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# VALIDATION REPORT

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## Danling Coal Mine Methane Power Generation Project in Jincheng City Shanxi Province, China

REPORT NO. 2008-9118

REVISION NO. 02



# VALIDATION REPORT

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CERTIFICATION AS

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Approved by: Michael Lehmann	Organisational unit: Climate Change Services
Client: EEA Fund Management	Client ref.: Ms. Da Fei Huang

**Project Name:** Daning Coal Mine Methane Power Generation Project in Jincheng City Shanxi Province, China

**Country:** China

**Methodology:** ACM0008

**Version:** 03

**GHG reducing Measure/Technology:** Coal Mine Methane capture and utilization, electricity generation and displacement.

**ER estimate:** Annual emission reductions are 416 565 tCO<sub>2</sub>e during the first seven years crediting period.

**Size**

☒ Large Scale

☐ Small Scale

**Validation Phases:**

☒ Desk Review

☒ Follow up interviews

☒ Resolution of outstanding issues

**Validation Status**

☐ Corrective Actions Requested

☐ Clarifications Requested

☒ Full Approval and submission for registration

☐ Rejected

In summary, it is DNV's opinion that the Daning Coal Mine Methane Power Generation Project in Jincheng City Shanxi Province, China, as described in the PDD of 17 May 2008, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0008. DNV thus requests the registration of the project as a CDM project activity.

Report No.: 2008-9118	Date of this revision: 2008-06-25	Rev. No. 02
Report title: Daning Coal Mine Methane Power Generation Project in Jincheng City Shanxi Province, China		
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Key words:

Climate Change

Kyoto Protocol

Validation

Clean Development Mechanism

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### Abbreviations

BM	Building Margin
CAR	Corrective Action Request
CBM	Coal Bed Methane
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH <sub>4</sub>	Methane
CL	Clarification request
CMM	Coal Mine Methane
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
DRC	Development and Reform Committee
EIA	Environmental Impact Assessment
EPB	Environmental Protection Bureau
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
N <sub>2</sub> O	Nitrous oxide
NDRC	National Development and Reform Committee
NGO	Non-governmental Organisation
NMHC	Non Methane Hydro Carbon
ODA	Official Development Assistance
OM	Operation Margin
PDD	Project Design Document
SCE	Standard coal equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VAM	Ventilation Air Methane



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Appendix A: Validation Protocol

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### 1 EXECUTIVE SUMMARY – VALIDATION OPINION

*Det Norske Veritas Certification AS (DNV) has performed a validation of the Daning Coal Mine Methane Power Generation Project in Jincheng City Shanxi Province, 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 Annex I Party is the United Kingdom. Both Parties fulfil the participation criteria and have approved the project and authorized the project participants. The DNA from China confirmed that the project assists in achieving sustainable development.*

*The project correctly applies 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 in gas engines, the project will displace grid electricity generated from fossil fuel and will avoid the emission of CMM which was passively vented. Hence, the project results in reductions of CH<sub>4</sub>/CO<sub>2</sub> emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.*

*The total emission reductions from the project are estimated to be on the average 416 565 tCO<sub>2</sub>e per year over the selected 7 year 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 Daning Coal Mine Methane Power Generation Project in Jincheng City Shanxi Province, China, as described in the PDD of 17 May 2008, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0008. DNV thus requests the registration of the project as a CDM project activity.*



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### 2 INTRODUCTION

EEA Fund Management has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the Daning Coal Mine Methane Power Generation Project in Jincheng City Shanxi Province, China project (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board.

#### 2.1 Objective

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

#### 2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0008. The validation team has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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



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### 3 METHODOLOGY

The validation consisted of the following three phases:

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

The following sections outline each step in more detail.

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

The following table lists the documentation that was assessed during the validation:

- /1/ PDD of Daning Coal Mine Methane Power Generation Project in Jincheng City Shanxi Province, China, Version 01, dated 10 May 2007, and Version 02, dated 17 May 2008.
- /2/ Daning CMM Power Generation Project Feasibility Study Report dated August 2004. Feasibility study report for Daning CMM power plant dated February 2005 and Approval the feasibility study reports by Jincheng Planning Committee dated 07 June 2005.
- /3/ Environment Impact Assessments dated 16 October 2004 and approval letter by Environmental Protection Bureau of Jincheng dated 9 November 2004.  
Environment Impact Assessments dated September 2007 and approval letter by Environmental Protection Bureau of Jincheng dated 1 November 2007.
- /4/ Jincheng City Fengrun CMM Utilization Co., Ltd., Letter to Jincheng Municipal CMM and Natural Gas Utilisation Development Committee dated 10 January 2005.
- /5/ Host Party approval letter by DNA of China dated 26 August 2007.
- /6/ Annex 1 Party approval letter by DNA of United Kingdom dated 19 October 2007.
- /7/ The construction contract signed between Jincheng City Fengrun CMM Utilization Co., Ltd. and the construction company for this project (Henan Jiaying Construction Municipal Engineering Co., Ltd.) dated 11 December 2005.
- /8/ CER purchase term sheet signed on 1 August 2007.
- /9/ The stockholders for Daning Coalmine  
<http://economy.enorth.com.cn/system/2007/09/14/001970705.shtml>
- /10/ Verification Report for the registered capital of the project participant issued by Shanxi Jincheng Dingkun Auditing Firm dated 10 August 2001.
- /11/ Jincheng Engineering Consultancy Centre, Research Report for the CMM Extraction and Utilization in Coalmines dated February 2005.
- /12/ Economic Research Centre for the Shanxi Provincial Government, The 4<sup>th</sup> Quarter Price Projection Report (2005).  
<http://www.sxnem.gov.cn/view.asp?ArticleID=1826>



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- /13/ Price connection between electricity and coal dated 23 June 2007.  
<http://finance.21cn.com/news/cjyw/2007/06/23/3311433.shtml>
- /14/ Electricity price in China dated 1 July 2005.  
<http://www.china.org.cn/english/2006/Jul/173343.htm>
- /15/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*.  
<http://www.ieta.org/ieta/www/pages/index.php?IdSitePage=200>
- /16/ ACM0008, *Consolidated baseline/monitoring methodology for coal bed methane and coal mine methane and use for power (electricity or motive) and heat and/or destruction by flaring*. Version 3
- /17/ CDM Executive Board, *Tool for the demonstration and assessment of additionality*, Version 3.
- /18/ CDM Executive Board: *ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources*, version 06 of 19 May 2006.
- /19/ CDM EB, Answer to DNV's request for deviation of Chinese project activities from AM0005, received on 1 December 2005. To be found on  
<http://cdm.unfccc.int/Projects/Deviations>
- /20/ *National Coalmine Safety Regulation (2005)*.
- /21/ China NDRC, *Coalmine Methane Treatment and Utilization Macro Plan*, June 2005.
- /22/ *Interim Rules on the Installation and Management of Small-scale Fuel-fired Generators* (issued in August 1997).
- /23/ National Development and Reform Committee (NRDC) and Department of Construction, *Economical Assessment and Parameters for Project Development*, version 3, 2006.
- /24/ The increasing returns in coalmine sector  
<http://stock1.jrj.com.cn/news/2005-02-22/000001021751.html>
- /25/ The consumer price in China  
<http://www.chinanews.com.cn/news/2005/2005-03-31/26/557586.shtml>.
- /26/ Chinese Labour Income  
[http://news.xinhuanet.com/fortune/2006-05/26/content\\_4602492.htm](http://news.xinhuanet.com/fortune/2006-05/26/content_4602492.htm)
- /27/ Jincheng Price Bureau, Notice on CMM Price, 24 November 2003.
- /28/ Methane to Markets Partnership Coal Subcommittee, *China, CMM Global Overview*.
- /29/ The filled local stakeholders' questionnaires dated 1<sup>st</sup> to 20<sup>th</sup> April 2007.
- /30/ [cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1365.pdf](http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1365.pdf) (BM calculation).
- /31/ [cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1358.xls](http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1358.xls) (OM calculation).
- /32/ [cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1364.pdf](http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1364.pdf) (Grid determination).
- /33/ China Electric Power Yearbooks 2003 – 2006.
- /34/ China Energy Statistics Yearbooks 2004 – 2006.





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/35/ 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

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

- Project title changed to conform to that in the LoAs;
- More detailed information about formulating baseline scenario alternatives;
- More detailed information about CMM utilization in the baseline scenario.

### 3.2 Follow-up Interviews with Project Stakeholders

On 6 September 2007, DNV performed the interviews to resolve the issues identified during the desk review of the project design document. Representatives of EEA Fund Management and Jincheng City Fengrun CMM Utilization Co., Ltd. were interviewed.

	Date	Name	Organization	Topic
/36/	6 September 2007	Da Fei Huang	EEA Fund Management Ltd	<ul style="list-style-type: none"> <li>➤ Applicability of selected methodology ACM0008</li> <li>➤ Baseline determination of the project</li> <li>➤ Issues related to the additionality</li> <li>➤ Common practice analysis</li> <li>➤ Emission reductions calculation</li> <li>➤ Emission reduction monitoring plan and project management</li> </ul>
/37/	6 September 2007	Zhong Zhi Zhang Yao Jin Liu	FengRun CMM Utilization Ltd	<ul style="list-style-type: none"> <li>➤ Information of project construction</li> <li>➤ The development of CMM utilization projects in China</li> <li>➤ Starting date of project and crediting period</li> <li>➤ The approval status (incl. EIA approval, the feasibility study report approval, CDM project approval)</li> <li>➤ Technology utilized</li> <li>➤ Historical gas venting/drainage</li> <li>➤ Risks and barriers for</li> </ul>



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- investment and technology
- Training and detailed procedures and records.
- Emission reduction monitoring plan and implementation
- Consulting process for stakeholders' comments

### 3.3 Resolution of Outstanding Issues

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

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

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the Daning Coal Mine Methane Power Generation Project in Jincheng City Shanxi Province, China is enclosed in Appendix A to this report.

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

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

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



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

  

<i>Validation Protocol Table 2: Requirement checklist</i>				
<i>Checklist Question</i>	<i>Reference</i>	<i>Means of verification (MoV)</i>	<i>Comment</i>	<i>Draft and/or Final Conclusion</i>
<i>The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>This is either acceptable based on evidence provided (OK), or a <b>corrective action request (CAR)</b> due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.</i>

  

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

**Figure 1 Validation protocol tables**



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### 3.4 Internal Quality Control

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

### 3.5 Validation Team

<i>Role/Qualification</i>	<i>Last Name</i>	<i>First Name</i>	<i>Country</i>
Team Leader, CDM validator	Yang	Weidong	China
CDM validator	Yue	Mindy	China
Sector expert	Lehmann	Michael	Norway
Technical reviewer	Flagstad	Ole Andreas	Norway
Technical reviewer (applicant)	Sun	Shuyong	China

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



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### 4 VALIDATION FINDINGS

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

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation.

#### 4.1 Participation Requirements

The project participants are Jincheng City Fengrun CMM Utilization Co., Ltd. of China and Trading Emissions PLC of the United Kingdom. The host Party China and the participating Annex I Party the United Kingdom meet the requirements to participate in the CDM.

The DNA of China has issued a Letter of Approval (LoA) /5/ on 26 August 2007, authorizing Jincheng City Fengrun CMM Utilization Co., Ltd. as a project participant and confirming that the project assists in achieving sustainable development.

The DNA of the United Kingdom has issued a LoA /6/ on 19 October 2007 authorizing Trading Emissions PLC as a project participant.

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

#### 4.2 Project Design

The proposed project aims to utilize purchased coal mine methane (CMM) through gas fired engines to generate electricity. The project consists of 9 sets of 500 kW, 13 sets of 600 kW, and 2 sets of 2 MW electricity generators (total 16.3 MW) located at the Daning coalmine, Yangcheng county Jincheng city Shanxi province, China. On an annual basis, the project is expected to utilize 65 721 600 cubic meters gas, generate 93 888 MWh electricity and supply 93 240 MWh electricity to the North China Power Grid. The annual emission reductions of the project are estimated to be 416 565 t CO<sub>2</sub>e.

The project participant needs to pay for the CMM to the Daning coalmine, as they are independent entities:

- Daning coalmine is owned by Shanxi Asian American-Danang Energy Co. (SAADEC). SAADEC is a joint venture, 56% owned by Asian American Coal, which comprises US energy firms and financial institutions, 36% owned by Shanxi Lanhua Sci-Tech Venture Co. Ltd and 8% by Shanxi Coal Transportation and Sales Corp /9/.
- Jincheng City Fengrun CMM Utilization Co., Ltd. (the project participant) is owned by Shanxi Jincheng Coal Advanced New Technology Service Center and more than 50 private persons, with three private persons holding more than 10% of the total shares respectively and all other private persons and Shanxi Jincheng Coal Advanced New Technology Service Center holding less than 7% of the total shares respectively, as evidenced by the Verification Report for the registered capital of the project participant issued by Shanxi Jincheng Dingkun Auditing Firm dated 10 August 2001 /10/



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DNV was able to confirm the above statements by checking the evidences provided.

The generators are manufactured in China; no foreign technology transfer is involved. Proper training was planned and provided to ensure the normal operation and monitoring of the facilities.

The project starting date was 11 December 2005. The selected date is the date on which the construction contract was signed /7/. The expected operational lifetime of the project is 20 years, which is considered reasonable. A 7-year renewable crediting period starting from 1 September 2008 or the date of registration, whichever is later, is selected.

### 4.3 Baseline Determination

The project applies the approved baseline methodologies ACM0008 (version 03) “Consolidated baseline/monitoring methodology for coal bed methane and coal mine methane and use for power (electricity or motive) and heat and/or destruction by flaring” which is linked to sectoral scopes 8 and 10 /16/. The project also applies the approved baseline methodologies ACM0002 (version 06) “*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*” which is linked to sectoral scope 1 /18/.

DNV was able to verify that the project meets all applicability criteria of the baseline methodologies:

- Daning coalmine is an underground working coal mines.
- The baseline is total atmospheric release of the CMM.
- The project will drain and capture CMM.
- The captured CMM will be utilized to generate electricity.
- No CBM drainage will be involved in the project.

In accordance with ACM0008 the baseline is determined through the following steps:

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

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 alternatives that face prohibitive barriers

Step 5. Identify most economically attractive baseline scenario alternative

In step 1, four options for CMM extraction, nine options for extracted CMM treatment, and three options for energy production are identified. These options are technically feasible and conform to the requirements of ACM0008 and project’s situation.

In step 2, three relevant regulatory requirements /20/ /21/ /22/ are identified for the baseline options’ assessment. The following are the assessment results:

- According to one of these, National Coalmine Safety Regulation /20/, only one of the identified options of CMM extraction complies with the requirements of the regulation;



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- According to another regulation, *Interim Rules on the Installation and Management of Small-scale Fuel-fired Generators /22/*, only two of the three options for energy production are eligible;
- According to the requirements in the two regulations, National Coalmine Safety Regulation /20/ and *Coalmine Methane Treatment and Utilization Macro Plan /21/*, all options for extracted CMM treatment comply with the requirements (refer to section 4.4 for more details).

In step 3, seven baseline scenario alternatives are formulated, including the BAU and the proposed project activity undertaken without being registered as a CDM project activity. The formulation is reasonable and appropriate.

In step 4, barrier of either technology or market need is identified for four of the baseline scenario alternatives. The barrier assessment is appropriate.

In step 5, the scenario of business as usual is through a financial analysis determined as the most economically attractive scenario.

More detailed information is given in the following Section 4.4.

Based on the assessment of the baseline alternatives presented in the PDD, DNV was able to verify that among all the identified baseline scenarios, the most likely baseline is the continuation of the current practice, i.e. continuation of the current CMM extraction practice with part of the extracted CMM to be released into the atmosphere.

For the project's electricity generation, the baseline is that the electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

The system boundaries are described in the following table:



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	GHGs involved	Description
Baseline emissions	CH <sub>4</sub>	Baseline emissions from methane release into atmosphere that are avoided by the project activity, i.e. equivalent to what is utilized in the project activity for power generation.
	CO <sub>2</sub>	Emissions equivalent to the same quantity of electricity generated by the project activity.
Project emissions	CO <sub>2</sub>	Fuel and electricity required to operate gas engines and ancillary equipment.
	CO <sub>2</sub>	Emissions from combustion of methane in gas engines.
	CH <sub>4</sub>	Unburned methane from gas engines.
Leakage		No leakage as justified in Section 4.6

### 4.4 Additionality

The project owner commissioned Jincheng Engineering Consultancy Centre to develop the feasibility study report (FSR) in February 2005 /2/. The FSR concluded that the project implementation was not economic viable without CDM /2/. During the feasibility study stage, the project owner has also consulted Jincheng Municipal CMM and Natural Gas Utilisation Development Committee regarding its CDM development plan in January 2005 /4/. The Committee provided supportive opinion on the CDM project development in its approval /4/. The project started implementation on 11 December 2005. Hence, evidence was provided to demonstrate that CDM benefits were seriously considered in the decision to proceed with the project activity. After the project was implemented, the project has continually taken actions to secure CDM status by signing the CER purchase term /8/ and publish the PDD /1/.

The project applies the *Tool for the demonstration and assessment of additionality*, Version 3 /17/ to demonstrate its additionality in the following steps:

*Step 1: Identification of alternatives to the project activity consistent with mandatory laws and regulations.* Alternatives to the project activity were identified and assessed according to the 4 steps outlined in ACM0008 to determine the baseline scenario. As stipulated by ACM0008, these steps also address the requirements of applying the additionality tool in the context of ACM0008.

- The identification of technically feasible options for capturing and/or using of CMM has resulted in the following options being identified:
  - 1) Four options for CMM extraction (ventilation air methane, pre mining CMM, post mining CMM and combination of these three options),
  - 2) Nine different options for extracted CMM treatment (CMM venting, using/destroying ventilation air methane rather than venting it, flaring of CMM, use for power generation (additional grid power generation and additional





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captive power generation), feed into gas pipeline, and possible combination of the options above),

- 3) There options for energy production (purchasing equivalent amount of electricity from North China Power Grid, construction of a coal-fired power plant with equivalent amount of installed capacity, generate electricity with the extracted CMM).
- Baseline options that do not comply with legal or regulatory requirements are eliminated. *The National Coalmine Safety Regulations /20/* require that the maximum concentration of methane in a mine's ventilation air remains below 1%. Only one of the CMM extraction options, that is, combination of ventilation, pre-mining CMM and post-mining can ensure that this requirement is met. The mines are rich in gas and to comply with the safety requirements, the extraction techniques need to be used jointly and the ventilation air methane, pre mining CMM or post mining CMM alone can be eliminated.

*The National Coalmine Safety Regulations* and *Coalmine Methane Treatment and Utilization Macro Plan /21/* also states that methane concentrations shall not be lower than 30% for CMM utilization for safety reason. The concentration of CMM used in this project is above 40% /2/. Thus, all the options for CMM utilization comply with the requirement.

*The Interim Rules on the Installation and Management of Small-scale Fuel-fired Generators /22/* requires that the fossil fuel-fired power units with less than 100MW is strictly regulated for installation. Thus, building a coal-fired power plant of the same capacity (16.3 MW) is prohibited by the national regulation

- Formulation of baseline scenario alternatives: Seven alternatives have been formulated, including continuation of the current situation and the proposed project activity not implemented as a CDM project. The other five different alternatives for CMM treatment are elaborated in detail in the PDD.
- Elimination of baseline scenario alternatives that face prohibitive barriers: Technical barriers, lack of market needs and lack of infrastructure for the technology implementation have been discussed as following:
  - 1) Prohibitive technical barrier: the average concentration of methane in the VAM is 0.75%. Up to now, there is no commercialized matured technology in China that could use the VAM of this concentration.
  - 2) Prohibitive barrier that there is lack of demand for additional heat generation: There are few people and residents surrounding the proposed project. The heat demand around Daning Coal Mine is now met by coal supply due to the easily availability and low price for coal and there is sufficient heat available. This is evidenced by a research report /11/. This scenario is therefore not feasible.
  - 3) Technical barrier that there is lack of infrastructure for the technology implementation: The concentration and flux of CMM from coal mine is unstable, so it is not suitable to feed into gas pipeline. Furthermore, there is no municipal pipeline connection in place. The construction of the pipeline system for the few dispersedly distributed villages needs large amount of investment.
  - 4) Technical and market barriers for the CMM to be utilized by the coalmine owners: The core business of the coal mine owners is coal production, which is a high



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return business. The minimum investment return benchmark in the Chinese coal industry is 15% compared to only 10% in the electricity sector /23/. Also, since 2004, with the soaring coal price, the profitability of coal mining has grown, further increasing returns. Therefore, coal mining owners generally consider it more economically attractive to invest in their core business and expand production rather than invest in ancillary businesses such as small scale power production. Furthermore, for the coal mine owners, investment in a power plant requires high level of additional technical know-how. Power generation is not the expertise of the coal producers. Developing projects in a different sector imposes technical risk. Moreover, gas price has been stipulated by the Jincheng Pricing Bureau in 2003 /27/. The coalmine saw it as a convenient business model to utilize its CMM by selling it to a third party (an energy generation company, i.e. the project owner). Given that the coalmine intends to focus on its core business, outsourcing power generation at a fixed price for its CMM is a sensible business deal.

- Elimination of baseline scenario alternatives that has no economic benefit or is not most economically attractive
  - 1) Flaring of CMM has no economic benefit with investment needed;
  - 2) The scenario to implement the project without CDM, as demonstrated in the following Step 2, has an IRR of 4.61%. This IRR is below the thermal power generation industry benchmark 10%.

DNV was able to verify the barrier assessment and economic analysis is appropriate and sufficient based on the actual situation of the project.

Due to these barriers and economic analysis, the most likely baseline scenario is that part of the drained gas is vented; electricity is purchased from the North China Power Grid. Both represent the current BAU scenario, which is deemed as a feasible baseline scenario.

### *Step 2: Investment analysis:*

Since the proposed project will generate financial benefits through sales of the electricity, and since the baseline is the continuation of the current situation, which is not an investment, the benchmark approach is selected for the investment analysis.

According to *Economical Assessment and Parameters for Project Development* /23/, a benchmark of 10% (equity IRR (after tax)) for thermal power generation industry is selected. In China the benchmark is generally determined according to the reference determined by the National Development and Reform Committee (NRDC) and Department of Construction. Hence, a benchmark of 10% is deemed reasonable. The corresponding IRR of the project is calculated to be 4.61%.

In assessing the input values used in the investment and sensitivity analyses, DNV has followed a 4-step approach:

*Step 1: Assessment of the sources of the input parameters used in the investment and sensitivity analyses:*



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a) All the input parameters used in the financial analysis except for those mentioned in the following paragraph b) are taken from the feasibility study reports (FSR) developed by Jincheng Engineering Consulting Center and approved by Jincheng Development Planning on 7 June 2005 /2/. The input parameters used in the financial analysis can thus be considered information provided by an independent and recognized source.

b) The input parameter not taken from the FSR includes the CMM price which is taken from the Notice on CMM Price issued by Jincheng Price Bureau Jincheng, a government department of Jincheng dated 24 November 2003 /27/. The CMM cost was taken from this document as the CMM price is regulated by the local government.

c) All the above input parameters were available at the time when the decision to proceed with the project was made (the start date of the project was 11 December 2005, the date of the construction notice) and was thus likely to be considered in the decision.

*Step 2: Confirmation of the values used in the PDD and investment analysis are fully consistent with the FSR and the Notice on CMM Price:*

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

*Step 3: Assessment of the period of time between the finalization of the FSR and the start date (Notice on CMM Price and the investment decision):*

a) The FSR was approved on 07 June 2005, 6 months before the implementation of the project.

b) The Notice on CMM Price was issued on 24 November 2003. This was the latest published CMM price at the time of decision making in 2005. There was no price change announced by the government between the notice issued in 2003 and the FSR being prepared in 2005. Moreover, inflation and fuel price growth was projected by the government at the time of the decision making in 2005 /12/. So, it is reasonable and conservative to assume that the CMM price has been the basis of the decision to proceed with the investment in the project.

*Step 4: Cross-check of the parameters used in the financial analysis*

The input parameters used in the financial analyses were compared with the data reported for other similar proposed CDM projects in the region, i.e. other CMM power generation projects in Shanxi province, by comparing investment costs per MW, electricity tariff, percentage of O&M costs relative to total investment costs. By additionally applying our sectoral competence, DNV was able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project given the fixed price on CMM dictated by Jincheng Price Bureau /25/.

It must be noted that the CMM price (0.15 RMB/m<sup>3</sup>CH<sub>4</sub>) is from a price regulation by the Chinese authorities /25/, and DNV was able to confirm that the project participants have to accept this price without negotiations. However, this price does not necessarily reflect the costs for CMM extraction and supply and the project participants were not able to obtain any information on the costs incurred by Daning coalmine for supplying CMM. If the CMM was supplied at no cost, the project would be financially attractive with an IRR of 26%.



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However, the buyer and the seller of CMM are independent companies and given the price regulation by the Chinese authorities, the price of 0.15 RMB/m<sup>3</sup>CH<sub>4</sub> is the price to be paid by the project participants to purchase CMM. DNV has assessed the additionality from a project specific point of view considering the price to be paid for CMM by the project participants. DNV's assessment of the additionality has not assessed the appropriateness of the price of CMM set by the Chinese authorities. This price was set to provide an incentive for coalmine owners to sell CMM for utilization of CMM by other entities. However, it appears that the price of CMM was set at a level which results in utilization of CMM for electricity generation becoming financially unviable in absence of CDM benefits, and it can be questioned whether the price would have been set at a lower level if there was no CDM.

A sensitivity analysis is conducted with the five most important parameters, and the following analysis demonstrates that with the reasonable range of these parameters, the calculated IRR is still below the benchmark.

### 1) Total investment

Only when the total investment is 31% below assumption, the IRR will be over the benchmark. But a 31% decrease of total investment is not possible for the following reason:

- The capital expenditure was estimated based on *Shanxi Civil and Installation Engineering Project Budget Index 2003, Electric Power Project Development Investment Estimation Index* and the market price at the time. In the few months between project design and construction, significant cost variance is unlikely.
- On the other hand, the consumer price has been continuously increasing in China due to the economic boom. At the time of decision making, the consumer price has been growing 3.9% compared to the previous year /25/.

### 2) Annual operation and maintenance cost

Only when the O&M cost is 21% below the estimate, the IRR will be over the benchmark. A 21% reduction of the O&M costs is not likely for the following reasons:

- Salary and maintenance costs accounts for significant proportion of the O&M cost. With the rapid economic development, the income of Chinese labour has been increasing /26/.
- As discussed above, the consumer price has also been growing.

### 3) CMM price

Only when the CMM price is 14% below estimate, will the IRR be over the benchmark. However, a 14% reduction of CMM price is not possible as the CMM price is regulated by the government /27/.

### 4) Electricity tariff

The electricity tariff (including VAT) for this project was determined as 0.2754 RMB/kWh /2/. Only when the electricity tariff is 11% higher than assumed, the IRR will be over the benchmark. However, it is not likely that the electricity tariff is increased by



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11% unilaterally, as the electricity tariff is highly regulated and controlled by the Central Government. That is, electricity tariff would only be adjusted based on significant increase of fuel costs and such a mechanism requires a complicated process of tariff adjustment approval. It is therefore common that electricity producers suffer an increasing fuel cost but are prevented from increasing the sales tariff /13/. The increase of electricity tariff alone to 11% without increased fuel costs is not currently legally viable /14/.

### 5) Operating hours

Only when the operating hours are 42% higher than assumed, the IRR will be over the benchmark. However, the annual electricity output of the project is estimated based on 7200 hours per annum. A 42% increase of 7,200 hours would exceed the 8,760 hours in a year.

In conclusion, DNV was able to confirm that this project activity is financial unattractive even after considering the possible fluctuation of the main parameters. However, the revenue from the CERs will improve the financial feasibility of the proposed project by enhancing the IRR of the project from 4.61% to 64.11%. The estimation processes and result for the IRR with CERs (64.11%) are verified by DNV as reasonable.

*Step 4: Common practice:* The utilization of substantial CMM resources from China's coal mines has been limited. Research has estimated that, in 2003, CMM extracted by drainage systems was 1.521 billion cubic meters. Only 629.21 million cubic meters was utilized /28/. This accounts for less than 20% of the potential for capture. Those utilizing CMM are predominated for householder consumer supply. There are few power generation schemes due to the capital cost of the plant. And those power generating projects generally have an over 100 MW capacity /28/.

Further research has been conducted on projects utilizing CMM in Shanxi province. The research was conducted via internet research and interview with the Agenda 21 Office of the Shanxi Provincial Government as local governmental representative. Fourteen projects with a total installation of 25MW /2/ were identified. But, there are obvious distinction between these installed projects and the project activity, listed as below:

- These projects are developed and owned by the coalmines, enjoying a free supply of CMM gas; the project activity being independent of the mine, it has to pay for the gas supply.
- These projects are backup generation units for the coalmine's domestic use; the project exports electricity to the grid.
- The scale of each of the 14 projects is significantly smaller than the project. The maximum installed capacity is 2MW.

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



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### 4.5 Monitoring

The monitoring methodology ACM0008 is correctly applied.

#### 4.5.1 Parameters determined ex-ante

The following parameters are determined ex-ante and were verified by DNV.

Data and Parameters	Unit	Value applied	Source of data used
Density of methane	kg/m <sup>3</sup>	0.67	Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Operating margin of North China grid (OM)	tCO <sub>2</sub> /MWh	1.1208	Calculated according to ACM0002 and most recent official data /31/
Build Margin of North China grid (BM)	tCO <sub>2</sub> /MWh	0.9397	Calculated according to ACM0002 and most recent official data /30/

#### 4.5.2 Parameters monitored ex-post

The following data and parameters need to be monitored.

1. Additional electricity consumption by project;
2. Methane sent to gas engines, by measuring concentration, volume, pressure and temperature of the incoming CMM;
3. NMHC concentration in extracted coal mine gas and carbon emission factor for combusted NMHC;
4. Electricity generation by project;

The monitoring plan provides for the collection and archiving of all relevant data:

##### Project emissions:

- additional electricity consumption by the project  $CONS_{ELEC,PI}$ ;
- CMM sent to the gas engines – their concentration, flow, temperature and pressure;
- $r$ , the relative proportion of NMHC compared to CH<sub>4</sub>.

##### Baseline emissions:

- CMM captured, sent to and destroyed in the project activity that would be released to the atmosphere in the baseline;
- Electricity generation of each power source / plant –  $GEN_y$ ;

##### Leakage:

- No leakage needs to be addressed in the project. See also in 4.6.

All of the above parameters will be monitored continuously except for:





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- The non-methane hydrocarbons (NMHC) concentration in the coal mine gas and its carbon emission factor, which will be monitored annually.
- The methane concentration in the CMM, which will be monitored daily.

### 4.5.3 Management system and quality assurance

The responsibility and authority for registration, monitoring, measurement and reporting activities have been properly addressed in the PDD. Also, DNV was able to verify that necessary procedures related to data handling, quality assurance and training of monitoring personnel have been appropriately implemented.

### 4.6 Estimate of GHG Emissions

The estimate of GHG emissions are in accordance with the formulae given in the baseline and monitoring methodology ACM0008.

#### Project emission:

The project emission includes additional energy used to capture and utilize methane  $PE_{ME}$ , the methane destroyed  $PE_{MD}$  and un-combusted methane  $PE_{UM}$ . The project boundary includes all equipment for the extraction, compression, storage and transportation of the captured CMM.

For  $PE_{MD}$  and  $PE_{UM}$ : related to gas engines, the default value  $Eff_{ELEC}$  (99.5%) given in the methodology is applied.

The quantity of methane sent to power generation is estimated according to the processing capacity of the power engines.

#### 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.

There is no baseline thermal use for the extracted CMM. 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. This is in accordance with the "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" /18/, which ACM0008 requires to apply to determine a grid electricity emission coefficient.

For the calculation of the operating margin (OM) emission factor, the simple OM emission factor calculation method is selected, because data are not available for applying the dispatch data analysis and low-cost-must-run projects constitute less than 50% of the total grid generation (In the most recent 5 years (2001-2005), the proportions of low-cost/must run resources in the total electricity output in North China Power Grid are respectively 1.1%, 0.8%, 0.89%, 0.86% and 0.76%, lower than 50%).

The aggregated generation and fuel consumption data are used due to less aggregated data are not available in the NCPG. Country specific data for net calorific value ( $NCV_i$ ) of each type of fossil fuels /34/, the IPCC 2006 /35/default values for the oxidation factor and emission



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factor of each type of fossil fuels, and the total electricity delivered to the NCPG are selected and are deemed reasonable. Vintage data for the years 2003, 2004 and 2005 from China Energy Statistics Yearbooks and China Electric Power Yearbooks 2004-2006 /34/ /33/ editions are used for the operating margin calculation. The OM is correctly evaluated to be 1.1208 tCO<sub>2</sub>/MWh.

Because plant specific fuel consumption and electricity generation data is not public available in China, the EB's guidance on determining the build margin in China /19/ was applied:

- The capacity additions from the years 2003 to 2005 /33/ is chosen and represents an addition of 23.78% of total installed capacity.
- The weight of installed capacity additions for thermal power plant is accounted for 99.28% of total installed capacity additions;
- There are no data available of installed capacity additions for oil and gas power in NCPG. However China Energy Statistics Yearbook (2006) /34/ shows that the oil and gas used in NCPG are very small, and only for starting up systems of coal fired power plant, accounting for ca. 0.82% of the total CO<sub>2</sub> emissions. The installed capacity addition for coal, oil and gas power plants being regarded as proportional with their CO<sub>2</sub> emissions percentage is deemed reasonable.
- The coal consumption efficiency of 343.33 gSCE/kWh is selected as the best technology commercially available in China. It can be acknowledged as the best available data available for estimating the BM in the China /30/. This best technology corresponds to a 35.82% of power supply efficiency for coal-fired electricity generation. The gas and oil consumption efficiency of 258 gSCE/kWh is selected as the best technology commercially available in China /30/. It can be acknowledged as the best available data available for estimating the BM in the China. This best technology corresponds to a 47.67% of power supply efficiency for gas or oil-fired electricity generation.
- Country specific data for net calorific value ( $NCV_i$ ) of each type of fossil fuels /34/, the IPCC 2006 /35/ default values for the oxidation factor and emission factor of each type of fossil fuels are used to calculate the BM.
- The BM is calculated to be 0.9397 tCO<sub>2</sub>/MWh

The default weights 0.5 for OM and 0.5 for BM in the *Tool to calculate the emission factor for an electricity system*, version 01 was used to calculate CM. The combined margin of 1.0303 tCO<sub>2</sub>/MWh is fixed *ex-ante* for the entire first crediting period.

### Leakage

According to the methodology, only 3 types of leakage need to be addressed.

- i) the displacement of baseline thermal energy use;
- ii) CBM extraction from out of the de-stressed zone;
- iii) impact of CDM project activity on coal production if the project activity is CBM/CMM extraction and the baseline scenario is ventilation only.





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Leakage related to the displacement of baseline thermal energy use does not need to be addressed, as there is baseline thermal use of CMM.

Moreover, no other leakage effects need to be accounted for considering the following situations of the proposed project:

1. No CBM drainage is involved in this proposed project, so CBM extraction from out of the de-stressed zone will not happen.
2. Since the baseline scenario is not ventilation only, i.e. there is CMM extraction in both the project activity and baseline scenario. There is thus no impact of the CDM project activity on the coal production is needed, and leakage related to additional coal production due to the project activity does not exist.
3. No reliable scientific information is currently available to assess the risk of the impact of a CDM project activity on coal prices and market dynamics; so the leakage related to this aspect needs not to be considered according to the ACM0008.

### 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 the 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.

## 4.7 Environmental Impacts

The Environment Impacts Assessment (EIA) of the proposed project was completed by Shanxi Jincheng City Environment Protection Study Institution /3/. The EIA was approved by Jincheng City Environment Protection Bureau /3/.

The EIA's and their approvals for this project underwent two phases. The first EIA and its approval did not cover the full capacity of the project. The project owner has retrospectively had a second EIA prepared and applied for its approval including the whole project (a total capacity installation of 16.3MW).

No significant adverse impacts to the environment were identified. The relevant environmental impacts are sufficiently documented in the PDD.

## 4.8 Comments by Local Stakeholders

From 1 to 20 April, 2007, the project owner and CDM developers visited each power station of the proposed project and asked for comments and suggestions from stakeholders by Stakeholders' Comments Questionnaire for CMM Utilization for Power Generation CDM Project constructed and operated by Jincheng Fengrun CMM Utilization Co., Ltd.

There were eight organizations and 9 individuals participating in this investigation. The eight organizations were respectively Jincheng City Coal CMM (natural gas) Utilization Office, Yangcheng County Development and Reform Bureau, Yangcheng County Environment Protection Bureau, Jincheng City Environment Protection Study Institute, Yangcheng State-run Yicheng Coal Mine, Qinshui County Jiafeng Town Nan Wa Si Coal Mine and Qinshui County Jiafeng Town Wuli Miao Coal Mine. The nine individuals were all villager



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representatives at domestic coal mines respectively in Qinshui County Jiafeng Town, Qinshui County Zhengcun Town and Yangcheng County Tingdian Town, etc.

A summary of the comments received was provided, which reflected the contents in the questionnaires /29/. The main concern is about noise to be generated by the power plants. The project developer will carry out the measures determined in the approved EIA to meet regulatory requirement for noise control.

### **4.9 Comments by Parties, Stakeholders and NGOs**

The PDD (version 01 of 10 May 2007) was made publicly available on DNV's climate change website ([www.dnv.com/certification/climatechange](http://www.dnv.com/certification/climatechange)) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period respectively from 23 May to 21 June 2007.

No comment was received.

**APPENDIX A**

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**CDM VALIDATION PROTOCOL**

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

Requirement	Reference	Conclusion
<b>About Parties</b>		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	<del>CAR-1</del> OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	<del>CAR-1</del> OK
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK
<b>About additionality</b>		
10. Reduction in GHG emissions shall be additional to any that would occur in the	Kyoto Protocol Art. 12.5c,	<del>CL-4</del>

Requirement	Reference	Conclusion
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.	CDM Modalities and Procedures §43	<del>CL-6</del> OK
<b>About forecast emission reductions and environmental impacts</b>		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	<del>CL-7</del> <del>CL-8</del> OK
<b>For large-scale projects only</b>		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	<del>CL-14</del> OK
<b>About stakeholder involvement</b>		
13. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	<del>CL-15</del> OK
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
<b>Other</b>		
15. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
16. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	<del>CL-2</del> <del>CL-3</del> OK

Requirement	Reference	Conclusion
17. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
18. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
19. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

**Table 2      Requirements Checklist**

<b>CHECKLIST QUESTION</b>		<b>Ref.</b>	<b>MoV*</b>	<b>COMMENTS</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
* MoV = Means of Verification, DR= Document Review, I= Interview						
<b>A.    General Description of Project Activity</b> <i>The project design is assessed.</i>						
<b>A.1.   Project Boundaries</b> <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>						
A.1.1. Are the project’s spatial boundaries (geographical) clearly defined?		/1/	DR I	Yes, the project is located near Jincheng City of Henan Province, in the central part of China. The geographical coordinate of the power plant is defined in the PDD.		OK
A.1.2. Are the project’s system boundaries (components and facilities used to mitigate GHGs) clearly defined?		/1/	DR I	The PDD defines the system boundaries according to the ACM0008, the boundaries include, <ul style="list-style-type: none"><li>● 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.</li><li>● Power generation facilities installed and used as part of the project activity.</li><li>● 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.</li></ul> But, clarification is needed why the installed capacity in the current version of PDD (16.3	<del>CL-1</del>	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				MW) is different from the installed capacity in the published PDD (25 MW).		
<b>A.2. Participation Requirements</b> <i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.</i>						
A.2.1. Which Parties and project participants are participating in the project?		/1/	DR I	Jincheng City Fengrun CMM Utilization Co. Ltd in China and Trading Emissions PLC in United Kingdom are participating in the project.		OK
A.2.2 Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?			I	Letters of Approval from DNA of China and DNA of United Kingdom have not been received.	<del>CAR-1</del>	OK
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority			I	Yes. China ratified the Kyoto Protocol on 30 August, 2002. United Kingdom ratified the Kyoto Protocol on 31 May 2002. Chinese DNA is the National Development and Reform Commission. The DNA of United Kingdom of Great Britain and Northern Ireland is The Department for Environment, Food and Rural Affairs.		OK
A.2.4 Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.		/1/	DR I	The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance		OK



CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				(ODA) funding towards China.		
<b>A.3. Technology to be employed</b> <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>						
A.3.1. Does the project design engineering reflect current good practices?	/1/	DR I		Yes. The project is divided into two parts: One is to capture and recover CMM from working coal seams. Another is the gas utilization systems by installation of electricity power plants.  Gas engines (500 kW and 2000kW for each respectively) made in China will be used, which has been successfully demonstrated in several Chinese mining areas.		OK
A.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR I		The gas engines are newly developed and used in China.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1/	DR I		The relevant training plan and records for the project were found during the on-site visit.		OK
<b>A.4. Contribution to Sustainable Development</b> <i>The project's contribution to sustainable development is assessed.</i>						
A.4.1. Has the host country confirmed that the project		I		This is not confirmed by the DNA of China	<del>CAR-1</del>	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
assists it in achieving sustainable development?				yet.		
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?		/1/	DR I	<p>Yes. The project will also</p> <ul style="list-style-type: none"> <li>- reduce local environment pollution in comparison to the fossil fuel currently used which produces CO2 and other pollutants ;</li> <li>- promote comprehensive resource utilization and rational energy use practices through utilization of the clean gas;</li> <li>- provide local employment opportunities.</li> </ul>		OK
<b>B. Project Baseline</b> <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>						
<b>B.1. Baseline Methodology</b> <i>It is assessed whether the project applies an appropriate baseline methodology.</i>						
B.1.1. Does the project apply an approved methodology and the correct version thereof?		/1/ /16/	DR I	Yes. The project is using 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 03).		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?		/1/ /16/	DR I	Yes. The project is located at existing underground coal mines, which will use		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			underground CMM drainage to recover the CMM. Part of the extracted CMM will be used for electricity generation. Prior to the project, the baseline scenario represents the partial release of the CMM to the air. The project meets all the applicability requirements of ACM0008.		
<b>B.2. Baseline Scenario Determination</b> <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>					
B.2.1. What is the baseline scenario?	/1/ /16/	DR I	The baseline scenario is <b>business as usual scenario</b> ; it includes two parts; one is continuation of current gas extraction practice. It consists of a combination of VAM extraction and pre and post CMM extraction; another is also the continuation of the current situation, which involves venting extracted CMM and VAM. But, it is should be clarified if baseline use of CMM exists.	<del>CL-2</del>	OK
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/ /16/	DR I	While the PDD basically followed step 1 -2 of identification in the ACM0008 to identify those options for capturing and/or using CMM and complying with all legal and regulatory requirements, it should also follow	<del>CL-3</del>	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				the step 3-5 of identification of baseline scenario in the ACM0008.		
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/ /16/	DR I		Refer to B.2.2.	CL3	OK
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /16/	DR I		Refer to B.2.2.	CL3	OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /16/ /21/	DR I		The baseline scenario has taken into account most relevant national and sectoral policies, including <i>Coalmine Methane Treatment and Utilization Macro Plan</i>		OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /16/	DR I		Yes. The baseline is determined using data available.		OK
B.2.7. Have the major risks to the baseline been identified?	/1/ /16/	DR I		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>B.3. Additionality Determination</b> <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>						
B.3.1. Is the project additionality assessed according to the methodology?	/1/ /16/	DR I		ACM0008 and “the Tool for the demonstration and assessment of additionality” are followed to demonstrate		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				the additionality of the project.		
B.3.2. Are all assumptions stated in a transparent and conservative manner?		/1/ /16/	DR I	<p>Please clarify the following issues:</p> <p>a. CMM capturing is part the project activities, and captured CMM is a product within a project, why payment has to be paid for CMM;</p> <p>b. Clarify and justify the engine operating hours used in the IRR calculation;</p> <p>c. Clarify and justify the choice of benchmark. This project claims 12% whereas a similar neighboring project (Fengrun 9 mines) from the same PP claims 8%. Both cases claim the same reference but different types of projects.</p> <p>d. Include engine operating hours in the sensitivity analysis of IRR;</p> <p>e. Update sensitivity analysis. Calculate when the chosen parameters reach the benchmark and assess whether this change is realistic.</p> <p>f. Follow requirements in the Tool for the Demonstration and Assessment of Additionality to conduct barriers assessment;</p> <p>g. Justify the comparing scope in the common practice analysis, and include all relevant projects in the analysis.</p>	<del>CL</del> 4	OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?		/1/	DR	Clarification is needed to show why the	<del>CL</del> 5	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
		/16/	I	project owner needs to pay for the CMM, that is, to demonstrate the project owner is independent from the coalmine company.		
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?		/1/ /16/	DR I	Evidence should be provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity. Please describe in the PDD the processes to seriously consider the incentive from the CDM in the decision to proceed with the project activity.	<del>CL-6</del>	OK
<b>B.4. Calculation of GHG Emission Reductions – Project emissions</b> <i>It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>						
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?		/1/ /16/	DR I	The following issues should be clarified: <ul style="list-style-type: none"> <li>● The most recent available data should be used for the calculation of the emission factor of North China Power Grid;</li> <li>● The project emissions related to the additional power consumed should be calculated;</li> <li>● The quantity of CMM consumed;</li> <li>● The original analysis report for NMHC content in the CMM should be</li> </ul>	<del>CL-7</del>	OK

<b>CHECKLIST QUESTION</b> * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			provided.		
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/ /16/	DR I	Refer to .4.2.	CL7	OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/ /16/	DR I	Refer to .4.2.	CL7	OK
<b>B.5. Calculation of GHG Emission Reductions – Baseline emissions</b> <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /16/	DR I	The calculations are documented according to the approved methodologies and in a complete and transparent manner.		OK
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/ /16/	DR I	Refer to .4.2.	CL7	OK
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/ /16/	DR I	Refer to .4.2.	CL7	OK
<b>B.6. Calculation of GHG Emission Reductions – Leakage</b> <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values</i>					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
– where applicable – is justified.					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /16/	DR I	This needs to be clarified on the condition if CMM baseline use exists.	CL-8	OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	/1/ /16/	DR I	Refer to B.6.1.	CL-8	OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	/1/ /16/	DR I	Refer to B.6.1.	CL-8	OK
<b>B.7. Emission Reductions</b> <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>					
B.6.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/ /16/	DR I	Related issues should be clarified.	CL-7 CL-8	OK
<b>B.8. Monitoring Methodology</b> <i>It is assessed whether the project applies an appropriate monitoring methodology.</i>					
B.7.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/ /16/	DR I	Yes. The monitoring plan is documented according to the approved methodology and in a complete and transparent manner.		OK
B.7.2. Will all monitored data required for verification and issuance be kept for two years after the end of	/1/	DR	Yes.		OK



<b>CHECKLIST QUESTION</b> * MoV = Means of Verification, DR= Document Review, I= Interview		<b>Ref.</b>	<b>MoV*</b>	<b>COMMENTS</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?		/16/	I			
<b>B.9. Monitoring of Project Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>						
B.8.1. 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/ /16/	DR I	Yes. The project emission will be determined based on the CO <sub>2</sub> emissions resulting from the utilization of CMM by the project, additional energy used in the project and un-combusted methane.  The methane flow, concentration, temperature and pressure to each end-use of the methane will be monitored and archived.  Additional power used will also be monitored and archived.  The value for r (relative proportion of NMHC to the methane concentration) will also to be monitored.		OK
B.8.2. Are the choices of project GHG indicators reasonable and conservative?		/1/ /16/	DR I	The choice of the indicators are reasonable and in line with the methodology.		OK
B.8.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?		/1/ /16/	DR I	The measurement methods for all GHG value are clearly stated and deemed appropriate.		OK
B.8.4. Is the measurement equipment described and deemed appropriate?		/1/	DR I	Yes.		OK

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B.8.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR I	The measurement accuracy should be addressed properly in the PDD.	CL-9	OK
B.8.6. Is the measurement <i>interval</i> identified and deemed appropriate?	/1/	DR I	The measurement interval is identified and deemed appropriately. All the measurement intervals are continuous except for the concentration of NMHC in the CMM and the concentration of methane in the CMM, which are measured respectively annually and daily.		OK
B.8.7. Is the <i>registration, monitoring, measurement and reporting</i> procedure defined?	/1/	DR I	Yes.		OK
B.8.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR I	Yes.		OK
B.8.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	/1/	DR I	Yes.		OK
<b>B.10. Monitoring of Baseline Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i>					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data	/1/	DR I	Yes. The monitoring plan provides for the collection and archiving of all relevant data,		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
necessary for determining baseline emissions during the crediting period?				as shown in the following: 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 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).		
B.9.2. Are the choices of baseline GHG indicators reasonable and conservative?		/1/	DR I	Yes. The choices of the baseline indicators are conservative and deemed reasonable.		OK
B.9.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?		/1/	DR I	Yes.		OK
B.9.4. Is the measurement <i>equipment</i> described and deemed appropriate?		/1/	DR I	Yes.		OK
B.9.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?		/1/	DR I	Refer to B.8.5.	<del>CL-9</del>	OK
B.9.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?		/1/	DR I	The measurement interval is identified and deemed appropriately.		OK

<b>CHECKLIST QUESTION</b> * MoV = Means of Verification, DR= Document Review, I= Interview		<b>Ref.</b>	<b>MoV*</b>	<b>COMMENTS</b>	<b>Draft Concl.</b>	<b>Final Concl.</b>
B.9.7. Is the registration, <i>monitoring, measurement and reporting</i> procedure defined?	/1/	DR I	Yes.			OK
B.9.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR I	Yes			OK
B.9.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR I	Yes.			OK
<b>B.11. Monitoring of Sustainable Development Indicators/ Environmental Impacts</b> <i>It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>						
B.10.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR I	Chinese DNA does not require collection and archiving of data related to environmental, social and economic impacts of the CMM fired power plant. The environmental impacts will be monitored by local environmental authority.			OK
B.10.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR I	Chinese DNA does not require collection and archiving of data related to environmental, social and economic impacts of the CMM fired power plant. The environmental impacts will be monitored by local environmental			OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			authority.		
B.10.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR I	Chinese DNA does not require collection and archiving of data related to environmental, social and economic impacts of the CMM fired power plant.		OK
<b>B.12. Project Management Planning</b> <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
B.11.1. Is the authority and responsibility of overall project management clearly described?	/1/	DR I	Yes. This is clearly described in the PDD.		OK
B.11.2. Are procedures identified for training of monitoring personnel?	/1/	DR I	Yes, These procedures are described in PDD.		OK
B.11.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR I	This needs to be clarified in the procedures.	<del>CL-10</del>	OK
B.11.4. Are procedures identified for review of reported results/data?	/1/	DR I	Yes, These procedures are described in PDD.		OK
B.11.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR I	This needs to be clarified in the procedures.	<del>CL-11</del>	OK
<b>C. Duration of the Project/ Crediting Period</b> <i>It is assessed whether the temporary boundaries of the project are</i>					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>clearly defined.</i>					
C.1.1. Are the project’s starting date and operational lifetime clearly defined and evidenced?	/1/	DR I	The project’s operational lifetime is defined as 20 years. But, the project’s starting date should be clearly defined.	<del>CL-12</del>	OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR I	The start of the crediting period is 1 January 2008; This should be revised.	<del>CL-13</del>	OK
<b>D. Environmental Impacts</b> <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
D.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR I	The analysis of environmental impacts is not provided yet.	<del>CL-14</del>	OK
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR I	The approval for EIA is not provided yet.	<del>CL-14</del>	OK
D.1.3. Will the project create any adverse environmental effects?	/1/	DR I	Refer to D.1.1 and D.1.2.	<del>CL-14</del>	OK
D.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR I	Refer to D.1.1 and D.1.2.	<del>CL-14</del>	OK
D.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR I	Refer to D.1.1 and D.1.2.	<del>CL-14</del>	OK
D.1.6. Does the project comply with environmental	/1/	DR	Refer to D.1.1 and D.1.2.	<del>CL-14</del>	OK

CHECKLIST QUESTION		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
* MoV = Means of Verification, DR= Document Review, I= Interview						
legislation in the host country?			I			
<b>E. Stakeholder Comments</b> <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>						
E.1.1. Have relevant stakeholders been consulted?		/1/	DR I	It needs to clarify who were consulted.	CL-15	OK
E.1.2. Have appropriate media been used to invite comments by local stakeholders?		/1/	DR I	The stakeholders were visited directly with questionnaire.		OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?		/1/	DR I	Stakeholder consultation process for this project is not required by regulations/laws.		OK
E.1.4. Is a summary of the stakeholder comments received provided?		/1/	DR I	Yes.		OK
E.1.5. Has due account been taken of any stakeholder comments received?		/1/	DR I	No negative comments were received.		OK

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

<b>Draft report clarifications and corrective action requests by validation team</b>	<b>Ref. to checklist question in table 2</b>	<b>Summary of project owner response</b>	<b>Validation team conclusion</b>
CAR 1 Letters of Approval from DNA of China and DNA of United Kingdom have not been received.	A.2.2.	The Letters of Approval from both DNA of China (dated 26/08/2007) and the UK (dated 19/10/2007) are attached.	Both LoAs have been received and verified as acceptable. This is closed.
CL 1 Clarification is needed why the installed capacity in the current version of PDD (16.3 MW) is different from the installed capacity in the published PDD (25 MW).	A.1.2.	See the background for this project in the following table (response to CL1), in which the reason for the change of installed capacity was explained. This explanation was included in the PDD also.	By checking and verifying the project background and the relevant evidences. It can be concluded that the change of the installed capacity in different versions of PDD was reasonable. This is closed.
CL 2 The baseline scenario is business as usual scenario; it includes two parts; one is continuation of current gas extraction practice. It consists of a combination of VAM extraction and pre and post CMM extraction; another is also the continuation of the current situation, which involves venting extracted CMM and VAM. But, it is should be clarified if baseline use of CMM exists.	B.2.1.	It is clarified the baseline use CMM does not exist. The PDD is revised to clarify the baseline.	The response is reflected in the revised PDD. The revised PDD is reviewed as acceptable. This is closed.
CL 3 While the PDD basically followed step 1 -2 of identification in the ACM0008 to identify those	B.2.2.	The PDD has been revised to follow Step 3-5 as specified in ACM0008 version 3.	The response is reflected in the revised PDD. The revised PDD is reviewed



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
options for capturing and/or using CMM and complying with all legal and regulatory requirements, it should also follow the step 3-5 of identification of baseline scenario in the ACM0008.			as acceptable. This is closed.
<p>CL 4</p> <p>For additionality assessment, please clarify the following issues:</p> <p>CMM capturing is part the project activities, and captured CMM is a product within a project, why payment has to be paid for CMM; Clarify and justify the engine operating hours used in the IRR calculation;</p> <p>Clarify and justify the choice of benchmark. This project claims 12% whereas a similar neighboring project (Fengrun 9 mines) from the same PP claims 8%. Both cases claim the same reference but different types of projects.</p> <p>Include engine operating hours in the sensitivity analysis of IRR;</p> <p>Update sensitivity analysis. Calculate when the chosen parameters reach the benchmark and assess whether this change is realistic.</p> <p>Follow requirements in the Tool for the Demonstration and Assessment of Additionality to conduct barriers assessment;</p> <p>Justify the comparing scope in the common practice analysis, and include all relevant</p>	B.3.2.	<p>The project owner is an independent company from the coalmines. The project is an off taker of the captured CMM from the mines.</p> <p>The operating hours is estimated in the feasibility study as a part of the project design by Jincheng Engineering Consultancy Centre. The average operating is 7200 hours per year.</p> <p>The IRR benchmark has been revised to be 10% as the power generation sector's benchmark. (Source: Economic Assessment and Parameters for Project Development, 2006, National Development and Reform Committee (NRDC) and Department of Construction)</p> <p>The engine operating hours are included in the revised IRR spreadsheets.</p> <p>As per the Tool for the demonstration and assessment of additionality (version 03), "If</p>	<p>The response is reflected in the revised PDD. The revised PDD is reviewed as acceptable.</p> <p>This is closed.</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
projects in the analysis.		<p>after the sensitivity analysis it is concluded that the proposed CDM project activity is unlikely to be the most financially attractive or it unlikely to be financially attractive, the proceed to Step 4 (Common practice analysis).”</p> <p>The projects identified as similar to the proposed project are the projects that utilise CMM for power generation (as using similar technology) in Shanxi Province China (as located in the same region with similar regulatory framework). All the similar projects with information accessible to the public have been included in the analysis.</p>	
<p>CL 5</p> <p>Clarification is needed to show why the project owner needs to pay for the CMM, that is, to demonstrate the project owner is independent from the coalmine company and clarify the price setting.</p>	B.3.3.	<p>Shanxi Jincheng Dingkun Auditing Firm conducted an audit on the registered capital of the project participant on 10 August 2001. A list of shareholders is provided in the audit report submitted for review.</p> <p>Danang Coalmine is owned by Shanxi Asian American-Danang Energy Co. (SAADEC). SAADEC is a joint venture, 56% owned by Asian American Coal, which comprises US energy firms and financial institutions, 36% owned by Shanxi Lanhua Sci-Tech Venture Co. Ltd and 8% by Shanxi Coal Transportation and Sales Corp.<sup>1</sup></p>	<p>By checking and verifying the evidences provided, it can be concluded that the project owner is independent from the coalmine company.</p> <p>Give the price regulation it is considered that the rice can not be negotiated between buyer and seller.</p> <p>Thus, it is reasonable for the project owner to include CMM price in the</p>

<sup>1</sup> <http://economy.enorth.com.cn/system/2007/09/14/001970705.shtml>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		<p>The above shows that the shareholders of the project company are different and independent to that the coalmine.</p> <p>The price of the CMM is fixed by Jincheng Price Bureau.</p>	<p>cost.</p> <p>This CL is closed.</p>
<p>CL 5 (continued)</p> <p>As part of the assessment of the investment analysis, we need to evaluate the cost of the CMM-price as it is an important economical parameter that can have a strong influence on the IRR of the projects. The aim of the evaluation is to assess whether the CMM price is valid and adequately represents the costs for CMM extraction. Information is thus requested on the costs incurred by Daning coalmine for supplying CMM.</p>	B.3.3	<p>Whether the cost of CMM extraction to assess whether the CMM price set by the relevant authority adequately reflects the costs involved in extracting the CMM is a question which only the relevant authorities can answer in detail when they determined the value of CMM by setting its price. More importantly, it is this CMM price which the project owner had to legally accept at the time of making the investment decision irrespective of the cost of CMM extraction. We would hereby like to offer our further justification for using the CMM price as previously stated:</p> <p>1. As stated in Article 3 of the PRC Pricing Law (attached), there are three kinds of pricing mechanism in China. These are a) market-determined prices, b) government-guided prices and c) government-set prices. For commodities such as natural gas the government typically issues a guidance price which permits a degree of flexibility. In this case, the final price agreed between two parties has to be approved by the relevant authorities according to a price</p>	<p>It must be noted that the CMM price (0.15 RMB/m<sup>3</sup>CH<sub>4</sub>) is from a price regulation by the Chinese authorities, and DNV was able to confirm that the project participants have to accept this price without negotiations. However, this price does not necessarily reflect the costs for CMM extraction and supply and the project participants were not able to obtain any information on the costs incurred by Daning coalmine for supplying CMM. If the CMM was supplied at no cost, the project would be financially attractive with an IRR of 26%. However, the buyer and the seller of CMM are</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		<p>range or benchmark. In the case of CMM however, the price is government-set which means that it is non-negotiable between the parties. This is the price which was considered during the project investment decision stage. The evidence of the CMM set-price issued by the Jincheng City Price Administration Bureau on 2003 and clarification letter by Jincheng Municipal CMM and Natural Gas Utilisation Development Committee (CNGUDC) have been submitted previously.</p> <p>2. Article 21 of the PRC Pricing Law sheds further light on how government-set prices are determined. Set-prices shall be fixed with reference to the average cost, market supply and demand of related merchandise or services. However, it is not only the economic cost which is taken into account but also the "social development and the affordance of the people". Because the government takes these broader considerations into account when setting prices it is not possible to justify the price of CMM simply on whether the CMM price represents closely the CMM extraction cost. In addition, Article 21 states that this price is determined based on the average in the region and not the cost in a specific project.</p> <p>3. In the case of China the baseline</p>	<p>independent companies and given the price regulation by the Chinese authorities, the price of 0.15 RMB/m<sup>3</sup>CH<sub>4</sub> is the price to be paid by the project participants to purchase CMM. DNV has assessed the additionality from a project specific point of view considering the price to be paid for CMM by the project participants. DNV's assessment of the additionality has not assessed the appropriateness of the price of CMM set by the Chinese authorities. This price was set to provide an incentive for coalmine owners to sell CMM for utilization of CMM by other entities. However, it appears that the price of CMM was set at a level which results in utilization of CMM for electricity generation becoming</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		<p>scenario for this kind of project is normally the release of CMM into the atmosphere without utilization (or only partially used for coalmines internally for the employees). This means that before 2003 the CMM value was almost zero. Since then it has been the intention of the relevant price-setting authorities to specify a CMM price to try to create and promote a CMM market in its preliminary stages. By setting a price it alerts coal mine owners that the CMM they are releasing to the atmosphere has a value thus encouraging CMM utilization. You will find evidence supporting this in Article 66 of the China Energy Conservation Law (attached). This states that the government will implement a price policy to incentivise individuals and companies to save resources/energy. This is a very important approach of economic institutional reform adopted both at the national and local authority level to encourage energy efficiency improvement.</p> <p>4. Given a clear CMM price indication by the relevant authority, the coalmine saw it as a convenient business model to utilize its CMM by selling it to a third party (an energy generation company, i.e. the project owner). Given that the coalmine intends to focus on its core business, outsourcing</p>	<p>financially unviable in absence of CDM benefits, and it can be questioned whether the price would have been set at a lower level if there was no CDM.</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		<p>power generation at a fixed price for its CMM was a sensible business deal. There is no economic reason to assume that the coalmine would be willing to sell below the government-set price, more importantly this would breach the law if they had agreed to sell CMM higher or lower than the government-set price (see article 39 of the PRC Pricing Law).</p> <p>5. The project is one of the first projects which use this business model of buying the CMM as a fuel to produce the electricity and sell it to the grid to benefit from the CDM. No similar project without the CDM has been implemented, commissioned or operated that could be identified by the project participants. Therefore the concern raised that there is a possibility of another CMM user which could purchase the CMM to do a project without CDM is unlikely.</p> <p>6. When you compare the CMM price of project to the other projects, we would like to make the following additional observations:</p> <ul style="list-style-type: none"> <li>- When the project owner is the coalmine, the CMM price is usually regarded as zero, but the cost for extraction can be included into their investment analysis. If the project owner is a third party</li> </ul>	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		(independent power generation) the CMM price can't be regarded as zero as they have to pay for it, but as a buyer it is not necessary to know how much it cost for the CMM extraction as it is not part of the investment made by the project owner.	
<p>CL 6</p> <p>Evidence should be provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity. Please describe in the PDD the processes to seriously consider the incentive from the CDM in the decision to proceed with the project activity.</p>	B.3.4.	<p>The project developer consulted Jincheng Municipal CMM and Natural Gas Utilisation Development Committee regarding its CDM development plan in January 2005. The confirmation from the Committee is provided for review. The confirmation is as following:</p> <p>It is quoted from the consultation letter that "... Considering the hindrance to the project development, in order to overcome the financial difficulty, we would like to apply for the Clean Development Mechanism to utilize the coal mine methane..." The Committee replied with its endorsement and advised the project owner to proceed as soon as possible.</p> <p>The relevant translation is included in the PDD.</p>	<p>The response is reflected in the revised PDD. The revised PDD is reviewed as acceptable.</p> <p>This is closed.</p>
<p>CL 7</p> <p>For calculation of GHG emission reductions, the following issues should be clarified:</p> <p>The most recent available data should be used for the calculation of the emission factor of</p>	B.4.1.	<p>The most recent available data (up to 2005) published is now used to calculate the emission factor of the North China Grid. The Chinese DNA has published the Report on Determination of Baseline Grid</p>	<p>The response is reflected in the revised PDD. The revised PDD is reviewed as acceptable.</p> <p>This is closed.</p>

<b>Draft report clarifications and corrective action requests by validation team</b>	<b>Ref. to checklist question in table 2</b>	<b>Summary of project owner response</b>	<b>Validation team conclusion</b>
North China Power Grid; The project emissions related to the additional power consumed should be calculated; The quantity of CMM consumed; The original analysis report for NMHC content in the CMM should be provided.		Emission Factor at <a href="http://cdm.ccchina.gov.cn">http://cdm.ccchina.gov.cn</a> and annex 3. The project's power consumption will be sourced from the project gross generation. Only net export is used to calculate the baseline emissions from the grid. The CMM consumptions of the project is estimated in the official FSR. The FSR has been submitted for review. The NMHC content is very small, that it can be considered as 0%, as per the FSR.	
CL 8 The leakage calculation needs to be clarified on the condition if CMM baseline use exists.	B.6.1.	There is no baseline usage of CMM.	The response is reflected in the revised PDD. The revised PDD is reviewed as acceptable. This is closed.
CL 9 The measurement accuracy should be addressed properly in the PDD.	B.8.5.	Accuracy is addressed in the PDD.	The response is reflected in the revised PDD. The revised PDD is reviewed as acceptable. This is closed.
CL 10 Procedures need to be identified for emergency preparedness for cases where emergencies can cause unintended emissions.	B.11.3.	The procedures are under development and will be in place prior to the start of crediting period.	The response is acceptable. This is closed.
CL 11 Procedures need to be identified for corrective actions in order to provide for more accurate	B.11.5.	The procedures are under development and will be in place prior to the start of crediting period.	The response is acceptable.



<b>Draft report clarifications and corrective action requests by validation team</b>	<b>Ref. to checklist question in table 2</b>	<b>Summary of project owner response</b>	<b>Validation team conclusion</b>
future monitoring and reporting.			This is closed
CL 12 The project's operational lifetime is defined as 20 years. But, the project's starting date should be clearly defined.	C.1.1.	The project starting date is clarified as 11/12/2005, date of signing the construction contract.	The relevant part of the PDD is revised accordingly; and the evidence provided was verified as acceptable. This is closed.
CL 13 The start of the crediting period is 1 January 2008; This should be revised.	C.1.2.	It is revised to 01/09/2008 or the actual date of CDM registration, whichever is latter.	The relevant part of the PDD is revised accordingly. This is closed.
CL 14 Please provide EIA and its approval.	D.1.1.	These are submitted for DOE's review.	Received and verified as acceptable. This is closed.
CL 15 It needs to clarify who were consulted in the stakeholder process.	E.1.1.	It is clarified the stakeholder consultation was conducted in the form questionnaire survey from 1st to 20th April 2007.	The relevant part of the PDD is revised accordingly. This is closed.

## Response to CL1

		Key document	Approval	Remarks
Initial consideration	08/2004	First FSR (25MW) Stage I: 5MW with the financial analysis Stage II: 20MW without financial analysis	No approval	The project owner initially planned to develop a 25MW installation in several stages. 5MW was planned as the first stage to be implemented. The FSR approval has been pending.
	16/10/2004	First EIA (5MW)	09/11/2004	Only the first stage (5MW) was planned and submitted for EIA approval.
CDM consideration	10/01/2005	Correspondence with CMM and Natural Gas Utilisation Development Committee regarding CDM	n/a	The project developer consulted the Jincheng Municipal CMM and Natural Gas Utilisation Development Committee regarding its CDM development plan in January 2005.
	02/2005	Second FSR with CDM consideration (16.3MW)	07/06/2005	A FSR was conducted for the installation of 16.3MW with CDM consideration. The extension approval was granted since there has been a pending application for the stage I installation. Considering the submitted FSR and the EIA approval granted for 5MW, this approval covers the pending application and the latter FSR covering the total 16.3MW.
Implementation	11/12/2005	Construction contract	n/a	The signing of the construction contract was considered as the start of the project activity. The construction contract specified the construction was to start in December 2005; and Stage I installation was expected to be operational by March 2006.
	05/2007	PDD published with 25MW	n/a	The start of the CDM application process enhanced the project owner's confidence in the project. Instead of the approved 16.3MW design, the project owner considered to develop the project in a larger scale and planned to follow up with a new 25MW feasibility study. At the time of submission for validation, since no new design of 25MW installation has been conducted, the initial FSR (08/2004) was used as the basis of the financial analysis in the published PDD. Even the analysis demonstrates the financial unattractiveness of the project, this data source was later considered inappropriate in the validation process for the reasons below: The FSR (08/2004) did not receive a government approval or result in the actual project implementation; The financial analysis of the FSR only covered the 5MW units. It is inaccurate to assume the financial performance of a 25MW project to

				<p>be proportional to a 5MW installation.</p> <p>Given the reasons above, the financial analysis in the published PDD was revised with valid data in a later stage of the validation.</p>
	09/20	Second EIA	01/11/2007	<p>An EIA was conducted retrospectively for the installation extension. In addition to the initially approved 5MW, another 11.8MW was assessed and approved.</p>
	05/2008	PDD revised as 16.3MW	n/a	<p>At this stage of the validation, the project owner has decided to develop the 16.3MW project as designed and approved. No new feasibility study will be conducted for a 25MW installation. Therefore the PDD is revised to include the 16.3MW installation only.</p>

**APPENDIX B**

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**CERTIFICATES OF COMPETENCE**



CERTIFICATE OF COMPETENCE

Weidong Yang

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

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

Høvik, 4 January 2008

Michael Lehmann

Michael Lehmann  
Technical Director, International Climate Change Services



## CERTIFICATE OF COMPETENCE

***Michael Lehmann***

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

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

Høvik, 5 February 2007

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

**Michael Lehmann**  
*Technical Director*

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# CERTIFICATE OF COMPETENCE

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*Mindy (Ming) Yue*

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

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# CERTIFICATE OF COMPETENCE

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*Ole Andreas Flagstad*

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

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

Høvik, 2 May 2008

*Michael Lehmann*

Michael Lehmann  
Technical Director, Climate Change Services



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# CERTIFICATE OF COMPETENCE

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*Shu Yong Sun*

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

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

Høvik, 12 March 2007

  
Einar Telnes  
Director, International Climate Change Services

  
Michael Lehmann  
Technical Director