A: Validation Protocol

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### 1 EXECUTIVE SUMMARY – VALIDATION OPINION

*Det Norske Veritas Certification AS (DNV) has performed a validation of the “Power generation from coking waste heat utilization project at Taiyuan Gangyuan Coking & Chemicals Co., Ltd in 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 review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.*

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

*The project correctly applies ACM0004 “Consolidated baseline/monitoring methodology for waste gas and/or heat and/or pressure for power generation”, version 2.*

*By utilising waste heat for power generation, instead of venting it, the project results in reductions of CO<sub>2</sub> emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.*

*The total emission reductions from the project are estimated to be on the average 176 645 tCO<sub>2e</sub> per year over the selected 7 year renewable crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.*

*Adequate training and monitoring procedures will be implemented before the starting date of the crediting period.*

*In summary, it is DNV’s opinion that the “Power generation from coking waste heat utilization project at Taiyuan Gangyuan Coking & Chemicals Co., Ltd in China”, as described in the PDD of 15 February 2008, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0004. DNV thus requests the registration of the project as a CDM project activity.*



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## 2 INTRODUCTION

EEA Fund Management Ltd. has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the “Power generation from coking waste heat utilization project at Taiyuan Gangyuan Coking & Chemicals Co., Ltd in 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 version 2. The validation team has, based on the recommendations in the Validation and Verification Manual /4/**Error! Reference source not found.** 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/ Taiyuan Gangyuan Coking & Chemicals Co., Ltd: *CDM Project Design Document - "Power generation from coking waste heat utilization project at Taiyuan Gangyuan Coking & Chemicals Co., Ltd in China"* version 1, dated 30 April 2007 and final version 7 of 15 February 2008.
- /2/ Letter of approval, DNA of China, of 26 August 2007.
- /3/ Letter of approval, DNA of United Kingdom, of 1 October 2007.
- /4/ International Emission Trading Association (IETA) & the World Bank Carbon Finance Group / Prototype Carbon Fund (PCF): *Validation and Verification Manual*.  
<http://www.ieta.org/ieta/www/pages/index.php?IdSitePage=200>
- /5/ ACM0004: Consolidated methodology for waste gas and/or heat for power generation - version 02, of 3 March 2006.
- /6/ ACM0002: Consolidated baseline/monitoring methodology for grid-connected electricity generation from renewable sources - version 06, 19 May 2006.
- /7/ Feasibility study report dated December 2005 approved by the Development and Reform Commission of Shanxi Province on 28 March 2006.
- /8/ Invoices from the grid company for electricity imported prior to the project implementation, 26 June 2006.
- /9/ Clarification letter from the Shanxi Province 21 Agenda Sustainable Development Office (under the Provincial Development and Reform Committee), April 2006.
- /10/ The EIA of Power generation from coking waste heat utilization project at Taiyuan Gangyuan Coking & Chemicals Co., Ltd project by the Shanxi Province Chemical Design Institute, and the approval letter by the Environmental Protection Bureau of Shanxi on 19 June 2001.
- /11/ CDM Executive Board: Tool for the demonstration and assessment of additionality, version 4, EB 36 meeting.
- /12/ Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories.
- /13/ China Electric Power Yearbooks 2002-2006.



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- /14/ China NDRC, the emission factor calculation for each power grid of China, published on 9 August 2007, NDRC official website:  
<http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1364.pdf>
- /15/ CDM Executive Board, Guidance for request for deviation titled “Application of AM0005 and AMS-I.D in China” (<http://cdm.unfccc.int/Projects/Deviations>)
- /16/ The General Office of the State Council, *Notice on Strictly Prohibiting the Installation of Fuel-fired Generation with the Capacity of 135MW or below*, decree No. 2002.6  
<http://www.chinavalue.net/wiki/showcontent.aspx?titleid=61180>
- /17/ Copies of the questionnaires distributed to the stakeholders, along with the responses.
- /18/ The agreement about accepting the electricity supplied by the project between the project owner and the grid company, of 9 July 2006.
- /19/ China energy statistical yearbook 2005, Page 214 - Energy balance of Shanxi-2004.
- /20/ IRR calculation spreadsheet for the project activity, of 17 December 2007.
- /21/ Revised IRR calculation spreadsheet for the project activity with updated sensitivity analysis and demonstrating that the depreciation values have been used in tax calculation towards cash flow, of 15 February 2008.
- /22/ Shanxi Coking Installations Category of the Provincial Governmental Document [2005]
- /23/ <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1052.xls>
- /24/ <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1051.xls>
- /25/ The regulation on management of Electricity Safety production and The regulation on management of commercial operation for new power plant:  
<http://www.cec.org.cn/news/showc.asp?id=24443> &  
<http://www.cec.org.cn/news/showc.asp?id=95680>
- /26/ The National Development And Reform Committee and State’s Planning Department, 2006 the *Economic Assessment Method and Parameters for Project Construction* 3<sup>rd</sup> edition.

The main changes between the version published for the 30 days stakeholder commenting period and the final version submitted for registration are:

- Version number and the date of the PDD have been updated,
- Emission reduction estimates have been updated since the project will be implemented in two phases,
- The sensitivity analysis in section B.5 of the PDD has been updated to reflect variation in each of the main parameters that is required to reach the benchmark of 12% and the likelihood of that change to occur,
- Date of operation of the coking plant, date of consideration of the waste heat recovery project, and the date of construction of the proposed project activity were added in section B.5 of the PDD,
- Discussion on barrier analysis has been removed in section B.5 of the PDD,





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- Starting date of project activity in section C.1.1 was updated from 1 January 2008 to 28 March 2006 which reflects the date of approval of the FSR,
- Starting date of the first crediting period in section C.2.1.1 was updated from 1 January 2008 to 15 May 2008, and
- The monitoring equipment in section B.7.2 was updated from “ammeter” to “electricity meter”.

### 3.2 Follow-up Interviews with Project Stakeholders

On 18 April 2007 and 25 July 2007, DNV performed interviews with Ms. Pan Junxiang, Chief of the Economic Development Section of The Development and Reform Commission of Shanxi Province to confirm selected information and to resolve issues identified in the document review. On 18 April 2007 DNV performed an interview with Mr. Zhou Fentao, Engineer at The Environmental Impact Assessment Center of Shanxi Province. An initial meeting was held with Trading Emissions PLC on 25 July 2007. Furthermore, all issues identified by DNV during the subsequent stages of validation have been clarified through continuous communications with Trading Emissions PLC. The project participants have also provided underlying documentation for review by DNV, confirming selected information and resolving issues identified in the validation. An overview of the reviewed documentation and interviewed persons is listed in the references in section 3.1 above.

### 3.3 Resolution of Outstanding Issues

The objective of this phase of the validation was to resolve any outstanding issues which needed to 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 a transparent manner the 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 three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the “Power generation from coking waste heat utilization project at Taiyuan Gangyuan Coking & Chemicals Co., Ltd in China” project is enclosed in Appendix A to this report.

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.

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

<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> due to 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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### 3.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participant. 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

<b>Role/Qualification</b>	<b>Last Name</b>	<b>First Name</b>	<b>Country</b>
Team leader, CDM Validator	Rescalvo	Miguel	Norway
CDM Validator	Kutty	Mathsy	India
CDM Validator	Yue	Mindy	China
GHG Auditor Trainee	Khawaja	Rafi	Norway
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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### 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.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation version 7 of 15 February 2008 /1/.

#### 4.1 Participation Requirements

The project participants are Taiyuan Gangyuan Coking & Chemicals Co., Ltd. from China and Trading Emissions PLC from the United Kingdom. The host Party China and the Annex I Party United Kingdom meet all the requirements to participate in the CDM.

The DNA of China has issued the letter of approval (LoA) on 26 August 2007 /2/, authorizing Taiyuan Gangyuan Coking & Chemicals Co., Ltd as project participant and confirming that the project contributes to the sustainable development in China. United Kingdom has issued the LoA on 1 October 2007 /3/, authorizing Trading Emissions PLC as project participant.

The project will not receive any public funding from Parties included in Annex I of the UNFCCC. The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funds towards China.

#### 4.2 Project Design

The project activity involves utilization for power generation of the waste heat generated during the coke production at an existing coking facility in Taiyuan Gangyuan coking plant. The coking facility is located at the Qingxu county, Taiyuan city in the Shanxi province of China. The power generated from the plant will be exported to the North China power grid (NCPG).

The project activity is located at a clean type non-chemical-recovery coke production facility, which has been in operation since 2003. In the absence of the proposed CDM project activity the coking plant met all its electricity requirements from the grid, while the waste heat was directly emitted into the atmosphere.

The project envisages installation of six waste heat boilers of 28 tonnes steam per hour capacity each; 3 steam turbines and three generators of capacities 2×12 MW and 1×6 MW. The project is expected to generate a total of 189 GWh electricity after meeting the auxiliary needs for the project. This will entirely be exported to the Shanxi Power Grid which is a constituent of the North China power grid (NCPG). The electricity demand for coke washing, molding, conveying and quenching as well as the electricity needs of other auxiliary facilities will be imported from the grid in the project scenario. DNV was able to confirm the estimated total electricity generation against the feasibility study report (FSR) /7/.

The project activity is planned to be implemented in two phases. The first phase involves installation of 18 MW waste heat recovery for power generation. The second phase of the project, which involved the installation of further 12 MW waste heat recovery, is expected to start construction and installation by 2009. The project activity will utilize the waste heat



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from the coking unit for power generation and displace part of the fossil fuel generated electricity from the NCPG.

The starting date of the project activity is 28 March 2006 /7/. This corresponds to the date of approval of the feasibility study report and the same has been confirmed by DNV during validation. The expected operational lifetime of the project activity is 30 years. Due to uncertainties in future market demand, technical development, inflation and change in policy the project proponent has used a 20 years project lifetime that was found reasonable to DNV. The project proponent has selected a renewable crediting period of 7 years with the starting date of 15 May 2008.

### 4.3 Baseline Determination

The project activity applies the approved consolidated baseline methodology ACM0004 version 2 “Consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation” /5/. This methodology is applicable to the project activity since

- i) The current practice is release of the waste heat into the atmosphere. During the site visit carried out as part of the validation process, it has been confirmed that the waste heat is released in the atmosphere without the existence of any boiler in the proximities,
- ii) The electricity generated by the project will displace part of the electricity in the north China power grid (NCPG).
- iii) No fuel switch activity is taking place in the coking process after the implementation of the project. Coal remains the main fuel used in the coke production facility and the project will not increase the coal consumption for other purposes than coking. The electricity consumption of the coking plant will after the implementation still be purchased from the grid.

The project’s system boundaries include the following:

		<b><i>GHGs involved</i></b>	<b><i>Description</i></b>
<b><i>Baseline emissions</i></b>	Grid electricity generation	CO <sub>2</sub>	Fossil fuel intense electricity generation in the grid.
<b><i>Project emissions</i></b>	None	-	The proposed project does not have on-site fossil fuel consumption

The project boundary includes the coking oven, boiler, steam turbines and the generator in addition to all the power plants connected physically to the electricity grid.

The plausible baseline scenarios discussed for the project include:

- a. The proposed project activity not undertaken as a CDM project activity: waste heat utilization and net export of electricity to the grid;
- b. Import of electricity from the grid and release of waste heat;
- c. 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 and release of waste heat;
- d. A mix of options (b) and (c), in which case the mix of grid and captive power should be specified;



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- e. Other uses of the waste heat and import of electricity from the grid;
- f. The continuation of the current situation: release of waste heat and import of electricity from the grid.

Alternative (a) is not financially attractive as discussed in section 4.4 below. Hence, this alternative scenario has been eliminated from the baseline scenario analysis.

Alternative (c) includes existing or new captive power generation onsite using energy sources other than waste heat and/or gas, such as coal, diesel, natural gas, hydro, wind, etc. The installation of a coal, diesel or natural gas based small scale power plant would not comply with the Chinese regulations. DNV was able to confirm against the *Interim Rules on the Installation and Management of Small-scale Fuel-fired Generators* /16/, that the installation of fossil fuel-fired power units with a capacity of less than 100 MW are strictly prohibited. Furthermore, utilization of the hydro and wind resources for power generation as a baseline scenario is not an option to the project developer, given the unavailability of hydro and wind resources at the project site. The same was confirmed by the China energy statistical yearbook, energy balance for Shanxi /19/.

Alternative (d), which is a combination of alternative (b) and (c) has been excluded from the analysis since, alternative (c) is not a plausible scenario for the project activity.

Alternative (e) has been excluded from the baseline study because there are no other applications of the waste heat currently, since the project is not located at the vicinity of other facilities or accommodations, to which the waste heat can be sold to. The usual practice for the waste heat is to be emitted into the atmosphere without being utilized for any purposes. DNV was also able to confirm the same with the local representatives of the National Development and Reform Commission in Shanxi, during the follow-up interviews.

Alternatives (b) is the continuation of the current situation, which is the generation of an equivalent amount of electricity by grid connected sources and import of power from the grid for internal uses, combined with release of the waste heat from the clean-type non-recovery coking furnaces. This alternative faces no barriers as compared to other alternatives identified. This alternative does not require the project developer to make any additional investments unlike in the case of the implementation of the project activity.

The baseline scenario thus selected for the project activity is an equivalent amount of grid based electricity generation. In the baseline scenario the electricity delivered from the project activity to the North China power grid would have been generated by fossil fuels grid-connected power plants and by the addition of new generation sources. The North China power grid is dominated by coal-fired power plants. It is deemed likely that coal-fired power plants will continue to dominate the power sector due to the local availability of low-cost coal. It is expected that renewable capacity additions will not have significant effects on the mix of the North China power grid during the crediting period.

The baseline determination is considered transparent and reasonable by DNV.

### 4.4 Additionality

The project proponent has demonstrated the additionality of the project by applying the “Tool for demonstration and assessment of additionality” version 4 /11/ as follows:





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The environmental impact assessment (EIA) of Power generation from coking heat waste utilization at Taiyuan Gangyuan Coking & Chemicals Co., Ltd project was approved by the Environmental Protection Bureau of Shanxi /10/ on 19 June 2001. The feasibility study report for the proposed project activity was approved by Shanxi Development and Reform Committee /7/ on 28 March 2006. The feasibility study report clearly indicates that the project is financially unattractive and point to the fact that if considering CDM revenues, the IRR will further improve the financial conditions for the project activity. Hence, DNV confirmed that CDM incentives were seriously considered in the approved feasibility study report (FSR).

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

As explained in section 4.3 above, amongst the identified alternatives, thermal based power generation (coal, diesel and natural gas) under alternative (c) is not compliant with the regulations in China, which does not allow for the installation of fossil fuel-fired power units with a capacity of less than 100 MW /16/. Hydro, wind power and other uses of waste heat are not available to the project participants. Hence, only a) the proposed project activity not undertaken as a CDM project activity and b) the continuation of the current situation with import of electricity from the grid are realistic alternatives.

*Step 2: Investment analysis:*

The benchmark analysis is adopted in the investment analysis for the project since revenues are generated by the project and there are no investment alternatives.

The benchmark chosen for the project activity is the benchmark financial IRR for the coking industry as per the *Economic Assessment Method and Parameters for Project Construction* 03 edition (2006). The benchmark considered for the project activity is deemed conservative and acceptable since the core business of the project developer remains coke production. From an investors' perspective, the sectoral benchmark of 12%, is thus acceptable in DNV's view, since if in case the returns expected from the project activity are lesser than that of the coking sector benchmark, the project proponent would rather invest in further coking production units, as opposed to investing in the project activity.

The investment analysis is based on the feasibility study report developed by Shanxi Electric Power Survey Design Institute and approved by the Development and Reform Commission of Shanxi Province on 28 March 2006. DNV has confirmed based on the agreement about accepting the electricity supplied by the project between the project owner and the grid company of 9 July 2006 /18/ that the net electricity generated (discounting the internal use of the waste heat recovery facility) will be sold to the grid.

In China, a feasibility study report (FSR) is required for approval of any project in China, and it is developed by a third party which is accredited for this task directly by the government. The FSR is only approved after public assessment of the sector experts designated by the government. A FSR can thus be considered information from an independent and recognized source.

During assessment of this project, the parameters used in the IRR analysis were compared with the FSR and found to be consistent. All taxes were confirmed to be correctly applied. Also the reasonableness of the other parameters used in the IRR was analyzed. The capacity factor, investment per MW and operating cost as a fraction of investment costs were found to be in line with similar projects validated by DNV. The IRR calculation spreadsheet has been provided and checked by DNV. DNV was thus able to verify the IRR calculations, to verify



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that the parameters used in the IRR were consistent with the parameters used in the FSR and to confirm that the parameters used in the IRR are reasonable.

An investment analysis for the project activity showed that the project IRR is 9.22% as compared to the benchmark of 12%.

It has been demonstrated by the project proponent that the IRR of the project will exceed the benchmark of 12% if the total investment drops by 16.80%, the O&M cost drops by 25.86%, the electricity price increases by 14.62% and the operating hours increase by 14.62%. A breakdown in total cost has been reviewed by DNV to assess the likelihood of variations in total investment and the O&M costs. In DNV's opinion, it is unlikely that these costs will vary to the extent that the IRR would exceed the benchmark. Projected increase in unit price of electricity sold to grid is very unlikely to change by 14.62% since establishing and modifying electricity tariff is highly regulated and controlled by the central government in China and the value used in the investment analysis is taken from the approved feasibility study report (0.228 RMB/kWh) which is higher than the currently electricity price in the Province approved by means of the "Notice on Adjustment on Electricity Price in Shanxi" issued by the Shanxi Provincial Pricing Bureau in 2004 (0.205 RMB/kWh). DNV has reviewed the agreement between the project proponent and the grid company for sale of electricity /18/ and the Notice on Adjustment on Electricity Price in Shanxi.

An increase in operating hours by 13.48% is also very unlikely since the annual electricity output of the project is already based on the high capacity factor of 83%.

Based on the details above, DNV was thus able to confirm that the project activity is not the most financially attractive option to the project developer.

*Step 3: Barrier analysis:* This step has been excluded and only an investment analysis has been chosen.

*Step 4: Common practice analysis:*

The coke production can either result in a waste heat or a waste gas generation. The coke production technology which results in only waste heat is called a clean-type technology. As per the Chinese regulations, there are certain mandatory requirements for coking units to utilize waste gas from the coke production. However, there are no mandatory requirements for coking units to utilize the waste heat.

Shanxi Province is the largest producer of coke in China. Of the total 717 coking units in Shanxi province /22/, only 35 use the clean-type technology for coke production, as opposed to the traditional technologies used by other plants. Out of these 35 coking units in Shanxi province, 10 are utilizing waste heat, or are in the process of planning to utilize waste heat, for electricity generation including the proposed project activity. DNV was able to confirm this against a clarification letter from the Shanxi Province 21 Agenda Sustainable Development Office (under the Provincial Development and Reform Committee). This letter lists the projects utilizing the clean-type technology for coke production and lists the projects that are in the CDM pipeline for electricity generation projects /9/. The remaining 25 clean-type coke production facilities in Shanxi province are either emitting the waste heat in the atmosphere or are in the early stage of planning to utilize waste heat for electricity generation. However, through communication with representative of Shanxi Development and Reform Committee (DRC), it has been confirmed that the common practice in Shanxi province is to release waste heat in the atmosphere without its utilization for electricity generation. It has





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also been stated by the representative of the Shanxi DRC that many clean-type coke producers have received approvals for their feasibility study reports to utilize waste heat for electricity generation. However, they have not initiated the process and are only producing coke due to financial constraints. In addition, the letter from the Shanxi Province 21 Agenda Sustainable Development Office referred above encourages the projects developers that are at planning stage to seize the CDM opportunity. All of the 10 projects currently utilizing waste heat for power generation and applying for CDM are being validated by DNV.

The consideration of only the clean-technology coking units has been accepted by DNV due to the fact that the two technologies are governed by different regulatory requirements. In addition, the two types of project technologies apply different types of boilers, viz.: the clean type technology uses waste heat recovery boilers, while the power generation in traditional technology type is using a combined gas and steam turbines.

In conclusion, based on the investment barrier and the common practice analysis provided, it is demonstrated that the project faces financial barriers and that the emission reductions from the project can therefore be deemed additional.

### 4.5 Monitoring

The project applies the approved monitoring methodology, ACM0004 “Consolidated methodology for waste gas and/or heat and/or pressure for power generation”, version 02 /5/. The selected monitoring methodology is justifiably applicable for the project activity as it involves power generation using waste heat generated at the coking facility and there is no change in the process from which the waste gas is generated.

#### 4.5.1 Parameters determined ex-ante

The grid emission factor of the North China power grid (NCPG) has been fixed *ex-ante* for the first crediting period of seven years. The estimation has been done in a transparent and conservative manner by the combined margin approach outlined in the ACM0002 methodology.

#### 4.5.2 Parameters monitored ex-post

The parameters that will be monitored in the project activity include the total electricity generation, auxiliary consumption and the net electricity exported to the NCPG. This data is continuously monitored using the meters installed at the project site and recorded on a monthly basis. The data can be cross-checked against the recorded reading through a remote control system at the grid company. The electricity meter will be automatically recorded by remote control system. Receipts from electricity sales will also be obtained for cross checking. All data will be archived for a period of two years following the end of the crediting period.

#### 4.5.3 Management system and quality assurance

The authority and responsibility of the project management has been clearly described to include a CDM manager for the overall supervision of the monitoring plan, a technical department for the calibration, maintenance of equipments in addition to checking and archiving of data. The financial department will be mainly involved in the checking of data like the electricity sales records, copies of electricity sales receipt and ammeter reading

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records. The responsibility of the data monitoring will involve monitoring data through the distributed control systems (DCS) which will be installed in the proposed project and can online measure, check and collect the meter data. Individual electricity meter will be installed at proper locations for monitoring of the auxiliary energy consumption, ( $EG_{aux}$ ) and for total electricity generated ( $EG_{gen}$ ). The electricity sold to the grid is also monitored. The monitored data can be further verified against the receipts from the grid company. The local power grid also uses a remote control system to for measurement of the metered data.

The electric metering system will be equipped, installed and operated in line with the requirements of the *Technical Administrative Code of Electric Energy Metering* (DL/T448-2000). All meters will be calibrated in line with the relevant standards and regulation for the power sector. On calibration of the meters, the meters are sealed in the presence of both the project developer and the grid company. The sealed meters are not allowed to be opened, without both parties being present.

The monitoring section will collect the information and data required by the monitoring plan. The collected information will be documented on a monthly basis, further to which the data is written stored electronically and a print out of the same is also taken. The copies of the electricity sales receipts from the grid company will also be stored for cross-verification.

### 4.6 Estimate of GHG Emissions

The emission reduction  $ER_y$  due to the project activity during the crediting period is estimated as a difference between the baseline emissions due to grid electricity generation with fossil fuels ( $BE_y$ ) and project emissions ( $PE_y$ ) and leakage ( $L_y$ ) as follows:

**Project emissions ( $PE_y$ ):** There is no auxiliary fuels utilized at the project site due to the project activity, and hence the project emissions are regarded as zero.

**Leakage ( $L_y$ ):** No leakage effects are required to be considered for the project activity as per the methodology. Hence leakage is taken as zero.

**Baseline emissions ( $BE_y$ ):** Baseline emissions in  $tCO_2$  is computed as a function of the baseline emissions factor of the North China regional power grid ( $EF_y$  in  $tCO_2/MWh$ ) and the net electricity exported to the grid by the project activity.

The baseline emission factor for the project is determined *ex-ante* as a combined margin, consisting of combination of the operating margin (OM) and build margin (BM) in line with ACM0002 version 06.

For calculation of the OM emission factor, the simple OM emission factor calculation method is selected because data are not available for applying the dispatch data analysis and low-cost-must-run projects constitute less than 50% of the total grid generation. The aggregated generation and fuel consumption data are used due to the more plant specific data are not available for the NCPG. Country specific data for net calorific value ( $NCV_i$ ) of each type of fossil fuel, the default values from 2006 revised IPCC guidelines /12/ for oxidation factor and the emission factor of fossil fuel and the total electricity delivered to the NCPG selected are deemed reasonable. Data for the years 2003, 2004 and 2005, which is the latest data available at the time of submission of the PDD for validation have been used for the estimation the OM emission factor. The OM is estimated to be  $1.1208 tCO_2e/MWh$ . DNV was able to confirm all assumption used for the OM estimation against the relevant data sources and further confirmed against the values as published by the Chinese DNA /23/.



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Because plant specific fuel consumption and electricity generation data is not public available in China, the EB guidance on the request for deviation titled “Application of AM0005 and AMS-I.D in China” has been applied as follows:

- Use of capacity additions from one year to another for estimating the build margin emission factor for grid electricity
- Use of weights estimated using installed capacity in place of annual electricity generation
- Use the efficiency level of the best technology commercially available in the provincial/regional or national grid of China, as a conservative proxy, for each fuel type in estimating the fuel consumption to estimate the build margin (BM).

The application of the above deviation is acceptable to the concerned project activity, since the AM0005 has now been replaced and incorporated in ACM0002. In line with the EB’s guidelines, the BM is estimated for the capacity additions from the years 2003 to 2005. The BM thus applying the deviation and as published by the DNA of China /24/ is estimated to be 0.9397 tCO<sub>2</sub>e/MWh. The combined margin thus works out to be 1.0303 tCO<sub>2</sub>e/MWh. The project is expected annually export 189 GWh electricity on complete implementation of the project /7/ to the grid. The project is expected to result in an estimated emission reduction of 176 645 tCO<sub>2</sub>e/year on average over the first seven year crediting period.

### 4.7 Environmental Impacts

An Environmental Impact Assessments (EIA) was conducted according to Chinese law & regulation, by the Shanxi Province Chemical Design Institute and the EIA report was further approved by the authorized State Environmental Protection Administration in 2001 /10/. The overall project (coke production with electricity generation) was, however, further delayed due to the financial and investment barriers faced by the coke plant and the WHR project. It was only on consideration of CDM that the proposed project activity (including electricity generation) was further pursued as was confirmed by DNV against the FSR /7/. The potential environmental impacts have been sufficiently identified and adequate environment management measures have been defined. No significant environmental impacts are envisaged in the project activity.

### 4.8 Comments by Local Stakeholders

In addition to the stakeholder consultation process stipulated in the Chinese EIA regulation, the project developer conducted an additional stakeholder consultation process. Between 9 March 2007 and 12 March 2007, the project proponent sent out letters inviting comments from the local public and in addition to the questionnaires distributed to the identified stakeholders. The identified stakeholders included, 10 people as representatives from the government, organizations and 30 others from the representing the locals from the nearby villages. The related governments and organizations included Qingxu County Environment Bureau, Qingxu county Environmental supervise team, People’s Government of Dongyu town in Qingxu county, Donggaobai village Committee, Zhonggaobai village Committee, Donggaobai Primary School in Dongyu town, Zhonggaobai Center School in Dongyu town, Qingxu Power Supply Company etc. There were no adverse comments on the project activity and all comments were supportive of the project. A summary of comments was provided and reviewed by DNV /17/.



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### 4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 30 April 2007 was made publicly available on DNV's climate change website [http://www.dnv.com/focus/climate\\_change/projects/projectdetails.asp?ProjectId=1186](http://www.dnv.com/focus/climate_change/projects/projectdetails.asp?ProjectId=1186) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 5 May 2007 to 3 June 2007.

No comments were received during the 30 day commenting period.

## **APPENDIX A**

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### **CDM VALIDATION PROTOCOL**

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

Requirement	Reference	Conclusion
<b>About Parties</b>		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	No public funding involved in the project.
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	China DNA - National Development and Reform Commission of the People's Republic of China DNA of United Kingdom: DEFRA, Department for Environment, Food and Rural Affairs.
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto	CDM Modalities §30/31a	China and United Kingdom are Parties to

Requirement	Reference	Conclusion
Protocol.		the Kyoto Protocol and have ratified the same on 30 August 2002 and 31 May 2002, respectively.
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK
<b>About Additionality</b>		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK
<b>About forecast emission reductions and environmental impacts</b>		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
<b>For large-scale projects only</b>		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK
<b>About stakeholder involvement</b>		
13. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK

Requirement	Reference	Conclusion
14. 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>		
15. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
16. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies & circumstances.	CDM Modalities and Procedures §45c,d	OK
17. 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
18. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
19. 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	OK



**Table 2: Requirements Checklist**

<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>
<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/	DR	Yes, the project's spatial boundaries have been clearly defined. The project is sited in southwest of Qingxu County and 8 km away from Qingxu County, and in the south of Taiyuan City and 38 km away from Taiyuan City. The geographical coordinates are east longitude 112°42', and north latitude 37°28'.		OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR	The projects' system boundaries are defined clearly to include the waste heat recovery system, i.e.: waste heat boiler, electricity generation facilities such as the steam turbine and the generator, captive power generating equipment, any equipment used to provide auxiliary heat to the waste heat recovery process and all the power plants connected to North China Power Grid.		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>					

<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>
A.2.1. Which Parties and project participants are participating in the project?	/1/	DR	Taiyuan Gangyuan Coking & Chemicals Co., Ltd from the host country China and Trading Emissions PLC from the United Kingdom, the annex I Party are project participants for this project activity.		OK
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/1/	DR	The letter of authorisation and the letter of approval for the project and its participants from the DNA of China and United Kingdom need to be submitted.	<del>CAR-1</del>	OK
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/	DR	The Republic of China has ratified in Kyoto Protocol on 30 August 2002, and established a DNA; National Development and Reform Commission of the People's Republic of China.  United Kingdom has also established a DNA "DEFRA, Department for Environment, Food and Rural Affairs" on ratification of the Kyoto Protocol on 31 May 2002.  The voluntary participation of the project needs to be confirmed against the letter of approval from the DNA.	<del>CAR-1</del>	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	The initial validation of the project activity does not reveal any information indicating that the project can be seen as diversion of any ODA funding towards China. The same needs to be confirmed against the DNA approval letter.	<del>CAR-1</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>
<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>	/1/	DR			
A.3.1. Does the project design engineering reflect current good practices?	/1/	DR	Yes, the project design engineering reflects current good practices.		OK
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/	DR	The project activity does not result in any technology transfer from other countries.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Provisions for identifying and meeting training and maintenance requirements need to be established.	<del>CL-09</del>	OK
<b>A.4. Contribution to Sustainable Development</b> <i>The project's contribution to sustainable development is assessed.</i>	/1/				
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/1/	DR	The letter of approval from the DNA confirming that the project assists in achieving sustainable development needs to be submitted.	<del>CAR-1</del>	OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The project activity will help in contributing to the sustainable development in the region by utilisation of the waste gas for energy purposes, reducing the dependency on the		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>
			fossil fuels for power generation thereby also reducing environmental pollution due to avoidance of emission of SO <sub>2</sub> , NO <sub>x</sub> and total suspended particles and creation of employment for the locals in the region.		
<b>B. Project Baseline</b> <i>The validation of the project baseline establishes whether the 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/	DR	Yes, the project rightly applies ACM0004, version 02, the approved consolidated baseline methodology for waste gas and/or heat and/or pressure for power generation.		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/	DR	The chosen methodology ACM0004 is applicable to the proposed project since it meets all the applicability criteria laid down by the methodology. The project involves utilization of the waste heat from the coking process with clean-type heat recovery coke ovens to generate electricity, and supply to the North China Grid. No fuel switch is envisaged in the waste heat production process, after the implementation of the proposed project, thus meeting all the		

<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>
			applicability criteria. The project developer is requested to justify the What was the fuel involved in the coking process prior to the project implementation. The same needs to be included in the PDD. The PP needs to clearly state in the PDD if a coking facility had a captive power plant in order to meet the electricity requirements for the entire coking facility before the implementation of the project activity and which other energy resources are used in the plant. Furthermore, it needs to be justified how the energy demand will be satisfied after the project implementation for all energy sources.	CL-02	OK
<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/	DR	The baseline scenario arrived at is that an equivalent amount of energy would have been imported from the grid.		OK
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/	DR	The project proponent has identified the following alternatives to the project activity to arrive at the baseline scenario:		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>
			<p>(a) The proposed project activity not undertaken as a CDM project activity;</p> <p>(b) Net import of electricity from the grid and release of waste heat;</p> <p>(c) 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;</p> <p>(d) A mix of options (b) and (c), in which case the mix of grid and captive power should be specified</p> <p>(e) Other uses of the waste heat and waste gas</p> <p>(f) The continuation of the current situation, whether this is captive or grid-based power supply (if not already included in the options above)</p> <p>Option (a) has been eliminated based on the barriers faced by the project as discussed in the section B.3: additionality of the protocol.</p> <p>The project developer needs to justify to what extent electricity shortages (due to the lack of proper electricity supply) at the project site currently affect the plant's operations.</p> <p>It is argued that option (c) is not the most probable baseline scenario since the project site is not ideal for tapping hydro power resources or wind power. Power generation</p>	<p><del>CL-02</del></p> <p><del>CL-01</del></p>	

<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>
			<p>using coal has been eliminated from being one of the plausible baseline scenarios since the regulations in the Republic of China do not allow for the construction of a coal fired captive power plant with same capacity. Construction of a captive power plant of the same capacity using diesel oil or natural gas has been ruled out due to high operation costs and poor economic benefits. The same needs to be justified with data.</p> <p>No current uses of the waste heat recovery and utilisation have been identified. Also, it is stated that there are no regulatory obligations for recovery and utilisation of this waste stream. Hence, this scenario is eliminated from being the plausible baseline scenario. However, the same is contradicted while discussing additionality by stating that in cases where there is residential demand for gas, part of the waste gas is utilised as civilian gas. The same needs to be justified. Accordingly, the baseline scenario arrived at is that in the absence of the project activity, an equivalent quantity of power would have been imported from the grid.</p>	<del>CAR-02</del>	
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/	DR	Yes. The project proponent has determined baseline scenario as per the methodology which is the most economically attractive		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>
			alternative amongst the alternative that faces no prohibitive barriers, emissions from a technology that represents economically attractable course of action, taking into account barriers to investment”.		
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	Some clarifications as raised in section B.2.2 need to be addressed.	<del>CL-01</del> <del>CAR-02</del>	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/	DR	See section B.2.2 The project developer is requested to justify the regulatory framework for coking plants and the different obligations for utilizing waste gas and heat.	<del>CAR-02</del>	OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	See section B.2.2.		OK
B.2.7. Have the major risks to the baseline been identified?	/1/	DR	Any risks associated with the chosen baseline needs to be addressed.	<del>CL-02</del>	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>					
B.3.1. Is the project additionality assessed according to the methodology?	/1/	DR	Yes, the project applies tools of additionality (TOA), version 04 as per the methodology. <u>Step 1: Identification of alternatives:</u> All the plausible alternatives to the project activity		OK



<b>CHECKLIST QUESTION</b> * MoV = Means of Verification, DR= Document Review, I= Interview	<b>Ref.</b>	<b>MoV</b> <b>*</b>	<b>COMMENTS</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
			<p>have been identified as mentioned in section B.2.2 above. Only option (c), utilisation of the coal for captive power generation, does not meet the requirements as per the law and hence is eliminated.</p> <p><u>Step 2: Investment Analysis:</u> The project proponent has chosen benchmark analysis for the demonstration of the financial barriers to the project. The IRR for the project activity is stated to be 9.22% as opposed to the benchmark of 12.0% (sector specific benchmark for coking industries) considered for the project activity.</p> <p>The first version of the PDD included a sensitive analysis for maximum variation of <math>\pm 10\%</math> of the total investment, the operation and maintenance costs and income from the sale of the electricity generated.</p> <p>However, the project developers were requested to calculate variation required in these parameters to reach the benchmark instead of using a default variation of <math>\pm 10\%</math>. Furthermore it was required to access how likely it is that the variation in these parameters would result in reaching or exceeding the benchmark and that the amount of electricity generated should be included as a variable in the analysis.</p> <p>Also, the values considered for the IRR</p>	CL-03	

<b>CHECKLIST QUESTION</b> * MoV = Means of Verification, DR= Document Review, I= Interview	<b>Ref.</b>	<b>MoV</b> <b>*</b>	<b>COMMENTS</b>	<b>Draft</b> <b>Concl.</b>	<b>Final</b> <b>Concl.</b>
			<p>calculation for total investment cost, annual O&amp;M costs, electricity tariff need to be substantiated with data. In the case of the electricity price, the project developer is requested to justify the price of the electricity displaced based on the historical electricity price paid by Taiyuan Gangyuan Coking &amp; Chemicals Co., Ltd and independent sources of price forecast.</p> <p>In addition, the source for the benchmark considered needs to be provided.</p> <p><u>Step 3: Barrier analysis:</u> The project proponent has discussed barrier analysis using financial barriers, technological barriers and other barriers.</p> <p><i>Financial Barrier:</i> It is argued that owing to the Government's decision to clear up and regulate investments and production of coking industry, the project proponent faced barriers in obtaining finances for the project activity. Documentary evidences for difficulties faced in obtaining loans for the project activity along with the Government's decision for clear ups and regulating investments in the coking industry need to be provided. (e.g.: loan rejection letters, etc)</p> <p><i>Technology Barrier:</i> It is argued that the change in the type of coal used in the coking plant results in changes in the waste gas</p>	CL-04	

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			<p>parameters such as pressure and temperature, which eventually affect the boiler operation.</p> <p><i>Other Barrier:</i> The project proponent faces additional barriers since they utilize clean type heat recovery coke ovens, which do not result in production of waste water, waste residue or chemical products. These chemicals produced in the traditional coke ovens can be sold to acquire additional revenue. Also, it is argued that the traditional coking facilities are established technologies and that many companies refuse investing in the clean type due to higher risks and initial investment involved. It remains to be justified how this would be a barrier to the project activity since the project activity only involves utilisation of the waste heat generated from the coking process, irrespective of the technology using which the waste heat is produced.</p> <p><u>Step 4 Common practice analysis:</u> It is stated that the Shanxi Province is the largest producer of coke in China. The common practice in the region till now is stated to flaring of the gases. In cases where the coking facility is near a residential area, parts of the waste gas are utilized as civilian gas. It has been stated that the common practice in the region does not involve use of the waste</p>	CL-05	

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			gas for electricity generation. In view of this, the following information needs to be provided: How many coking facilities are present in the region or province? How many of them utilize the waste gas from the process for any purposes at all? How many among them use the same for electricity generation? <i>Comments on additionality of project activity are reserved till the above stated clarifications are addressed.</i>		
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/	DR	Refer to section B.3.1		OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	Refer to section B.3.1		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/	DR	The start date of the project activity is the 01 January 2008. The project developer is requested to clarify the status of implementation of the project (contracted, construction started, etc). In case the project is already under development, it shall be justified that the incentive from the CDM was seriously considered in the decision to proceed with the project activity.	<del>CL-14</del>	OK
<b>B.4. Calculation of GHG Emission Reductions – Project emissions</b>					

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<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	It is stated in the PDD that the project does not use any auxiliary fuels for the generation start ups, emergencies or additional heat gain before entering the waste heat recovery boiler. Hence, no project emissions have been included for emission reduction calculation.  It needs to be clarified as to what provisions have been made to meet the fuel requirements during emergencies and start ups.	CL-06	OK
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/	DR	Same as above.		OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Same as above.		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>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>
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	<p>The baseline emissions are calculated in line with the methodology, ACM0004 and ACM0002 (for emission factor calculation). The baseline emission factor is fixed ex-ante. The project has considered the North China power grid for the estimation of the emission factor. The emission factor is estimated as an average of the operating margin and the build margin. The operating margin is estimated as the simple operating margin of 1.0585 tCO<sub>2</sub>e/MWh and is fixed ex-ante during the entire crediting period. The final figure need to be confirmed after the CL/CAR are solved. Because plant specific fuel consumption and electricity generation data is not public available in China, the project proponent adopts the deviation method as approved by the CDM EB as follows, which are deemed to applicable for this project.</p> <ul style="list-style-type: none"> <li>- Use of capacity additions for estimating the build margin emission factor for grid electricity</li> <li>- Use of weights estimated using installed capacity in place of annual electricity generation</li> <li>- Use the efficiency level of the best technology commercially available in the</li> </ul>		OK

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			<p>provincial/regional or national grid of China, as a conservative proxy, for each fuel type in estimating the fuel consumption to estimate the build margin (BM).</p> <p>The BM thus has been calculated to be 0.9066 tCO<sub>2</sub>e/MWh. The final figure need to be confirmed after the CL/CAR are solved.</p> <p>Hence, the emission factor for the North China power grid has been worked out to be 0.9826 tCO<sub>2</sub>e/MWh. The final figure need to be confirmed after the CL/CAR are solved.</p> <p>The values considered in the emission factor calculation needs to be revised to use the latest IPCC 2006 values, for the oxidation factors.</p> <p>The data vintage for the calculation of the OM and BM are the China Electric Power Yearbook 2003-2005 and the 2002-2005. At the time of the PDD submission for validation most recent data for year 2005 was available. The project developer is requested to modify the calculations accordingly.</p>	<del>CL-07</del>	
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	<p>The values considered in the emission factor calculation needs to be revised to use the latest IPCC 2006 values, for the oxidation factors.</p> <p>In addition, the PDD states that the electricity</p>	<del>CL-07</del>	OK

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			generated will be used internally and will be supplied to other facilities. It needs to be clarified which other facilities will be supplied with electricity and it needs to be secured that emission reductions would not be claimed by recipient plant(s) for using a zero-emission energy source.	CL-15	
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	Yes.		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 effects need to be addressed as per this methodology.		OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	Not applicable		OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	Not applicable		OK
<b>B.7. Emission Reductions</b> <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation</i>					



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<i>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	<p>The project activity is estimated to result in a total of 176 645 tCO<sub>2</sub>e emission reductions over the 7 year renewable crediting period.</p> <p>The project is planned to be implemented in 2 phases, a first one with 18 MW installed capacity and a second one with 12 MW. This is not reflected in the estimation of CERs for the crediting period.</p>	CL16	OK
<b>B.8. Monitoring Methodology</b> <i>It is assessed whether the project applies an appropriate monitoring methodology.</i>					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes, the monitoring methodology adopted for the project activity is in accordance with approved methodologies ACM0004 version 02. The monitoring plan has been documented in a transparent manner.		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, whichever occurs later?	/1/	DR	Yes.		OK
<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>					

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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	No auxiliary consumption of fuels is involved in the project activity and hence no parameter needs to be included in the monitoring plan.  However, it needs to be confirmed how the energy requirements are met during emergencies and start ups.	<del>CL-06</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	The monitoring plan provides for collection and archiving of most of the necessary data for estimation of GHG emissions within project boundary.  However, the net electricity delivered to the different facilities needs to form a part of the monitoring plan.	<del>CL-08</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 method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR	Yes, the measurement method has been clearly stated for each baseline parameter.		OK
B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate?	/1/	DR	Yes.		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>
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	Procedures for dealing with erroneous measurements are in place. However, the measurement accuracy for meter readings needs to be addressed.	<del>CL-09</del>	OK
B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/1/	DR	Yes.		OK
B.10.7. Is the registration, <i>monitoring</i> , <i>measurement</i> and <i>reporting</i> procedure defined?	/1/	DR	Yes, procedures for registration, monitoring, measurements and reporting have been defined.		OK
B.10.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	Procedures for maintenance of monitoring equipments and installations need to be identified. Calibration of the various meters is carried out as per the regulations issued by the China Government.	<del>CL-09</del>	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	Yes, procedures for handling of the day to day records have been addressed in the PDD.		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	No leakage effects need to be addressed as per the methodology, ACM0004.		OK

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B.11.2. Are the choices of project leakage indicators reasonable and conservative?	/1/	DR	Not applicable.		OK
B.11.3. Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate?	/1/	DR	Not applicable.		OK
<b>B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts</b> <i>It is assessed whether choices of indicators are reasonable 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	It needs to be clarified if the host country laws require for the monitoring of sustainable development indicators / environmental impacts for the project activity.	<del>CL-10</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 above.		OK
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	Same as above.		OK
<b>B.13. Project Management Planning</b> <i>It is checked that project implementation is properly</i>					

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<i>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	Yes, the authority and responsibility of the overall project management has been clearly defined.		OK
B.13.2. Are procedures identified for training of monitoring personnel?	/1/	DR	Procedures for identifying training needs of the monitoring personnel need to be defined.	<del>CL-09</del>	OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	Procedures for emergency preparedness during situations that can lead to unintended emissions need to be defined.	<del>CL-09</del>	OK
B.13.4. Are procedures identified for review of reported results/data?	/1/	DR	Procedures for review of the reported data need to be defined.	<del>CL-09</del>	OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	Procedures for corrective actions in order to provide for more accurate future monitoring and reporting need to be clearly defined.	<del>CL-09</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.1.1. Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/	DR	The project's starting date is 1 January 2008 with an operational lifetime of the project activity of 21 years. It needs to be confirmed if the start date is the commissioning date and proof for start date of the project activity need to be provided.	<del>CL-11</del>	OK

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			The starting date of the project has been revised to 28 March 2006, date of approval of the Feasibility Study Report.		
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR	The project proponent has chosen a renewable crediting period of 7 years with the start date of the crediting period being 15 May 2008.		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.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	Yes, the project proponent has sufficiently described the environmental impacts of the project activity in the PDD.		OK
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR	The EIA study has been conducted for the project activity in line with the host Party requirements. The EIA and the feasibility study report in addition to their letters of approval need to be submitted.	CL-12	OK
D.1.3. Will the project create any adverse environmental effects?	/1/	DR	The main environmental impact due to the project implementation is the noise generated and the waste water. The other environmental impacts include the waste gas from the process the SO <sub>2</sub> and the gypsum from the desulphurisation plant.		OK
D.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	Yes.		OK

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D.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	The plant has implemented a desulphurisation unit (with 80% SO <sub>2</sub> reduction rate) and dust removal unit for removal of SO <sub>2</sub> and dust respectively before the gas is emitted into the atmosphere. Also, waste water generated is treated in the septic tank. The gypsum generated in the desulphurisation plant and the solid wastes generated are collected and transported outside the power plant to be treated. It needs to be confirmed how the gypsum and solid waste generated and finally disposed.	<del>CL-12</del>	OK
D.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR	Approval for the project activity from the Department of Environment may be submitted. The various consents for establishment and/or operation of the project from the pollution control agencies in China need to be submitted. Approvals for the use and operations of the boiler need to be reviewed. These approvals or licenses need to be submitted.	<del>CL-12</del>	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.1.1. Have relevant stakeholders been consulted?	/1/	DR	The project proponent has identified relevant stakeholders to this project. The stakeholders	<del>CL-13</del>	OK

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			<p>identified include government bodies and local population as below:</p> <p>Governments and organizations included: Qingxu County Environment Bureau, Qingxu County Environmental Supervise Team, People's Government of Dongyu Town in Qingxu County, Donggaobai village committee, Zhonggaobai village committee, Donggaobai primary school in Dongyu Town, Zhonggaobai Center School in Dongyu Town, Qingxu Power Supply Company etc. The villager's included representatives from Jiaochengwang village, Jiaochengtan village, Donggaobai village, Zhonggaobai village, Jiabei village, Xigaobai village and Qingxubei Village etc.</p> <p>Documentary evidence for the stakeholder consultation process conducted for the project activity needs to be provided.</p>		
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Between 9 March 2007 and 12 March 2007, the project proponent sent out letters and questionnaires to all identified stakeholders to opine on the project activity. Copies of the letter sent out need to be provided.	<del>CL-13</del>	OK
E.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?	/1/	DR	It needs to be confirmed during the follow up interviews, if a stakeholder consultation process is mandated by the laws of the host Party, and if applicable, has it been conducted as per the requirements of the law.	<del>CL-13</del>	OK
E.1.4. Is a summary of the stakeholder comments	/1/	DR	Yes, the comments received from the		OK



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received provided?			stakeholders have been sufficiently addressed in the PDD.		
E.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	No negative or adverse comments were received for the project activity.		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 table 2	Summary of project owner response	Validation team conclusion
<b>CAR 1</b> The letter of authorisation and the letter of approval for the project and its participants from the DNA of China and United Kingdom need to be submitted.	A.2.2 A.2.3 A.4.1	Please find the attached LoA from China and UK.	The LoAs for China and United Kindom have been submitted.  This CAR is closed.
<b>CAR 2</b> No current uses of the waste heat recovery and utilisation have been identified and hence, this option is eliminated from being the plausible baseline scenario. However, the same is contradicted while discussing additionality by stating that in cases where there is residential demand for gas, part of the waste gas is utilised as civilian gas. The same needs to be clarified. The project developer is requested to justify the regulatory framework for coking plants and the different obligations for utilizing waste gas and heat.	B.2.2	<ul style="list-style-type: none"> <li>It is clarified that there is no residential demand for gas in the surrounding area of Taiyuan Gangyuan Coking Facility. The section B.4 and B.5 PDD has been revised accordingly for clarification.</li> <li>Regarding the obligation for the regulatory requirements:  It is clarified there are two general types of coking technologies in China: <ul style="list-style-type: none"> <li>the traditional <i>by-product</i> coking ovens, and</li> <li>the relatively new clean-type <i>non-chemical –recovery</i> ovens.</li> </ul> </li> </ul> The <i>by-product</i> coke oven is widely used. During the coking process, heated volatiles are driven off and form the so-called ‘by-product coke oven gas’. Such gas can collected and used to produce	OK. DNV was able to confirm that the regulatory requirements for utilization of the waste gas are applicable to the coking units using the traditional coking ovens, where the by-product recovery, (i.e. utilization of waste “gas”) is possible. Since the project activity only involves utilization of waste “heat” and not the waste “gas”, this requirement does not apply. DNV was also able to confirm this with the local representative of the Development and Reform commission, Shanxi.  This CAR is closed.

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
		<p>other chemical products. The recycling of the by-product gas is required by the <i>Shanxi Coking Industry Management Regulation</i> to enforce local enterprises' resource utilization and economic performance.</p> <p>The clean-type <i>non-chemical-recovery</i> oven, compared to the <i>by-product</i> oven, has an additional gas combustion process within the oven itself. The by-product gas is combusted to a maximized level before any release from the oven. The final residual gas from the coking process is the combustion gas (as referred to in the PDD), which contains a large amount of heat but no combustible gases. Such combustion gas cannot be utilized for further chemical production. Such combustion gas is not considered as a resource, unlike the typical by-product gas.</p> <p>(For further details of the process, please refer to section A.4.3 of the PDD.)</p>	

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
		<p>There are no regulative requirements for the clean-type <i>non-chemical-recovery</i> coking facilities on the use of the waste heat. The representative of the Development and Reform Commission (DRC) of Shanxi Province confirmed the said requirements at the validation interview.</p> <p>As explained above, the clean-type coking facilities only produce waste heat but not residual combustible gas. The requirement in “Shanxi Coking Industry Management Regulation” that residual gas must be recovered is not applicable to the proposed project.</p>	

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
<p><b>CL 1</b>  <u>Baseline Determination:</u>  Construction of a captive power plant of the similar capacity as the project using diesel oil or natural gas has been ruled out from being the baseline scenario due to high operation costs and poor economic benefits. The same needs to be justified with data (e.g. cost comparison of per MW cost using oil &amp; diesel as compared to the power generation using the waste heat recovery technology).</p>	B.2.2	<p>It is clarified that construction of a captive power plant using diesel oil or natural gas is ruled out due to legal reason.</p> <p>According to <i>Interim Rules on the Installation and Management of Small-scale Fuel-fired Generators</i> (issued in August 1997) /16/, the fossil fuel-fired power units with less than 100MW is strictly prohibited for installation. So building a coal-fired, or diesel oil-fired, or natural gas-fired power plant of the same capacity as the proposed project is prohibited by the national regulation. It is revised in section B.4 of the PDD.</p>	<p>DNV was able to confirm against the interim rules on Installation and Management of small-scale fossil fired generator, that installation of new thermal power plants with capacity less than 100 MW is strictly prohibited in China.</p> <p>OK. This CL is closed.</p>
<p><b>CL 2</b>  Any risks associated with the chosen baseline needs to be addressed.  Also, the following points need to be addressed:</p> <ul style="list-style-type: none"> <li>The project participants need to clearly explain in the PDD how the client was meeting his energy needs (for the entire coking facility) before the implementation of the project activity: import from grid or captive power plant. Also, if they had a captive power plant already, what was the</li> </ul>	B.2.7	<p>1) In the baseline, the coking ovens are operating non-stop throughout the year. There is occasional grid supply shortage in the area. In the case of supply shortage, the coking plant shuts off the supply to the auxiliary facilities (i.e. the office building and canteen). The production has therefore not been affected. There are no regulative requirements for the clean-type coking facilities on the use of the waste heat.</p>	<p>1) OK. The coking units imported power from the grid. The same was confirmed by DNV against the invoices from the grid company.</p> <p>2) OK. All electricity used at the coking plant for processes that include coal washing, molding, conveying, quenching, and other auxiliary activities has been imported from the grid.</p>

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
<p>fuel used in the captive plant?</p> <ul style="list-style-type: none"> <li>• The different energy sources of the plant in the current configuration need to be elaborated in the PDD. Furthermore, it needs to be justified how the energy demand will be satisfied after the project implementation for all energy sources.</li> <li>• The project developer needs to justify to what extent electricity shortages (due to the lack of proper electricity supply) at the project site affects the plant's operations.</li> </ul>		<p>The coking facility has been importing from the North China Power grid. It is clarified there is no captive power plant in the baseline scenario;</p> <p>2) The Gangyuan coking plant has been operational since 2006. For the coking plant, all the electricity used has been imported from the grid. The electricity is mainly used for coal washing (50%), molding (10%), conveying and quenching (30%), and all other auxiliary activities including the office and canteen (10%). Based on the attached electricity purchase invoice, the annual electricity consumption is estimated at around 6,500MWh. After the project implementation, the electricity utilization of the coke plant will not be affected. The coking plant will continue to utilize the electricity from grid after the waste heat power plant commissions.</p> <p>From the project activity, waste heat utilization power plant, all the electricity is to be exported to the</p>	<p>3) OK. The plant utilizes the electricity from the grid for all operations in the plant since its operation in Oct 2006.</p> <p>OK. This CL is closed.</p>

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
		<p>grid. For the safety and stability of the grid, all the electricity production and distribution have been central-controlled by the local authority and the grid company /25/. The project activity has been approved as a grid connected power plant. It is required not to use electricity internally (other than maintaining the power plant operation). Further more, the electricity from the grid is more stable than the electricity directly sourced from the project power plant which can be influenced by waste heat production.</p> <p>3) As explained above, in the case of supply shortage, the coking plant shuts off the supply to the auxiliary facilities (i.e. the office building and canteen). The production has therefore not been affected. In any case of minor fluctuation from the 30MW power plant, it will not cause noticeable impact on the production lines.</p>	

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
<p><b>CL 3</b></p> <p>1) The calculation sheets for the IRR calculation and the sensitivity analysis need to be submitted.</p> <p>2) Also, the values considered for the IRR calculation for total investment cost, annual O&amp;M costs, electricity tariff need to be substantiated with independent data and evidences.</p> <p>3) The project developer is requested to justify the price of the electricity displaced for internal use based on the historical electricity price paid by Taiyuan Gangyuan Coking &amp; Chemicals Co., Ltd and independent sources of price forecast.</p> <p>4) It needs to be clarified if the project has secured a power purchase agreement (PPA).</p> <p>5) The project is planned to be implemented in 2 different phases: a first one with 18 MW installed capacity and a second one with 12 MW. It is not possible to confirm with the information provided, if the investment analysis has taking this planning into account.</p>	B.3.1	<p>1) Please find the IRR spreadsheet attached.</p> <p>2) The parameters of O&amp;M cost and VAT have been included in Page 3 and Annex 1 of the Feasibility Study Report (FSR).</p> <p>The IRR calculation is based on the data from FSR. The disposal of liquid assets and recovery of scrap value of fixed assets have not been included the original FSR conducted by Shanxi Electric Power Survey and Design Institute.</p> <p>As per DNV's requirement, the estimated disposal of liquid assets and recovery of scrap value of fixed assets are included in the additional IRR spreadsheet. The assets recovery estimation has been made based on the project owner's business development plant with reference to the <i>Economic Assessment Method and Parameters for Project Construction</i> published by the National Development and Reform Committee and the State's Planning Department in 2006. The rest of the</p>	<p>1) The IRR calculation has been reviewed by DNV. OK when the points as addressed in "CL 03 continued" need to be substantiated with documentary evidence.</p> <p>2) OK. The specific data source and the documentary evidence for the assumptions used for the IRR calculations were provided to DNV. The IRR calculations were also revised to include the parameters "disposal of liquid assets, recovery of scrap value of fixed assets.</p> <p>3) OK. The electricity purchase invoices were submitted to DNV.</p> <p>4) OK. The approval for the project was reviewed by DNV.</p> <p>5) OK. The project during its inception and review of financial viability was initially planned to be carried out in one phase. However, due to lack of</p>



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
		<p>assumptions are strictly based on the original cashflow. It is demonstrated the liquid assets and recovery of scrap do not significantly affect the IRR.</p> <p>3) The electricity purchase invoices were sampled during the validation site visit. The invoice is attached.</p> <p>4) The procedure establishing a PPA in China is as the followings. The official approval has to be secured as the essential step. When the plant is operational, the tariff will be set based on the standard tariff of the time. The PPA will then be finalized with the tariff. Gangyuan has secured the official approval.</p> <p>5) During project design, 30MW installation has been planned. However due to the economic unattractiveness, the project has been postponed. Only 18MW installation of power plant was started as the phase I development. The project owner hopes the CDM economic benefit of the 18MW</p>	<p>funds, the plant was decided to be implemented in two phases. Hence, the IRR analysis carried out at the start of the project activity is the suitable financial analysis for the project.</p>

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
		<p>installation can help to initiate the remaining of the planned development. The construction of the 12 MW installation is expected to start on 01 January 2009, if the project can be registered as CDM project.</p> <p>The original financial analysis (2005) formed the basis of the investment decision. Therefore it is accurate and reasonable to use the original IRR in the PDD. So the calculation of IRR in PDD should be based on the original financial analysis (2005) since CDM has been under consideration when project owner started FSR work on 30MW.</p>	

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
<p><b>CL 3 contd.</b> The following points need to be substantiated with documentary evidence:</p> <ul style="list-style-type: none"> <li>a. Urban maintenance and construction tax is stated to be 5% and 8% in the PDD and the calculation sheet respectively.</li> <li>b. For the first year, the electricity revenues, operational costs etc are lesser. Please state the reason. When was the project started? This needs to come out clear in the PDD.</li> <li>c. The benchmark of 12% considered for the project activity needs to be justified.</li> </ul>	B.3.1	<ul style="list-style-type: none"> <li>a. It is clarified that the urban maintenance and construction tax is 5%; the surcharge for education is 3%. These two items were combined and displaced as one item as a total of 8%. The confusion was caused by displace of the spreadsheet.</li> <li>b. The financial analysis was conducted as a part of the feasibility study by Shanxi Electric Power Survey Design Institute. The assumptions have been made based on the industrial references and expertise. It is to the project proponent's understanding that the project was expected in the second year since start of construction, the project would become partly operational. Full capacity was planned to commission from the third year onwards. The actual construction started in April 2007.</li> <li>c. As per the "Tool for demonstration and assessment of additionality", the benchmark is to represent standard returns in the market, considering the specific risk of the project type. It is</li> </ul>	<ul style="list-style-type: none"> <li>a. OK. The FSR was verified for the taxes</li> <li>b. OK.</li> <li>c. OK. The benchmark of 12% chosen is a benchmark IRR for coking industry as specified in the <i>Economic Assessment Method and Parameters for Project Construction</i>. The same is acceptable given the fact that the core business of the project developer is coke production, and in case of returns less than the 12%, the project developer will chose to invest in more coking units, rather than project activity implementation..</li> </ul> <p>However, a more realistic approach is required towards the sensitivity analysis. This has been described further in detail when "CL 03 continued" below.</p>

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
		<p>indicated 12% is the benchmark FIRR for the coking industry in page 204 of the <i>Economic Assessment Method and Parameters for Project Construction</i> /26/. Given the core business of the project owner is coking, 12% is chosen as the benchmark FIRR of the proposed project.</p> <p>The IRR of 12% is the return the investors expect on their capital. If such IRR cannot be expected, the same investor could simply invest further funds in the coking production lines from which they can achieve this return. It is elaborated in Section B.5 of PDD</p>	

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
<p><b>CL 3 contd.</b></p> <p>Sensitive Analysis: The PDD includes a sensitive analysis for maximum variation of <math>\pm 10\%</math> of the total investment, the operation and maintenance costs and income from the sale of the electricity generated.</p> <p>The project developers are requested to calculate variation required in these parameters to reach the benchmark instead of using a default variation of <math>\pm 10\%</math>. Furthermore it is required to assess how likely it is that the variation in these parameters would result in reaching or exceeding the benchmark.</p> <p>The electricity generated should be included as a variable in the analysis.</p>	B.3.1	<p>The variation in the total investment, O&amp;M costs and electricity sales revenue for the IRR to reach the benchmark is added in the PDD.</p> <p>The electricity output is discussed as one of the factors affecting the electricity sales revenue.</p>	<p>OK. It has been demonstrated by the project proponent that the IRR of the project will exceed the benchmark of 12% if the total investment drops by 16.80%, the O&amp;M cost drops by 25.86% and the electricity sale revenue increases by 14.62%. A breakdown in total cost has been reviewed by DNV to assess the likelihood of variations in them.</p> <p>In DNV's opinion, it is unlikely that these costs will vary to the extent that the IRR would exceed the benchmark. Moreover, projected increase in the sale revenue of the electricity produced to exceed benchmark of 12% is also unlikely since the annual electricity output of the project is based on a higher load factor of 83% and establishing and modifying the electricity tariff is highly regulated and controlled by the central government in China.</p> <p>The values used in the investment analysis are taken from the approved feasibility study report (0.228 RMB/kWh) and were considered</p>

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
			<p>conservative by DNV when compared with the value listed in the “Notice on Adjustment on Electricity Price in Shanxi” issued by the Shanxi Provincial Pricing Bureau in 2004 (0.205 RMB/kWh)</p> <p>OK. This CL is closed.</p>

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
<p><b>CL 4</b></p> <p><i>Additionality:</i> Documentary evidences for difficulties faced in obtaining loans for the project activity along with the Government's decision for clear ups and regulating investments in the coking industry need to be provided. (e.g.: loan rejection letters, etc). Also, it is stated that the project proponent is one of the pathfinders in adopting clean-type and heat recovery coke ovens for electricity generation. The same needs to be elaborated</p>	B.3.1	<p>1) The proposed project has adopted the investment analysis in line with the tool to demonstrate the additionality. It is sufficient to demonstrate the additionality of the project. As per the tool's instruction, the barrier approach can therefore be optional. To avoid confusion, the discussions on barriers have been removed from the PDD.</p> <p>2) Please refer to section B.5 in the PDD.</p>	<p>OK. In order to avoid confusion the barrier approach has been removed from the PDD. Therefore, the financial barriers have been excluded from the additionality discussion.</p> <p>OK. This CL is closed.</p>
<p><b>CL 5</b></p> <p><i>Common Practice analysis:</i> It remains to be justified how this use of clean type heat recovery ovens as opposed to traditional coke ovens would be a barrier to the project activity since the project activity only involves utilization of the waste heat generated from the coking process, irrespective of the technology through which the waste heat is produced</p> <p>Also, it has been stated that the common practice in the region does not involve use of the waste gas for electricity generation. In view of this, the following information needs to be provided: How many coking facilities are present in the region or province? How</p>	B.3.1	<p>The popularity of traditional oven over the clean-type oven is removed from the barrier analysis from the PDD.</p> <p>According to the additionality tool (version 04), "projects are considered similar if they are in the same country/region and/or reply on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc."</p> <p>Waste heat recovery projects affiliated to the traditional coke oven cannot be</p>	<ul style="list-style-type: none"> <li>OK. The technological barriers discussed for additionality have been excluded from the PDD.</li> <li>It is discussed in the PDD that there are 717 coking units in Shanxi province. Currently only 35 of them, which use clean-technology, have been considered for the common practice analysis. The consideration of only the clean-technology coking units has been justified and accepted by DNV due to the fact that the two technologies are governed by different regulatory requirements. It is mandated by law in Shanxi</li> </ul>

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
<p>many of them utilize the waste gas from the process for any purposes at all? How many among them use the same for electricity generation.</p>		<p>considered similar to the project activity that recovers waste heat from the clean-type coke oven. Firstly, different regulatory requirement is applied. This also determines the use of the technology used for recovery process and power generation. Below is a summary of the difference.</p> <p>Technical difference:</p> <ul style="list-style-type: none"> <li>- The traditional technology that uses waste gas from coke production to produce the electricity is affiliated to the traditional coke production. It has been widely used in Shanxi province. The outflow from the traditional coke oven is the combustible gases containing CH<sub>4</sub>, H<sub>2</sub>, CO etc. with much higher heat value. So the process of power generation for traditional technology includes gas turbine or combined cycle turbine.</li> <li>- The technology applied by proposed project activity is affiliated to the clean-type oven. There is no combustible gas from clean type oven except waste heat steam with lower heat value comparing to waste gases. So the technology applied by proposed project</li> </ul>	<p>province that all coking units utilize the waste gas generated from coking unit. The coking units using clean type technology however, do not generate waste gas but only waste heat and there are no expectations for the waste heat utilization in the region. In addition, technically speaking the two types of coking units apply two different types of waste heat recovery system.</p> <p>DNV was also able to confirm against a clarification letter from the Shanxi Province 21 Agenda Sustainable Development Office (under the Provincial Development and Reform Committee) the list of 10 projects utilizing the clean type technology and that are in the pipeline depending on CDM revenues for their electricity generation initiative.</p> <p>However, further clarification is requested in this regard when “CL 05 continued” below.</p>



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
		<p>is using waste heat through installation of the waste heat recovery boilers.</p> <p>Regulatory difference:</p> <ul style="list-style-type: none"> <li>- Waste gas recovery is mandated for traditional oven.</li> <li>- There is no mandatory requirement for waste heat recovery.</li> </ul> <p>It is demonstrated that waste heat recovery from traditional coke oven cannot be considered similar activity to the project. The activities that are considered similar to the project activity include only the recovery of waste heat from the clean type coke ovens.</p> <p>Furthermore, according to the Annex 2 table of the <i>Shanxi Coking Installations Category of the Provincial Governmental Document [2005] no.13</i>, there are 35 clean type <i>non-chemical-recovery</i> coke plants, 10 of them are in the process of CDM application. Of these, 25 coking plants are still under planning and 10 plants are either in operation or under construction. The 10 plants with active operation/construction are all planning to utilize waste heat as CDM projects.</p>	

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
		<p>Please refer to Section B.5 of PDD.</p> <p>The official statistical report of Shanxi Coking Installations Category of the Provincial Governmental Document [2005] can be found at the below website:</p> <p><a href="http://www.shanxigov.cn/gb/zgsx/zwgk/zcfg/szfwj/jzf/userobject1ai33002.html">http://www.shanxigov.cn/gb/zgsx/zwgk/zcfg/szfwj/jzf/userobject1ai33002.html</a></p> <p>A clarification letter from the Shanxi Province 21 Agenda Sustainable Development Office (under the Provincial Development and Reform Committee) is submitted for review.</p> <p>The list of coking units that utilize the waste heat (all for power generation) and apply for CDM has been provided in section B.5 of PDD and the information is from Shanxi DRC.</p>	

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
<p><b>CL 5 contd.</b></p> <p>With regards to common practice, it has been observed by DNV that the technology provider claims that all WH projects using this technology either produce electricity or recover the waste heat (refer to the provider webpage) without releasing it in the atmosphere. Therefore, it needs to be clarified what heat recovery method is being implemented currently at the coking plant.</p> <p>In addition justification is needed if the scenario with current heat recovery system in place is not included in the possible alternative scenarios that could be implemented in the absence of the proposed CDM project activity.</p>	B.3.1	<p>The common practice analysis is conducted in accordance with the additionality tool. According to the additionality tool (version 04), “projects are considered similar if they are in the same country/region and/or reply on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc.”</p> <p>Similar projects are identified in Shanxi Province are taken into consideration, given the similarity of local regulations, access to resources/technology and income level, etc. The similar projects have been identified based on official source (A clarification letter from the Shanxi Province 21 Agenda Sustainable Development Office has been submitted for review).</p> <p>10 projects were identified with the said information accessible to the project participant at the time of PDD development. In addition to these 10 projects, the webpage indicates another</p>	<p>Out of 35 clean-type coking units in Shanxi province, 10 are utilization waste heat for electricity production including the proposed project activity. DNV was able to confirm this against a clarification letter from the Shanxi Province 21 Agenda Sustainable Development Office (under the Provincial Development and Reform Committee). The remaining 25 clean-type coke production facilities in Shanxi province are either emitting the waste heat in the atmosphere or are in the early stage of planning to utilize waste heat for electricity generation. However, through communication with representative of Shanxi Development and Reform Committee (DRC), it has been confirmed that the common practice in Shanxi province is to release waste heat in the atmosphere without its utilization for electricity generation.</p> <p>OK. This CL is closed.</p>

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
		<p>6 coke plants with electricity generation capacity in Shanxi.</p> <p>Given DNV's concern, the Shanxi Development and Reform Committee (DRC) has been consulted to clarify the list of existing projects in Shanxi. It has been confirmed by the representative that these 6 coking plants with clean-type ovens are at the early planning stage to start installing waste heat recovery with CDM development (without official submission to the local government). The contact details of the Shanxi DRC representative is provided as follows for reference: Ms Pan Jun Xiang, telephone/fax: +86 351 319 4604.</p>	

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 6</b> It is stated in the PDD that the project does not use any auxiliary fuels for the generation start ups, emergencies or additional heat gain before entering the waste heat recovery boiler. It needs to be clarified as to what provisions have been made to meet the fuel requirements during emergencies and start ups	B.4.1 B.9.1	It has been confirmed there are no auxiliary fuels in the project boundary. The waste heat is continuously supplied to boiler to produce steam by heat exchanging, and then power the steam turbines and generators. It does not need other fuels for start up.	OK. This CL is closed.
<b>CL 7</b> 1. The values considered in the emission factor calculation needs to be revised to use the latest IPCC 2006 values, for the oxidation factors. 2. The data vintage for the calculation of the OM and BM are the China Electric Power Yearbook 2003-2005 and the 2002-2005. At the time of the PDD submission for validation most recent data for year 2005 was available. The project developer is requested to modify the calculations accordingly.	B.5.1 B.5.2	The oxidation factors have been revised according to the IPCC 2006 values in the PDD.  Most recent published data has been used for the grid emission coefficient calculation. Please refer to Annex 3 of the revised PDD.	1. The oxidation factors have been revised to be in line with the latest IPCC 2006 guidelines. 2. OK. The PDD has now been revised to include the latest data for the emission factor estimation. The OM has been verified to be 1.1208 tCO <sub>2</sub> e /MWh. The BM has been verified to be 0.9307 tCO <sub>2</sub> e /MWh. The combined margin is 1.0303tCO <sub>2</sub> e /MWh.  OK. This CL is closed.
<b>CL 8</b> The net electricity exported to the different facilities also needs to form a part of the monitoring plan	B.10.1	The net electricity exported is revised to be included in the monitoring plan. Refer to section B.7.1 in the PDD. The values of EG <sub>AUX</sub> and EG <sub>sales,i</sub> have	OK. The section B.7.1 of the PDD has been revised to include EG <sub>sales</sub> . OK. This CL is closed.

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
		been filled up.	

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
<p><b>CL 9</b> Procedures for the following need to be identified:</p> <ol style="list-style-type: none"> <li>1. Procedures for maintenance of monitoring equipments and installations.</li> <li>2. The measurement accuracy for meter readings needs to be addressed.</li> <li>3. Provisions for identifying and meeting training and maintenance requirements need to be established</li> <li>4. Procedures for emergency preparedness during situations that can lead to unintended emissions need to be defined</li> </ol> <p>Procedures for review of the reported data and corrective actions need to be clearly defined.</p>	<p>B.10.5 B.10.8 B.13.3 B.13.5</p>	<p>The detailed monitoring plan and procedures will be ready prior to the start of crediting period.</p>	<p>The monitoring plan in the PDD must be supplemented with the updated procedures before monitoring period starts.</p> <p>OK. This CL is closed.</p>
<p><b>CL 10</b> It needs to be clarified if the host country laws require for the monitoring of sustainable development indicators / environmental impacts for the project activity.</p>	<p>B.12.1</p>	<p>There is no requirement on monitoring of sustainable development indicators or environmental impacts for the project activity. The project will be implemented strictly comply with the State regulations.</p>	<p>OK. This CL is closed.</p>
<p><b>CL 11</b> It needs to be confirmed if the start date is the commissioning date and proof for start date of the project activity need to be provided.</p>	<p>C.1.1</p>	<p>OK. The PDD has further been revised.</p>	<p>OK. The choice of the start date of the project activity as the approval date for FSR has been found acceptable to DNV.</p>

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 11 Contd.</b> The start date of the project activity in the revised PDD is 01 April 2007. However, the proof provided is date 10 April 2007. Please confirm the same		The date of feasibility study approval is used as start date, i.e. 28 March 2006. PDD has been revised. The approval is attached.	FSR was approved on 28 March 2006 prior to the start of the project activity considering CDM revenue.  OK. This CL is closed.
<b>CL 12</b> The EIA and the feasibility study report in addition to their letters of approval need to be submitted. Also, it needs to be confirmed how the gypsum and solid waste generated and finally disposed Additionally, the approval for the project activity from the Department of Environment is requested. The various consents for establishment and/or operation of the project from the pollution control agencies in China need to be submitted. Approvals for the use and operations of the boiler need to be submitted.	D.1.2 D.1.5	1. The documents have been submitted. The project is delayed because of lack of funding even the project owner has obtained the approval for EIA early. Revised in the PDD. 2. Minimum amount of the wastes are expected from the process. Measures have been studied in the EIA and will be implemented for the waste treatment. The EIA approval has been granted. 3. The approvals for the FSR and the EIA have been submitted to the validator.	1. The EIA and the FSR have been submitted to DNV. 2. OK. 3. All the applicable consents have been submitted to DNV.  OK. This CL is closed.
<b>CL 13</b> Documentary evidence for the stakeholder consultation process conducted for the project activity needs to be provided, e.g. copies of the letter sent out need to be provided. Also, it needs to be confirmed, if a stakeholder consultation process is mandated by the laws of the host Party, and if	E.1.2 E.1.3	Evidence is attached. It is confirmed the stakeholder consultation has been conducted according to the requirements of the Chinese law. The requirement of Chinese law is that in the required procedure of EIA it needs to do the stakeholder consultation.	OK. A stakeholder consultation as required for EIA, has been carried out by the project proponent. Since the EIA approval is part of the LOA issuance process and LOA has been issued by DNA of China on 26 August 2007, it can be concluded that the stakeholder consultation process has



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
applicable, has it been conducted as per the requirements of the law.			<p>been carried out per the requirements of the law.</p> <p>OK. This CL is closed.</p>
<p><b>CL 14</b></p> <p>The project developer is requested to clarify the status of implementation of the project (contracted, construction started, etc.) In case the project is already under development, it shall be justified that the incentive from the CDM was seriously considered in the decision to proceed with the project activity</p>	B.3.4	<p>According to EB 33<sup>rd</sup> report, the starting date of the project is the earliest implementation or construction date of the proposed project. 10 April 2007 is the date a contract was signed between the project owner and the construction contractor. The start date of project activity has now been revised to the date of the FSR approval.</p> <p>The project owner has taken CDM into consideration prior to the project start. The project owner was informed of the CDM opportunity in the coking industry by the local government. A statement from the provincial DRC is attached. Also it is mentioned in FSR CDM has been taken into consideration prior to the project start.</p>	<p>The start date of the project activity is defined to be the date of the approval of the FSR. Proof for CDM consideration has been confirmed against the FSR.</p> <p>OK. This CL is closed.</p>
<p><b>CL15</b></p> <p>The PDD states that the electricity generated will be used internally and will be supplied to other facilities. It needs to be clarified which other facilities will be supplied with</p>	B.5.2	<p>The electricity will be exported to the grid prior to another external party's usage.</p> <p>If any case an external operation will be receiving the power supply directly</p>	OK. This CL is closed.

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
electricity and it needs to be secured that emission reductions would not be claimed by recipient plant(s) for using a zero-emission energy source.		from the project, an official statement regarding no CDM benefits will be claimed by such energy source will be issued by the external power user. The other facilities will be supplied with electricity are belong to the same group with the power plant and still under planning. The emission reductions can't be claimed by recipient plant since all electricity will be exported to the grid and then bought by the other facilities. It has been revised in section A.2 of PDD.	
<b>CL16</b> The project is planned to be implemented in 2 phases, a first one with 18 MW installed capacity and a second one with 12 MW. This is not reflected in the estimation of CERs for the crediting period.	B.7.2	The clarification is made in the PDD. It has been revised in section A.2 of PDD.	OK. The PDD has been revised adequately to address the same.  OK. This CL is closed.

**APPENDIX B**

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**CERTIFICATES OF COMPETENCE**



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## CERTIFICATE OF COMPETENCE

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***Miguel Rescalvo***

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>	--		
<b><i>Technical Reviewer for (group of) methodologies:</i></b>			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes		
ACM0002, AMS-IA-D, AM0019, AM0026, AM0029, AM0045	Yes		
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes		

Høvik, 3 July 2007

Einar Telnes  
*Director, International Climate Change Services*

Michael Lehmann  
*Technical Director*



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## CERTIFICATE OF COMPETENCE

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***Mathsy Kutty***

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, 26 September 2007

Einar Telnes  
*Director, International Climate Change Services*

Michael Lehmann  
*Technical Director*



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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*



## 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-IA-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 DirectorHendrik Brinks



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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-CDMJi-i1

<b>GHG Auditor:</b>	Yes		
<b>CDM Validator:</b>	Yes	<b>JI Validator:</b>	--
<b>CDM Verifier:</b>	--	<b>JI Verifier:</b>	--
<b>Industry Sector Expert for Sectoral Scope(s):</b>	Sectoral scope 1, 2, 3 & 12		
<b>Technical Reviewer for (group of) methodologies:</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*