VALIDATION REPORT

JINCHENG SIHE COAL MINE CMM GENERATION PROJECT IN CHINA

REPORT NO. 2006-1768

REVISION NO. 02

DET NORSKE VERITAS

VALIDATION REPORT

Date of first issue: 2006-10-22	Project No.: 28924626
Approved by: Michael Lehmann Technical Director	Organisational unit: International Climate Change. Services
Client: World Bank Carbon Finance Unit	Client ref.: Tao Wang

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Summary:

Det Norske Veritas Certification AS.(DNV) has performed a validation of the "Jincheng Sihe Coal Mine CMM Generation Project" in China 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. This validation report summarizes the findings of the validation.

The validation consisted of the following three phases: i) a desk review of the project design, baseline and monitoring plan, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion. In addition, project participants and DNV have responded to issues raised by the CDM Executive Board, during the review process. Corrections requested by EB45 paragraph 45(k), footnote 9, and by EB46 paragraph 72 (j) are incorporated in this report.

In summary, it is DNV's opinion that the "Jincheng Sihe Coal Mine CMM Generation Project", as described in the project design document version 8.0 dated 17 April 2009 meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodology ACM0008 version 03. Hence, DNV requests the registration of the "Jincheng Sihe Coal Mine CMM Generation Project" as a CDM project activity.

Report No.: 2006-1768	Subject Group: Environment
Report title: "Jincheng Sihe Coal Mine CMM Generation Project" in China.	
Work carried out by: Ming (Mindy) Yue, Tim Kuo, Weidong Yang, Mark Zhu, Li Wei, Tonje Folkestad	
Work verified by: K.Venkata Raman (applicant), Ole Andreas Flagstad	

Date of this revision:	Rev. No.:	Number of pages:
2009-04-15	02	24

Indexing terms

Key words	Service Area
Climate Change Kyoto Protocol Validation Clean Development Mechanism	Validation.
	Market Sector
	Fugitive Emission Mining

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Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CBM	Coal Bed Methane
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification request
CMM	Coal Mine Methane
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
EIA	Environmental Impact Assessment
EPB	Environmental Protection Bureau
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
JMC	Jincheng Anthracite Mining (Group) Co. Ltd.
LoA	Letter of Approval
MP	Monitoring Plan
NCPG	North China (Regional) Power Grid
N_2O	Nitrous oxide
NGO	Non-governmental Organisation
NMHC	Non Methane Hydro Carbon
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change
VAM	Ventilation Air Methane

1 INTRODUCTION

The World Bank has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the "Jincheng Sihe Coal Mine CMM Generation Project" (hereafter called "the project") in China. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consists of the following personnel:

Ms. Ming (Mindy) Yue	DNV Beijing	Team leader, CDM validator
Mr. Tim Kuo	DNV Beijing	GHG auditor
Mr. Weidong Yang	DNV Beijing	GHG auditor
Ms. Tonje Folkestad	DNV Oslo	GHG auditor
Mr. Li Wei	DNV Beijing	GHG auditor
Mr. Mark Zhu	Subcontractor	Mining sector expert
Mr. K.Venkata Raman	DNV Bangalore	Technical reviewer (Applicant)
Mr. Ole Andreas Flagstad	DNV Oslo	Technical reviewer

1.1 Validation 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).

1.2 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 ACM0008 (version 03) /26/ and ACM0002 (version 6) /27/. The validation team has, based on the recommendations in the Validation and Verification Manual /25/ 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.

1.3 Description of Proposed CDM Project

The project activity of coal mine methane (CMM) capture and utilization is located at the Sihe Coal Mine, Qinshui County, Jincheng City, Shanxi Province of China, belonging to the Jincheng Anthracite Mining (Group) Co. Ltd. (JMC). The project envisages the capture and utilization of

the CMM for the generation of 120 MW electricity power and export to the North China grid. Electricity generation in the project activity is through (a) gas fired engines (60 numbers of 1.8 MW capacity each) and heat exchangers for the waste heat from these that provides input to (b) steam turbines (4 numbers of 3 MW capacity each), there by aggregating to 120 MW. The remaining waste heat generated is recovered in waste heat recovery system and utilized for domestic heating, however, CERs are not being claimed for this component. In the baseline scenario, a small part of CMM was being utilized for a) heat purpose in the mine complex (cooking and hot water) and b) experimental power generation of 15 MW (since 2002). It has been demonstrated by a gas balance /22/ that the utilized CMM was negligible when compared to the vented CMM.

The project does not involve the drainage and utilisation of any coal bed methane (CBM).

The feasibility study report was completed in February 2004 and the project was approved by the Development and Reform Commission of Shanxi Province on 18 October 2004 /4/. The project started construction on 26 January 2007. This date was verified based on the "Project Construction Start Report" /20/.

Emission reductions will be achieved by the displacement of electricity from the fossil fuel dominated North China Power Grid (NCPG) with electricity generated by the combustion of CMM, which in the baseline scenario was vented to the atmosphere. The annual average emission reductions during the 10 years of crediting period are estimated at 3 016 714 tonnes CO_2e.

2 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design, baseline and monitoring plan

II follow-up interviews with project stakeholders

III the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /25/. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol for the "Jincheng Sihe Coal Mine CMM Generation Project" is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol 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) validation protocol 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.

The term clarification (CL) may be used where additional information is needed to fully clarify an issue.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.*

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

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

Figure 1 Validation protocol tables

2.1 Review of Documents

The PDD /1/ submitted by the World Bank, version 3 dated 13 June 2006, version 5 dated 10 March 2007, version 07.3 dated 8 January 2008, version 7.7 dated 24 June 2008 and version 8.0 dated 17 April 2009, were assessed during the validation. Additional background documents /2/-/24/ related to the project design, baseline and approval documents, feasibility study report and the environmental impacts assessment (EIA) report were also assessed as a part of the validation.

2.2 Follow-up Interviews

During the period of 21-23 September 2006, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of JMC and World Bank were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Jincheng Anthracite Mining (Group) Co. Ltd.	➢ Project background ➢ Technology utilized ➢ Project operation, monitoring, management ➢ Local stakeholders consultation ➢ Historical gas venting/drainage ➢ Additionality ➢ Financial information on the project ➢ Project's EIA ➢ Starting date of project and crediting period
World Bank	➢ Project background ➢ Financing of the project activity ➢ Future CMM drainage estimation
Global Institute on Climate Change, Tsinghua University, CDM consultant	➢ Baseline scenario alternatives ➢ Assumption and calculation of emission reductions ➢ Additionality

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified for DNV's positive conclusion on the project design. The corrective action requests and requests for clarification raised by DNV, presented to the project participant in DNV's draft validation report of 22 October 2006 (rev 0) were resolved during communications between the World Bank and DNV. To guarantee the transparency of the validation process, the concerns raised and responses given are documented in the validation protocol in Appendix A.

Since modifications to the project design were necessary to resolve DNV's concerns, the World Bank decided to revise the PDD and resubmitted the final PDD as version 7.7 dated 24 June 2008. In response to the relevant decisions at EB45 and EB46 version 8.0 dated 17 April 2009

was submitted. After reviewing and assessing the revised PDD, DNV issued this final and corrected validation report and opinion.

The main changes to the PDD with regard to the PDD version published for the 30 days stakeholder consultation period are as follows:

- *The version of the applied methodology ACM0008 has been changed from version 02 to version 03.*
- *The version of PDD format has been changed from version 02 to version 03.*
- *The version of the Tool for the demonstration and assessment of additionality has been changed from version 02 to version 03.*
- *A 10-year fixed crediting period was chosen instead of a 7-year renewable crediting period.*
- *Corrections requested by the CDM Executive Board in decisions at EB45 and EB46 have been incorporated.*

2.4 Internal Quality Control

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

3 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.

In addition, project participants and DNV have responded to issues raised by the CDM Executive Board, during the review process, please refer to the website for the review history of the proposed project activity 1896.

3.1 Participation Requirements

The project participant from the Host Party China is Shanxi Jincheng Anthracite Mining Group Co., Ltd. The project participants from the participating Annex-1 Parties the Netherlands, Japan and the United Kingdom are the International Bank for Reconstruction and Development as Trustee of Prototype Carbon Fund (PCF) and the Netherlands Clean Development Mechanism Facility (NCDMF), Japan Carbon Finance, Ltd. and ICECAP Carbon Trading Company, respectively.

The host Party China and the participating Annex-1 Parties the Netherlands, Japan and the United Kingdom meet all relevant participation requirements for the CDM. The DNA of China has issued a Letter of Approval /2/, authorizing Shanxi Jincheng Anthracite Mining Group Co., Ltd. as the project participant and also confirming the project's contribution to China's sustainable development. Letters of approval have also been received from the DNAs of the participating Annex-1 Parties Netherlands /3/, Japan /3/ and United Kingdom /4/.

Public funding involved in the project is from the state of Netherlands, and it has been confirmed from the letter of approval that any public funding used does not result in a diversion of official development assistance and is separate from and is not counted towards its financial obligations as a Party.

3.2 Project Design

The proposed project aims at the capture of CMM and utilizing it for power generation (120 MW) and exporting the electricity to the North China Power Grid (NCPG). The gas engines power generation sets, waste heat boilers and steam turbines for the project are sourced from Caterpillar Inc. of U.S.A., Shanghai Eagle New Technology Engineering Company and Hangzhou Steam Turbine & Power Group Company, respectively. Since the project design is not a common/prevailing practice in China intensive training programs have also been envisaged for the operating and maintenance staff before the commissioning of the project, for safe and stable performance. As the project equipments are being sourced from reputed manufacturers, the project design is deemed sound.

The project start date is 24 March 2005, the date of the loan agreement between the Chinese Government and the Asian Development Bank (ADB), taken as the date of the decision to go ahead with the project /13b/. The expected operational lifetime of the project is 25 years. A fixed crediting period has been selected, starting from 1 September 2008 or the date of registration, whichever is later.

The project is expected to contribute to the sustainable development of China through improved environmental protection and increased clean energy supply.

3.3 Baseline Determination

The project applies the approved baseline methodologies ACM0008 (version 03) “Consolidated baseline methodology for coal bed methane and coal mine methane capture and use for power and heat and/or destruction by flaring”/26/.

DNV was able to verify that the project meets all the applicability criteria of the baseline methodologies as the project a) extracts CMM by ventilation, pre-mining and post-mining b) utilizes the captured CMM to generate and export electricity c) The extracted CMM is from an underground working coal mine and there is no CBM drainage involved in the project.

The baseline for the project activity has been determined following the 5 steps, in accordance with ACM0008 version 03.

Step 1, Identify technically feasible options for capturing and/or using CBM or CMM

It has been demonstrated through the ventilation statement of JMC (2006,1 and 2006,4) /21/ that the extraction of the CMM is by ventilated air, pre-mining and post mining with a share of 53%, 45% and 2 respectively.

For extraction of CMM, four possible scenarios were presented. DNV confirms that the previous practice of combining ventilation air methane, pre- and post-mining extraction was documented as the only legally sound option.

For usage of CMM, eight alternatives were identified.The following alternatives for extracted CMM treatment have been identified for the baseline selection:

i. Venting;
ii. Using/destroying ventilation air methane rather than venting it;
iii. Flaring of CMM;
iv. Use for additional grid power generation, but not implemented as a CDM project;
v. Use for additional captive power generation;
vi. Use for additional heat generation;
vii. Feed into gas pipeline (to be used as fuel for vehicles or heat/power generation);
viii. Possible combinations of options i to vii.

The following alternatives for energy production are considered:

a. North China Grid supplies the same amount of electricity;
b. Generate electricity with the extracted CMM, but not implemented as a CDM project, i.e. option iv in step 1b;
c. Construction of a coal-fired power plant with equivalent amount of installed capacity.

Step 2. Eliminate baseline options that do not comply with legal or regulatory requirements

One alternative was ruled out by conditions in the power purchase agreement: (v) Use for additional captive power production.

One alternative for power production, c) Construction of a coal-fired power plant with equivalent amount of installed capacity (120 MW), is not in compliance with Chinese law.

All the other alternatives identified are in compliance with the laws and regulations.

Step 3. Formulate baseline scenario alternatives

The baseline scenarios formulated are thus a combination of extraction of CMM by ventilation, pre-mining and post-mining.
For the treatment of CMM the options are a) venting b) using/destroying the VAM rather than venting c) flaring of CMM d) grid power generation but not as CDM project e) use for additional heat f) for distribution, and (g) combination of above.
For the power generation the remaining alternatives are a) power generation in the grid and b) project activity not a s a CDM activity.

Step 4. Eliminate baseline scenario alternatives that face prohibitive barriers

Of the remaining alternatives, a barrier analysis has been applied.

Two alternatives were eliminated due to investment barriers: (ii) Using/destroying ventilation air methane rather than venting it, and (iii) Flaring of CMM. DNV finds it justified that these could be ruled out because they would require investment with no possibility of generating revenue.

Two other alternatives were ruled out due to market barriers: (vi) Additional heat generation, and (vii) Feed into gas pipeline. The validator from DNV had verified the situation of Sihe coal mine during the site visit and found it justified that there was no potential demand or infrastructure available for distribution of heat or gas.

Continuation of alternatives (i) venting and (iv) usage of the CMM for grid-connected power production were thus the remaining alternatives for CMM usage.

After elimination of alternatives as described above, the possible baseline scenarios identified are a) continuation of the present practice of CMM extraction and venting with a small portion being used for onsite heating and experimental power generation and additional power being generated from the grid and for the power generation alternative b), i.e. the project activity without considering the CDM revenues.

It has been demonstrated that of the two remaining baseline alternatives, the continuation of the present practice does not incur any investment. The project activity without considering CDM revenues incurs investment and generates revenues also. However, it was demonstrated that the latter faces an investment barrier, since it does not meet the IRR threshold (please refer to Section 3.4 below). As a conclusion, the baseline scenario of continuation of the current situation was identified as the only alternative not facing any barriers.

Step 5: Identify most economically attractive baseline scenario alternative
After step 4 of the baseline identification, only one baseline alternative remained, and Step 5 therefore found to be redundant for the proposed project activity.

Availability of CMM:
The baseline conditions of the mines and the baseline usage of the CMM were verified by the DNV during the validation process. CMM utilization in the baseline scenario includes 4 boilers for cooking and heating purposes and a 15 MW experimental power plant. Based on the statistics data by the JMC the CMM utilization for the boiler, cooking and power plant during the baseline condition is 34.17 million m^3.

According to the project's Feasibility Study Report (FSR), the project power generation capacity of 120 MW will consume 181.47 Million cubic meter of methane (pure methane or equivalent) per year[i]. DNV has reviewed the source for this estimation, the FSR for JMC Sihe CMM Utilization[ii] published in 2004 by the independent accredited organization Chongqing Branch of China Coal Research Institute.

Thus, when the 120 MW power plant is running at full capacity, the total CMM demand for the power plant and the baseline usage would be around 215 million m^3 per year.

In the report it is estimated that the total amount of CMM possible to drain would be more than 6 800 Million m^3 of methane. JMC has invested in the installation of an improved drainage system. As a result, the CMM drainage at the Sihe coal mine has increased from 59.92 Million m^3 in 2003 to 191.32 Million m^3 in 2007[iii]. The stable increase of CMM drainage during the last 5 years supports the estimation of a rate of CMM drainage of about 250 million m^3 per year

[i] "FSR for JMC Sihe CMM Power Plant Project", page 124.
[ii] Chongqing Branch of China Coal Research Institute, "FSR for JMC Sihe CMM Utilization", (August 2004).
[iii] JMC's original annual gas drainage statistics in 2003, 2004, 2005, 2006, 2007.

reached by 2018. DNV has verified this estimate against the FSR for JMC Sihe CMM Utilization[i] and the Estimation for CMM Drainage from 2008 to 2018 by JMC Sihe Coal Mine[ii].

In summary, the availability of CMM is projected to be 250 million m^3 per year by 2018. The CMM demand from the 120 MW power plant and the baseline CMM utilization for boiler, cooking and existing power plant will total about 215 million m^3 per year. Thus, DNV finds it justified that the CMM available will be sufficient for the consumption of CMM by the project at its full capacity, in addition to the baseline.

3.4 Additionality

The additionality of the project has been demonstrated using the "Tool for demonstration and assessment of additionality" version 03 /27/.

The project start date has been defined as 24 March 2005, the date of the loan agreement between the Chinese Government and the Asian Development Bank (ADB) /13b/, and thus before the project commenced validation. It has been demonstrated to DNV that CDM benefits were seriously considered in the decision to proceed with the project activity /13/. Documentation for early consideration of CDM include a memorandum of understanding for the coal mine methane (CMM) demonstration project dated 8 October 2004, as well as an Asian Development Bank (ADB) report and recommendations of the President to the Board of Directors of ADB dated 16 November 2004. In addition, an Emission Reduction Purchase Agreement between Jincheng Anthracite Coal Mining Group, Co. Ltd. and the International Bank for Reconstruction and Development as trustee for the Prototype Carbon Fund, was signed on 1 December 2004.
After that the PP decided to invest in the project. The above documents have been verified by DNV.

Step 1: Alternatives to the project activity were identified in accordance with the guidelines provided by ACM0008 for the identification of the baseline scenario (please refer to section 3.3 above).

Step 2: Investment analysis:

The main focus of the investment analysis by JMC was to assess the ability of the project to service debt, and therefore a project IRR was analysed in the PDD.

Since the project activity generates revenues from the sale of power, a benchmark analysis has been carried out. The benchmark project IRR of 15% has been fixed according to the prescription of *Methods and Parameters for Economic Assessment of Construction Project* /17/ published by China National Planning Commission and China Ministry of Construction, as the benchmark internal rate of return (IRR) for the coal and gas industry.

Based on the data in the project feasibility study report and the feed-in tariff agreement the project IRR for whole investment without considering the CDM revenues has been demonstrated to be 11.74% which is below the benchmark, confirming that the project in the absence of CDM benefits is not financially attractive. It has also been demonstrated that the IRR of the project improves to 26,46% when considering CDM revenues **(**assuming a CER price of 7 Euros).

[i] Chongqing Branch of China Coal Research Institute, "FSR for JMC Sihe CMM Utilization", (August 2004).
[ii] Estimation for CMM Drainage from 2008 to 2018 by JMC Sihe Coal Mine

Suitability of the benchmark:

a) Source document:
DNV has verified that the IRR benchmark of 15% was sourced from the publication "Method and Parameters for Economic Assessment of Construction Projects" (version 2, published in 1993). Furthermore, the expiry of the version 2 has been verified by reviewing version 3 of the document, which came into effect in August 2006. The benchmark is applicable for construction projects in the coal mining sector.

As pointed out in Section 3.2 above, the date of investment decision for the proposed project was 24 March 2005, when the loan agreement between the Chinese government and the Asian Development Bank was signed.

In accordance with the guidance given in Annex 45 of the EB41 report, DNV therefore finds it demonstrated that the source document of the benchmark was the most updated one at the time of the investment decision.

b) Application of a benchmark for the coal mining sector rather than the power sector:
We refer to the PDD for details /1/.

It is DNV's opinion that in the context of selecting the appropriate industry benchmark, the project is to be regarded as a captive power project, because the main purpose of the project is generation of power to meet part of the power of the Jincheng Anthracite Mining Corporation's (JMC) facility.

In January 2005, a report from the JMC Power Supply Department projected the company's electricity demand to grow over the period 2005-2010, and concluded that even after installing the proposed project activity, a CMM-based power plant of 120 MW, the power needs of the company would not be fully met by the company's own generating capacity[i]. The projections are included in the project participants' response. The validity of the projections has been further substantiated by the actual electricity invoices for the period 2006-2008, which have also been verified by DNV[ii].

The estimated output from the 120 MW plant was given in the Feasibility Study Report[iii], and was verified by DNV during the validation. Analysing these sources, it was projected that JMC would import more power than it would export, *i.e.* would continue to be a net consumer of power.

In practice, the power produced in the project will be supplied to the grid and then sold back to the facility. DNV has verified this by reviewing the Grid Connection Agreement signed by JMC and the power company[iv]. DNV further confirms, based on an article issued by the provincial

[i] JMC Power Supply Division: Current situation and Project ion on JMC's Power Consumption, January 2005.

ii The power purchase invoices from 2006 to 2008.

[iii] Beijing Huayu Engineering Co. Ltd. of China National Coal Engineering Group, Zhaozhuang Project FSR (2003)

[iv] Grid Connection Agreement between Shanxi Power Company and JMC on 29 December 2007

government, that this arrangement is required in China as a means to ensure safety and stability of the power production and reliability of power supply[i].

DNV was able to confirm the following:

1. The source document for the benchmark confirms that when a project owner invests in a project based on another sector rather than its own core business base, and has little experience in characteristics and risk of the project, the sectoral benchmark IRR of its own core business applies[ii].
2. Coal mining is the main business of Jincheng Anthracite Mining Corporation (JMC), the project owner. DNV was able to verify that according to the Audit Report on JMC 2004 Financial Statement[iii], issued by an independent public accounting company in 2005, 78.9% of the company's revenue in 2004 was from coal mining, while only 0.69% was from electricity generation.
3. JMC has applied the 15% benchmark for other investments which was demonstrated by the following documentary evidence:
    - The rejection of the project "Jinju Stainless Steel Pipeline Project" in a managers' meeting at JMC in February 2004, due to its IRR which was lower than the 15% benchmark[iv].
    - The implementation of the Zhaozhuang coal mining and selection project after the NDRC's approval in 2004[v]. DNV verified that a 15% IRR benchmark was applied in the feasibility study report of the project, dated in 2003[vi]. The project was considered to be financially feasible by JMC with the IRR of 18.2%.

c) Increased risk:
The project participants argue that several factors increase the financial risk of the proposed project activity. The coal assets of JMC are used as collateral for the ADB loan[vii], and therefore the assets and the cash flow of JMC are subject to considerable risk in case of failure of the proposed project activity. DNV was able to verify these requirements against the Loan Repayment and Collateral Agreement between Shanxi Financial Bureau and JMC and finds the stated risk justified.

In addition, since the proposed project activity does not fall within JMC's core business, coal mining. DNV finds it reasonable that to JMC, the risk associated with the project activity is likely to be higher than most of their investments. Hence the required return (benchmark) of 15% is likely to be conservative.

In summary, the benchmark of 15% represents the benchmark stipulated by relevant national authorities at the time of the investment decision and DNV could validate that the benchmark is applicable to the project activity.

[i] http://www.dss.gov.cn/Article_print.asp?ArticleID=197921 (Shanxi Province Energy Research Institute and Economic Commission)
[ii] "Method and Parameters for Economic Assessment of Construction Projects" (version 2, published in 1993)
[iii] Shanxi Gouyuan (2005) Audit Report on JMC 2004 Financial Statement. Shanxi Guo Yuan CPA Firm
[iv] JMC's General Manager Meeting Minutes No.8 on 10 Feb 2004.
[v] Approval of the Zhaozhuang Project by NDRC (04/2004)
[vi] Beijing Huayu Engineering Co. Ltd. of China National Coal Engineering Group, Zhaozhuang Project FSR (2003).
[vii] Loan Repayment and Collateral Agreement between Shanxi Financial Bureau and JMC

Why the DOE has accepted lower benchmarks for other similar projects:
We acknowledge that other similar captive power projects for the extraction and utilization of CMM have applied lower benchmarks. This is partly due to the fact that investment decisions were made after version 3 of the "Method and Parameters for Economic Assessment of Construction Projects" came into effect in August 2006 and partly that projects have selected the more conservative benchmark of version 3 despite the fact that version 2 was still applicable at the time of the investment decision.

However, in DNV's assessment the fact that other project developers have chosen to apply a more conservative benchmark does not disqualify the selection of the 15% benchmark for the proposed project activity, because:

- The project participants used the most updated source of benchmark at the time of the investment decision.
- The benchmark has been consistently used in other investment decisions around the same time.
- In the context of selecting the appropriate industry benchmark, the project is to be regarded as a captive power project and applying the benchmark for the coal mining sector rather than the power sector is thus appropriate.

To conclude, DNV finds it justified and reasonable that a project IRR benchmark of 15% was applied for the proposed project activity.

Validation of input values to the investment analysis:

DNV has validated the input values of the investment analysis using a 4-step approach.

1: Assessment of the sources of the input parameters

All of the input values for the investment analysis have been taken from the feasibility study report (FSR) for JMC Sihe CMM Power Plant Project of February 2004. The FSR was prepared by China Electric Design and Research Institute /6/. This entity is an independent design organisation which is A class accredited by the Ministry of Construction of People's Republic of China[i]. This accreditation is evidenced by the certificate within the project FSR.

The FSR was approved by Shanxi Development and Reform Commission on 18 October 2004 /7/ and the approval documentation reiterates key investment criteria such as total investment cost. The FSR is therefore a reliable and independent source of information on which to base an investment decision.

The input parameters used in the financial analysis can thus be considered information provided by an independent and recognised source.

2: Confirmation of consistency between the PDD and the feasibility study report

DNV compared the input parameters for the financial analysis included in the PDD with the parameters stated in the FSR and was able to confirm that the values applied are consistent with the value stated in the FSR.

[i] Qualification rank: A. No.01005-sj, issued by National Ministry of Construction of P.R China.

3: Assess the period of time between the finalization of the feasibility study report and the investment decision

As justified in the PDD and validated by DNV, the investment decision for the project was made on 24 March 2005, when the loan agreement between the Chinese government and the Asian Development Bank was signed.

ADB started to appraise the project at the very beginning of 2003 and decided to provide the loan to the project. On 24 March 2005 the Chinese Government signed the loan agreement with ADB, which became valid on 24 October 2005. During the time, the project participants carried out project preparation according to the agreement with ADB and the project feasibility study report. The project participant issued an invitation for bids to procure the main equipment, namely the gas engine generator, in the newspaper China Daily (page 10) on 15 November 2005. All equipment was delivered at the end of 2006. In late January 2007, the PP formally started the civil works construction of the power plant.

In order to ensure that FSR values were valid and applicable at the time of the investment decision, DNV during validation considered the time span between the FSR approval and the investment decision.The feasibility study report was approved in October 2004 and thus only five months prior to the decision to proceed with the project activity. Given this relative short period of time between approval of the feasibility study report and the decision to proceed with the project activity it is unlikely in the context of the project that the input values would have materially changed and that it is thus reasonable to assume that the feasibility study report has been the basis of the decision to proceed with the investment in the project.

4: Cross-check the parameters used in the financial analysis

According to the evidences and cross-checking with the other documents such as the power purchase agreement signed in December 2007, /11/ /15/ /16/ /17/, DNV is able to confirm that the input values are reasonable and adequately represent the economic situation of the project.

Conditions of the Asian Development Bank loan:

DNV compared the proposed project investment analysis input values with other CMM utilization projects developed in China. DNV has used the following parameters as part of projects comparison: investment costs per MW, electricity tariff and percentage of operation and maintenance costs relative to total investment costs. By applying its sectoral expertise, DNV was able to confirm that the input parameters used in the investment analysis were comparable to those of similar projects.

Therefore, DNV finds it sufficiently justified that the input parameters of the investment analysis adequately represent the economic situation of the project at the time of the investment decision.

The Asian Development Bank loan:

As stated in the project participants' response letter, the loan of USD 72.03 Million by the Asian Development Bank (ADB) was provided to the Shanxi Government. DNV confirms that the requirements and repayment conditions for JMC were:

- The loan has a term of 24 years including a grace period of 4 years, an interest rate determined in accordance with ADB's LIBOR-based (London Interbank Offer Rate) lending facility and applicable charges and fees.

- The Loan Repayment Guarantee Agreement between Shanxi Province Financial Bureau and JMC[i] requires JMC to pledge its land and coal resources as collateral and to provide guarantees from another coal mining group in Shanxi province[ii].

The JMC CMM utilization project is a part of the overall ADB CMM demonstration project in Shanxi Province[iii]. The main objective of the Project is the demonstration of latest technologies for CMM production, capture, and utilization which inherently implied high technological and implementation risks for JMC.
DNV has verified the document from ADB confirming that the loan does not lead to a diversion of ODA, and that the funding for the proposed CDM project activity is not counted towards its financial obligations.

Sensitivity analysis

A sensitivity analysis indicates that the IRR is below the benchmark when varying the critical parameters like the total investments, O&M cost, electricity output and feed-in tariff. If the total investment decreases by 21.2%, the annual operation and maintenance cost decrease by 53.5% or the annual amount of electricity delivered to the grid or the feed-in tariff increases by 18.1%, the IRR of this project will reach 15%, the benchmark IRR.

The project is now at its late stage of construction, and the real cost is about 3% higher than the estimated total cost due to the increase of equipments, construction material, labor cost, etc. It is agreed by DNV that it is impossible for the total investment to decrease by 21.2%.

Also, because both the labor cost as well as the equipment maintenance parts prices have been increasing during the past several years in China, it is impossible for the annual operation and maintenance cost to decrease by 53.5%.

The feed-in tariff has already been determined by the price authority of China and it it is unlikely to increase in the future with a substantial increase of 18.1%.

Step 4: Common practice:

It has been demonstrated that the utilization of CMM in China is only 5% /18/ and limited to utilization in coal miners' households, by local small-scale industry and for small scale power generation. It has been verified by DNV that currently several CMM power generation projects with installed capacity larger than 10 MW are under development in China are seeking CDM revenue support. Hence, utilization of CMM in China does not represent a common practice.

In summary, it is clearly demonstrated that, the project is not a likely baseline scenario and the emission reductions are additional to what would have happened in absence of the project activity.

3.5 Monitoring Plan

The project applies the approved monitoring methodology ACM0008 "Consolidated monitoring methodology for virgin coal bed methane and coal mine methane capture and use for power (electrical or motive) and heat and/or destruction by flaring". The selected monitoring methodology is applicable for the project activity.

[i] Loan Repayment and Collateral Agreement between Shanxi Financial Bureau and JMC.
[ii] Loan Guarantee Agreement between Shanxi Government and Shanxi Lu'an Coal Group in 2006.
[iii] Loan agreement (ordinary operations between People's republic of China and Asian Development Bank), Coal Mine Methane Development Project, 24 March 2005

In line with the methodology, the following parameters will be monitored *ex-post.*

1. Methane delivered to power plant - measured
2. Concentration of methane (in mass) in extracted gas (%) - analysed
3. Non methane hydro carbons (NMHC) concentration in coal mine gas - analysed
4. Carbon emission factor for NMHC when (3) is > 1%
5. Electricity supplied to and received from the grid by the project - measured.

The project's monitoring plan includes:

- A description of the responsibilities and authorities for project management,

- Procedures for monitoring and reporting, and QA/QC procedures,

- A description of the installation of metering equipment,

- Procedures for the calibration of metering equipment,

- A description of training and maintenance needs.

Detailed procedures have been elaborated and are in place.

Further details on the monitoring plan are presented in the following:

a) power generation and CMM consumption by the existing experimental 15MW power plant;

In the updated PDD /1/, a flowchart is presented to demonstrate that the existing experimental 15 MW power plant is separate from the 120 MW unit planned in the proposed project activity. The power from the 15 MW unit will not pass through the Qinchi 220 kV substation, where the net electricity production of the project activity is monitored for the purpose of CER calculation.

For the 15 MW power plant is a captive power plant, the following meter will be installed:

- Electricity meter: electricity meters have been installed at the outlet of power plant to monitor the electricity generated continuously;
- Gas concentration meter: to be installed at the inlet to the existing power plant to monitor the concentration of the CMM gas sent to the power plant;
- Gas flow meter: to be installed at the inlet to the existing power plant to monitor the volume of CMM supplied to the power plant;
- Separate meters to measure the temperature and pressure of the CMM sent to the exiting power plant. The accuracies and calibration of the equipment will be according to the relevant national standards and the manufacturer's specifications. The data will be monitored by JMC qualified staff and will be backed up and archived. All the data shall be kept until two years after the end of the crediting period, or after the last CER issuance.

In DNV's opinion, this setup is sufficient to ensure that no CERs will be claimed for power generated in the existing 15 MW power plant.

However, the setup needs to be checked during verification of the project.

b) Checking the flow and concentration meters;

Flow meters and concentration meters will be calibrated annually and maintained regularly to ensure accuracy. Responsible staff will manually record the readings hourly and archive the data

daily. The archived data will be reviewed by the CDM manager. The flow meter and concentration meter will be checked and maintained monthly.

c) Consistency with the monitoring methodology in monitoring of methane fraction in CMM gas;

The percentage of methane in CMM will be measured in by a continuous gas analyzer, on wet basis. These data will be recorded hourly and archived daily. The temperature and pressure indicators will also be measured and recorded. PC_{NMHC} will be monitored annually by a qualified laboratory.

d) Monitoring of electricity to be supplied to and imported from the grid for the project activity.

All electricity generated by the project will be supplied to the North China Power Grid. A 220 kV transformer station will be installed at the project power plant, and will in its turn be connected to the Qinchi 220 kV transformer station of the grid. In total, 21 electricity meters will be installed.

The meters at the transformer station of the project power plant will monitor the electricity supplied to/imported from the grid, the electricity consumed by on-site workshops and the total electricity used by the power plant. These will not be used for claiming CERs.

The CERs will be calculated based on two bi-directional meters at the Qinchi 220kV transformer station of the grid, which will monitor the electricity supplied to/imported from the power grid. The meters will be 0.2S grade; one of them will be a main meter used to calculate the emission reductions, while the other functions as a backup.

DNV finds that these details provided by the project participants will ensure a sound setup of monitoring, however it needs to be checked during verification that the monitoring plan and implementation of the same are in compliance with the detailed plan.

3.6 Calculation of GHG Emissions

Estimate of GHG emissions are in accordance with the formulae given in the baseline and monitoring methodology ACM0008 (version 3).

Project emission: The project emissions in the project activity include emissions from the methane destroyed (PE_{MD}) and emissions due to un-combusted methane (PE_{UM}). Since additional energy is not being used (from the baseline) for CMM capture, emissions due to energy use are not being considered.

Since the captured methane is destroyed in the gas engines for electricity generation, the emissions due to combustion are calculated as the product of the methane, carbon emission factor from methane destructed (IPCC default value of 2.75 t $CO_2e/t\ CH_4$) and the non methane hydro carbon if more than 3%. For the calculation of the methane destructed, the IPCC default value of efficiency of methane destructed has been considered at 99.5%.

The emissions due to un-combusted methane have been calculated as per the formulae in the methodology. The efficiency of methane destruction has been considered at 99.5%.

The project emissions have been calculated to 345 461 tCO_2e/y.

Baseline emissions:

The baseline emissions consist of the CH_4 emissions resulting from release of methane to the atmosphere avoided by the project $BE_{MR,y}$ and the CO_2 emissions $BE_{USE,y}$ displaced by the project's production of power and heat.

The only methane destruction in the baseline scenario is for residential use at the Sihe coal mine (8 094 600m^3CH_4/y) and the methane destruction in the experimental power generation (32 256 000 m^3CH_4/y) /22/. The CMM balance provided indicates that the CMM used for the power generation in the project activity is excess and was being emitted to the atmosphere in the baseline. In order to ensure that the project only uses excess CMM and that no CMM currently being used for onsite heating and experimental power generation is diverted to the power plant, the CMM balance will be determined annually ex post relate to the concern raised above.

Since there is no CBM involved in the project, all the methane destroyed is included as $BE_{MR,y}$.

For the calculation of the baseline emissions due to replacing grid electricity, the North China Power Grid (NCPG) has been selected as the grid system boundary.

The ex-ante grid emission factor has been calculated as the combined margin emission coefficient (CM) for North China Power Grid (NCPG) in line with ACM0002, version 6. The operating margin (OM) has been calculated as the "simple OM" since low cost must run power plants constitute less than 50% of the total grid generation and due to limited data availability for a carrying out a dispatch analysis. The average emission factor for the grid for each fuel type was calculated *ex-ante* based on a 3-year full generation-weighted average of the most recent statistics available (2002, 2003, and 2004 at the time of PDD submission). The simple OM emission factor is calculated as 1.0585 tCO_2/MWh.

Due to the non availability of plant specific fuel consumption and electricity generation data in China, the CDM EB guidance for the calculation of the build margin (BM) emission factor in China was followed and the following data were used.

- Use of capacity additions 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 build margin is calculated as follows:

- The capacity additions from the years 2001 to 2004 is chosen and represents 25.69% of total installed capacity.
- The weight of installed capacity additions from thermal power plant is 99.58% of total installed capacity additions.
- The standard coal consumption of 336.66 g SCE/kWh is used as the best technology commercially available in China[i] to determine the BM emission factor.

[i] http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1051.pdf

- There are no data available of installed capacity additions for oil and gas power in NCPG. However, the China Energy Statistics Yearbook of 2004 shows that the oil and gas used in NCPG are very small, and only for starting up systems of coal fired power plants, accounting for 0.7% of the total CO_2 emissions. And the emissions of coal accounted for 99.3%. It is unlikely that there will be significant additions of gas fired power plant in the NCPG during the first crediting period. Hence, considered the installed capacity addition for oil and gas power plant being zero is deemed reasonable.
- The local value of 29.27 GJ/t standard coal equivalent, 25.8 tC/TJ for carbon content of the coal and the IPCC default value of carbon oxidisation factor of 98% are used to calculate the BM.
- The BM is calculated as 0.9035 tCO_2/MWh.

The ex-ante combined margin was calculated using weights of 50:50 and arrived at 0.9810 tCO_2/MWh. The estimated net electricity production is taken from the feasibility study (823 200 MWh/year) and corresponds to the net electricity production of 120 MW with 7000 hours operating time. The GHG calculations are complete and transparent, and their accuracy has been verified.

The baseline emissions have been calculated as 3 362 174 tCO_2e/y.

Leakage:

In line with ACM0008 leakage from various parameters were evaluated and it is demonstrated that leakage effects need not to be considered for the project for the following reasons:

Displacement of baseline thermal energy uses:

There is thermal energy use in the baseline, i.e. the residential usage. A baseline thermal demand analysis has been performed in the PDD. The baseline annual thermal demand for the crediting period is calculated to be about 8 094 600m^3 CH_4, which is quite small compared with the total methane current extracted and vented to the atmosphere (210 000 000m^3CH_4). The baseline thermal demand analysis indicated that there is sufficient CMM to meet the baseline thermal demand and no displacement could occur due to the project activity.

CBM drainage from outside the de-stressed zone:

This project does not involve CBM, and this type of leakage is thus not applicable.

Impact of CDM project activity on coal production:

It has been demonstrated that the CDM project activity does not increase or decrease the coal production. Hence, according to ACM0008, no impact of CDM project activity on coal production needs to be considered. Leakage related to additional coal production due to the project activity does not exist.

Impact of CDM project activity on coal prices and market dynamics:

According to ACM0008, it is not necessary to consider this possibility at this stage.

Emission reductions:

Emission reductions are calculated as the difference between baseline emissions, project emissions and leakage, resulting in an annual emission reduction of 3 016 714 tCO_2e/y.

Uncertainty

The major uncertainty related to the project's emission reductions is the amount of CMM captured in the future. To estimate future CMM, the project owner provided its formal coal production plan for 10 years after project start. Relative emissions are not likely to vary significantly at each mine so gas availability can be reasonably predicted from the product of relative emissions and projected annual coal production levels, given that demand for coal will remain at the same level for at least the crediting period.

3.7 Environmental Impacts

An Environmental Impact Assessment (EIA) has been conducted according to Chinese law & regulation. The project Environment Impact Assessment was done in September 2002 and its supplementary report was finished in July 2004 /8/. The potential environmental impacts have been sufficiently identified. No significant environmental impacts are expected from the project activity. The State Environmental Protection Administration has approved the EIAs of the project activity on 29 January 2003 and 23 August 2004 respectively /9/.

3.8 Comments by Local Stakeholders

A public consultation was conducted in the power plant preparation office of the project owner in August 2003. The local people whose land was acquired for this project and villagers that may be affected by construction and operation of the project attended the meeting. The EIA report was also disclosed to the public in this project office and village communities. The announcement of the report disclosure was made in the local newspaper, Taihang Daily /19/ and the project was supported by a major section of the people. The project participants also assigned a third party carried out monitoring and evaluation on the resettlement in the project. The monitoring and evaluation report indicated that most of the people resettled were satisfied /15/. A summary of comments is provided and verified by DNV.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of 13 June 2006 was made publicly available on DNV's climate change website (www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 11 August to 9 September 2006. The PDD of 10 March 2007 was again made publicly available on DNV's climate change website and comments were invited through the CDM website from 28 March 2007 to 26 April 2007.

No comment was received during this period.

5 VALIDATION OPINION

"Det Norske Veritas Certification AS (DNV) has performed a validation of the "Jincheng Sihe Coal Mine CMM Generation Project" in China. 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 participating Annex I Parties are the Netherlands, Japan and the United Kingdom. All participating 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 ACM0008 "Consolidated baseline methodology for coal bed methane and coal mine methane capture and use for power (electrical and motive) and heat and/or destruction by flaring", version 3.

By burning CMM to generate electricity, the project avoids the venting of CH_4 to the atmosphere and displaces electricity from the fossil fuel dominated grid resulting in reductions of CO_2 emissions. The emission reductions 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 3 016 714 tCO_2e per year over the selected 10-year fixed 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 have been implemented.

In summary, it is DNV's opinion that the "Jincheng Sihe Coal Mine CMM Generation Project" in China, as described in the PDD version 8.0 dated 17 April 2009 meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0008. DNV thus requests the registration of the project as a CDM project activity."

REFERENCES

Documents provided by the project proponent that relate directly to the project:

/1/ CDM PDD version 3 dated 13 June 2006, version 5 dated 10 March 2007, version 07.3 dated 8 January 2008, and version 7.7 dated 24 June 2008, and version 8.0 dated 17 April 2009.

/2/ Letter of Approval issued by DNA of China dated 1 August 2007.

/3/ Letter of Approval issued by DNA of the Netherlands dated 27 April 2007.

/4/ Letter of Approval issued by DNA of Japan dated 31 October 2006.

/5/ Letter of Approval issued by DNA of the United Kingdom dated 8 May 2007.

/6/ China Electric Design And Research Institute: *Revised Feasibility Study Report for Jincheng Sihe CMM power plant*, completed in February 2004

/7/ Development and Reform Commission of Shanxi Province: *Approval of the feasibility study, Document no.: [2004]612*, 18 October 2004.

/8/ Project Environment Impact Assessment in September 2002 and its supplementary report in July 2004.

/9/ Approval letter of the EIA by State Environment Protection Administration respectively on 29 January 2003 and 23 August 2004.

/10/ Approval for the project's accessing to the grid on 8 August 2005

/11/ Shanxi Power Grid Company and Shanxi Jincheng Coal Mine Group Co. Ltd., *Power Purchase Agreement*, 29 December 2007.

/12/ Coal mine gas analysis reports

/13/ Ministry of Finance, Shanxi Provincial Planning Commission, and Asian Development Bank: *Memorandum of Understanding, Coal Mine Methane (CMM) development project, Asian Development Bank Loan Appraisal Mission*, 8 October 2004.
Asian Development Bank: *Report And Recommendation Of The President To The Board Of Directors On A Proposed Loan To The People's Republic Of China For The Coal Mine Methane Development Project*, 16 November 2004
Jincheng Anthracite Coal Mining Group, Co. Ltd. and the International Bank for Reconstruction and Development as trustee for the Prototype Carbon Fund: *Emission Reduction Purchase Agreement*, 1 December 2004.

/13b/ People's republic of China and Asian Development Bank: *Loan agreement (ordinary operations), Coal Mine Methane Development Project*, 24 March 2005

/14/ Training plan for the project

/15/ Monitoring and Evaluation Report on Involuntary Resettlement in the Jincheng CBM Exploration and CMM Power Generation Project, May 2006

/16/ *National Coalmine Safety Regulation*

/17/ China National Planning Commission and China Ministry of Construction, *Methods*

and Parameters for Economic Assessment of Construction Project (version 2) (Valid until August 2006), P115. April 7, 1993.

/18/ China Coal Information Institute (CCII), Optimal Projects for China's Coal Mine Methane Mitigation, 3rd International Methane & Nitrous Oxide Mitigation Conference, Beijing, China, November 2003. http://www.coalinfo.net.cn/coalbed/meeting/2203/papers/coal-mining/001.pdf.

/19/ Tanghang Daily, 28 May 2004 and 31 May 2004

/20/ "Project Construction Start Report" for the Jincheng Sihe Coal Mine CMM Generation Project, 26 January 2007.

/21/ The Ventilation Statement of JMC(2006,1 and 2006,4)

/22/ Gas balance spreadsheet

/23/ CERs estimation spreadsheet of the project

/24/ IRR calculation spreadsheet of the project

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

/25/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/26/ CDM Executive Board: *ACM0008 - Consolidated baseline methodology for coal bed methane and coal mine methane capture and use for power (electrical or motive) and heat and/or destruction by flaring*, version 03, EB 28 meeting

/27/ CDM Executive Board: *Tool for the demonstration and assessment of additionality*, version 03, EB 29 meeting.

/28/ CDM Executive Board: *ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources*, version 06 of 19 May 2006.

Persons interviewed during the validation, or persons who contributed with other information that are not included in the documents listed above:

/29/ Kentaro Yabe, World Bank

/30/ Li Zhanliang, Deputy Chief Accountant, JMC

/31/ Xu Yusheng, Chief Engineer, JMC

/32/ Zhao Bin, Deputy Chief Engineer (vatilation), JMC

/33/ Zhai Ruihong, Environment manager, JMC

/34/ Sun Biao, project manager, JMC

/35/ Li Aimin, operator at pump station, JMC

/36/ Li Jinfang, operator at pump station JMC

/37/ Cheng Zhuo, World Bank

/38/ Duan Maosheng, Global Institute of Climate Change, Tsinghua University.

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APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion	Cross Reference / Comment
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	Table 2, Section E.4.1
2. 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	~~CAR 1~~ OK	The Letter of approval by DNA of China has been received.
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK	Table 2, Section E.4.1
4. 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	~~CAR 1~~ OK	The Letters of approval by the DNA of China has been received.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	~~CL 4~~ ~~CL 5~~ ~~CL 6~~ OK	Table 2, Section B.2
7. 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	~~CL 1~~ OK	~~Public funding is involved in the project (one of the buyers is the Netherlands government). A letter is needed from Netherlands government that the fund used in the project will not lead to the diversion of ODA towards~~

Requirement	Reference	Conclusion	Cross Reference / Comment
			~~China.~~ The State of the Netherlands confirms that any public funding used to participate in the PCF and NCDMF does not result in a diversion of official development assistance and is separate from and is not counted towards its financial obligations as a Party included in Annex I
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures §29	OK	The DNA of China is the National Development and Reform Commission. The DNA of Netherlands is the Ministry of Housing, Spatial Planning and the Environment. The DNA of Japan is Cabinet Secretariat, Assistant Chief Cabinet Secretary. The DNA of United Kingdom is the Ministry of Environment, Food and Rural Affairs.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	OK	China is a Party to the Kyoto Protocol and has ratified it on 30 August 2002. Netherlands ratified the Kyoto Protocol on 31 May 2002. Japan ratified Kyoto Protocol on 4 June 2002. United Kingdom ratified Kyoto Protocol on 31 May 2002.
10. The participating Annex I Party's assigned amount shall have	CDM Modalities and	OK	The assigned amount of the

Requirement	Reference	Conclusion	Cross Reference / Comment
been calculated and recorded	Procedures §31b		Netherlands and United Kingdom is 92% of the emissions in 1990. The assigned amount of Japan is 94% of that in 1990.
11. 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	All the 3 Annex I Parties have in place a national registry and report to UNFCCC regularly on its GHG inventories.
12. 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	Table 2, Section G
13. 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	Table 2, Section F
14. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board	CDM Modalities and Procedures §37e	OK	Table 2, Section B.1.1 and D.1.1
15. 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, Section D
16. 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	The PDD has been published on DNV's website and Parties, stakeholders and NGOs have the the CDM website been invited to provide comments on the validation requirement during a period of 30 days, from 11 August 2006 until 9 September 2006. The PDD of

Requirement	Reference	Conclusion	Cross Reference / Comment
			10 March 2007 was again made publicly available on DNV's climate change website and comments were invited through the CDM website from 28 March 2007 to 26 April 2007. No comment was received.
17. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	CDM Modalities and Procedures §45c,d	OK	Table 2, Section B.2
18. 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	Table 2, Section B.2
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format	CDM Modalities and Procedures Appendix B, EB Decision	OK	The project design document uses UNFCCC CDM-PDD template version 3.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A. General Description of Project Activity *The project design is assessed.*					
A.1. Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR I	Yes. The project is located at the Sihe Coal Mine, Qinshui County, Jincheng City, Shanxi Province of China. The east longitude is 112°31'10" and the north latitude is 35°35'15".		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR I	The system boundaries include ● All equipment installed and used as part of the project activity for the extraction, compression and storage of CMM at the project site and transportation of CMM to gas engines. ● Power and heat generation facilities installed and used as part of the project activity. ● Power plants connected to the electricity grid, where the project activity exports power to the grid, as per the definition of project electricity system and connected electricity system given in ACM0002.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A.2. Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.*					
A.2.1. Does the project design engineering reflect current good practices?	/1/	DR I	Yes. The project design engineering reflects current good practices. The project is to utilize the gas extracted to produce electricity, including constructing a power plant at Sihe mine. The descriptions of the power generation and waste heat technology, e.g. their specifications, are not sufficient. Please also clarify whether there is waste heat recovery and whether CERs has been claimed from it.	~~CL 2~~	OK
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR I	Yes. see also A.2.1	~~CL 2~~	OK
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR	No.		OK
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/ /14/	DR I	Yes. The project requires extensive initial training.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Training plan and training records for the project has not been identified.	~~CL 3~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A.3. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/ /7/ /9/	DR	Yes. The project is line with all the national and local legislation and plans. The project has been approved by the local government on 18 October 2004.		OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/	DR	Yes. The project is line with China's specific CDM requirements. But formal LoA from DNA of China has not yet been obtained.	~~CAR 1~~	OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	Yes. The project is line with the sustainable development policies of China. But the formal LoA from Chinese DNA has not yet been obtained.	~~CAR 1~~	OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The local environment will directly benefit from the project. It will also increase the safety at the coal mine. Considerable employment will also be created by the project.		OK
B. Project Baseline *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
B.1. Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
B.1.1. Is the baseline methodology previously	/1/	DR	Yes. The project is using ACM0008		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
approved by the CDM Executive Board?			"Consolidated baseline methodology for coal bed methane and coal mine methane capture and use for power (electrical and motive) and heat and/or destruction by flaring" (version 03).		
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR	Yes. The project is located at existing underground coal mines, which will utilize the extracted coal mine gas for power generation. Prior to the project, the baseline scenario represents the partial or total release of the CMM to the air. The project meets all the applicability requirements of ACM0008.		OK
B.2. Baseline Determination *The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.*					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/ /6/ /11/ /16/ /17/	DR	Yes. The application of the methodology and the discussion and determination of the chosen baseline is transparent. The baseline is chosen in line with the methodology: Step 1: Identify all technically feasible options for capture and/or using of CMM; All possible options for CMM treatment need to be identified and elaborated. In the PDD, please: 1) Clarify whether there is	~~CL 4~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			waste heat recovery involved in the project; 2) Identify possible heat production in the baseline 3) Clarify whether emission reductions from waste heat utilization will be claimed. Step 2: Eliminate baseline options that do not comply with legal or regulatory requirements; Step 3: Formulate baseline scenario alternatives; Step 4: Eliminate baseline scenario that faces prohibitive barriers; Step 5: Identify most economically attractive baseline scenario alternative. During the site visit, a 15 MW captive power plant utilizing CMM has been identified. However, there is a lack of description of the baseline situation in the PDD.	~~CL 5~~ ~~CL 6~~	
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/	DR	See B.2.1	~~CL 4~~ ~~CL 5~~ ~~CL 6~~	OK
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR	Yes.		OK
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /16/	DR	Yes. The baseline scenario has taken into account all relevant national and sectoral policies, including the *National Coalmine Safety Regulation*, *Coalmine Methane Treatment and Utilization Macro Plan*. The		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			macro-economic trends and political aspirations are also taken into account.		
B.2.5. Is the baseline determination compatible with the available data?	/1/	DR	Yes. The baseline is determined using data available.		OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR	No. See also B.2.1	~~CL 4~~ ~~CL 5~~ ~~CL 6~~	OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/ /6/ /11/ /17/	DR	The PDD is using the Tool for demonstration and assessment of additionality version 03 to justify its additionality. But the following is requested: a. Evidence on the starting date of the project activity b. Date of the MOU with ADB (Evidence demonstrating that CDM benefits were seriously considered in the decision to proceed with the project) c. Please provide the IRR calculation spreadsheet d. A proper justification of the sale price of CMM.	~~CL 7~~	OK
B.2.8. Have the major risks to the baseline been identified?	/1/	DR	Yes. The major risk to the baseline is the decrease of the coal production, which will lead to the decrease of the methane drainage amount.		OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Yes.		OK
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*					
C.1.1. Are the project's starting date and operational	/1/	DR	The operational lifetime is 25 years.	~~CL 8~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
lifetime clearly defined and reasonable?			The starting data of the project needs to be specified and relevant evidence needs to be provided.		
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	Yes. A fixed crediting period is chosen, starting from 1 September 2008 or the date of registration, whichever is later.		OK
D. Monitoring Plan *The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).*					
D.1. Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/1/	DR	Yes. ACM0008 (Version 03) is applied.		OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/	DR	Yes. The project meets all applicability requirements of the methodology and the PDD properly justify the application of the methodology.		OK
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/	DR	Yes.		OK
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/1/	DR	Yes.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.2. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	Yes. The project emissions will be determined based on the CO_2 emissions resulting from the utilization of CMM by the project, additional energy used in the project and un-combusted methane. The methane flow, concentration will be monitored and archived. The value for r (relative proportion of NMHC to the methane concentration) will also to be monitored.		OK
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR I	The choice of the indicators are reasonable and in line with the methodology.		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR I	The specific project emission indicators are possible to be monitored. The developer will install instruments to monitor the amount of CMM sent to gas engines and boilers - its flows and CH_4 concentrations. The energy (electricity) consumed by the project will also need to be monitored. The major specifications of the monitoring instruments, such as accuracy of the methane concentration, need to be stated clearly in the PDD.	~~CL 9~~	OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR I	See D.2.3	~~CL 9~~	OK
D.2.5. Will the indicators enable comparison of project	/1/	DR	Yes.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
data and performance over time?		I			
D.3. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR I	According to the methodology, only 3 types of leakage need to be addressed. 1. the displacement of baseline thermal energy use; 2. CBM extraction from out of the de-stressed zone; 3. impact of CDM project activity on coal production if the project activity is CBM/CMM extraction and the baseline scenario is ventilation only For the project, there is no CBM extraction in the project and the baseline scenario is not ventilation only. However, during the site visit, thermal energy usage has been found in the baseline case. Hence, a baseline thermal demand analysis is needed to demonstrate that there will be sufficient CMM to satisfy any possible fluctuation in baseline thermal demand.	~~CL 10~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.4. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR I	According to the monitoring plan, the project owner will monitor: (1) CMM captured, sent to and destroyed in the project activity that would be released to the atmosphere in the baseline; (2) electricity replaced by the project. The OM and BM emission factors applied to determine the displacement of emissions due to the project's electricity generation are determined *ex- ante* in accordance with ACM0002 (version 6).		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR I	Yes. The choice of the baseline indicators is in line with the monitoring methodology and deemed reasonable.		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR I	Yes. It is possible to monitor / measure these indicators.		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR I	Yes.		OK
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning	/1/	DR	The monitoring methodology ACM0008 and the DNA of China does not require the		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
environmental, social and economic impacts?			monitoring of indicators related to sustainable development.		
D.6. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
D.6.1. Is the authority and responsibility of project management clearly described?	/1/	DR I	Yes. the authority and responsibility of project management are clearly described.		OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR I	Yes.		OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1/	DR I	No	~~CL 11~~	OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR I	No	~~CL 11~~	OK
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR I	No	~~CL 11~~	OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR I	No	~~CL 11~~	OK
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR I	No	~~CL 11~~	OK
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR I	No	~~CL 11~~	OK
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR I	No	~~CL 11~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR I	No	~~CL 11~~	OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR I	No	~~CL 11~~	OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1/	DR I	No	~~CL 11~~	OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR I	No	~~CL 11~~	OK
E. Calculation of GHG Emissions by Source *It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.*					
E.1. Project GHG Emissions *The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.*					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/	DR	Yes. All aspects related to direct and indirect GHG emissions are included in the design: (1) additional energy used in the project; (2) combustion emission from the end use of the captured CMM; (3) un-combusted methane from end use. Please clarify how the additional energy used in the project is estimated.	~~CL 12~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Yes. The GHG calculations are documented in a complete and transparent manner.		OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/1/	DR	Yes. The efficiencies of methane destruction for power generation are in compliance with the IPCC default values.		OK
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	/1/	DR	Yes.		OK
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/1/	DR	Yes. The calculation is in line with the methodology. All sources and gases are listed. The project owner has provided a current gas analysis report, indicating that concentration of NMHC is less than 1% so that emission from NMHC could be excluded from the calculation.		OK
E.2. Leakage *It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed and estimated ex-ante.*					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/1/	DR	The project's baseline is not ventilation only and no CBM capture and utilization is involved. Hence, no leakage effects need to be addressed. See also in D.3.1.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.3. Baseline Emissions *The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.*					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/	DR	Yes. The baseline emissions are the methane released into the atmosphere in absence of the project. The gas flow and methane concentration of the CMM captured and utilised by the project will be used to calculate these emissions. Moreover, baseline emissions are the emission from power/heat generation replaced by the project. Power (kWh) produced by the project will be used for the calculation.		OK
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR	Yes. The baseline boundaries are clearly defined and all sources have been covered. The baseline boundaries include the methane released to the atmosphere which is avoided in the project activity and the power generation replaced by the project. For power generation, the baseline boundary is the North China Power (Regional) Grid (NCPG). The choice of the grid has been properly justified.		OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Yes. The calculation is documented in a complete and transparent manner.		OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR	Yes. Conservative assumptions have been used when calculating baseline emissions. For the replaced electricity in NCPG, the CEF is calculated and determined ex-ante		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			in accordance with ACM0002 (Version 06).		
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR	Yes. The baseline emission will mainly depend on the future coal production rate, gas content of the coal, mining method and coal permeability.		OK
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/1/	DR	Yes.		OK
E.4. Emission Reductions *Validation of ex-ante estimated emission reductions*.					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1/	DR	Yes.		OK
F. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/		Yes. The analysis of environmental impacts has been sufficiently described in the PDD.		OK
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /8/ /9/	DR	Yes. There are requirements for an EIA for such projects in China. The project performed an EIA in September 2002 and another supplementary EIA in July 2004. Both EIAs has been approved by the State Environment Protection Administration (SEPA).		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	According to the EIA reports, the project will not cause any adverse impacts to the environment.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	No transboundary environmental impacts are identified according to the EIA reports.		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	Yes.		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR	Yes. The project's EIA reports have been approved by SEPA.		OK
G. Stakeholder Comments *The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.*					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR I	Yes. The local people whose land was acquired for this project and villagers that may be affected by construction and operation of the project have been consulted.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/ /19/	DR I	Yes. A public consultation was conducted in the Power Plant Preparation Office of the project owner in August 2003. The EIA report was also disclosed to the public in this project office and village communities. The announcement of the report disclosure was made in the local newspaper, Taihang Daily.		OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/ /15/	DR	Yes. The stakeholder consultation process was carried out in accordance with the relevant regulations/laws. The project participants also assigned a third party carried out monitoring and evaluation on the resettlement in the project. The monitoring and evaluation report indicated that most of the people		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			resettled were satisfied.		
G.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	Yes.		OK
G.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR I	90% of local residents supported this project and the left 10% people didn't indicate their opinions. No amendment to the project design was needed according to the comments received.		OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
CAR 1 The formal LoA from DNA of China has not been obtained.	A.3.2 A.3.3	The LoA from China DNA has already been provided.	OK. The Letter of Approval by DNA of China has been obtained, dated 1 August 2007. The CAR is closed.
CL 1 Public funding is involved in the project (one of the buyers is the Netherlands government). A letter is needed from Netherlands government that the fund used in the project will not lead to the diversion of ODA towards China.		A letter from the Netherlands Government stating that the fund used in the project will not lead to the diversion of ODA towards China has already been provided.	OK. The State of the Netherlands confirms that any public funding used to participate in the PCF and NCDMF does not result in a diversion of official development assistance and is separate from and is not counted towards its financial obligations as a Party included in Annex I in the Written Approval for the proposed project. The CL is closed.
CL 2 The descriptions of the power generation and waste heat technology, e.g. their specifications, are not sufficient. Please also clarify whether there is waste heat recovery and whether CERs has been claimed from it.	A.2.1	The specifications of the power generation and waste heat technology have been added in section A4.3 of the PDD. Waste heat from the power generation process is recovered and utilized for domestic purposes; however, to be conservative, CERs will not be claimed for this component.	OK. The detailed description of the power generation and waste heat technology has been included in the PDD. The emission reductions for the waste heat recovery will not be claimed for this project. The CL is closed.
CL 3 Training plan and training records for the project has not been identified.	A.2.5	Training plan and training records has been identified in the "CDM Project Management and Operating Procedures" which has already been provided to the DOE.	OK. The *CDM Project Management and Operating Procedures* has been verified. Training plan and training records are included in it. The CL is closed.
CL 4	B.2.1	All possible options for CMM treatment	OK.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
All possible options for CMM treatment need to be identified and elaborated.		have been identified and discussed in details in the PDD.	Relevant discussions have been included in the PDD. The CL is closed.
CL 5 In the PDD, please: 1) Clarify whether there is waste heat recovery involved in the project; 2) Identify possible heat production in the baseline; 3) Clarify whether emission reductions from waste heat utilization will be claimed.	B.2.1	1) Waste heat from the power generation process is recovered and utilized for domestic purposes; however, to be conservative, CERs will not be claimed for this component. 2) Since no CER will be claimed from the waste recovery and utilization, there's no need to discuss heat production scenarios in the baseline. 3) No CER will be claimed from the waste heat recovery and utilization component.	OK. The CL is closed.
CL 6 During the site visit, a 15 MW captive power plant utilizing CMM has been identified. However, there is a lack of description of the baseline situation in the PDD.	B.2.1	The revised PDD describes the 15MW captive power plant utilizing CMM. The existing power generation unit utilized decommissioned aircraft engine and was firstly installed in 2000 and completed in 2003. The efficiency of the existing unit is 0.437 m^3/kWh (pure CH_4), 87% lower than that of the power technology utilized in this project, i.e. 0.234 m^3/kWh (pure CH_4).	OK. The low efficient 15MW captive power plant utilizing CMM has been described in the PDD. A gas balance analysis /22/has also been verified. It shows that there is still CMM venting besides the baseline thermal demand, text captive power plant CMM demand and the CMM consumed by the proposed project. The CL is closed.
CL 7 The following is requested: 1) Evidence on the starting date of the project	B.2.7	1) Approval of the Construction Start has been provided. 2) The MOU with the ADB has been	OK. The Approval of Construction Start of the Jincheng Sihe Coal Mine CMM Generation

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
activity 2) Date of the MOU with ADB (Evidence demonstrating that CDM benefits were seriously considered in the decision to proceed with the project) 3)Please provide the IRR calculation spreadsheet		provided and the date is Sept, 2004. 3) IRR calculation spreadsheet has been provided.	Project /20/ has been verified. The date of MOU with ADB has been specified. The IRR calculation has been verified and deemed to be reasonable. The CL is closed.
CL 8 The starting date of the project activity needs to be specified and the relevant evidence is also needed**.**	C.1.1	Approval of the Construction Start has been provided and the specific data is specified.	OK. The Approval of Construction Start of the Jincheng Sihe Coal Mine CMM Generation Project /20/ has been verified. The construction start date is 25 January 2007. However, the project start date has been revised to 24 March 2005, the date of the loan agreement between the Chinese Government and the Asian Development Bank, see reference /13b/. The CL is closed.
CL 9 The energy (electricity) consumed by the project will also need to be monitored. The major specifications of the monitoring instruments, such as accuracy of the methane concentration, need to be stated clearly in the PDD.	D.2.3	The energy (electricity) consumed by the project will be from the electricity generated by the project, CERs will only be claimed for net electricity delivered to the grid by this project, thus there's no need for monitoring. The major specifications of the monitoring instruments, such as accuracy of the methane concentration, have been stated in the PDD and the Monitoring Plan.	OK. The electricity consumed by the project will be deducted from the electricity generated. The net electricity supplied to the grid will be monitored and used in emission reductions calculation. The relevant information of the monitoring instruments has been included in the PDD. The CL is closed.
CL 10 Thermal energy usage has been found in the	D.3.1	A techno-economic analysis has been conducted to analyze possible future	OK. The baseline thermal demand analysis

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
baseline. Hence, a baseline thermal demand analysis is needed to demonstrate that there will be sufficient CMM to satisfy any possible fluctuation in baseline thermal demand.		thermal demand, and as elaborated in the PDD, the implementation of this project will not affect the baseline thermal demand.	has been verified. Under conservative assumptions, the baseline annual thermal demand in the crediting period is estimated to be be about 8 094 600m^3 CH4, which is quite small compared with the total methane current extracted and vented to the atmosphere (210 000 000 m^3 CH_4). A gas balance analysis has also been verified. It shows that there is still CMM venting besides the baseline thermal demand, text power plant CMM demand and the CMM consumed by the proposed project. The CL is closed.
CL 11 Procedures related to the training of monitoring personnel, calibration of monitoring instruments, data handling, emergency treatment, and so on are not ready.	D.6	A "CDM Project Management and Operating Procedures" has been provided and the training of monitoring personnel, calibration of monitoring instruments, data handling, emergency treatment, etc. are described in details in that document.	OK. The relevant procedures have been included in the *CDM Project Management and Operating Procedures*, which has been verified. The CL is closed.
CL 12 Please clarify how the additional energy used in the project is estimated?	E.1.1	The energy (electricity) consumed by the project will be from the electricity generated by the project, CERs will only be claimed for net electricity delivered to the grid by this project. Electricity consumption of this project has already been considered in estimating the amount of net electricity to be delivered by this project to the grid, which has been used to estimate	OK. The electricity consumed by the project will be deducted from the electricity generated. The net electricity supplied to the grid will be monitored and used for emission reductions calculation. The CL is closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		the emission reductions.	

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APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Mindy (Ming) Yue

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

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 5 January 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Weidong Yang

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

GHG Auditor:	Yes		
CDM Validator:	--	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Tim Kuo

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

GHG Auditor:	Yes		
CDM Validator:	--	***JI Validator:***	--
CDM Verifier:	Yes	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 30 October 2007

Michael Lehmann
Techncal Director, International Climate Change Services

Chao Zhu

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

GHG Auditor:	--		
CDM Validator:	--	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	8		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Raman Venkata Kakaraparthi

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

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	Yes	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 5		
Technical Reviewer for (group of) methodologies:			
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes		

Høvik, 30 October 2007

Michael Lehmann
Technical Director, International Climate Change Services

Ole Andreas Flagstad

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

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:		***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):			
Technical Reviewer for (group of) methodologies:			
ACM0008	Yes		

Høvik, 2 May 2008

Michael Lehmann
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CERTIFICATE OF COMPETENCE

Wei Li

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:		Yes				
Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas						
Renewables	*Hydro power*					
	Wind power					
	Other renewable					
Biomass						
Grid connection of isolated system						
Cement						
Waste-heat / waste-gas recovery						
Efficiency of thermal power plants						
Coal mine methane						
Fuel switch						
Manure management						
Waste / wastewater treatment						
Energy efficiency						
N_2O						
HFCs						
Flare reduction						
PFCs						
Charcoal						
CO_2 recovery						
Transport						
Non-renewable biomass						
Biofuel						
Pipeline leakage reduction						
SF_6						

Høvik, 1 July 2008

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services

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Tonje Folkestad

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:		Yes				
Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas						
Renewables	*Hydro power*					
	Wind power					
	Other renewable					
Biomass						
Grid connection of isolated system						
Cement						
Waste-heat / waste-gas recovery						
Efficiency of thermal power plants						
Coal mine methane						
Fuel switch						
Manure management						
Waste / wastewater treatment						
Energy efficiency						
N_2O						
HFCs						
Flare reduction						
PFCs						
Charcoal						
CO_2 recovery						
Transport						
Non-renewable biomass						
Biofuel						
Pipeline leakage reduction						
SF_6						

Høvik, 9 January 2009

Michael Lehmann

Technical Director, Climate Change Services