



VALIDATION REPORT

EDF TRADING LIMITED

VALIDATION OF THE

SHANXI FENXI COAL MINE

METHANE UTILIZATION

PROJECT

REPORT NO. **BVC/CHINA-VAL/6157/2011**

Revision No. **02**

BUREAU VERITAS CERTIFICATION

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VALIDATION REPORT

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Client: EDF Trading Limited	Client ref.: Ms. Liu Yanyan

Summary:

Bureau Veritas Certification has completed the validation of Shanxi Fenxi Coal Mine Methane Utilization Project owned by Shanxi Fenxi Coal Mine Methane Development Ltd. located in Lvliang City, Shanxi Province, P.R.China on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up on-site visit and interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the validation process is a list of Clarification and Corrective Actions Requests (CL and CAR), presented in Appendix A. Taking into account this output, the project proponent revised its project design document.

In summary, it is Bureau Veritas Certification's opinion that the project correctly applies the baseline and monitoring methodology ACM0008 Version 07 and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.

Report No.: BVC/CHINA-Val/6157/2011	Subject Group: CDM
Project title: Shanxi Fenxi Coal Mine Methane Utilization Project	
Work carried out by: Mr. Ernesto Tan Wenbin Team Leader Mr. Tony Li Xingtong Team Member Mr. Feng Jun External Experts	
Internal technical Review carried out by: Mr. Robin Wang	
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Work approved by:
Flavio Gomes

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1. INTRODUCTION

EDF Trading Limited (The project participant from Annex I Party) has commissioned Bureau Veritas Certification to validate its CDM project Shanxi Fenxi Coal Mine Methane Utilization Project (hereafter referred to as “**the Project**”) owned by Shanxi Fenxi Coal Mine Methane Development Ltd. (hereafter referred to as “**the PP**”) in Lvliang City, Shanxi Province, P.R.China.

This report summarizes the findings of the validation of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1. Objective

The validation serves as project design verification and is a requirement of all projects. It is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design, as documented, is sound and reasonable, and meet the stated requirements and 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).

UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

1.2. Scope

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

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

1.3. Validation team and Internal Technical Reviewer

FUNCTION	NAME	CODE HOLDER	TASK PERFORMED*
Team Leader	Mr.Ernesto Tan Wenbin	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input checked="" type="checkbox"/> RI
Team Member	Mr.Tony Li Xingtong	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input type="checkbox"/> RI
Technical Specialist	Mr.Feng Jun	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input type="checkbox"/> RI

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Financial Specialist	N.A.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI
Internal Technical Reviewer (ITR)	N.A.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI
Specialist supporting ITR	Mr. Robin Wang	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI

*DR = Document Review; SV = Site Visit; RI = Report issuance

2. METHODOLOGY

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a validation protocol was customized for the project, according to the version 01.2 of the Clean Development Mechanism Validation and Verification Manual /2/, issued by CDM Executive Board at its 55th meeting on 30/07/2010. The protocol shows, in a transparent manner, criteria (requirements), means of validation and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, 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 completed validation protocol is enclosed in Appendix A to this report.

2.1. Review of Documents

The Project Design Document (PDD) submitted by Energy Systems International and additional background documents related to the project design and baseline, i.e. country Law, Guidelines for Completing the Project Design Document (CDM-PDD), Approved methodology, Kyoto Protocol, Clarifications on Validation Requirements to be Checked by a Designated Operational Entity were reviewed.

To address Bureau Veritas Certification corrective action and clarification requests, Energy Systems International revised the PDD and resubmitted it on 31/10/2012 and the validation conclusion presented in this report relate to the project as described in the PDD version 03.

2.2. Follow-up Interviews

From 22/11/2011 to 24/11/2011, Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of the project participants, the consultant and local stakeholders were

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interviewed (see Section 6 REFERENCES). The main topics of the interviews are summarized in Table 1.

Table 1. Interview topics

Interviewed organization	Interview topics
Shanxi Fenxi Coal Mine Methane Development Ltd. (The PP from host party)	<ul style="list-style-type: none"> ➤ Project background information and CDM consideration. ➤ Project technology, operation, maintenance and monitoring capability. ➤ Project monitoring and management plan. ➤ Stakeholder consultation process. ➤ Project approval status (incl. EIA approval, CDM project approval status) ➤ CMM projects development in the area ➤ Government policies related to CMM projects
Local Stakeholder	<ul style="list-style-type: none"> ➤ Project background in details ➤ Stakeholder comments ➤ Social and environmental impact of the project
Timing Carbon UK Ltd and EDF Trading Limited and Energy Systems International (the participants from Annex I party and consultant)	<ul style="list-style-type: none"> ➤ Applicability of selected methodology. ➤ Baseline determination. ➤ Emission reductions calculation. ➤ Emission reduction monitoring plan.

2.3. Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the project design.

Corrective Action Request (CAR) is issued, where:

- The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- The CDM requirements have not been met;
- There is a risk that emission reductions cannot be monitored or calculated.

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Bureau Veritas Certification may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix A.

2.4. Internal Quality Control

The validation report underwent an Internal Technical Review (ITR) before requesting registration of the project activity.

The ITR is an independent process performed to examine thoroughly that the process of validation has been carried out in conformance with the requirements of the validation scheme as well as internal Bureau Veritas Certification procedures.

The Team Leader provides a copy of the validation report to the reviewer, including any necessary validation documentation. The reviewer reviews the submitted documentation for conformance with the validation scheme. This will be a comprehensive review of all documentation generated during the validation process.

When performing an Internal Technical Review, the reviewer ensures that:

- The validation activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.
- The review encompasses all aspects related to the project which includes project design, baseline, additionality, monitoring plans and emission reduction calculations, internal quality assurance systems of the project participant as well as the project activity, review of the stakeholder comments and responses, closure of CARs, CLs and FARs during the validation exercise, review of sample documents.

The reviewer compiles clarification questions for the Team Leader and Validation Team and discusses these matters with Team Leader.

After the agreement of the responses on the 'Clarification Request' from the Team Leader as well as the PP(s) the finalized validation report is accepted for further processing such as uploading on the UNFCCC webpage

3. VALIDATION CONCLUSIONS

In the following sections, the conclusions of the validation are stated.

The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are described in the Validation Protocol in Appendix A.



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The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A. The validation of the Project resulted in **2** Corrective Action Requests (CARs) and **11** Clarification Requests (CLs).

The CARs and CLs were closed based on adequate responses from the Project Participant(s) which meets the applicable requirements. They have been reassessed before their formal acceptance and closure.

The number between brackets at the end of each section corresponds to the VVM paragraph.

3.1. Approval (49-50)

The letters of approval have been received and the following support documentation has been verified by Bureau Veritas Certification:

- ✍ The DNA of China has issued a Letter of Approval (No.3725) in Feb.2012, authorizing Shanxi Fenxi Coal Mine Methane Development Ltd. as the Project Participant for the Project in China^[4].
- ✍ The DNA of China has issued a Letter of Approval (No.3725) in Feb.2012 authorizing Shanxi Fenxi Coal Mine Methane Development Ltd. as the Project Participant and confirms that Shanxi Fenxi Coal Mine Methane Utilization Project contributes to China's Sustainable development^{[3] [21]}.
- ✍ The DNA of Netherland has issued a Letter of Approval (2012ANL606) on 02/04/2012, authorizing Timing Carbon UK Ltd as the Project Participant^[4].
- ✍ The DNA of France has issued a Letter of Approval (12-0288 II 5E JBBter) on 26/04/2012, authorizing EDF Trading Limited as the Project Participant^[5].

Bureau Veritas Certification received these letters of approval from the project participants and does not doubt the letters' authenticity.

The letters of approval do not contain a specific version of both the PDD and the validation report.

The title and contents of the letters of approval refer to the precise proposed CDM project activity title in the PDD being submitted for registration.

- ✍ Bureau Veritas Certification considers the letters of approval are in accordance with **para. 45 - 48 /VVM**.

3.2. Participation (54)

The participation for each project participant has been approved by a Party of the Kyoto Protocol.

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☞ Complying with **para.54/VVM**, Bureau Veritas Certification hereby confirms that by referring to the information on UNFCCC website i.e.

<http://maindb.unfccc.int/public/country.pl?country=CN>; and

<http://maindb.unfccc.int/public/country.pl?country=FR>

<http://maindb.unfccc.int/public/country.pl?country=NL>

3.3. Project design document (57)

☞ Complying with **para.57/VVM**, Bureau Veritas Certification hereby confirms that the PDD complies with the latest Project Design Document Form (CDM-PDD) version 03.2 and guidance documents for completion of PDD version 07.

3.4. Changes in the Project Activity

During the site visit, no physical changes except the exact geo-coordinates regarding to the implementation of the Project were observed in project as compared to details mentioned in webhosted PDD, the exact geo-coordinates have been measured by the validation team onsite, which has been listed as follows:

CMM Stations	Geographical Coordinates
Xuejialing Station	110°58' 06"E, 37°20' 43" N (110.9683°E, 37.3453°N)
Duhumao Station	110°57' 17"E, 37°19' 45"N (110.9547°E, 37.3292°N)
Guojiashan Station	110°48' 14"E, 37°31'41"N (110.8039°E, 37.5281°N)
Mazhuang Station	112°06' 20"E, 37°38'08"N (112.1056°E, 37.6356°N)

3.5. Project description (64)

The Project is composed of four coal mine methane (CMM) power stations (Xuejialing Station and Duhumao Station in Hexi mine, Guojiashan Station in Shuangliu mine and Mazhuang Station in Zhongxing mine) located in Lvliang City, Shanxi Province, P.R.China.

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The Project is a CMM utilization project for grid-connected power generation, and the total installed capacity of the Project is 19.9MW. The Project is composed of four coal mine methane (CMM) power stations located in Hexi, Shuangliu and Zhongxing coalmines which have production capacities of 1.5 Mt/y, 2.0 Mt/y and 0.3 Mt/y respectively, equipped with 6 sets of 650kW gas gensets in Xuejialing power station, and 32 sets of 500kW gas gensets in Duhumao, Guojiashan and Mazhang power stations. Waste heat recovery systems will be fixed as well. The Project could recover approximately 55,898.4GJ of waste heat from waste recovery boilers annually. The heat supplied by the Project would replace the thermal energy supplied from coal-fired boilers. The net electricity generated by the Project is 93,690MWh. In the full operation year in 2015, the annually methane volume (V_{CH_4}) sent to power plant is 35.8659Mm³/y. The emission reductions from the waste heat recovery are not claimed. The Project will result in annual average emission reductions of 484,973tCO₂e¹ during the fixed 10-year crediting period.

In the absence of the Project, power and heat supply to the mine was from the North China Power Grid (NCPG) and coal fired boilers respectively. This is same as the baseline scenario. The project scenario is considered additional in comparison to the baseline scenario, and therefore eligible to receive Certified Emissions Reductions (CERs) under the CDM, based on the analysis presented in the PDD.

The processes undertaken by Bureau Veritas Certification to validate the accuracy and completeness of the Project description include the document review and crosscheck with the approved FSR and relevant approvals issued by local governments.

- ✎ 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 the host country.
- ✎ Complying with para.64/VVM, Bureau Veritas Certification hereby confirms that the project description in PDD is accurate and complete in all respects and that there is no change to the project activity design or boundary as compared to the webhosted PDD.

3.6. Baseline and monitoring methodology

3.6.1. Baseline and monitoring methodology

The Project uses the approved consolidated baseline and monitoring methodology ACM0008 Version 07– “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” valid from 30/07/2010 /1/. The steps taken to assess the relevant information contained in the PDD against each applicability condition are described below.

By on-site visiting and interviewing with the PP, Bureau Veritas Certification confirms that the Project complies with the applicability conditions of methodology ACM0008 Version 07.

¹ The average annual emission reductions are changed because of the change of crediting period, and the annual emission reductions in the full-operation year have not been changed.

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- ✓ The project activity involve the underground boreholes in the mine to capture pre mining CMM;
- ✓ The baseline is the total atmospheric release of the methane;
- ✓ The methane is captured and destroyed by power generators.
- ✓ The remaining share of the methane to be diluted for safety reason is still vented;
- ✓ All the CMM captured by the project will be used for power generation, and will not be vented.
- ✓ The methodology applies to existing mining activities of Hexi, Shuangliu and Zhongxing coalmines.

The Project does not involve any of the following features with which the methodology ACM0008 Version 07 does not apply to the Project:

- Operate in opencast mines;
- Capture methane from abandoned/decommissioned coalmines.
- Capture/use of virgin coal bed methane, e.g. methane of high quality extracted from coal seams independently of any mining activities;
- Use CO₂ or any other fluid/gas to enhance CBM drainage before mining takes place.

The methodology applied also refers to the latest approved version of the following tools:

- Tool to calculate the emission factor for an electricity system (Tool-Grid EF) /3/;
- Tool for the demonstration and assessment of additionality (Tool-Additionality) /4/;

The Project supplies electricity to NCPG, so the Tool-Grid EF is applicable to calculate the baseline emissions for the Project while substituting CMM power generation for grid electricity. Therefore the Tool-Grid EF version 2.2.1 is applicable.

Bureau Veritas Certification hereby confirms that the selected baseline and monitoring methodology, tool and other methodology component is previously approved by the CDM Executive Board, and is applicable to the Project, which, complies with all the applicability conditions therein.

Based on the on-site assessment, Bureau Veritas Certification hereby confirms that as a result of the implementation of the Project, except for CO₂ emission induced from CMM combustion which is addressed by the applied methodology, there are no other greenhouse gas emissions occurring within the project boundary, which are expected to contribute more

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than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology..

3.6.2. Project boundary (80)

Bureau Veritas Certification has validated the project boundary by:

- a) Assessing the relevant documents including FSR.
- b) Observing the physical site and equipment used in the process.

The project boundary is clearly defined in line with ACM0008 Version 07. The spatial extent of the project boundary comprises all equipments installed and used as part of the Project for the CMM transmission; power and heat generation facilities installed and used as part of the Project; North China Power Grid that the power plant is connected to; coal fired boilers that would supply heat to users.

The greenhouse gases and emission sources included in the project boundary are CH₄ emissions as a result of venting gas that would be captured in the Project; CO₂ emissions from the production power that is replaced by the Project; CO₂ emissions from the production heat using coal as fuel that is replaced by the project activity.

☞ Complying with **para.80/VVM**, Bureau Veritas Certification hereby confirms that the identification of project boundary is in line with the delineation of grid boundaries as provided in the methodology ACM0008 Version 07. And the delineation of grid boundaries as provided in the version of “Notification on Determining Baseline Emission Factor of China’s Grid” published by NDRC (China’s DNA) on 20/12/2010 (hereafter called “Notification of China-Grid EF”)^[11]. During on-site visit, via observations of the physical site, Bureau Veritas Certification hereby confirms that the identified boundary and the selected sources and gases are justified for the Project.

3.6.3. Baseline identification (87-88)

The Project is the installation of four newly built and grid-connected CMM generation plants that deliver the electricity to the NCPG and recover waste heat from waste recovery boilers. Hence, according to methodology ACM0008 Version 07, the baseline scenario is determined properly as: Combinations of ventilation air methane and pre mining extraction; the extracted CMM utilized in the Project will be released directly to the atmosphere; NCPG supplies the equivalent amount of electricity; and heat supplied by coal fired boilers.

The validation team is able to confirm that approach of the baseline scenario identification procedure and the elimination of the unfeasible scenarios are fully in line with the procedure outlined in the methodology ACM0008 Version 07:

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

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Step 1a. Options for CMM extraction

Technically feasible options for CMM extraction for the coal mines include:

- A. Ventilation air methane;
- B. Pre mining CMM extraction;
- C. Post mining CMM extraction;
- D. Combinations of ventilation air methane and pre mining extraction. Ventilation accounts for approximately 43% of total methane volume, and pre mining extraction accounts for approximately 57% of total methane volume in Xuejialing Station. In Duhumao station, ventilation and pre mining account for approximately 40% and 60% of total methane volume respectively. In guojiashan station, ventilation and pre mining account for approximately 40% and 60% of total methane volume. In Mazhuang station, ventilation and pre mining account for approximately 19% and 81% of total methane volume respectively. This is the continuation of current CMM extraction practice in each CMM extraction station.

Step 1b. Options for extracted CMM treatment

The possible baseline scenario alternatives for treating extracted CMM include:

The CMM treatment options in the proposed coalmine include:

- i. Venting. This is the continuation of existing CMM treatment practice;
- ii. Using/destroying ventilation air methane rather than venting it;
- iii. Flaring of CMM;
- iv. Use for additional grid power generation, this is the Project activity not implemented as a CDM project.
- v. Use for additional captive power generation;
- vi. Use for additional heat generation;
- vii. Feed into gas pipeline (to be used as fuel for vehicles or heat/power generation);
- viii. Possible combination of options i to vii with the relative shares of gas treated under each option specified.

Step 1c. Options for energy production

The electricity could be produced through the following options:

The alternatives for power generation include:

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- 1) Electricity supply by NCPG. This is the continuation of existing power supply practice;
- 2) Electricity supply from captive coal-fired power generation of same scale;
- 3) CMM power generation. This is the project activity not undertaken as a CDM project;
- 4) Electricity supply from a renewable power plant of same scale;

The alternatives for heat production include:

- 5) Continuation of current heat supply by coal-fired boilers. This is the continuation of existing heat supply practice;
- 6) Heat supply by the heating grid;
- 7) Heat supply by the CMM gas boiler;
- 8) Waste heat recovery from CMM-fuelled engines. This is the Project activity not undertaken as a CDM project.

The validation team confirms that the baseline scenario options for CMM extraction, extracted CMM treatment, and energy production have been listed in the Section B.4 of the PDD.

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

Step 2.a The baseline options A, B, C are eliminated:

The *State Administration of Coal Mine Safety* is China's administration in charge of the coal mine safety, by which the safety requirements of CMM extraction and utilization are established. The validation team has checked all the currently in effect laws and regulations in the website of the State Administration of Coal Mine Safety^[26]. National Coalmine Safety Regulation version 2010^[26] require that methane concentrations in the air should be below 1% to avoid the risk of explosion. In order to keep the methane concentration below 1% in the air for the coal mines underground, it needs methane extraction in during-mining and/or pre-mining and/or post-mining. Ventilation and pre-mining and/or post-mining extraction are together required to keep the concentration of methane below 1% for guaranteeing the safety production in the Project Coal Mine. The validation team confirms that solely adopting alternative A, B or C does not comply with the regulatory requirements and are eliminated, and option D will be considered as an extraction alternative.

Step 2.b The baseline option iii is eliminated.

It is also regulated in *National Coalmine Safety Regulation version 2010*^[26], item 148 that CMM with methane concentration lower than 30% would not be combusted directly. Bureau Veritas Certification has checked the gas test report of the three mines^[48], and found the CH₄ concentration for Zhongxing Mine is 14.15%, for Shuangliu Mine is 18.34%, for Hexi Mine is 18.95%, which is much lower than 30%. Bureau Veritas Certification has also crosschecked

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the Daily CMM extraction reports (from May.2011 to Oct.2011) of Hexi, Shuangliu and Zhongxing Mines^[49], and confirmed the CH₄ concentration of the mines is lower than 30%. Considering the above factors, the validation team confirms that the baseline option iii (Flaring of CMM) can be eliminated.

While it is also regulated that CMM transfer and utilization of CMM with methane concentration lower than 30% should apply safety technology and measures when it is sent for power generation or other utilizations. Option i, ii, iv, v, vi, vii and viii could be feasible options for CMM utilization.

Step 2.c Alternative 2 for energy production (building coal fired power plant) is eliminated

There is a difference in the utilization hours between a thermal power plant and a CMM power plant with equivalent electricity. In 2007, the average utilizing hours of thermal power plants could reach 4,885 hours (China Electric Power Yearbook 2009, P706)^[46]. If considering the capacity that can be generated by the same annual electricity generation as the alternative scenario for the Project, the installed capacity of the thermal plant would be 24.4MW. However according to the decree *Notice on Strictly Prohibiting the installation of Fuel-fired Generators with the Capacity of 135 MW or Below* issued by the *General Office of the State Council*, No. [2002]6^[27], the alternative doesn't comply with Chinese relevant laws and regulations. The validation team confirms that the alternative 2 for energy production (building coal fired power plant) is eliminated.

The validation team confirms that the PDD has correctly eliminated scenario options for CMM extraction A, B, C and option iii (Flaring of CMM) for CMM treatment options for safety related laws and regulations and alternative scenario 2 for energy production (coal fired power plant) for installed capacity limitation.

Step 3. Formulate baseline scenario alternatives**Step 3a. Baseline scenario alternatives for CMM extraction:**Alternative Scenario D

Combinations of ventilation air methane and pre mining extraction. Ventilation accounts for approximately 43% of total methane volume, and pre mining extraction accounts for approximately 57% of total methane volume in Xuejialing Station. In Duhumao station, ventilation and pre mining account for approximately 40% and 60% of total methane volume respectively. In Guojiashan station, ventilation and pre mining account for approximately 40% and 60% of total methane volume. In Mazhuang station, ventilation and pre mining account for approximately 19% and 81% of total methane volume respectively. This is the continuation of current CMM extraction practice in each CMM extraction station.

Step 3b. Alternatives for CMM treatment

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The scenarios left in step 1b are:

Alternative Scenario i

CMM ventilation.

Alternative Scenario ii

VAM Utilization.

Alternative Scenario iv

Recovered CMM could be utilised for power generation delivered to North China Power Grid. This is the project activity not implemented as a CDM project.

Alternative Scenario v

Recovered CMM power generation for use directly at the coalmine

Alternative Scenario vi

Recovered CMM could be combusted in gas boilers to produce thermal energy or heat at the coal mine. This thermal energy could be in the form of hot water, hot air or steam.

Alternative Scenario vii

Extracted CMM could be delivered to the local pipeline for residential or commercial use. The low pressure-type system usually requires the delivered gas to be >30% CH₄.

Alternative Scenario viii

Combination of options above.

Step 3c. Alternatives for energy production

The alternatives for power generation include:

1. Electricity supply by NCPG. This is the continuation of existing power supply practice;
3. CMM power generation. This is the project activity not undertaken as a CDM project;
4. Construction of a renewable power plant with equivalent amount of electricity;

The alternatives for heat production include:

5. Continuation of current heat supply by coal-fired boilers;
6. Heat supply by the Grid;

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7. Heat supply by the CMM gas boiler;

8. Waste heat recovery from CMM-fuelled engines. This is the Project activity not undertaken as a CDM project.

The validation team confirms that the PDD has correctly formulated baseline scenario alternatives after eliminating scenarios that do not comply with legal or regulatory requirements.

Step 4. Eliminate baseline scenario alternatives that face prohibitive barriers***Step 4a. Barrier analysis of the alternatives for CMM extraction:******Alternative scenario D:***

This is the continuation of CMM extraction practice at the project site without the Project.

Step 4b. Barrier analysis of the alternatives for CMM treatment:

The barriers analyses of CMM treatment alternatives as a result of Step 3b are as follows:

i: this is the Business as Usual (hereafter called BAU).

ii: VAM Utilization.

The Project does not involve VAM utilization. Therefore this option is not feasible, and then can be eliminated.

iv: Recovered CMM could be utilised for power generation delivered to NCPG.

No barrier has been identified for the alternative.

v: Recovered CMM power generation for use directly at the coalmine

No barrier has been identified for the alternative.

vi: Recovered CMM could be combusted in gas boilers to produce thermal energy or heat at the coal mine. This thermal energy could be in the form of hot water, hot air or steam.

No barrier has been identified for the alternative.

vii: Extracted CMM could be delivered to the local pipeline for residential or commercial use.

As per the result of the study^[30], extracted CMM could be delivered to the local pipeline at the concentration of at least 30%, and according to the latest “*Classification and essential property of city gas*” (GB/T 13611-2006)^[50], if the gas contains methane and air only, the methane concentration must be at least 30.1% for feeding into the gas pipeline, which make it impossible that the extracted CMM is directly delivered to the gas pipeline as per the Gas Test Report and the daily CMM extraction reports of Hexi, Shuangliu and Zhongxing Mines^{[48][49]}.

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Furthermore, as the coal mines are all located in the mountain area, Bureau Veritas Certification has confirmed neither any gas pipeline connection nor methane concentrating facility of the three mines exists, therefore the alternative has been eliminated due to the barriers above.

viii: According to above discussion, the alternative *ii* and *vii* are eliminated above, the left combination is *i* & *iv*, *i* & *v*, *i* & *vi*.

Step 4c. Barrier analysis of the alternatives for energy production

The alternatives for power generation include:

1. Electricity supply by North China Power Grid. No barrier exists.
3. Generate electricity with the extracted CMM, but not implemented as a CDM project.

No barrier has been identified for the alternative.

4. Construction of a renewable power plant with equivalent amount of electricity

The validation team confirms that:

It is not feasible to develop hydropower and wind power plant with equivalent electricity because of lacking hydropower and wind power resources in the local areas. Due to the high investment per unit and lower return rate of solar power generation, no solar project can generate the equivalent electricity to the Project in Shanxi Province currently, and it is not feasible to develop solar power plant with equivalent electricity. For the biomass generation, due to price of biomass continuously rising and some other reasons, most of the biomass power generation projects are suffering from severe loss after the projects operating. So, it is not feasible to develop biomass power plant with equivalent electricity^[47].

Therefore, the option 4 is not feasible and should be eliminated.

The alternatives for heat production include:

5. Continuation of current heat supply by coal-fired boilers. This is the continuation of existing heat supply practice; No barrier exists.
6. Heat supply by the heating Grid;

By the onsite assessment in the project area and the interview with the local residents and representatives of local government, Bureau Veritas Certification has confirmed neither heating grid nor the pipeline connection exist in the local mountain area. The alternative has been eliminated due to the lack of infrastructure.

7. Heat supply by the CMM gas boiler;

No barrier exists for the alternative, it will be further eliminated in step 5, and please refer to section 3.7 of the Report.

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8. Waste heat recovery from CMM-fuelled engines. This is the Project not undertaken as a CDM project, which will be eliminated in step 5 and refer to in section 3.7 of the Report.

Therefore, the options D (Combinations of ventilation air methane and pre mining extraction), i (CMM ventilation) iv (Recovered CMM could be utilised for power generation delivered to NCPG), v (Recovered CMM power generation for use directly at the coalmine), vi (Recovered CMM could be combusted in gas boilers to produce thermal energy or heat at the coal mine), and for energy production, alternatives 1, 3, 5, 7 and 8 are the feasible baseline options.

Step 5. Identify most economically attractive baseline scenario alternative

According to ACM0008 Version 07, investment comparison analysis has been used for the Project to identify most economically attractive baseline scenario alternative. Since the Scenario i and scenario 1 and 5 are the BAU, no further financial input and output is required for the PP, thus, the NPV of these scenarios are zero (i.e. NPV(scenario i)=0, NPV(scenario 1)=0 and NPV (scenario 5=0)).

And as per the result of the comparison analysis in Section 3.7, NPV (Scenario iv), NPV (Scenario v) and NPV (Scenario vi) are negative, lower than NPV (Scenario i), thus, Option iv, v and vi have been eliminated.

The combined scenario 3 and 8 are the same as the Project but not implemented as a CDM Project; and the scenario 7 is the same as scenario vi, therefore, NPV (Scenario 3+Scenario 8), NPV (Scenario 7) are negative, lower than the NPV (Scenario 1) and NPV (scenario 5), thus, alternatives 3, 7 and 8 have been eliminated.

Please refer to section 3.7 of the Report for detailed analysis.

In conclusion, in CMM extraction step only alternative scenario D can be implemented. In CMM treatment step, continuation of the current CMM extraction practice with all the extracted CMM released into atmosphere is the only baseline scenario. In energy production step, continuation of power supply by NCPG and heat supply by coal fired boilers is the baseline scenario.

✌ Complying with para. 87 and 88/VVM, Bureau Veritas Certification hereby confirms that:

- (a) All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- (b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- (c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- (d) Relevant national and/or sector policies and circumstances are considered and listed in

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the PDD;

(e) The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

3.6.4. Algorithms and/or formulae used to determine emission reductions (92-93)

Bureau Veritas Certification confirms that the steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the methodology ACM0008 Version 07.

The emission reduction ER_y by the project activity during a given year y is the difference between the baseline emissions (BE_y) and project emissions (PE_y), and also eliminates the leakage of CDM project activities (LE_y) as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y : Emissions reductions of the project activity during the year y (tCO₂e)

BE_y : Baseline emissions during the year y (tCO₂e)

PE_y : Project emissions during the year y (tCO₂e)

LE_y : Leakage emissions in year y (tCO₂e)

3.6.4.1. Project emission

The steps for calculating the project emission:

$$PE_y = PE_{ME} + PE_{MD} + PE_{UM}$$

Where :

PE_y Project emissions in year y (tCO₂e)

PE_{ME} Project emissions from energy use to capture and use methane in year y (tCO₂e);

PE_{MD} Project emissions from methane destroyed in year y (tCO₂e);

PE_{UM} Project emissions from un-combusted methane in year y (tCO₂e).

1) Combustion emissions from additional energy required for CBM/CMM/VAM capture and use

Additional power energy may be used to capture, transport, compress and use the CMM.

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Emissions from this electricity consumption should be treated as project emissions. No fossil fuels and heat are consumed in the project activity. Thus, the formula is as follows:

$$PE_{ME} = CONS_{ELEC,PJ} \times CEF_{ELEC}$$

Where:

PE_{ME} Project emissions from energy use to capture and use or destroy methane (tCO₂e)

$CONS_{ELEC,PJ}$ Additional electricity consumption for use or destruction of methane, if any (MWh)

CEF_{ELEC} Carbon emissions factor of electricity (tCO₂/MWh). The consumed electricity is sourced from the grid. Therefore CEF_{ELEC} is the grid emission factor calculated according to the *Tool-Grid EF*. The CEF_{ELEC} is the same as EF_{ELEC} below.

2) Combustion emissions from use of captured methane

Combustion emissions from use of captured methane in the Project include emissions from methane destroyed through flaring and power generation. Therefore,

$$PE_{MD} = MD_{ELEC} \times (CEF_{CH_4} + r \times CEF_{NMHC})$$

$$MD_{ELEC} = MM_{ELEC} \times Eff_{ELEC}$$

$$r = PC_{NMHC} / PC_{CH_4}$$

Where:

PE_{MD} Project emissions from methane destroyed (tCO₂e);

MD_{ELEC} Methane destroyed through power generation in year y (tCH₄);

$MM_{ELEC,y}$ Methane measured delivered to power plant in year y (tCH₄)

Eff_{ELEC} Efficiency of methane destruction/oxidation in power plant (taken as 99.5% from IPCC).

GWP_{CH_4} Global warming potential of methane (21 tCO₂e/tCH₄).

CEF_{CH_4} Carbon emission factor for combusted methane (2.75 tCO₂e/tCH₄);

CEF_{NMHC} Carbon emission factor for combusted non methane hydrocarbons (tCO₂e/tNMHC);

r Relative proportion of NMHC compared to methane. r of the CMM used in the Project is lower than 1%.

PC_{CH_4} Concentration of methane (in mass) in extracted gas (%), measured on wet basis;

PC_{NMHC} NMHC concentration (in mass) in coal mine gas (%).

3) Un-combusted methane from project activity

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$$PE_{UM} = GWP_{CH_4} \times MM_{ELEC} \times (1 - Eff_{ELEC})$$

Where:

PE_{UM} Project emissions from un-combusted methane (tCO₂e) ;

GWP_{CH_4} Global warming potential of methane (21 tCO₂e/tCH₄);

MM_{ELEC} Methane measured sent to electricity generation (t CH₄);

Eff_{ELEC} Efficiency of the methane destruction in electricity generation (99.5%);

3.6.4.2. Baseline emissions

The baseline emissions include the baseline emissions from methane released into the atmosphere and baseline emissions from power generation in the baseline scenario.

Baseline emissions are given by the following equation:

As per the methodology ACM0008 Version 07, the baseline emissions are calculated as:

$$BE_y = BE_{MD,y} + BE_{MR,y} + BE_{Use,y}$$

where:

BE_y : Baseline emissions in year y (tCO₂e)

$BE_{MD,y}$: Baseline emissions from destruction of methane in the baseline scenario in year y (tCO₂e)

$BE_{MR,y}$: Baseline emissions from release of methane into the atmosphere in year y that is avoided by the project activity (tCO₂e)

$BE_{Use,y}$: Baseline emissions from the production of power, heat or supply to gas grid replaced by the project activity in year y (tCO₂e)

1) Methane destruction in the Baseline $BE_{MD,y}$

In baseline scenario, all the extracted gas is vented and not destroyed, thus $BE_{MD,y} = 0$.

2) Methane released into the atmosphere $BE_{MR,y}$

Emissions from the release of methane into the atmosphere in the year y that is avoided by the Project activity ($BE_{MR,y}$, tCO₂e) are calculated as:

$$BE_{MR,y} = GWP_{CH_4} \times CMM_{PJ,ELEC,y} = GWP_{CH_4} \times MM_{ELEC}$$

Where:

$BE_{MR,y}$: Baseline emissions from release of methane into the atmosphere in year y that is avoided by the project activity (tCO₂e)

GWP_{CH_4} : Global warming potential of methane (21tCO₂e/tCH₄)

$CMM_{PJ,ELEC,y}$: Pre-mining CMM captured, sent to and destroyed by power generation in the project activity in year y(tCH₄)

MM_{ELEC} : Methane measured sent to power plant (tCH₄)

2) Baseline emissions from power generation

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The power generation in the Project will replace electricity consumption from the NCPG. And the project will not claim the emission reduction due to the heat replaced by the Project (waste heat recovered from the waste recovery boilers). Thus, the following equation used to estimate $BE_{Use,y}$.

Baseline emissions from power generation ($BE_{Use,y}$, tCO₂e) are calculated as

$$BE_{Use,y} = GEN_y \times EF_{ELEC}$$

Where:

GEN_y Electricity supplied by the Project activity in year y to NCPG (MWh);

EF_{ELEC} Emissions factor of NCPG (tCO₂/MWh).

The emission factor of NCPG is the combined margin emission factor ($EF_{grid,CM,y}$) calculated as following seven steps according to the *Tool-Grid EF* version 02.2.1. In addition, the calculation in the PDD refers to the "Notification of China-Grid EF"^[11], which is the most recent information available at the time of CDM-PDD submission to Bureau Veritas Certification for validation.

Bureau Veritas has checked the "Notification of China-Grid EF" and can confirm that the emission factor calculation is in accordance with data in the China Electric Power Yearbook from 2005 to 2009 and China Energy Statistical Yearbook from 2007 to 2009, and also complies with requirement the Tool-Grid EF. According to the Notification of China-Grid EF, the Simple OM emission factor ($EF_{grid,OM,y}$) of NCPG is calculated as 0.9914tCO₂e/MWh. Similarly, the build margin emission factor ($EF_{grid,BM,y}$) of the NCPG is calculated as 0.7495tCO₂e/MWh.

According to the "Tool-Grid EF", the default weights $\omega_{OM} = 0.5$ for Operating Margin and $\omega_{BM} = 0.5$ for build Margin in the first crediting period of CMM Power Projects are adopted.

Therefore, the combined baseline emission factor is determined ex-ante and will remain fixed during the first crediting period, viz.

$$EF_{grid,CM,y} = 0.9914 \times 0.5 + 0.7495 \times 0.5 = 0.87045 \text{ tCO}_2\text{e/MWh}$$

The calculated result of $EF_{grid,CM,y} = 0.87045 \text{ tCO}_2\text{e/MWh}$ is consistent with that in the "Notification of China-Grid EF".

3.6.4.3. Leakage

As per the methodology, Leakage is given by the following equation:

$$LE_y = LE_{d,y} + LE_{o,y}$$

where:

LE_y : Leakage emissions in year y (tCO₂e)

$LE_{d,y}$: Leakage emissions due to displacement of other baseline thermal energy use of

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methane in year y (tCO₂e)

LE_{o,y}: Leakage emissions due to other uncertainties in year y (tCO₂e)

Displacement of baseline thermal energy use

There is no CMM utilization in the baseline scenario, so no displacement of baseline thermal energy uses would occur.

CBM drainage from outside the de-stressed zone

The Project does not involve CBM, thus the leakage emissions in this part are 0.

Impact of CDM project activity on coal production

There is no noticeable impact of CDM project activity on coal production since the baseline scenario is not ventilation only. CMM extraction is part of baseline scenario. Thus, there would not be any impact on the coal production. The leakage emissions of this part are 0.

Impact of CDM project activity on coal prices and market dynamics

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

Therefore, the leakage of the Project due to (1) displacement of other baseline thermal energy uses of methane and (2) other uncertainties are both zero. Therefore the Leakage LE_y of the Project is zero.

3.6.4.4. Emission reductions

Before 2015, the Project will not fully operate, and the emission reductions have been estimated as per the implementation plan of the Project. Given the data provided, the average expected annual emission reductions are 484,973 tCO₂e, in the fixed 10-year crediting period and the expected annual emission reductions in normal year is 517,910 tCO₂e. This is considered to be a reasonable estimation using the assumptions given by the Project.

☞ Complying with **para.92 and 93/VVM**, based on the above assessment, Bureau Veritas Certification hereby confirms that:

- (a) All assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- (b) All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;
- (c) All values used in the PDD are considered reasonable in the context of the proposed CDM project activity;
- (d) The baseline methodology ACM0008 Version 07 and “Tool-Grid EF” has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;
- (e) All estimates of the baseline emissions can be replicated using the data and parameter

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values provided in the PDD.

3.7. Additionality of a project activity (97)

The steps taken and sources of information used to cross-check the information contained in the PDD on this matter are described below:

“Tool for Demonstration and Assessment of Additionality” version 6.1.0 dated 13/09/2012 (hereinafter called “Tool-Additionality”) (/3/) has been employed for demonstrating and assessing the additionality of the Project. The additionality of the Project has been carefully checked, in doing so Bureau Veritas Certification has put the main focus on the following issues:

3.7.1. Prior consideration of the clean development mechanism (104)

The FSR of the Project was completed in Apr.2008 by Shandong Shengli-Power Machinery Gas-fired Power Engineering Design & Consulting Co., Ltd. and then approved by Shanxi Development and Reform Committee (Code: Jin Fa Gai Bei An [2008] No.148) on 09/05/2008. The FSR showed that the Project would not have been realized without CDM financial support. Based on the conclusion of the FSR, the PP decided to implement the Project with CDM support on 02/06/2008. On 15/07/2008, the Construction Contract of Xuejialing Power Station was signed. This is the earliest of the dates at which the implementation or construction or real action of the Project began and has been identified as the project start date.

From the table analyzed in section 3.7.1.1 of this report, Bureau Veritas Certification was able to verify that the start date of the Project determined as 15/07/2008 is appropriate (the signed date of the Construction Contract of Xuejialing Power Station) and is the earliest of the dates at which the implementation or construction or real action of the Project began. This is in accordance with the latest CDM glossary. (/6/)

The Project is the existing project according to the definition in the “Guidelines on the demonstration and assessment of prior consideration of the CDM” version 04 (EB62 Annex 13) (hereinafter called “Guidelines-Prior Consideration”) /5/, i.e. the start date of the Project is before 02/08/2008. And the PDD has been published for global stakeholder consultation on 11/10/2011, after the starting date of the Project.

Bureau Veritas Certification has checked the documented evidences provided by the PP, especially the CDM Consultation Agreement with CAMCO^[15] and Termination of Consultation Agreement with CAMCO^[19], and found the consultation has been terminated due to the commercial reason, and the evidences are credible. According to the evidence gathered, it has been verified that the gaps between the documented evidences are less than two years. Hence, Bureau Veritas Certification can confirm that CDM was seriously considered in the decision to implement the Project.

3.7.1.1. Historical information on project timeline

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It has been demonstrated by the timeline of events of the Project that the CDM revenue was seriously considered in the decision to proceed with the Project prior to start of the Project and, the continuing and real action were taken to secure CDM status for the Project in parallel with its implementation:

Table 2 Timeline of the Project

Date	Events	Evidence verified
Apr.2008	FSR was finalized by Shandong Shengli-Power Machinery Gas-fired Power Engineering Design & Consulting Co., Ltd.	[8]
09/05/2008	FSR approved by Shanxi Development and Reform Committee	[9]
Jun.2008	EIA has been finalized	[10]
30/06/2008	EIA approved by Shanxi Environmental Protection Bureau	[10]
02/06/2008	Board meeting decided to apply for CDM.	[12]
15/07/2008	Construction Agreement of Xuejialing Power Station (the starting date of the Project)	[13]
22/10/2008	EPC contract (except the construction part) signed of Xuejialing Power Station	[14]
17/07/2009	CDM Consultation Agreement with CAMCO	[15]
17/12/2010	Termination of Consultation Agreement with CAMCO	[19]
26/01/2011	CDM Term Sheet with Timing Carbon Ltd.	[20]
11/10/2011	PDD was published on UNFCCC for GSP	[1]

☞ According to the latest Glossary of CDM terms Ver. 06.0 (/6/) and “*Guidelines-Prior Consideration*” (/5/), Bureau Veritas Certification confirms that the start date of the Project in the PDD is appropriate and reasonable at that situation.

☞ Complying with **para.100-103/VVM**, Bureau Veritas Certification has verified this issue, which could significantly influence the additionality of the Project, and confirms that the serious consideration under the context of the Project has been addressed appropriately in accordance with the above guidance. Consequently, the chronological events described with the relevant documented evidences are the objective foundation on which Bureau Veritas Certification developed its validation opinions.

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3.7.2. Identification of alternatives (107)

Bureau Veritas Certification ensures the consistency between baseline scenario determination and additionality demonstration. The procedure of the identification of alternatives is ignored as per the methodology ACM0008 Version 07.

3.7.3. Investment analysis (114)

Considering the baseline scenario identified above, option III, the Benchmark Analysis, is applied in the investment analysis as per the *Sub-step 2b of "Tool-Additionality"*, which is in accordance with "Guidelines on the Assessment of Investment Analysis" version 05 (/8/).

Project IRR of 8% (post-tax) sourced from the "Interim Rules on Economic Assessment of Electric Power Engineering Retrofit Projects" issued by State Power Corporation of China in 2002, was employed by the Project as benchmark^[22]. Bureau Veritas Certification has verified this benchmark and confirms that it is widely applied in Chinese power generation industries. Therefore, Bureau Veritas Certification confirms that the benchmark is suitable for the Project.

Before reviewing the IRR calculation, Bureau Veritas Certification has validated the basic parameters listed in the PDD in accordance with the guidance of Para. 113/VVM. (/2/)

As per the relevant evidences provided, Bureau Veritas Certification confirms that the PP's final decision to proceed with the investment in the Project has been made based on the approved FSR^[8], which was finalized in Apr.2008 and approved on 09/05/2008. Based on the conclusion of the FSR, the PP decided to proceed with the Project on 02/06/2008 with the support from CDM revenues. Therefore, Bureau Veritas Certification confirms that the input values from the FSR were valid and applicable to the Project at the time of investment decision. In addition, given the short period of time between the FSR and the decision to proceed with the Project, Bureau Veritas Certification was therefore confident that it is unlikely in the context of the underlying Project that the input values would have materially changed, which is in line with the guidance of **Para. 113(a)/VVM**.

At the same time, Bureau Veritas Certification compared the input values for the financial analysis in the PDD and the FSR, and confirms that all input parameters used in the financial analysis are taken from the approved FSR, Bureau Veritas Certification was therefore of the opinion that the investment analysis is in accordance **Para. 113(b)/VVM**.

Furthermore, Bureau Veritas Certification has reviewed the IRR calculation sheet and confirms that:

- ✎ The **operation period** of 18 years was selected reasonably following the requirements of "Interim Rules on Economic Assessment of Electric Power Engineering Retrofit Projects" and Para.3 of "Guidelines on the Assessment of Investment Analysis" version 05 (/8/).
- ✎ The **residual value rate** of 5% was in compliance with relevant regulation in China, i.e. Enterprise Income Tax Law Implementation Regulations of People's Republic of China (The People's Republic of China State Council Order No. 512)^[28]

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✎ The **total static investment** in the approved FSR is 167.6335million RMB and unit investment is 8,424 RMB/kW.

- Because the construction of the Project is not completed, the financial closure of the Project is unavailable. Some cost items are unavailable at present, such as fire protection, safety equipments and road planting necessary to the Project. As per the implementation schedule of the four power stations of the Project, the Xuejialing Station and Mazhuang Stations are the first batch to be implemented. The validation team has checked the estimated total static investment against the already signed contracts of key equipment and construction related of the Project (e.g. Construction Agreement of Xuejialing Power Station, EPC contract for Xuejialing Power Station, Construction contract of Mazhuang Power Station, Power gensets purchasing contract of Mazhuang Power Station and System equipment purchasing contract of Mazhuang Power Station)^{[13]-[17]}, especially for the Xuejialing and Mazhuang Stations, and found the total value of the contracts for Xuejialing Station and Mazhuang Station accounts 29.3577million and 40.487million respectively, about 103.42% and 112.54% of the estimated respective static investment in the FSR.

- Bureau Veritas Certification has conducted a statistics as following criteria: CMM Power Generation projects in Shanxi Province with gas internal-combustion engine, only includes project activity components of CMM power generation or CMM power generation with waste heat recovery, registered as the CDM Project on UNFCCC website.

Bureau Veritas Certification has also checked investment per unit with the statistics as shown in appendix B^[45] and found that unit investments (RMB/kW) vary from 3,003 (UNFCCC Ref.1230) to 12,309 RMB/kW (UNFCCC Ref.1900). The investment per unit of the Project (8,424 RMB/kW) falls within this range. Therefore, Bureau Veritas Certification can confirm that the total static investment estimated in FSR is appropriate, valid and applicable at the time of the investment decision.

✎ The **tariff** of 0.285RMB/kWh used in the PDD is taken from FSR approved by the Shanxi Development and Reform Committee in 09/05/2008. According to the FSR and PDD, the Project supplies electricity to grid of Shanxi Province, which is a part of NCPG. The validation team has studied the tariff background in Shanxi Province in 2008.

- As per the Opinions of the State Council on Accelerating the CMM extraction and utilization (Code: Guo Ban Fa [2006] No.47) issued by the Office of State Council on 15/06/2006, the tariff for CMM power generation should follow the tariff approved by the government or the tariff for the desulfurized coal-fired power plant^[35].
- During the period of the FSR compiling, the latest bus-bar tariff for desulfurized coal-fired power plant of NCPG was 0.2754RMB/kWh (VAT included), which can be referred to the Price notification on tariff of NCPG (Code: Fa Gai Jia Ge [2006] No.1228)^[36]

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- During the period of the FSR compiling, several new grid connected CMM power generations also adopted the tariff of 0.2754RMB/kWh (VAT included), issued by Shanxi Price Bureau^{[37][38]}.
- On 13/03/2008, the PP and the grid company held the meeting for the Project about the power connection issues and tariff. And the tariff of 0.285RMB/kWh has been initially confirmed by both sides^[39].

Therefore, the validation team is of the opinion that the tariff of 0.285 RMB/kWh (incl. VAT) employed in approved FSR and PDD is reasonable and conservative.

The validation team has analyzed the tariff applied in the registered CMM projects in Shanxi Province, and found the highest applicable tariff is 0.38 RMB/kWh (incl. VAT, eg. UNFCCC Ref.3876); Even applying the highest tariff 0.38RMB/kWh in the Project, the Project IRR is 5.69%^[24], still lower than the benchmark.

In summary, Bureau Veritas Certification is of the opinion that the tariff employed in approved FSR and PDD is appropriate.

- ☞ The annual heat supply of 55,898.4GJ and the heat price of 20 RMB/GJ are sourced from the approved FSR. Bureau Veritas Certification has checked the signed steam supply contract^[40], and found the parameters are appropriate.
- ☞ The **annual supplied power** of the Project was determined based on the experience of the FSR developer and the technical parameters of the same capacity generators as stated in FSR. Therefore the supplied electricity is considered to be appropriate.
 - The operation hour of 6000h was determined based on the information from FSR, which was developed by an accredited third party (Shandong Shengli-Power Machinery Gas-fired Power Engineering Design & Consulting Co., Ltd.) contracted with the PP and approved by Shanxi Development and Reform Committee. Therefore, Bureau Veritas Certification confirms that the operation hour determined in the FSR is credible.
 - As per the approved FSR^[8], the continuous power rate is 0.86, thus the engines output is 560kW for the 650kW engines (Model: 650GF6-W2), and 430kW for the 500kW engines (Model: 500GF1-3PWW). Thus the annual power generated by the Project will be 102,720MWh $(= (560kW \times 6 + 430kW \times 32) \times 6000h)$.

The continuous power is due to the nature of the gas-fired genset, and is common in the CMM power generation project (eg. UNFCCC Ref.1928, 3016, 3200 and so on).

Bureau Veritas Certification has crosschecked the value with the technical contracts of the Gas-Fired Reciprocating Engines^[41], and found consistent and reasonable.

Considering the pumps, fans and other auxiliary facilities applied in the Project, the electricity self-consumption rate has been determined in the FSR as 8.528%.

Therefore, the electricity supplied to the NCPG is 93,690MWh

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(=102,720MWh*(1-8.528%)).

- As per the statistics ^[45], the operation hour varies from 6000h (UNFCCC Ref.1801, 3266, 4534 and 4098) to 8000h (UNFCCC Ref.3016). The operation hour of the Project is 6000h, falls in the range and is verified to be appropriate. And the continuous power rate varies from 0.7 (UNFCCC Ref.3190) to 1.0 (UNFCCC Ref. 1896, 1900, 3179), the electricity self-consumption rate varies from 0% to 10%. Thus, the continuous power rate and the electricity self-consumption rate falls in the range and is verified to be appropriate. According to the sensitivity analysis result, even the continuous power rate of 1.0 is applied in the Project, the post tax project IRR will not be higher than the selected benchmark.
- ✎ Bureau Veritas Certification confirms that the **annual O&M cost** is the sum of salary and welfare of employees, material fee, maintenance fee, insurance fee and miscellaneous account, which was studied based on the “Economic Evaluation Method and Parameters for Project Construction” (version 3) ^[23].
- The range of ratio of O&M costs to total static investment of the similar projects varies from 2.8% (UNFCCC Ref.1900) to 24.0% (UNFCCC Ref.1230) ^[45], and the ratio of O&M costs to total static investment of the Project is 8.3%, falls in this range and is verified to be appropriate.
- ✎ A post-tax benchmark is applied for the investment analysis of the Project. Bureau Veritas Certification has checked the IRR calculation sheet against the approved FSR, and confirms no debt involved in the Project, i.e. no interest has been taken into account in the calculation of income tax.
- ✎ Bureau Veritas Certification has checked the IRR calculation sheet and confirmed that depreciation has been deducted in estimating gross profits on which tax is calculated, and be added back to net profits for the purpose of calculating the financial indicator. The depreciation period is in line with the national regulation which requires that the depreciation should be larger than 10 years ^[28]. Bureau Veritas Certification confirms that the depreciation calculated complies with “Economic Evaluation Method and Parameters for Project Construction” (version 3) ^[23].
- ✎ Bureau Veritas Certification has also verified values of various taxes through crosschecking against the taxation rules conducted by local government and found to be fully consistent.
 - The income tax of 25% complies with Enterprise Income Tax Law of China which is effective from 01/01/2008 ^[31].
 - The VAT complies with the *Provisional Regulations of the People’s Republic of China on Value Added Tax* (State Council 1993[134]) issued by the State Council of P.R.China which is effective from 01/01/1994 ^[32].
- ✎ Complying with para.113/VVM, based on the assessment above, Bureau Veritas

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Certification hereby confirms that the underlying assumptions are appropriate and the financial calculations are correct.

Based on the data from the approved FSR valid and applicable to the Project at the time of investment decision, the Project IRR of the Project without CDM revenues is -0.45%, lower than the benchmark, which shows that the Project is not financially attractive compared to the benchmark in the absence of CDM benefits.

For the Scenario v:

The same amount of electricity supplied by the grid will be replaced by the captive electricity generation, and the basic parameters are the same as the scenario iv except the tariff. According to the sales receipts issued by the local grid company during Mar.2008-Jun.2008^[51], when the FSR has been finalized and approved, the tariff for the electricity imported from the grid was 0.372RMB/kWh, and the tariff has been applied in the scenario v. Therefore, the captive power generation tariff is reasonable.

And the NPV of the CMM power generation connected to the grid (Scenario iv) is -7,921 (10⁴ RMB), the NPV of the captive power generation (Scenario v) is -2,185 (10⁴ RMB), those are lower than the NPV of Scenario i (NPV=0).

For the Scenario vi:

The Project involves no gas-fired boiler components, and then it has been referred to the procedure of the registered CDM Project Ningxia Wulan Coal Mine Methane Power Generation Project (UNFCCC Ref.No.3289).

The source of the basic parameters are sourced from the FSR for power generation of the Project and the input values of other CDM projects including CMM boilers for heat generation. Bureau Veritas Certification has checked the total investment, operation cost (O&M cost), capacity, CH₄ consumption against the PDD/IRR spreadsheet of CDM Projects (UNFCCC Ref.1250, 1319, 1929 and 1931), and found consistent.

The NCV of methane is sourced from the research paper of China, and assumed thermal efficiency of 90% is the normal efficiency for the gas boilers, and the discount rate of 8% is conservative to keep the same as the other scenarios for the post-tax benchmark should be 10% for the heat supply projects^[23]. For the other parameters (eg. gas consumption, operation hours, heat price, gas price), they are consistent with those of scenario iv. CMM purification is required for the gas-fired boiler, the validation team has checked the gas purification investment and O&M cost for purification against the Investment and cost analysis Report of CMM Purification Project issued by the Shandong Shengli-Power Machinery Gas-fired Power Engineering Design & Consulting Co., Ltd.^[52], and found consistent.

Based on the verified parameters, the NPV of scenario vi has been correctly calculated as -1,280 (10⁴ RMB), which is also lower than the NPV of scenario i (NPV=0).

Bureau Veritas Certification has reviewed the IRR calculation^[24] and confirms that the IRR processing is consistent with the "Guidelines on the assessment of investment analysis"

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version 05 (/8/) and the data sources as well as the analysis approach are reliable and based on host country's regulation for compilation of FSR. According to *Guidance on the Assessment of Investment Analysis (ver 05)*, the parameters constituted more than 20% of either total project costs or total project revenues have been taken in the sensitivity analysis. Furthermore, the O&M cost is a variable which constitutes less than 20% but has a material impact on the analysis. For the annual heat supply and the heat price constituted much lower than 20% of total project revenues, they are not taken in the sensitivity analysis, which has no material impact on the analysis. Therefore, four financial parameters were taken as uncertain factors for sensitive analysis of financial attractiveness:

- Total Investment
- Tariff /Annual Power supply
- Annual O&M costs

And $\pm 10\%$ variations of above factors have been considered in the sensitivity analysis. Bureau Veritas Certification confirms that the variables and variations $\pm 10\%$ performed for sensitivity analysis is deemed to be appropriate for the Project, and the IRR of the Project does not reach the benchmark under these variations.

- ✌ With a decrease in total Investment by 41%, the Project IRR may reach 8%. However, as per the discussion above, it's impossible that the total investment of the Project (four power stations) decreases 41%.
- ✌ With an increase in tariff by 49.4%, i.e. 0.426RMB/kWh (Incl. VAT), the Project IRR will reach 8%. It will be even higher than the highest tariff of 0.38RMB/kWh among registered CDM CMM Power generation projects in Shanxi Province, thus Bureau Veritas Certification concludes that it is unlikely that the tariff could increase to make IRR reach benchmark of 8%.
- ✌ With an increase by 49.4% in Annual Power supply, the project IRR will reach the benchmark. The annual operation hour would be 8964 hours, which deems impossible. Therefore, Bureau Veritas Certification confirms that it is unlikely that the electricity generation could increase by 49.4% during the whole life of the Project.
- ✌ With a decrease in annual O&M cost by 75.2%, the Project IRR may reach 8%. The O&M cost comprises materials expense, maintenance cost, insurance fee, employee salary and welfare and miscellaneous accounts. All of these costs are determined by a qualified third-party entity based on long-term operational experience. Considering prices of raw materials and wage standard in China have been rising in recent years^{[39][43]}, the annual O&M cost is unlikely to decrease.

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Considering the CERs sale revenues (calculated with 90RMB/tCO₂e), the project IRR of the Project can be crossing the benchmark at 14.57% and become economically feasible.

Bureau Veritas Certification can conclude that both of the variation range and relevant assumptions stated in the PDD are robust and the investment of the Project is deemed to be financially unattractive.

☞ Complying with **para.114/VVM**, based on the assessment result by the financial expert engaged, Bureau Veritas Certification hereby confirms that the underlying assumptions are appropriate and the financial calculations are correct.

3.7.4. Barrier Analysis (118)

The Step 3 Barrier analysis was not applied for the Project.

3.7.5. Common Practice Analysis (121)

According to the *Tool for the demonstration and assessment of additionality (Version 06.1.0)*, the common practice analysis is illustrated by following sub-steps.

Sub-step 4a: Analyze other activities similar to the proposed project activity:

Sub-step 4a-1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity

The total installation capacity for power generation of the Project is 19.9MW. Range of +/-50% of the capacity is from 9.95MW to 29.85MW.

Sub-step 4a-2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculation in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. Note their number N_{all} . Registered CDM project activities and projects activities undergoing validation shall not be included in this step.

According the *Tool for the demonstration and assessment of additionality*, the applicable geographical area covers the entire host country as a default. The start date of the Project was 15/07/2008. Therefore, N_{all} is the number of all the power plants within the applicable capacity range (9.95MW to 29.85MW) and operated before 15/07/2008 in China, except the registered CDM projects or under validation projects.

For convenient of discussion in following sub-steps, the N_{all} is divided into three parts:

1. The unknown value **X** is made to represent the number of all the non-coal mine gas utilization projects (including fossil fuel plants, nuclear plants, waste heat/gas plants, solid waste treatment plants, renewable energy power plants, etc.), and captive plants in N_{all} ;
2. The unknown value **Y** is made to represent the number of the coal mine gas utilization projects not located in Shanxi Province in N_{all} ;
3. The rest in N_{all} is the number of coal mine gas utilization projects located in Shanxi Province, thus the unknown value **R** is made to represent it.

Then the N_{all} is composed of: $N_{all} = X + Y + R$.

Sub-step 4a-3. *Within plants identified in sub-step 2, indentify those that apply technologies different that the technology applied in the proposed project activity. Note their number N_{diff} .*

Considering the facts that the non-coal mine gas utilization projects and captive plants enjoy different energy source/fuel, the plants in X are identified as applying different technology with the proposed project, thereby the number X is included in the N_{diff} .

Moreover, in China, the provincial government is the highest level of local government. The local regulatory framework is often set by local government (e.g. price regulation, investment policy and so on). In addition, the natural conditions and investment conditions (e.g. electricity tariff, the commodity price and labour salary, etc.) are quite different among provinces. Then only the province could be regarded as applicable geographical area. And the FSRs and EIA statements of the proposed project were all approved by Provincial Government. Thereby the coal mine gas utilization projects in Y are identified as applying different technology with the proposed project, then the number Y is included in the N_{diff} .

Therefore, $N_{diff} = X + Y$

Searching from public & available sources, such as Global Methane International Coal Mine Methane Projects Database^[44], China's DNA website and UNFCCC website, the mine gas utilization project operated before 15/07/2008 in Shanxi are all registered as CDM project. Therefore, $R=0$.

Sub-step 4a-4: *Calculate factor $F=1-N_{diff}/N_{all}$ representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity. The proposed project is a common practice within a sector in the applicable geographical area if both the following conditions are fulfilled:*

- (a) *the factor F is greater than 0.2, and*
- (b) *$N_{all}-N_{diff}$ is greater than 3.*

Since $N_{all} = X + Y + R$, $N_{diff} = X + Y$, $R=0$

$N_{diff} = N_{all}$

$N_{all} - N_{diff} = 0$, which is less than 3.

Therefore, the Project is not a common practice.

☞ Complying with **para.121/VVM**, Bureau Veritas Certification has verified the description in the PDD and found that it is consistent with the sectoral statistics and therefore confirms that the Project is not common practice in the region.

Based on above demonstration that in accordance with "Tool-Additionality" and supported by

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reliable data sources, it is the opinion of Bureau Veritas Certification that the Project is thus additional.

3.8. Monitoring plan (124)

The Project uses the approved consolidated monitoring methodology ACM0008 Version 07 to develop the monitoring plan.

Applicability of this methodology is justified in PDD. Refer discussions on the applicability of the methodology at Section 3.5.1 above. Bureau Veritas Certification hereby confirms that the monitoring plan complies with the requirements of the methodology.

Bureau Veritas Certification confirms that it is appropriate to monitor the following parameters, as listed in the CDM-PDD, as well as their monitoring procedures and QA/QC procedures:

- MM_{ELEC} Methane measured sent to gas engines
- $PC_{CH_4,y}$ Concentration of methane (in mass) in extracted gas (%), measured on wet basis
- $PC_{NMHC,y}$ NMHC concentration in coal mine gas
- $CEF_{NMHC,y}$ Carbon emission factor for combusted non methane hydrocarbons
- GEN_y Electricity supplied by the Project to NCPG
- $CONS_{ELEC, PJ}$ Additional electricity consumption by the project
- $CMM_{PJ,I,y}$ Pre-mining CMM capture, sent to and destroyed by use i in the project activity in year y , which is equal to MM_i

The accuracy of all the meters has been provided in the monitoring plan. All the instruments installed in the Project should be in line with the relevant national standard, i.e.:

Type	Accuracy	National / Sectoral Standard
Electricity meter	At least 0.5/0.5S	DL/T448-2000
CH ₄ concentration meter	$\leq \pm 3\%$	AQ1027-2007
Gas flow meter	$\leq \pm 2\%$	AQ1027-2007

The QA/QC and training plan has been described in the monitoring plan

QA/QC: The following requirement shall be met in the monitoring operation: strictly training the personnel on watch, strengthening the norms of manual data reading process, guaranteeing of two persons to complete the monitoring operation at the same time. Data monitoring and recording should be implemented by trained technical personnel and periodically reported to the QA/QC auditor with signed hard copies. All the original reports will

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be categorized and kept for 2 years after the end of the crediting period or the last issuance of CERs, whichever occurs later.

In case of CMM meters failure, gas consumed by power engines are not claimed for ERs. The operator records the time of failure and make sure that meters installed are in calibration valid period.

In case of power meters failure, no power will be imported when the power generators are in operation. When the power generators shut down, the imported power from the Grid is estimated base on the previous records. The maximum value will be adopted for ER calculation in this period.

By on-site interview with the PP, Bureau Veritas Certification confirms that the monitoring arrangements described in the monitoring plan are feasible within the project design, and the means of implementation of the monitoring plan are sufficient to ensure the emission reductions achieved by the Project can be reported ex post and verified. Bureau Veritas Certification is of the opinion that the monitoring plan complies with the requirements of the methodology.

☞ Complying with **para.124/VVM**, Bureau Veritas Certification hereby confirms that the monitoring arrangements described in the monitoring plan are feasible within the project design and the project participants are able to implement the monitoring plan.

3.9. Sustainable development (127)

The Host Party China's DNA confirmed the contribution of the Project to the sustainable development of the host Party. Refer to item 3.1 of this report.

3.10. Local stakeholder consultation (130)

Prior to the publication of the PDD on the UNFCCC website, the PP conducted a survey on local stakeholders during the EIA process. Totally 90 copies of questionnaires (30 for each mine) were distributed and all of them had been returned with 100% return rate^[33].

The collected questionnaires with responses from stakeholders are maintained by the PP and were presented to Bureau Veritas Certification for assessment during the site visit of the validation activity^[33].

The stakeholders have recognized the contribution of the Project to local environment and social economy. Their views were endorsed by the local stakeholders interviewed during the site visit of the validation activity.

During the on-site visit, Bureau Veritas Certification has conducted an interview with local stakeholders and confirms that the stakeholders affected had been invited in a transparent

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manner. The interview with stakeholders and review of returned questionnaires shows that the summary of the comments received has been completely provided in the PDD and due account of the comments has been described in the PDD. Bureau Veritas Certification hereby confirms that the process of local stakeholder consultation is observed to be adequate.

- ☞ Complying with **para.130/VVM**, Bureau Veritas Certification hereby confirms that the local stakeholder consultation was performed and the process of local stakeholder consultation is observed to be adequate. The Project will be beneficial to the local sustainable development without negative effect on the local stakeholders.

3.11. Environmental Impacts (133)

The PP has undertaken an analysis of environmental impacts and Bureau Veritas Certification confirms that the Environmental Impact Assessment was carried and approved by the Shanxi Environmental Protection Bureau on 30/06/2008 (Code: Jin Huan Han [2008] No.489)^[10].

The environmental impact caused by the Project has been identified and analyzed in the PDD. By checking the EIA report and its approval, Bureau Veritas Certification is able to ensure that the environment impact is caused by waste water, solid wastes, noise, and air pollution. All above impacts would be controlled within an acceptable limit by implementing corresponding mitigation measures as per the statement of the EIA. The impacts mentioned above were insignificant according to the conclusion of the EIA.

- ☞ Complying with **para.133/VVM**, Bureau Veritas Certification hereby confirms that the Project will not have any significant impacts on the environment by means of measures of pollution avoidance and control as well as ecological recovery.

4. COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

- ☞ Complying with **para.173/VVM**, the PDD using methodology ACM0008 Version 07 was webhosted on the UNFCCC for global stakeholders' comments as per CDM requirements. The Project was webhosted from 11/10/2011 to 09/11/2011.

No comments were received during this period.

5. VALIDATION OPINION

Bureau Veritas Certification has performed a validation of the Shanxi Fenxi Coal Mine Methane Utilization Project in P. R. China. The validation was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan; ii) follow-up on-site visit and interviews with project stakeholders; iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

Project participants used the latest Validation and Verification Manual (version 01.2), Tool for demonstration and assessment of additionality (version 06.1.0), Paragraph 113 of VVM (version 01.2) and Guidelines on the demonstration and assessment of prior consideration of the CDM (version 04) to demonstrate the additionality of the Project. In line with these requirements, the PDD provides investment analysis to determine that the project activity itself is not the baseline scenario. The latest Tool to calculate the emission factor for an electricity system (version 02.2.1) is also applied to determine the emission factor of North China Power Grid.

By installing grid-connected CMM power plants, the Project is likely to result in reductions of GHG emissions. An investment analysis demonstrates that the Project activity is not a plausible baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented and maintained as designed, the project is expected to achieve the average annual emission reductions of 484,973tCO₂e over the 10-year fixed crediting period.

The review of the project design documentation (version 03) and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project correctly applies and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria. Bureau Veritas Certification thus requests registration of Shanxi Fenxi Coal Mine Methane Utilization Project as CDM project activity.

6. REFERENCES

Category 1 Documents:

Documents provided by the Energy Systems International and PP that relate directly to the GHG components of the project.

- [1]. PDD version 01 dated 26/09/2011 and webhosted on 11/10/2011

<http://cdm.unfccc.int/Projects/Validation/DB/GHTWRS8OQ2NWBWCXA0MB2GMERNVXSR/view.html>

- [2]. PDD version 03 dated 31/10/2012

- [3]. Letter of Approval from DNA of China (Host country) in Feb.2012 (Code: No.3725)

- [4]. Letter of Approval from DNA of Netherlands (Annex I party) dated 02/04/2012 (Code: 2012ANL606)

- [5]. Letter of Approval from DNA of France (Annex I party) dated 26/04/2012 (Code: 12-0288 II 5E JBBter)

- [6]. Modalities of Communication Form signed by Shanxi Fenxi Coal Mine Methane Development Ltd. and Timing Carbon UK Ltd and EDF Trading Limited.

- [7]. Renewable Energy Law issued by NDRC of China effective from 01/01/2006.

- [8]. Feasibility Study Report (FSR) conducted by Shandong Shengli-Power Machinery Gas-fired Power Engineering Design & Consulting Co., Ltd. dated Apr.2008

- [9]. The FSR approval issued by Shanxi Development and Reform Committee on 09/05/2008 (Code: Jin Fa Gai Bei An [2008] No.148)

- [10].EIA report in Jun.2008 and Approval issued by Shanxi Environmental Protection Bureau on 30/06/2008 (Code: Jin Huan Han [2008] No.489)

- [11].Notification on Determining Baseline Emission Factor of China's Grid dated on 20/12/2010.

<http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2552.pdf>

- [12].PP's Board Meeting Minutes made on 02/06/2008

- [13].Construction Agreement of Xuejialing Power Station signed on 15/07/2008

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- [20]. Termsheet of the Project signed with Timing Carbon Ltd. on 26/01/2011
- [21]. Public information of Letter of Approval issued by NDRC on 02/03/2012
<http://cdm.ccchina.gov.cn/web/NewsInfo.asp?NewsId=5954>
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- [23]. "Economic Evaluation Method and Parameters for Project Construction" (version 3)
- [24]. IRR/NPV calculation spreadsheet
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- [26]. <http://www.chinasafety.gov.cn>.
National Coalmine Safety Regulation issued by State Administration of Coal Mine Safety, effected from 01/03/2010
http://www.chinasafety.gov.cn/newpage/Contents/Channel_5330/2010/0126/83595/content_83595.htm
[http://www.chinasafety.gov.cn/files/2005-03/17/F_a40852441d814e24b7e26265bd0053a6_mkaqgc-all\(wszt\).doc](http://www.chinasafety.gov.cn/files/2005-03/17/F_a40852441d814e24b7e26265bd0053a6_mkaqgc-all(wszt).doc)
- [27]. Notice on Strictly Prohibiting the installation of Fuel-fired Generators with the Capacity of 135 MW or Below issued by the General Office of the State Council, Decree No. [2002]6 dated 15/04/2002
http://www.gov.cn/gongbao/content/2002/content_61480.htm
- [28]. <http://www.sx.chinanews.com/2005-05-17/1/22643.html>
- [29]. Electricity Law of People's Republic of China, <http://baike.baidu.com/view/437556.htm>
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- [31]. Enterprise Income Tax Law Implementation Regulations of People's Republic of China issued by The People's Republic of China State Council, document code: Order No. 512
- [32]. Provisional Regulations of the People's Republic of China on Value Added Tax, effective from 01/01/1994
- [33]. 90 pieces of stakeholder survey questionnaires
- [34]. Notice of National Council Issued about the Power System of Organization Reform

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Programme (National issued [2002] No.5)

- [35]. Opinions of the State Council on Accelerating the CMM extraction and utilization (Code: Guo Ban Fa [2006] No.47)
http://www.gov.cn/zwggk/2006-06/19/content_314623.htm
- [36]. Price notification issued by NDRC on 28/06/2006 (Code: Fa Gai Jia Ge [2006] No.1228)
http://www.sdpc.gov.cn/zfdj/jggg/dian/t20060630_128827.htm
- [37]. Price notification issued by Shanxi Price Bureau on 14/12/2006, (Code: Jin Jia Shang Zi [2006] No.406)
<http://www.sxprice.gov.cn/sy/jgzc/20090103/174664.html>
- [38]. Price notification issued by Shanxi Price Bureau on 05/03/2007, (Code: Jin Jia Shang Zi [2007] No.70)
<http://www.sxprice.gov.cn/sy/jgzc/20090205/092544.html>
- [39]. Meeting minutes (Code: Zhuan Ji [2008] No.035) for the Project issued by the grid company on 14/03/2008
- [40]. Steam supply contract between the PP and the coal mine
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<http://www2.ergweb.com/cmm/projects/ProjectFind.aspx>
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- [46]. China Electric Power Yearbook 2009
- [47]. <http://www.sdwj.gov.cn/ggfw/jgdy/dybg/05/4066.shtml>
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- [49]. Daily CMM extraction reports (from May.2011 to Oct.2011) of Hexi, Shuangliu and Zhongxing Mines

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[50]. "Classification and essential property of city gas" (GB/T 13611-2006)

[51]. Sales receipts issued by the local grid company during Mar.2008-Jun.2008

[52]. Investment and cost analysis Report of CMM Purification Project issued by the Shandong Shengli-Power Machinery Gas-fired Power Engineering Design & Consulting Co., Ltd. in Feb.2008

Category 2 Documents:

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

- /1/. ACM0008 Version 07 "Consolidated methodology for coal bed methane, coal mine methane and ventilation air methane capture and use for power (electrical or motive) and heat and/or destruction through flaring or flameless oxidation" dated 30/07/2010
- /2/. Validation and Verification Manual version 01.2 dated 30/07/2010, EB55 Annex 1
- /3/. Tool to calculate the emission factor for an electricity system. Version 2.2.1 dated 29/09/2011
- /4/. Tool for the demonstration and assessment of additionality. Version 06.1.0 dated 13/09/2012
- /5/. Guideline on the Demonstration and Assessment of Prior Consideration of the CDM version 04 (EB62 Annex 13)
- /6/. Glossary of CDM terms version 06.0 (EB66 Annex 63)
- /7/. Guidelines for the Reporting and Validation of Plant Load Factors version 01 (EB48, Annex11)
- /8/. Guidelines on the assessment of investment analysis, Version 05 (EB62, Annex5)

Persons and Stakeholders Interviewed:

List persons interviewed during the validation or persons that contributed with other information that are not included in the documents listed above.

Shanxi Fenxi Coal Mine Methane Development Ltd.

Mr. Liu Dongkui	CEO
Mr. Zhao Lifei	Staff
Ms. Zhang Yaqing	Staff
Mr. Han Xiaojun	Staff
Ms. Yuan Guoyun	Staff



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Environment Protection Bureau of Lvliang City

Mr. Dong Wenjun

Local Resident

Mr.Chang Zhonglin Resident

Ms.Feng Lieqin Resident

EDF Trading Limited

Ms. Liu Yanyan Section Supervisor

Timing Carbon UK Ltd.

Ms. Ma Rui Project Manager

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7. CURRICULA VITAE OF THE DOE'S VALIDATION TEAM MEMBERS

Mr. Ernesto Wenbin	Tan Bureau Veritas Certification, China	<p>Team Leader, Climate Change Lead Verifier</p> <p>He holds a bachelor degree in Geology and a master degree in Structural Geology. He gained 2 years' technical experience in Petroleum Exploitation and Storage & Transportation sector and 1 year's experiences in construction sector in P.R China. Before joining BV, he was a CDM consultant with 2 years' experience. He obtained the certificate of CDM Verifier and Auditor for ISO 14001.</p>
Mr. Li Xingtong	Bureau Veritas Certification, China	<p>Team Member, Climate Change Lead Verifier</p> <p>He holds a Master Degree in Landscape Ecology and Bachelor Degree in Environmental Engineering. Before joining Bureau Veritas Certification in 2009, he gained one year of CDM technical experience in P.R China. He obtained the certificate of CDM Verifier, Lead Auditor for ISO 14001 and completed the course assessment for the ISO 14064:2006.</p>
Mr. Feng Jun	External Experts	<p>External Experts</p> <p>He holds a B.E of Mining Engineering of Department of Department of Mining Engineering, Taiyuan University of Technology and a Ph.D of Peking University. He gained 7 years directly experience of coal mining industry in China covering coal mining engineering, coal mining technological research, and coal mining management.</p>

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Mr.Robin Wang	Bureau Veritas Certification, China	<p>Internal Technical Reviewer , Climate Change Lead Verifier</p> <p>He holds a Bachelor Degree in Gas & Heating Engineering. He was a Gas Engineer with over 10 years' experiences in oil & gas sector and building technologies in P.R. China. Before joining BV in 2007, he gained two years of CDM audit experience in P.R China. He obtained the certificate of CDM Lead Verifier and Lead Auditor for ISO 14001. He has passed training course of ISO 14064.</p>
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APPENDIX A: CDM PROJECT VALIDATION PROTOCOL

Table 1 Validation requirements based on the Clean Development Mechanism Validation and Verification Manual (Version 01.2)

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
1. Approval	VVM	44-50	COUNTRY A (People's Republic of China)	COUNTRY B (insert the country name)		
1.1. Has the DNA of each Party indicated as being involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval? (If yes, provide the reference of the letter of approval, any supporting documentation, and specify if the letter was received from the project participant or directly from the DNA)	VVM	45	<p>CAR-1. The LoA of all the parties has not yet been presented.</p> <p>The DNA of China has issued a Letter of Approval (No.3725) in Feb.2012, authorizing Shanxi Fenxi Coal Mine Methane Development Ltd. as the Project Participant for the Project in China.</p> <p>✍ The DNA of China has issued a Letter of Approval (No.3725) in Feb.2012 authorizing Shanxi Fenxi Coal</p>	<p>CAR-1. The LoA of all the parties has not yet been presented.</p> <p>The DNA of Netherland has issued a Letter of Approval (2012ANL606) on 02/04/2012, authorizing Timing Carbon UK Ltd as the Project Participant.</p> <p>The DNA of France has issued a Letter of Approval (12-0288 II 5E JBBter) on 26/04/2012, authorizing EDF Trading Limited as the Project Participant.</p>	CAR-1	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
			Mine Methane Development Ltd. as the Project Participant and confirms that Shanxi Fenxi Coal Mine Methane Utilization Project contributes to China's Sustainable development ^{[3] [21]} .			
1.2. Does the letter of approval from DNA of each Party confirm that : - The Party is a Party of the Kyoto Protocol - The participation is voluntary - In the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country - Refers to the precise proposed CDM project activity title in the PDD being submitted for registration	VVM	45	Pending on CAR-1 Yes	Pending on CAR-1 Yes	Pending	OK
1.3. Is(are) the letter(s) of approval unconditional with respect to (1.2) above?	VVM	46	Yes. It is unconditional in China	Yes. It is unconditional in Netherlands and France.	OK	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
1.4. Has(ve) the letter(s) of approval been issued by the respective Party's designated national authority (DNA) and is valid for the CDM project activity under validation?	VVM	47	Pending on CAR-1 Yes	Pending on CAR-1 Yes	Pending	OK
1.5. Is there doubt with respect to the authenticity of the letter of approval?	VVM	48	Pending on CAR-1 No	Pending on CAR-1 No.	Pending	OK
1.6. If yes, was verified with the DNA that the letter of approval is authentic?	VVM	48	Pending on CAR-1 N.A.	Pending on CAR-1 N.A	Pending	OK
2. Participation	VVM	51-54	PP1 (Shanxi Fenxi Coal Mine Methane Development Ltd.)	PP2 (Timing Carbon UK Ltd and EDF Trading Limited)		
2.1. Are the project participants listed in tabular form in section A.3 of the PDD?	VVM	52	Yes.	Yes.	OK	OK
2.2. Does the DOE have a contractual relationship with the project participants?	EB50	Ann 48	No	Yes Bureau Veritas Certification has a contractual relationship with the EDF Trading Limited.	OK	OK
2.3. Is the information in section A.3 consistent with the contact details provided in annex 1 of the PDD?	VVM	52	Yes	Yes	OK	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
2.4. Has the participation of each of the project participants been approved by at least one Party involved, either in a letter of approval or in a separate letter specifically to approve participation? (Provide reference of the approval document for each of the project participants)	VVM	52	Pending on CAR-1 Yes	Pending on CAR-1 Yes	Pending	OK
2.5. Are any entities other than those approved as project participants included in these sections of the PDD?	VVM	52	No.		OK	OK
2.6. Has the approval of participation issued from the relevant DNA?	VVM	53	Refer to section 1.1	Refer to section 1.1	OK	OK
2.7. Is there doubt with respect to (2.6) above?	VVM	53	Refer to section 1.5	Refer to section 1.5	OK	OK
2.8. If yes, was verified with the DNA that the approval of participation is valid for the proposed CDM project participant?	VVM	53	Refer to section 1.6	Refer to section 1.6	OK	OK
3. Project design document	VVM	55-57				
3.1. Is the PDD in accordance with the applicable CDM requirements for completing the PDD?	VVM	56	Yes. Latest Version 03.2. per the GUIDELINES FOR -Version 07 - 02/08/2008 (hereafter referred as "CDM-PDD Guideline")		OK	OK
3.2. In CDM-PDD section A.1 are the following provided?	EB 41	Ann 12	Yes.		OK	OK
3.2.1. Title of project	EB	Ann 12	Shanxi Fenxi Coal Mine Methane Utilization Project		OK	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
	41				
3.2.2. Current version number and date of document	EB 41	Ann 12	GSP Version 01, dated 26/09/2011 Final Version 03 dated 31/10/2012	OK	OK
3.3. In CDM-PDD section A.2 are following provided?	EB 41	Ann 12			
3.3.1. A brief description of the project activity covering purpose which includes the scenario existing prior to the start or project, present scenario and baseline scenario	EB 41	Ann 12	<p>Yes</p> <p>The Project is composed of 4 coal mine methane (CMM) power stations located in Hexi, Shuangliu and Zhongxing coalmines. The total installation capacity of the Project is 19.9MW equipped with 6 sets of 650kW gas gensets in Xuejialing power station, and 32 sets of 500kW gas gensets in Duhumao, Guojiashan and Mazhang power stations. Waste heat recovery systems will be fixed as well.</p> <p>When the project is fully operated, the anticipated annual CMM consumption will be up to 35.87Mm³. Most of CH₄ in CMM would be converted to low GWP CO₂ by combustion in gas engines except for a small part of unburned methane. The annual electricity output will be 102,720MWh, 93,690MWh of which will be delivered to the North China Power Grid (NCPG). The rest electricity will be consumed by the power station self use. Moreover, the Project could recover approximately 55,898.4GJ of waste heat from waste recovery boilers</p>	OK	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>annually.</p> <p>Before implementation of the Project, all the extracted CMM was released into the atmosphere directly, which causes not only the waste of resources but also air pollution. Power and heat supply to the mine was from the North China Power Grid and coal fired boilers respectively. Baseline scenario of the Project is the continuation of the mine practice.</p>		
3.3.2. Explanation on how the GHG emission reductions are effected	EB 41	Ann 12	Yes. The Project will reduce the direct emissions of methane to the atmosphere and replace certain amount of electricity generated by NCPG, the heat supplied by the Project would replace the thermal energy supplied from coal-fired boilers.	OK	OK
3.3.3. The PP's views on the contribution of project activity to sustainable development	EB 41	Ann 12	Yes, the contribution of project activity to sustainable development includes reducing environment pollution, make full use of the CMM, and decrease coal usage, etc.	OK	OK
3.3.4. Are there any changes/modifications compared to the webhosted PDD?	EB 41	Ann 12	No.	OK	OK
3.4. In CDM-PDD section A.3 are following provided in the tabular format?	EB 41	Ann 12			
3.4.1. List of project participants and parties	EB 41	Ann 12	<p>Yes</p> <p>The project participant:</p> <p>Shanxi Fenxi Coal Mine Methane Development Ltd.</p>	OK	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			The host party: People's Republic of China Timing Carbon UK Ltd and EDF Trading Limited Parties: Netherlands and France		
3.4.2. Identification of Host Party	EB 41	Ann 12	Yes	OK	OK
3.4.3. Indication whether the Party wishes to be considered as project participant	EB 41	Ann 12	No Party wishes to be considered as project participant.	OK	OK
3.5. In CDM-PDD section A.4.1 are following provided?	EB 41	Ann 12			
3.5.1. Technical description, location, host party(ies) and address as required	EB 41	Ann 12	The Project is located in Lvliang City, Shanxi Province, P.R.China.	OK	OK
3.5.2. Detailed physical location with unique identification of the project activity (eg. Longitude/latitude)	EB 41	Ann 12	<p>Xuejialing Station is located in southeast of Xuejialing village, while Duhumao Station is located in northwest of Duhumao village.</p> <p>Guojiashan Station is located in northwest of Guojiashan village.</p> <p>Mazhuang Station is located in the northwest of Mazhuang village.</p> <p>CL-1 The exact geo-coordinates of the project sites should be provided in the PDD.</p> <p>The geographical coordinates has been listed as:</p>	CL-1	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			CMM Stations		
			Geographical Coordinates		
			Xuejialing Station		
			110°58' 06"E, 37°20' 43" N		
			Duhumao Station		
			110°57' 17"E, 37°19' 45"N		
			Guojiashan Station		
			110°48' 14"E, 37°31'41"N		
			Mazhuang Station		
			112°06' 20"E, 37°38'08"N		
3.5.3. Are there any changes/modifications compared to the webhosted PDD?	EB 41	Ann 12	Pending on CL-1 The geo-coordinates of all the stations have been added.	Pending	OK
3.6. In CDM-PDD section A.4.2 is the list of categories of project activities provided?	EB 41	Ann 12	Yes. Category 8: Mining / Mineral Production Category 10: Fugitive Emission from Fuels (solid, oil and gas)	OK	OK
3.7. In CDM-PDD section A.4.3 are following provided?	EB 41	Ann 12			
3.7.1. A description of how environmentally safe and sound technology, and know-how, is transferred to the Host Party(ies)	EB 41	Ann 12	CL-2 A description of how environmentally safe and sound technology, and know-how, is transferred to the Host Party is required. No technology transfer involved in the Project. Bureau Veritas Certification has checked the contracts of the main equipments and found the information in revised	CL-2	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			PDD is appropriate. Thus, the CL-2 is closed.		
3.7.2. Explanation of purpose of project activity with scenario existing prior to the start of project, scope or present activities and the baseline scenario	EB 41	Ann 12	Scenario existing prior to the start of project and baseline scenario: the CMM extracted by the extraction stations is vented directly to the atmosphere. The electricity imported from NCPG is mainly generated by fossil fuels. And the heat needed in the coal mine was provided by the coal fired boilers.	OK	OK
3.7.3. List and arrangement of the main manufacturing/production technologies, systems and equipments involved	EB 41	Ann 12	<p>CL-3 The main manufacturing technologies and parameters of all the reciprocating engines have not been provided in the PDD.</p> <p>Its main manufacturing technologies and parameters are added in Section A 4.3. Bureau Veritas Certification has checked the contracts of the reciprocating engines and found the information in revised PDD is consistent. Thus, the CL-3 has been closed.</p> <p>CL-4 The suitability of the electricity supplied to the grid should be clarified.</p> <p>The annual supplied power of the Project and the operation hour of 6000h (annual utilization hours of 6000hours) was determined based on the information from FSR, which was developed by an accredited third party (Shandong Shengli-Power Machinery Gas-fired</p>	<p>CL-3</p> <p>CL-4</p>	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>Power Engineering Design & Consulting Co., Ltd.) contracted with the PP and approved by Shanxi Development and Reform Committee. Therefore, Bureau Veritas Certification confirms that the operation hour determined in the FSR is credible.</p> <p>As per the technical contracts of the Gas-Fired Reciprocating Engines, the continuous power rate of the engines is 560kW for the 650kW engines (Model: 650GF6-W2), and 430kW for the 500kW engines (Model: 500GF1-3PWW). Thus the annual power generated by the Project will be 102,720MWh $(=(560kW \times 6 + 430kW \times 32) \times 6000h)$.</p> <p>The continuous power is due to the nature of the gas-fired genset, and is common in the CMM power generation project (eg. UNFCCC Ref.1928, 3016, 3200 and so on).</p> <p>Considering the pumps, fans and other auxiliary facilities applied in the Project, the electricity self-consumption rate has been determined in the FSR as 8.528%.</p> <p>Therefore, the electricity supplied to the NCPG is 93,690MWh $(=102,720MWh \times (1 - 8.528\%))$.</p>		

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>Bureau Veritas Certification has made statistics as following criteria: CMM Power Generation projects with gas internal-combustion engine, no other project activity components except CMM power generation or CMM power generation with waste heat recovery, registered as the CDM Project in Shanxi Province. As per the statistics ^[45], the operation hour varies from 6000H (UNFCCC Ref.1801, 3266, 4534 and 4098) to 8000h (UNFCCC Ref.3016).</p> <p>And the continuous power rate varies from 0.7 (UNFCCC Ref.3190) to 1.0 (UNFCCC Ref. 1896, 1900, 3179), the electricity self-consumption rate varies from 0% to 10%. Thus, the continuous power rate and the electricity self-consumption rate falls in the range and is verified to be appropriate.</p> <p>Thus, the CL-4 has been closed.</p>		
3.7.4. The emissions sources and GHGs involved	EB 41	Ann 12	CH ₄ and CO ₂ involved.	OK	OK
3.7.5. Are there any changes/modifications compared to the webhosted PDD?	EB 41	Ann 12	There are no changes/modifications compared to the PDD for GSP.	OK	OK
3.8. In CDM-PDD section A.4.4 is the estimation of emission reductions provided as requested in a tabular	EB 41	Ann 12	CAR-2. (1) Clarification on the discrepancy of emission reductions in 2013 and the other year should be provided.	CAR-2	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
format?			<p>(2) The value of emission reductions in 2014 is inconsistent with the table in section B.6.4.</p> <p>(1) According to the Table A-1 of the PDD, 8*500kW gensets in Duhumao Power Station is planned to be operated at the beginning of 2014, which causes shortage of emission reductions in 2013 in total.</p> <p>(2) As 16*500kW gensets in Guojiashan Power Station is planned to be implemented in two phases, the second phase (8*500kW) will be operated at the beginning of 2015. Thus, the estimated emission reductions in 2014 should be 413,799tCO₂e which is less than that of 2015. Bureau Veritas Certification has checked the PDD version 02.1, and found the estimated emission reduction in 2013 is reasonable and the emission reductions in 2014 have been revised to consistent.</p>		
3.9. In CDM-PDD section A.4.5 is Information regarding Public funding provided?	EB 41	Ann 12	No public funding from Annex I Parties has been involved for this CDM project.	OK	OK
3.10. In CDM-PDD section B.1 are following provided?	EB 41	Ann 12			
3.10.1. The approved methodology and version number	EB 41	Ann 12	ACM0008 Version 07 has been applied.	OK	OK
3.10.2. Any methodologies or tools which the above approved methodology draws upon and their version number	EB 41	Ann 12	<p>"Tool to calculate the emission factor for an electricity system" Version 02.2.1</p> <p>"Tool for the demonstration and assessment of</p>	OK	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			additionality" Version 6.1.0		
3.11. In CDM-PDD section B.2 are following provided?	EB 41	Ann 12			
3.11.1. Justification to the choice of methodology that the project activity meets each of the applicability conditions	EB 41	Ann 12	Yes, refer to section 5.2.2.	OK	OK
3.11.2. Documentations with references that had been used. This can be provided in Annex 3 instead	EB 41	Ann 12	Yes	OK	OK
3.12. In CDM-PDD section B.3 are following provided?	EB 41	Ann 12			
3.12.1. Description of all sources and gases included in the project boundary in the table	EB 41	Ann 12	Yes. Gases CH ₄ , CO ₂ are included.	OK	OK
3.12.2. A flow diagram of the project boundary physically delineating the project activity	EB 41	Ann 12	Yes	OK	OK
3.12.3. The flow diagram with all equipments, systems and flows of mass and energy etc	EB 41	Ann 12	Yes The flow diagrams with equipments, system and flows of mass and energy have been included for the four power stations.	OK	OK
3.13. In CDM-PDD section B.4 are following provided?	EB 41	Ann 12			

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
3.13.1. Explanation how the most plausible baseline scenario is identified in accordance with the selected baseline methodology	EB 41	Ann 12	<p>Yes. The PDD identifies the most plausible baseline with the following procedure in accordance with the methodology ACM0008:</p> <ul style="list-style-type: none"> -Step 1. Identify technically feasible options for capturing and 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 	OK	OK
3.13.2. Justification of key assumptions and rationales	EB 41	Ann 12	Yes	OK	OK
3.13.3. Transparent illustration of all data used to determine the baseline scenario (variables, parameters, data sources, etc.)	EB 41	Ann 12	Yes	OK	OK
3.13.4. A transparent and detailed description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the Project activity	EB 41	Ann 12	<p>Yes. The identified baseline scenario is:</p> <p>Continuation of the current CMM extraction practice with all the extracted CMM released into atmosphere, continuation of power supply by North China Power Grid and heat supply by coal fired boilers.</p>	OK	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
3.13.5. Are there any changes/modifications compared to the webhosted PDD?	EB 41	Ann 12	No.	OK	OK
3.14. In CDM-PDD section B.5 are following provided?	EB 41	Ann 12			
3.14.1. Explanation of how and why this project activity is additional and therefore not the baseline scenario in accordance with the selected baseline methodology	EB 41	Ann 12	Yes. The PDD explains how and why this project activity is additional and therefore not the baseline scenario in accordance with the methodology ACM0008 through the investment analysis.	OK	OK
3.14.2. Justification of key assumptions and rationales	EB 41	Ann 12	Yes	OK	OK
3.14.3. Transparent illustration of all data used to determine the baseline scenario (variables, parameters, data sources etc)	EB 41	Ann 12	Yes	OK	OK
3.14.4. Evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity, if the starting date of the project activity is before the date of validation	EB 41	Ann 12	The starting date of the Project is 15/07/2008, when the construction agreement of Xuejialing power station has been signed, and it's earlier than the date of publication of PDD on 11/10/2011. As per the approved FSR, the IRR of the project is too low to reach sector benchmark. And on 02/06/2008, the project owner made the decision of CDM implementation. The meeting minute has been checked	OK	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			by Bureau Veritas Certification and found credible.		
3.15. In CDM-PDD section B.6.1 are following provided?	EB 41	Ann 12			
3.15.1. Explanation as to how the procedures, in the approved methodology to calculate project emissions, baseline emissions, leakage emissions and emission reductions are applied to the Project activity	EB 41	Ann 12	<p>The project emissions $PE_y = PE_{ME,y} + PE_{MD,y} + PE_{UM,y}$</p> <p>Leakage = 0</p> <p>Baseline emissions $BE_y = BE_{MD,y} + BE_{MR,y} + BE_{Use,y}$</p> <p>Emission reductions $ER_y = BE_y - PE_y$</p> <p>The procedures of the methodology are clearly described.</p> <p>And the baseline emission does not include heat supply, thus $BE_{Use,y} = GEN_y \times EF_{ELEC}$.</p> <p>Bureau Veritas Certification has checked the equations and found conservative and reasonable.</p>	OK	OK
3.15.2. Equations used in calculating emission reductions	EB 41	Ann 12	Yes.	OK	OK
3.15.3. Explanation and justification for all relevant methodological choices, including different scenarios or cases, options and default values	EB 41	Ann 12	Yes. The auditor has checked all the relevant methodological choices, including different scenarios or cases, options and default values, and confirms that the explanation and justification are reasonable.	OK	OK
3.16. In CDM-PDD section B.6.2 are following provided?	EB 41	Ann 12			
3.16.1. A compilation of information on the data and parameters that are not monitored throughout the crediting period but that	EB 41	Ann 12	Yes. The PDD provided these parameters.	OK	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
are determined only once and thus remains fixed throughout the crediting period and that are available when validation is undertaken					
3.16.2. The actual value applied	EB 41	Ann 12	Yes.	OK	OK
3.16.3. Explanation and justification for the choice of the source of data	EB 41	Ann 12	Yes.	OK	OK
3.16.4. Clear and transparent references or additional documentation in Annex 3	EB 41	Ann 12	Yes.	OK	OK
3.16.5. Where values have been measured, a description of the measurement methods and procedures (e.g. which standards have been used), indicated the responsible person/entity having undertaken the measurement, the date of measurement(s) and the measurement results	EB 41	Ann 12	N.A.	OK	OK
3.17. In CDM-PDD section B.6.3 are following provided?	EB 41	Ann 12			
3.17.1. A transparent ex ante calculation of project emissions, baseline emissions (or, where applicable, direct calculation of emission reductions) and leakage	EB 41	Ann 12	Yes After the Project is fully operated, the $ER_y = BE_y - PE_y = 586,186 - 68,276 = 517,910 \text{ tCO}_2\text{e}$.	OK	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
emissions expected during the crediting period, applying all relevant equations provided in the approved methodology					
3.17.2. Documentation how each equation is applied, in a manner that enables the reader to reproduce the calculation	EB 41	Ann 12	Yes. The GHG calculation spreadsheet enables the reader to reproduce the calculation of emission reductions.	OK	OK
3.17.3. Additional background information and or data in Annex 3, including relevant electronic files (i.e. spreadsheets)	EB 41	Ann 12	The data in Annex 3 has been provided in spreadsheets.	OK	OK
3.18. In CDM-PDD section B.6.4 are the results of the <i>ex ante</i> estimation of emission reductions for all years of the crediting period, provided in a tabular format?	EB 41	Ann 12	Pending on CAR-2 Yes	Pending	OK
3.19. In CDM-PDD section B.7.1 are following provided?	EB 41	Ann 12		-	-
3.19.1. Specific information on how the data and parameters that need to be monitored would actually be collected during monitoring for the project activity	EB 41	Ann 12	Yes MM _{ELEC} , will be monitored by project participants using a flow meter. PC _{CH4,y} will be monitored by Project Owner hourly using methane concentration meter. PC _{NMHC,y} will be obtained through annual analysis by sampling CMM by 3 rd qualified entity. CEF _{NMHC,y} will be obtained through analysis of the fractional composition of captured gas.	OK	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl								
			GEN _y and CONS _{ELEC-PJ} will be monitored continuously with electricity meter.										
3.19.2. For each parameter the following below information, using the table provided:	EB 41	Ann 12											
3.19.2.1. The source(s) of data that will be actually used for the Project activity (e.g. which exact national statistics). Where several sources may be used, explain and justify which data sources should be preferred.	EB 41	Ann 12	Yes	OK	OK								
3.19.2.2. Where data or parameters are supposed to be measured, specify the measurement methods and procedures, including a specification which accepted industry standards or national or international standards will be applied, which measurement equipment is used, how the measurement is undertaken, which calibration procedures are applied, what is the accuracy of the measurement method, who is the responsible person/entity that should undertake the measurements and	EB 41	Ann 12	<div>All the instruments installed in the project should be accorded with the relevant national standard, i.e.:<table><tr><th>Type</th><th>National / Sectoral Standard</th></tr><tr><td>Electricity meter</td><td>DL/T448-2000</td></tr><tr><td>CH₄ concentration meter</td><td>AQ1027-2007</td></tr><tr><td>Gas flow meter</td><td>AQ1027-2007</td></tr></table></div> <div>The accuracy of all the meters has been provided in the monitoring plan. The QA/QC and training plan has been described in the</div>	Type	National / Sectoral Standard	Electricity meter	DL/T448-2000	CH ₄ concentration meter	AQ1027-2007	Gas flow meter	AQ1027-2007	OK	OK
Type	National / Sectoral Standard												
Electricity meter	DL/T448-2000												
CH ₄ concentration meter	AQ1027-2007												
Gas flow meter	AQ1027-2007												

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
what is the measurement interval; (i) A description of the QA/QC procedures (if any) that should be applied; (ii) Where relevant: any further comment. Provide any relevant further background documentation in Annex 4.			monitoring plan .		
3.20. In CDM-PDD section B.7.2 are following provided?	EB 41	Ann 12			
3.20.1. A detailed description of the monitoring plan	EB 41	Ann 12	Yes. The monitoring plan includes the sections Organization, Quality control and technical service, Data collection and storage, Training and equipment installation, and Equipment specifications and calibration.	OK	OK
3.20.2. The operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects generated by the project activity	EB 41	Ann 12	Yes. The project manager will be in charge of the overall technical management of the project including the monitoring plan.	OK	OK
3.20.3. The responsibilities for and institutional arrangements for data collection and archiving	EB 41	Ann 12	Yes	OK	OK
3.20.4. Indication that the monitoring plan reflect good monitoring practice appropriate to	EB 41	Ann 12	Yes	OK	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the type of project activity					
3.20.5. Relevant further background information in Annex 4	EB 41	Ann 12	No further background information in Annex 4.	OK	OK
3.21. In CDM-PDD section B.8 are following provided?	EB 41	Ann 12			
3.21.1. Date of completion of the application of the methodology to the project activity study in DD/MM/YYYY	EB 41	Ann 12	Yes The baseline and monitoring study of the GSP version was completed on 26/09/2011. And the baseline and monitoring study of the final version was completed on 31/10/2012.	OK	OK
3.21.2. Contact information of the person(s)/entity(ies) responsible for the application of the baseline and monitoring methodology to the project activity	EB 41	Ann 12	Yes, contact information of Energy Systems International has been provided.	OK	OK
3.21.3. Indication if the person/entity is also a project participant listed in Annex 1	EB 41	Ann 12	The person/entity is not a PP.	OK	OK
3.22. In CDM-PDD section C.1.1, Is the project's starting date clearly defined and evidenced?	EB 41	Ann 12	Yes 15/07/2008 is the starting date.	OK	OK
3.23. In CDM-PDD section C.1.2 is the expected operational lifetime of the project activity in years and months provided?	EB 41	Ann 12	Yes 18 years	OK	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
3.24. In CDM-PDD section C.2, is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. three x 7 years or fixed crediting period of max. 10 years)? ?	EB 41	Ann 12	Yes Fixed crediting period of max.10 years, starting from 01/12/2012, has been defined.	OK	OK
3.25. In CDM-PDD section D, are the conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the Host Party, if environmental impacts are considered significant by the project participants or the Host, provided?	EB 41	Ann 12	Yes The EIA statements of the project were done in Jun.2008, which was approved by Shanxi Environmental Protection Bureau on 30/06/2008. The environmental impacts including air quality, water quality, noise and solid waste has been analyzed, and no negative effects have been found.	OK	OK
3.26. In CDM-PDD section E.1 are the following provided?	EB 41	Ann 12			
3.26.1. The process by which comments by local stakeholders have been invited and compiled. An invitation for comments by local stakeholders shall be made in an open and transparent manner, in a way that facilitates comments to be received from local stakeholders and allows for a	EB 41	Ann 12	During the environmental impact assessment process in Jun.2008, public comments had been invited to evaluate the Project. Public participation process adopted the method of sending "Public Opinion Questionnaires". 90 questionnaires were sent out (30 for each mine) during the investigation with replied number of 90 (rate 100%).	OK	OK

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
reasonable time for comments to be submitted.					
3.26.2. The project activity is described in a manner, which allows the local stakeholders to understand the project activity, taking into account confidentiality provisions of the CDM modalities and procedures.	EB 41	Ann 12	Questionnaires were sent out to people living and working near each station.	OK	OK
3.26.3. The local stakeholder process has been completed before submitting the Project activity to the DOE for validation.	EB 41	Ann 12	The process has been completed during the environmental impact assessment process in 2008, before the validation.	OK	OK
3.27. In CDM-PDD section E.2 are following provided?	EB 41	Ann 12			
3.27.1. Identification of local stakeholders that have made comments	EB 41	Ann 12	Yes	OK	OK
3.27.2. A summary of this comments.	EB 41	Ann 12	Most people agree that it will not or slightly affect the local environment. Additionally, most of people think that the project will boost the economic development. No one opposes the construction of the project.	OK	OK
3.28. In CDM-PDD section E.3 is the explanation of how due account have been taken of comments received from local stakeholders provided?	EB 41	Ann 12	During construction period, bug dust is the main emission by construction activities and transportation of materials. Although, construction dusts pollution is short-time lasting with low intensity and small impact area, vehicles are required to slow down to reduce the dusts.	OK	OK

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			<p>Meanwhile, periodical watering could reduce the dusts as well.</p> <p>No negative comments have been received on the project. Moreover, the local community possesses strong positive comments on the effects that the Project will make on the local economy and infrastructure. In addition, to reduce the impacts on the local environment produced from the construction of the project, the project owner will take the environmental protection measures in accordance with the EIA.</p>		
3.29. In CDM-PDD Annex 1 are the following provided?	EB 41	Ann 12			
3.29.1. Contact information of project participants	EB 41	Ann 12	Yes	OK	OK
3.29.2. For each organisation listed in section A.3 the following mandatory fields: Organization, Name of contact person, Street, City, Postfix/ZIP, Country, Telephone and Fax or e-mail	EB 41	Ann 12	Yes	OK	OK
3.30. In CDM-PDD Annex 2 is information from Parties included in Annex I on sources of public funding for the project activity which shall provide an affirmation that such funding does not result in a diversion	EB 41	Ann 12	N.A.	OK	OK

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of official development assistance and is separate from and is not counted towards the financial obligations of those Parties provided?					
3.31. In CDM-PDD Annex 3 is the background information used in the application of the baseline methodology provided?	EB 41	Ann 12	Yes	OK	OK
3.32. In CDM-PDD Annex 4 is the background information used in the application of the monitoring methodology provided?	EB 41	Ann 12	N.A.	OK	OK
4. Project description	VVM	58-64			
4.1. Is the description of the proposed CDM project activity as contained in the PDD:	VVM	59	<p>The Project is composed of 4 coal mine methane (CMM) power stations located in Hexi, Shuangliu and Zhongxing coalmines. The total installation capacity of the Project is 19.9MW equipped with 6 sets of 650kW gas gensets in Xuejialing power station, and 32 sets of 500kW gas gensets in Duhumao, Guojiashan and Mazhang power stations. Waste heat recovery systems will be fixed as well.</p> <p>When the project is fully operated, the anticipated annual CMM consumption will be up to 35.87Mm³. Most of CH₄ in CMM would be converted to low GWP CO₂ by combustion in gas engines except for a small part of</p>	OK	OK

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			<p>unburned methane. The annual electricity output will be 102,720MWh, 93,690MWh of which will be delivered to the North China Power Grid (NCPG). The rest electricity will be consumed by the power station self use. Moreover, the Project could recover approximately 55,898.4GJ of waste heat from waste recovery boilers annually.</p> <p>Before implementation of the Project, all the extracted CMM was released into the atmosphere directly, which causes not only the waste of resources but also air pollution. Power and heat supply to the mine was from the North China Power Grid and coal fired boilers respectively. Baseline scenario of the Project is the continuation of the mine practice.</p>		
4.1.1. sufficiently covering all relevant elements?	VVM	59	Yes	OK	OK
4.1.2. accurate?	VVM	59	Yes	OK	OK
4.1.3. providing the reader with a clear understanding of the nature of the proposed CDM project activity?	VVM	59	Yes	OK	OK
4.1.4. Are there any changes/modifications compared to the webhosted PDD?	VVM	59	There are no changes/modifications compared to the webhosted PDD.	OK	OK

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4.2. Is the proposed CDM project activity in existing facilities or or utilizing existing equipments?	VVM	60	No. It's a newly-built project.	OK	OK
4.3. Is the CDM project activity one of the following types:	VVM	60			
4.3.1. Large scale?	VVM	60	Yes	OK	OK
4.3.2. Non-bundled small scale projects with emission reductions exceeding 15,000 tonnes per year?	VVM	60	N.A.	OK	OK
4.3.3. Bundled small scale projects, each with emission reductions not exceeding 15,000 tonnes?	VVM	60	N.A.	OK	OK
4.4. If yes to (4.2) or (4.3) above, was a physical site inspection conducted to confirm that the description in the PDD reflects the proposed CDM project activity, unless other means are specified in the methodology?	VVM	60	N.A.	OK	OK
4.5. If yes to (4.3.3) above, was the number of physical site visits base on samping?	VVM	60	N.A.	OK	OK
4.6. If yes is the sampling size appropriately justified through statistical analysis?	VVM	60	N.A.	OK	OK

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4.7. For other individual proposed small scale CDM project activities with emission reductions not exceeding 15,000 tonnes per year, was a physical site inspection conducted?	VVM	61	N.A.	OK	OK
4.8. For all other proposed CDM project activities not referred to in VVM paragraphs 59 – 61, was a physical site inspection conducted?	VVM	62	Yes The onsite physical site inspection has been conducted during 22/11/2011 to 24/11/2011.	OK	OK
4.9. If no, was it appropriately justified?	VVM	62	N.A.	OK	OK
4.10. Does the proposed CDM project activity involve the alteration of an existing installation or process?	VVM	63	No.	OK	OK
4.11. If yes, does the project description clearly state the differences resulting from the project activity compared to the pre-project situation?	VVM	63	N.A.	OK	OK
5. Baseline and monitoring methodology					
5.1. General requirement	VVM	65-67			
5.1.1. Do the the baseline and monitoring methodologies selected by the project participants comply with the	VVM	65	Yes. The baseline and monitoring methodology ACM0008 Version 07 comply with that previously approved by the CDM Executive Board.	OK	OK

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methodologies previously approved by the CDM Executive Board?					
5.1.2. Is the selected methodology applicable to the project activity?	VVM	66	Refer to (5.2.1) below	-	OK
5.1.3. Had the PP correctly applied the selected methodology?	VVM	66	Refer to (5.2.4) below	-	OK
5.1.4. Had the selected methodology been correctly applied with respect to project boundary?	VVM	67	Refer to (5.3) below	-	OK
5.1.5. Had the selected methodology been correctly applied with respect to baseline identification?	VVM	67	Refer to (5.4) below	-	OK
5.1.6. Had the selected methodology been correctly applied with respect to Algorithms and/or formulae used to determine emission reductions?	VVM	67	Refer to (5.5) below	-	OK
5.1.7. Had the selected methodology been correctly applied with respect to additionality?	VVM	67	Refer to (6) below.	-	OK
5.1.8. Had the selected methodology been correctly applied with respect to monitoring methodology?	VVM	67	Yes Refer to section 3.19	OK	OK
5.2. Applicability of the selected methodology to the project activity	VVM	68-77			

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5.2.1. Is the methodology correctly quoted?	VVM	70	Yes	OK	OK
5.2.2. Are the applicability conditions of the methodology met?	VVM	71			
5.2.2.1. Does this project activity involve the use of any of the following extraction? - Surface drainage wells to capture CBM associated with mining activities; - Underground boreholes in the mine to capture pre mining CMM; - Surface goaf wells, underground boreholes, gas drainage galleries or other goaf gas capture techniques, including gas from sealed areas, to capture post mining CMM; - Ventilation air methane that would normally be vented.	ACM	0008	Yes. The Project involves pre mining CMM captured through underground boreholes.	OK	OK
5.2.2.2. Does the project activity capture, utilize or destruct CMM or VAM at a working coal mine?	ACM	0008	Yes The Project captures, utilizes or destructs CMM at working mines.	OK	OK
5.2.2.3. Is the baseline the partial or total atmospheric release of the methane	ACM	0008	All the methane is vented without usage in baseline. The methane is captured and destroyed by power	CL-5	OK

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<p>and the project activities include the following method to treat the gas captured?</p> <ul style="list-style-type: none"> - The methane is captured and destroyed through flaring; and/or - The methane is captured and destroyed through flameless oxidation and/or - The methane is captured and destroyed through utilisation to produce electricity, motive power and/or thermal energy; emission reductions may or may not be claimed for displacing or avoiding energy from other sources; - The remaining share of the methane, to be diluted for safety reason, may still be vented; - All the CBM or CMM captured by the project should either be used or destroyed, and cannot be vented. 			<p>generators, and part of CMM is still vented in the Project.</p> <p>CL-5 As described in the PDD, part of CMM is still vented in the Project, please clarify the requirements of the methodology have been met.</p> <p>Not all the extracted CMM will be transmitted to the power engines. Only part of CMM will be captured by the project and sent to the power engines. The remaining share of the CMM will still be vented as it is in the baseline scenario.</p> <p>The original description in the PDD is revised to be more accurate and meet the requirement of the methodology.</p>		
5.2.2.4. Are project participants able to supply the necessary to data for ex ante projections of methane demand as described in sections Baseline Emissions and Leakage	ACM	0008	<p>Yes.</p> <p>All the methane is vented to the atmosphere in the baseline without any use.</p>	OK	OK

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5.2.2.5. Is the mining activity new or existing activity?	ACM	0008	The CMM has been captured from Hexi, Shuangliu and Zhongxing coalmines, those are existing mining activities.	OK	OK
5.2.2.6. Does the project activity have the following features which the methodology selected is not applicable to? - Operate in open cast mines; - Capture methane from abandoned/decommissioned coalmines; - Capture/use of virgin coal bed methane, e.g. methane of high quality extracted from coal seams independently of any mining activities; - Use CO ₂ or any other fluid/gas to enhance CBM drainage before mining takes place.	ACM	0008	No. The Project is operated with underground coal mines. Extraction activities are concomitance with coal production No CBM related activity is involved.	OK	OK
5.2.3. Is the project activity expected to result in emissions other than those allowed by the methodology?	VVM	71	No. The PP identifies the expected emissions of the project activity. No expected emissions other than those allowed by the methodology exist.	OK	OK
5.2.4. Is the choice of the methodology justified?	VVM	71	Yes. The choice of the methodology is justified in the Section B.2 of the PDD.	OK	OK

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5.2.5. Have the project participants shown that the project activity meets each of the applicability conditions of the approved methodology?	VVM	71	Refer to (5.2.4) above	-	OK
5.2.6. Have the project participants shown that the project activity meets each of the applicability conditions of any tool or other methodology component referred to the methodology?	VVM	71	Refer to (5.2.2) above	-	OK
5.2.7. Is the DOE, based on local and sectoral knowledge, aware that comparable information is available from sources other than that used in the PDD?	VVM	71	Yes	OK	OK
5.2.8. If yes, was the PDD cross checked against the other sources to confirm that the project activity meets the applicability conditions of the methodology? (provide the reference to these choices)	VVM	71	Yes	OK	OK
5.2.9. Can a determination regarding the applicability of the selected methodology to the proposed CDM project activity be made?	VVM	72		OK	OK
5.2.10. If no, clarification of the methodology was	VVM	72	Yes.	OK	OK

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requested, in accordance with the guidance provided by the CDM Executive Board?			The methodology ACM0008 Version 07 is applicable to the Project activity.		
5.2.11. If answer to (5.2.2) above is “no”, revision or deviation from the methodology was requested, in accordance with the guidance provided by the CDM Executive Board?	VVM	73	N.A.	OK	OK
5.2.12. If yes to (5.2.10) and (5.2.11) above, a request for registration was submitted before the CDM Executive Board has approved the proposed deviation or revision?	VVM	74	N.A.	OK	OK
5.3. Project boundary	VVM	78-80			
5.3.1. Is the delineation in the PDD of the project boundary correct and include identification of all locations, processes and equipment including secondary equipment and associated processes such as logistics etc.?	VVM	79	<p>Yes, the project boundary of the Project has been clearly described in the PDD:</p> <p>The spatial extent of the project boundary comprises:</p> <ul style="list-style-type: none"> All equipment installed and used as part of the project activity for CMM transmission at the project site. There was extraction system in the coal mine before implementation of the project activity. The extraction system is not included in the project activity; 	OK	OK

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			<ul style="list-style-type: none"> Power generation facilities and waste heat recovery systems installed and used as part of the project activity; NCPG that the power plant is connected to; coal fired boilers that would supply heat to users. The defined project boundary is in line with ACM0008 Version 07.		
5.3.1.1. Does the CDM-PDD include all the following emission sources for the purpose of determining project activity emissions? <ul style="list-style-type: none"> - CO₂ emissions from the combustion of methane in a flare, engine, power plant or heat generation plant; - CO₂ emissions from the oxidation of methane in an flameless oxidation unit; - CO₂ emissions from the combustion of non methane hydrocarbons (NMHCs), if they represent more than 1% by volume of the extracted coal mine gas; - CO₂ emissions from on-site fuel consumption due to the project activity, 	ACM	0008	Yes. The CDM-PDD include all the following emission sources for the purpose of determining project emissions: <ul style="list-style-type: none"> - CO₂ emissions from the combustion of methane in power plant; - CO₂ emissions from the combustion of non methane hydrocarbons (NMHCs), if they represent more than 1% by volume of the extracted coal mine gas; - CO₂ emissions from on-site fuel consumption due to the project activity, including transport of the fuel; - Fugitive emissions from unburned methane. 	OK.	OK

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including transport of the fuel; - Fugitive emissions from unburned methane.					
5.3.1.2.Does the CDM-PDD include all the following emission source for the purpose of determining baseline emissions? - CH ₄ emissions as a result of venting gas that would be captured in the project scenario; - CO ₂ emissions from the destruction of methane in the baseline scenario; - CO ₂ emissions from the production of heat and power (motive and electrical) that is replaced by the project activity.	ACM	0008	Yes. The CDM-PDD include all the following emission sources for the purpose of determining baseline emissions: - CH ₄ emissions as a result of venting gas that would be captured in the project scenario; - CO ₂ emissions from the production of power (electrical) that is replaced by the project activity.	OK.	OK
5.3.1.3.Does the CDM-PDD comprise the following <i>spatial extent</i> of the project boundary? - All equipment installed and used as part of the project activity for the extraction, compression, and storage of	ACM	0008	Yes. The CDM-PDD comprise the following <i>spatial extent</i> of the project boundary, as indicated in the diagram of the Section B.3 of the CDM-PDD: - All equipment installed and used as part of the project activity for the extraction and storage of CMM at the	OK.	OK

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<p>CMM and CBM at the project site, and transport to an off-site user;</p> <ul style="list-style-type: none"> - Flaring, flameless oxidation, captive power and heat generation facilities installed and used as part of the project activity; - Power plants connected to the electricity grid, where the project activity exports power to the grid, as per the definition of project electricity system and connected electricity system given in "Tool to calculate the emission factor for an electricity system". 			<p>project site;</p> <ul style="list-style-type: none"> - Power generation facilities and waste heat recovery systems installed and used as part of the project activity; - Power plants connected to the electricity grid, where the project activity exports power to the grid, as per the definition of project electricity system and connected electricity system given in "Tool to calculate the emission factor for an electricity system". 		
5.3.2. Does the delineation in the PDD of the project boundary meet the requirements of the selected baseline?	VVM	79	Yes	OK	OK
5.3.3. Have changes been made to the project boundary in comparison to the webhosted PDD? If yes please comment on the reason for the changes.	VVM	79	No.	OK	OK
5.3.4. Have all sources and GHGs required by the methodology been included within	VVM	79	Yes Refer to section 5.3.1	OK	OK

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the project boundary?					
5.3.5. Does the methodology allow project participant to choose whether a source or gas is to be included within the project boundary	VVM	79	No.	OK	OK
5.3.6. If yes, have the project participants justified that choice?	VVM	79	N.A.	OK	OK
5.3.7. If yes, is the justification provided reasonable? (provide reference to the supporting documented evidence provided by the project participants)	VVM	79	N.A.	OK	OK
5.4. Baseline identification	VVM	81-88			
5.4.1. Has any procedure contained in the methodology to identify the most reasonable baseline scenario, been correctly applied?	VVM	82			
5.4.1.1. If yes, have all the baseline scenario options been exactly listed in the Section B.4 of the PDD?	ACM	0008	<p>The baseline scenario options for CMM extraction, extracted CMM treatment, and energy production have been listed in the Section B.4 of the PDD.</p> <p>CL-6 Regarding as the options for energy production, some possible options are absent in the analysis,</p>	CL-6	OK

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			<p>especially applying another fuel and heat generation.</p> <p>In energy production alternative, construction of a renewable power plant with equivalent amount of electricity is added. Renewable power plants including hydro, wind, biomass and solar plants are discussed in step 4. And the scenario 7 Heat supply by the CMM gas boiler has been added in the PDD.</p>		
5.4.1.2.If yes, has the PDD correctly eliminated baseline options that do not comply with legal or regulatory requirements?	ACM	0008	<p>The PDD has correctly eliminated scenario options for CMM extraction A, B, C and option iii (Flaring of CMM) for CMM treatment options for safety related laws and regulations, and scenario option 2 for energy production (coal fired power plant) for installed capacity limitation.</p> <p>CL-7 Regarding the regulation GB21522-2008, which requires that CMM of concentration $\geq 30\%$ cannot be released directly to the atmosphere without utilization or flaring, please clarify why the baseline option i Venting is not eliminated.</p> <p>According to extraction reports of Hexi, Shuangliu and Zhongxing coal mines, CMM extracted from the coal mines are of low CH₄ concentration ($<30\%$), which is not regulated in GB21522-2008. Venting extracted CMM is the continuation of CMM treatment practice before the proposed project was implemented. Thus, it is not eliminated.</p>	CL-7	OK

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			Bureau Veritas Certification checked the CH ₄ concentration report for the three coal mines in 2011, and found that the concentration is lower than 30%.		
5.4.1.3.If yes, has the PDD corretly formulate baseline scenario alternatives?	ACM	0008	Yes. The PDD has correctly formulate baseline scenario alternatives after eliminating scenario that do not comply with legal or regulatory requirements.	OK	OK
5.4.1.4.If yes, has the PDD correctly eliminate baseline scenario alternatives that face prohibitive barriers?	ACM	0008	<p>For CMM treatment,</p> <p>The Scenario ii of VAM Utilization is eliminated for the Project does not involve VAM utilization.</p> <p>CL-8 (1) For there are some captive power plants in China, the reason to exclude alternative scenario v should be clarified.</p> <p>(2) The elimination of alternative scenario vi should be further clarified.</p> <p>(1) The revision has been made in the revised PDD and no barrier has been identified, and the alternative v has been excluded in step 5.The NPV of scenario v is -2,185(10⁴ RMB), which is lower than that of scenario i (zero).</p> <p>(2) The revision has been made in the revised PDD and</p>	CL-8	OK

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			<p>the scenario alternative vi has been excluded in step 5. The NPV of scenario alternative vi is -1,280 (10⁴ RMB), which is lower than that of scenario alternative i (zero). Thus, alternative scenario vi has been excluded.</p> <p>The scenarios iv, v and vi have been discussed in section 3.7 of the Report.</p> <p>The Scenario vii of Extracted CMM could be delivered to the local pipeline for residential or commercial use has been eliminated because it cannot satisfy the requirement of national standard and neither any gas pipeline connection nor methane concentrating facility exists in the three mines.</p> <p>For energy production,</p> <p>The Scenario 6 of heat supply by the grid has been excluded for the proposed coal mine are all located in the mountain area which is lack of infrastructure for supplying heat by the Grid that covers the whole coal mine areas and the coal mine are all located in the mountain area.</p> <p>Pending on CL-6</p>		

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			<p>Yes</p> <p>In energy production alternative, construction of a renewable power plant with equivalent amount of electricity is added. Renewable power plants including hydro, wind, biomass and solar plants are discussed in step 4. It is not feasible to develop hydropower and wind power plant with equivalent electricity because of lacking hydropower and wind power resources in the local areas. Due to the high investment per unit and lower return rate of solar power generation, no solar project can generate the equivalent electricity to the Project in Shanxi Province currently, and it is not feasible to develop solar power plant with equivalent electricity. For the biomass generation, due to price of biomass continuously rising and some other reasons, most of the biomass power generation projects are suffering from severe loss after the projects operating. So, it is not feasible to develop biomass power plant with equivalent electricity</p>	Pending	
5.4.1.5.If there exist more than one baseline scenario option combinations, has the PDD correctly identify most economically attractive baseline scenario alternative?	ACM	0008	Yes. Scenario i, 1 and 5 are the most economically attractive scenario.	OK	OK

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5.4.2. Does the selected methodology require use of tools (such as the “Tool for the demonstration and assessment of additionality” and the “Combined tool to identify the baseline scenario and demonstrate additionality”) to establish the baseline scenario?	VVM	82	Only Step 2 (investment analysis) of the “Tool for the demonstration and assessment of additionality” shall be used to identify the most plausible baseline scenarios by eliminating options which are clearly economically unattractive.	OK	OK
5.4.3. If yes, was the methodology consulted on the application of these tools? (In such cases, the guidance in the methodology shall supersede the tool.)	VVM	82	N.A.	OK	OK
5.4.4. Does the methodology require several alternative scenarios to be considered in the identification of the most reasonable baseline scenario?	VVM	83	Yes Several alternative scenarios required in the methodology, i.e. Scenarios in steps: Step 1a: Options for CMM extraction Step 1b: Options for CMM treatment Step 1c: Options for energy production	OK	OK
5.4.5. If yes, are all scenarios that are considered by the project participants and are supplementary to those required by the methodology reasonable in the	VVM	83	Pending on CL-6 Yes	Pending	OK

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context of the proposed CDM project activity?					
5.4.6. Has any reasonable alternative scenario been excluded?	VVM	83	Refer to section 5.4.1	-	OK
5.4.7. Is the baseline scenario identified reasonably supported by:	VVM	84	Refer to section 5.4.1	-	OK
5.4.7.1. Assumptions?	VVM	84	Refer to section 5.4.1	-	OK
5.4.7.2. Calculations?	VVM	84	Refer to section 5.4.1	-	OK
5.4.7.3. Rationales?	VVM	84	Refer to section 5.4.1	-	OK
5.4.8. Are the documents and sources referred to in the PDD correctly quoted and interpreted?	VVM	84	Bureau Veritas Certification has checked the documents and sources referred to in the PDD, and confirm that the documents and sources referred to in the PDD are correctly quoted and interpreted.	OK	OK
5.4.9. Was the information provided in the PDD cross checked with other verifiable and credible sources, such as local expert opinion, if available? (identify the sources)	VVM	84	Yes. During the on-site validation, the auditor has cross checked the information provided in the PDD with local expert opinion. The interviewee included local environment, electricity government, and the local residents, the PP and the consultant.	OK	OK
5.4.10. Have all applicable CDM requirements	VVM	85	Yes.	OK	OK

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been taken into account in the identification of the baseline scenario for the proposed CDM project activity?			The requirements include the methodology ACM0008, the VVM, the Tool for the Demonstration and Assessment of Additionality, and etc have been taken into account.		
5.4.11. Have all relevant policies and circumstances been identified and correctly considered in the PDD, in accordance with the guidance by the CDM Executive Board?	VVM	85	Yes Refer to section 5.4.1	OK	OK
5.4.12. Does the PDD provide a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity?	VVM	86	Yes Before the project was implemented, the extracted coal mine methane would be released into the atmosphere. The electricity imported from NCPG which mainly generated by fossil fuels. The heat needed in the coal mine was provided by the coal fired boilers before the implementation of the project activity.	OK	OK
5.5. Algorithms and/or formulae used to determine emission reductions	VVM	89-93			
5.5.1. Have the equations and parameters in the PDD been correctly applied with	VVM	90	The steps taken and equations applied to calculate project emissions (including the PE_{ME} , PE_{MD} and PE_{UM}),	OK	OK

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respect those in the select approved methodology?			baseline emissions (including $BE_{MD,y}$, $BE_{MR,y}$ and $BE_{Use,y}$), leakage, and emission reductions comply with the requirements of the ACM0008 Version 07 and the Tool-Grid EF version 02.2.1.		
5.5.2. Does the methodology provide for selection between different options for equations or parameters?	VVM	90	No different options for the Project.	OK	OK
5.5.3. If yes, has adequate justification been provided (based on the choice of the baseline scenario, context of the proposed CDM project activity and other evidence provided)?	VVM	90	N.A.	OK	OK
5.5.4. If yes, have correct equations and parameters been used, in accordance with the methodology selected?	VVM	90	Refer to (5.5.2) above	-	OK
5.5.5. Will data and parameters be monitored throughout the crediting period of the proposed CDM project activity?	VVM	91	Refer to (3.19.2)	-	OK
5.5.6. If no, and these data and parameters will remain fixed throughout the crediting period, are all data sources and assumptions:	VVM	91		-	OK
5.5.6.1. Appropriate and correct?	VVM	91	Yes	OK	OK
5.5.6.2. Applicable to the proposed CDM	VVM	91	Yes	OK	OK

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project activity?					
5.5.6.3. Resulting in a conservative estimate of the emission reductions?	VVM	91	Yes	OK	OK
5.5.7. Will data and parameters be monitored on implementation and hence become available only after validation of the project activity?	VVM	91	Yes.	OK	OK
5.5.8. If yes, are the estimates provided in the PDD for these data and parameters reasonable?	VVM	91	Yes. The estimates provided in PDD for these data and parameters are sourced from the Feasibility Study Report, which has been approved by the government.	OK	OK
6. Additionality of a project activity	VVM	94-97			
6.1.1. Does the CDM-PDD state the latest version of the additionality tool being used?	VVM	95	Yes. The PDD describe how the proposed CDM project is additional through investment analysis.	OK	OK
6.1.2. Is the entire host country selected as the applicable geographical area as a default?	EB 69	Ann 20	Yes China has been defined as the region.	OK	OK
6.1.3. If the technology applied in the project is not country specific, is the applicable geographical area extended to other countries?	EB 69	Ann 20	No.	OK	OK
6.1.4. If the applicable geographical area is smaller than the host country, has the	EB 69	Ann 20	N.A.	OK	OK

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project participants provided justification that technologies that vary considerably from location to location depending on local conditions?					
6.1.5. Has the measure of proposed project activity falls in: (a) Fuel and feedstock switch; (b) Switch of technology with or without change of energy source (including energy efficiency improvement as well as use of renewable energies); (c) Methane destruction; (d) Methane formation avoidance.	EB 69	Ann 20	The Project falls in (c) Methane destruction.	OK	OK
6.1.6. Were the following steps of the tool to assess additionality used:	EB 69	Ann 20			
6.1.6.1. Identification of alternatives to the project activity?	EB 69	Ann 20	For similarity of both approaches used to determine baseline scenario with the additionality tool, Step 1 of the Tool for the demonstration and assessment of additionality has been ignored in the PDD as per the ACM0008 Version 07.	OK	OK
6.1.6.2. Investment analysis to determine that the Project activity is either: 1) not the	EB 69	Ann 20	Yes 1) Benchmark analysis has been used.	OK	OK

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most economically or financially attractive, or 2) not economically or financially feasible?					
6.1.6.3. Barriers analysis?	EB 69	Ann 20	No. No barrier analysis has been applied.	OK	OK
6.1.6.4. Common practice analysis?	EB 69	Ann 20	Yes	OK	OK
6.1.7. Step 1, Identification of alternatives to the project activity	EB 69	Ann 20	Because of the similarity of both approaches used to determine the baseline scenario and the additionality tool, Step 1 of the Tool for the demonstration and assessment of additionality has been ignored.	OK	OK
6.1.8. Have the following alternatives been included while defining alternatives as per sub-step 1a?	EB 69	Ann 20			
6.1.8.1. (a) The Project activity undertaken without being registered as a CDM project activity;	EB 69	Ann 20	N.A.	OK	OK
6.1.8.2. (b) Other realistic and credible alternative scenario(s) to the proposed CDM project activity scenario that deliver outputs services or services with comparable quality, properties and application areas, taking into account, where relevant,	EB 69	Ann 20	N.A.	OK	OK

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examples of scenarios identified in the underlying methodology;					
6.1.8.3. (c) If applicable, continuation of the current situation (no project activity or other alternatives undertaken).	EB 69	Ann 20	N.A.	OK	OK
6.1.9. Has the project participant included the technologies or practices that provide outputs or services with comparable quality, properties and application areas as the proposed CDM project activity and that have been implemented previously or are currently being introduced in the relevant country/region?	EB 69	Ann 20	N.A.	OK	OK
6.1.10. Has the outcome of Step 1a: Identified realistic and credible alternative scenario(s) to the project activity done correctly? Please briefly mention the outcome.	EB 69	Ann 20	N.A.	OK	OK
6.1.11. Is the alternative(s) in compliance with all mandatory applicable legal and regulatory requirements, even if these	EB 69	Ann 20	N.A.	OK	OK

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laws and regulations have objectives other than GHG reductions, e.g. to mitigate local air pollution.?					
6.1.12. If an alternative does not comply with all mandatory applicable legislation and regulations, has it been shown that, based on an examination of current practice in the country or region in which the law or regulation applies, those applicable legal or regulatory requirements are systematically not enforced and that noncompliance with those requirements is widespread in the country?	EB 69	Ann 20	N.A.	OK	OK
6.1.13. Has the outcome of Step 1b: Identified realistic and credible alternative scenario(s) to the project activity that are in compliance with mandatory legislation and regulations taking into account the enforcement in the region or country and EB decisions on national and/or sectoral policies and regulations done correctly? Please state the outcome.	EB 69	Ann 20	N.A.	OK	OK

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6.1.14. Has PP selected Step 2 (Investment analysis) or Step 3 (Barrier analysis) or both Steps 2 and 3?	EB 69	Ann 20	Only step 2 (Investment analysis) has been selected.	OK	OK
6.1.15. Step 2, Investment analysis	EB 69	Ann 20			
6.1.15.1. Sub-step 2a: Determine appropriate analysis method;	EB 69	Ann 20	Yes	OK	OK
6.1.15.2. Sub-step 2b: Determine whether to apply simple cost analysis (Option I), investment comparison analysis (Option II) or benchmark analysis (Option III)	EB 69	Ann 20	Considering that there are not only CDM revenues but also the power sale revenues, option I is not adopted.	OK	OK
6.1.15.3. Sub-step 2c: Calculation and comparison of financial indicators (only applicable to Options II and III);	EB 69	Ann 20	Yes Option III has been applied.	OK	OK
6.1.15.4. Sub-step 2d: Sensitivity analysis (only applicable to Options II and III).	EB 69	Ann 20	Yes	OK	OK
6.1.16. In sub-step 2a has the determination of appropriate method of analysis done as per the guidance as below?	EB 69	Ann 20			

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6.1.16.1. Simple cost analysis if the CDM project activity and the alternatives identified in Step 1 generate no financial or economic benefits other than CDM related income (Option I).	EB 69	Ann 20	N.A.	OK	OK
6.1.16.2. Otherwise, use the investment comparison analysis (Option II) or the benchmark analysis (Option III). Specify option used with justification.	EB 69	Ann 20	Yes Option III has been selected.	OK	OK
6.1.17. Has the below guideline followed for sub-step 2b Option I. Apply simple cost analysis? Document the costs associated with the CDM project activity and the alternatives identified in Step 1 and demonstrate that there is at least one alternative which is less costly than the project activity.	EB 69	Ann 20	N.A.	OK	OK
6.1.18. Has the below guideline followed for sub-step 2b Option II. Apply investment comparison analysis? Identify the financial indicator, such as IRR, NPV, cost benefit ratio, or unit cost of service	EB 69	Ann 20	N.A.	OK	OK

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most suitable for the project type and decision-making context. Please specify					
6.1.19. Has the below guideline followed for Sub-step 2b: Option III. Apply benchmark analysis?	EB 69	Ann 20			
6.1.19.1. Identify the financial/economic indicator, such as IRR, most suitable for the project type and decision context.	EB 69	Ann 20	Yes. IRR is identified as the financial indicator.	OK	OK
6.1.19.2. When applying Option II or Option III, the financial/economic analysis shall be based on parameters that are standard in the market, considering the specific characteristics of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer. Only in the particular case where the project activity can be implemented by the project participant, the specific financial/economic situation of the	EB 69	Ann 20	Yes. The financial analysis is based on the FSRs, which has been finished by the authorized institute and is standard in the market, considering the specific characteristics of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer.	OK	OK



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company undertaking the project activity can be considered.					
6.1.19.3. Discount rates and benchmarks shall be derived from: (a) Government bond rates, increased by a suitable risk premium to reflect private investment and/or the project type, as substantiated by an independent (financial) expert or documented by official publicly available financial data; (b) Estimates of the cost of financing and required return on capital (e.g. commercial lending rates and guarantees required for the country and the type of project activity concerned), based on bankers views and private equity investors/funds' required return on comparable projects; (c) A company internal benchmark (weighted average capital cost of the company), only in the particular case referred to above in 2. The project	EB 69	Ann 20	Benchmark 8% of CMM power generation is derived from (d) Government/official approved benchmark where such benchmarks are used for investment decisions: <i>Interim Rules on Economic Assessment of Electric Power Engineering Retrofit Projects</i> .	OK	

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developers shall demonstrate that this benchmark has been consistently used in the past, i.e. that project activities under similar conditions developed by the same company used the same benchmark; (d) Government/official approved benchmark where such benchmarks are used for investment decisions; (e) Any other indicators, if the project participants can demonstrate that the above Options are not applicable and their indicator is appropriately justified. Please specify benchmark and justify.					
6.1.20. Has the below guideline followed for Sub-step 2c: Calculation and comparison of financial indicators (only applicable to Options II and III)?	EB 69	Ann 20			
6.1.20.1. Calculate the suitable financial indicator for the proposed CDM project activity and, in the case of Option II above, for the other	EB 69	Ann 20	Yes. The PP has calculated the IRR for the proposed CDM project activity. The PDD includes the relevant costs	OK	OK

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alternatives. Include all relevant costs (including, for example, the investment cost, the operations and maintenance costs), and revenues (excluding CER revenues, but possibly including inter alia subsidies/fiscal incentives, ODA, etc, where applicable), and, as appropriate, non-market cost and benefits in the case of public investors if this is standard practice for the selection of public investments in the host country.			including the investment cost, the CMM cost, and the operations and maintenance costs, and revenues (electricity sales revenue) excluding CER revenues (the project does not involve subsidies/fiscal incentives or ODA). The project also does not involve non-market cost and benefits and public invest.		
6.1.20.2. Present the investment analysis in a transparent manner and provide all the relevant assumptions, preferably in the CDM-PDD, or in separate annexes to the CDM-PDD.	EB 69	Ann 20	CL-9 Some main parameters, such as the heat supply, heat price, debt equity ratio, should be presented in the PDD. Parameters including heat supply, heat price are all added in Table B-4 of the PDD. No debt involved in the Project as per the approved FSR. These parameters are all sourced from FSR.	CL-9	OK
6.1.20.3. Justify and/or cite assumptions.	EB 69	Ann 20	Pending on CL-9 Yes	Pending	OK
6.1.20.4. In calculating the financial/economic	EB 69	Ann 20	Yes.	OK	OK

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indicator, the project's risks can be included through the cash flow pattern, subject to project-specific expectations and assumptions.			The project's risk is included through the cash flow pattern in calculating the IRR.		
6.1.20.5. Assumptions and input data for the investment analysis shall not differ across the project activity and its alternatives, unless differences can be well substantiated.	EB 69	Ann 20	N.A. for Option III has been selected.	OK	OK
6.1.20.6. Present in the CDM-PDD a clear comparison of the financial indicator for the proposed CDM activity. Please specify details for above.	EB 69	Ann 20	N.A. for Option III has been selected.	OK	OK
6.1.21. Has the below guideline followed for Sub-step 2d: Sensitivity analysis (only applicable to Options II and III)? Include a sensitivity analysis that shows whether the conclusion regarding the financial/economic attractiveness is robust to reasonable variations in the critical assumptions.	EB 69	Ann 20	Yes. A sensitivity analysis that shows whether the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions is included.	OK	OK
6.1.22. Has the outcome of Step 2 clearly	EB	Ann	Yes. Without CER revenues, the IRR of the Project is	OK	OK

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mentioned with justification?	69	20	-0.45%. That return is much lower than the benchmark IRR of 8%. Therefore the Project is not economically viable. It is clear that when Total investment, Annual O&M Cost and Annual Power Supply/Power Tariff change within the scope of $\pm 10\%$, the IRR of the Project will remain below 8%, the benchmark IRR.		
6.1.23. Step 3: Barrier analysis	EB 69	Ann 20	No barrier analysis has been applied.	OK	OK
6.1.24. Have the latest approved version of the "Guidelines for objective demonstration and assessment of barriers" been taken into account when applying this step?	EB 69	Ann 20	N.A.	OK	OK
6.1.25. For barriers other than barriers due to project being "first of its kind" as defined in 6.1.26.3, has the project participant demonstrated that the CDM would alleviate the identified barriers that prevent the proposed project activity from occurring?	EB 69	Ann 20	N.A.	OK	OK
6.1.26. Has the below guideline followed for Sub-step 3a: Identify barriers that would prevent the implementation of the proposed CDM project?	EB 69	Ann 20			

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6.1.26.1. Investment barriers: (a) For alternatives undertaken and operated by private entities: Similar activities have only been implemented with grants or other non-commercial finance terms. (b) No private capital is available from domestic or international capital markets due to real or perceived risks associated with investment in the country where the proposed CDM project activity is to be implemented, as demonstrated by the credit rating of the country or other country investments reports of reputed origin.	EB 69	Ann 20	N.A.	OK	OK
6.1.26.2. Technological barriers: (a) Skilled and/or properly trained labour to operate and maintain the technology is not available in the relevant country/region, which leads to an unacceptably high risk of equipment disrepair and malfunctioning or other	EB 69	Ann 20	N.A.	OK	OK

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underperformance; (b) Lack of infrastructure for implementation and logistics for maintenance of the technology, (c) Risk of technological failure: the process/technology failure risk in the local circumstances is significantly greater than for other technologies that provide services or outputs comparable to those of the proposed CDM project activity, as demonstrated by relevant scientific literature or technology manufacturer information, (d) The particular technology used in the proposed project activity is not available in the relevant region.					



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<p>6.1.26.3. Barriers due to prevailing practice: The project activity is the “first of its kind”:</p> <p>(a) For the measures identified under 6.1.5, a proposed project activity is the First-of-its-kind in the applicable geographical area if : (i) The project is the first in the applicable geographical area that applies a technology that is different from any other technologies able to deliver the same output and that have started commercial operation in the applicable geographical area before the start date of the project; and (ii) Project participants selected a crediting period for the project activity that is .a maximum of 10 years with no option of renewal;</p> <p>(b) For the measures identified under 6.1.5, a proposed project activity that was identified as the First-of-its-kind project activity is additional and Sub-step 3b does not</p>	EB 69	Ann 20	N.A.	OK	OK

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<p>apply.</p> <p>For other measures, the project proponents shall propose approach for demonstrating that a project is a first-of-its-kind and Sub-step 3b applies.</p>					
6.1.26.4. Other barriers, preferably specified in the underlying methodology as examples.	EB 69	Ann 20	N.A.	OK	OK
6.1.27. Has the outcome from Step 3a clearly mentioned in PDD?	EB 69	Ann 20	N.A.	OK	OK
6.1.28. Has the below guideline followed for Sub-step 3 b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the Project activity)?	EB 69	Ann 20	N.A.	OK	OK
6.1.28.1. If the identified barriers also affect other alternatives, explain how they are affected less strongly than they affect the proposed CDM project activity. In other words, demonstrate	EB 69	Ann 20	N.A.	OK	OK

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that the identified barriers do not prevent the implementation of at least one of the alternatives. Any alternative that would be prevented by the barriers identified in Sub-step 3a is not a viable alternative, and shall be eliminated from consideration.					
6.1.28.2. Provide transparent and documented evidence, and offer conservative interpretations of this documented evidence, as to how it demonstrates the existence and significance of the identified barriers and whether alternatives are prevented by these barriers.	EB 69	Ann 20	N.A.	OK	OK
6.1.28.3. The type of evidence to be provided should include at least one of the following: (a) Relevant legislation, regulatory information or industry norms; (b) Relevant (sectoral) studies or surveys (e.g. market surveys, technology studies, etc)	EB 69	Ann 20	N.A.	OK	OK

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undertaken by universities, research institutions, industry associations, companies, bilateral/multilateral institutions, etc; (c) Relevant statistical data from national or international statistics; (d) Documentation of relevant market data (e.g. market prices, tariffs, rules); (e) Written documentation of independent expert judgments from industry, educational institutions (e.g. universities, technical schools, training centres), industry associations and others. Please specify.					
6.1.29. Has the outcome from Step 3 clearly mentioned in PDD?	EB 69	Ann 20	N.A.	OK	OK
6.1.30. Step 4: Common practise analysis	EB 69	Ann 20	Yes	OK	OK

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6.1.31. Has the proposed project been demonstrated to be first of its kind (according to sub-step 3a)?	EB 69	Ann 20	No.	OK	OK
6.1.32. If not, for measures different from those listed in 6.1.5, have all the sub-steps as below followed?	EB 69	Ann 20			
6.1.32.1. Has the below guideline followed for Sub-step 4a: Analyze other activities similar to the Project activity? Provide an analysis of any other activities that are operational and that are similar to the Project activity. Other CDM project activities are not to be included in this analysis. Provide documented evidence and, where relevant, quantitative information. On the basis of that analysis, describe whether and to which extent similar activities have already diffused in the relevant region.	EB 69	Ann 20	<p>Yes</p> <p>China has been defined as the region.</p> <p>The Project started on 15/07/2008. Searching from public & available sources, such as <i>Global Methane International Coal Mine Methane Projects Database</i>, China's DNA website and UNFCCC website, all the mine gas utilization project operated before 15/07/2008 has been registered as CDM project or are applying for CDM projects.</p> <p>No similar project has been identified.</p>	OK	OK
6.1.32.2. Has the below guideline followed for Sub-step 4b: Discuss any similar Options that are occurring? If similar activities are identified, then it is	EB 69	Ann 20	<p>Yes.</p> <p>All of the projects are applying for CDM projects or were registered as CDM projects.</p>	OK	OK

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necessary to demonstrate why the existence of these activities does not contradict the claim that the Project activity is financially/economically unattractive or subject to barriers. This can be done by comparing the Project activity to the other similar activities, and pointing out and explaining essential distinctions between them that explain why the similar activities enjoyed certain benefits that rendered it financially/economically attractive (e.g., subsidies or other financial flows) and which the Project activity cannot use or did not face the barriers to which the Project activity is subject. In case similar projects are not accessible, the PDD should include justification about non-accessibility of data/information.					

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6.1.33. For measures that are listed in 6.1.5, have all the sub-steps as below followed?	EB 69	Ann 20			
6.1.33.1. Step 1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity.	EB 69	Ann 20	Yes The total installation capacity for power generation of the Project is 19.9MW. Range of +/- 50% of the capacity is from 9.95MW to 29.85MW.	OK	OK
6.1.33.2. Step 2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. Note their number N_{all} . Registered CDM project activities and projects activities undergoing validation shall not be included in this step;	EB 69	Ann 20	According the Tool for the demonstration and assessment of additionality, the applicable geographical area covers the entire host country as a default. The start date of the Project was 15/07/2008. Therefore, N_{all} is the number of all the power plants within the applicable capacity range (9.95MW to 29.85MW) and operated before 15/07/2008 in China, except the registered CDM projects or under validation projects. For convenient of discussion in following sub-steps, the N_{all} is divided into three parts: 1. The unknown value X is made to represent the number of all the non-coal mine gas utilization projects (including fossil fuel plants, nuclear plants, waste heat/gas plants, solid waste treatment plants, renewable energy power plants, etc.), and captive plants in N_{all} ;	OK	OK

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			<p>2. The unknown value Y is made to represent the number of the coal mine gas utilization projects not located in Shanxi Province in N_{all};</p> <p>3. The rest in N_{all} is the number of coal mine gas utilization projects located in Shanxi Province, thus the unknown value R is made to represent it.</p> <p>Then the N_{all} is composed of: N_{all} = X + Y + R.</p>		
6.1.33.3. Step 3: Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed project activity. Note their number N _{diff} .			<p>Considering the facts that the non-coal mine gas utilization projects and captive plants enjoy different energy source/fuel, the plants in X are identified as applying different technology with the proposed project, thereby the number X is included in the N_{diff}.</p> <p>Moreover, in China, the provincial government is the highest level of local government. The local regulatory framework is often set by local government (e.g. price regulation, investment policy and so on). In addition, the natural conditions and investment conditions (e.g. electricity tariff, the commodity price and labour salary, etc.) are quite different among provinces. Then only the province could be regarded as applicable geographical area. And the FSRs and EIA statements of the proposed</p>	OK	OK

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			<p>project were all approved by Provincial Government. Thereby the coal mine gas utilization projects in Y are identified as applying different technology with the proposed project, then the number Y is included in the N_{diff}.</p> <p>Therefore, $N_{diff} = X + Y$</p> <p>Searching from public & available sources, such as Global Methane International Coal Mine Methane Projects Database ^[44], China's DNA website and UNFCCC website, the mine gas utilization project operated before 15/07/2008 in Shanxi are all registered as CDM project. Therefore, $R=0$.</p>		
6.1.33.4. Step 4: Calculate factor $F=1-N_{diff}/N_{all}$ representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity.			<p>Since $N_{all} = X + Y + R$, $N_{diff} = X + Y$, $R=0$</p> <p>$N_{diff} = N_{all}$</p> <p>$N_{all} - N_{diff} = 0$</p>	OK	OK

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6.1.33.5. Are the following conditions are fulfilled: (a) the factor F is greater than 0.2, and (b) Nall-Ndiff is greater than 3.			$N_{all} - N_{diff} = 0$, which is less than 3. Therefore, the Project is not a common practice.	OK	OK
6.1.34. Has the outcome from Step 4 clearly mentioned in PDD?	EB 69	Ann 20	Yes. All of the projects are applying for CMM projects or were registered as CDM projects, and these CDM project activities are not to be included in this analysis, subject to the additionality tool.	OK	OK
6.1.35. Has it been proved that the project is additional?	EB 69	Ann 20	Pending on CL-9 Yes, it been proved that the Porject is additional.	Pending	OK
6.2. Prior consideration of the clean development mechanism	VVM	98-104			
6.2.1. Is the project ativity start date prior to the date of publication of the PDD for stakeholder comments?	VVM	98	The start date of the Project has been identified as 15/07/2008, which is prior to the PDD published on 11/10/2011.	OK	OK
6.2.2. If yes, were the CDM benefits considered necessary in the decision to undertake the project as a proposed CDM project activity?	VVM	98	Yes The Board's decision to go through the CDM process for the Project has been made on 02/06/2008.	OK	OK

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6.2.3. Is the start date of the project activity, reported in the PDD, in accordance with the “Glossary of CDM terms”, which states that “The starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins.”?	VVM	99	Yes The start date has been identified as 15/07/2008, which is the signing date of construction agreement of Xuejialing Power station, and it's the earliest date at which either the implementation or construction or real action of a project activity begins.	OK	OK
6.2.4. Does the project activity require construction, retrofit or other modifications?	VVM	99	The Project requires construction.	OK	OK
6.2.5. If yes, is it ensured that the date of commissioning cannot be considered as the project activity start date?	VVM	99	Yes. The date of commissioning has not been considered as the project activity start date.	OK	OK
6.2.6. Is it a new project activity (a project activity with a start date on or after 02 August 2008) or an existing project activity (a project activity with a start date before 02 August 2008)?	VVM EB 62	100 Ann 13	It's an existing project activity for the start date is 15/07/2008, earlier than 02/08/2008.	OK	OK
6.2.7. For a new project, for which PDD has not been published for global stakeholder consultation or a new	VVM EB	101 Ann	N.A.	OK	OK

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methodology proposed to the CDM Executive Board before the project activity start date, had PPs informed the host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status? (Provide reference to such confirmation from host Party DNA and UNFCCC secretariat).	62	13			
6.2.8. For an existing project activity, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, are the following evidences provided:	VVM EB 62	102 Ann 13			
6.2.8.1. evidence that must indicate that awareness of the CDM prior to the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project, including, inter alia:	VVM EB 62	102 Ann 13			
6.2.8.1.1. minutes and/or notes related to the consideration of the decision by	VVM EB	102 Ann	Yes The Board's decision to go through the CDM process for	OK	OK

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the Board of Directors, or equivalent, of the project participant, to undertake the project as a proposed CDM project activity?	62	13	the Project has been made on 02/06/2008.		
6.2.8.2. reliable evidence from project participants that must indicate that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation, including, inter alia:	VVM EB 62	102 Ann 13			
6.2.8.2.1. contract with consultants for CDM/PDD/methodology services?	VVM EB 62	102 Ann 13	CL-10 CDM Consultation Agreement with CAMCO should be provided to DOE. Termination of Consultation Agreement with CAMCO dated 17/12/2010 has been provided.	CL-10	OK
6.2.8.2.2. draft versions of PDDs	EB 62	Ann 13	No	OK	OK
6.2.8.2.3. underlying documents such as letters of authorization	EB 62	Ann 13	No	OK	OK
6.2.8.2.4. letters of intent	EB 62	Ann 13	The CDM Term Sheet with Timing Carbon Ltd. dated 26/01/2011 has been provided.	OK	OK
6.2.8.2.5. emission reduction purchase agreement (ERPA) term sheets	EB 62	Ann 13	No.	OK	OK

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6.2.8.2.6. Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds)?	VVM EB 62	102 Ann 13	No.	OK	OK
6.2.8.2.7. evidence of agreements or negotiations with a DOE for validation services?	VVM EB 62	102 Ann 13	No.	OK	OK
6.2.8.2.8. submission of a new methodology to the CDM Executive Board or requests for clarification or revision of existing methodologies to the CDM Executive Board?	VVM EB 62	102 Ann 13	No.	OK	OK
6.2.8.2.9. publication in newspaper?	VVM EB 62	102 Ann 13	No.	OK	OK
6.2.8.2.10. interviews with DNA?	VVM EB 62	102 Ann 13	No.	OK	OK
6.2.8.2.11. earlier correspondence on the project with the DNA or the UNFCCC secretariat?	VVM EB 62	102 Ann 13	No.	OK	OK

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6.2.8.2.12. If letters, e-mail exchanges and other documented communications help to substantiate the evidence, has the DOE assessed and confirmed the authenticity of such communications, inter alia through cross-checking (e.g. interviews).	EB 62	Ann 13	No.	OK	OK
6.2.8.2.13. Has the chronology of events including time lines been appropriately captured and explained/detailed in the PDD?	VVM	102	Yes, the timeline has been included in the PDD.	OK	OK
6.3. Identification of alternatives	VVM	105-107			
6.3.1. Does the approved methodology that is selected by the proposed CDM project activity prescribe the baseline scenario and hence no further analysis is required?	VVM	105	No.	OK	OK
6.3.2. If no, does the PDD identify credible alternatives to the project activity in order to determine the most realistic baseline scenario?	VVM	105	Yes	OK	OK
6.3.3. Does the list of alternatives given in the	VVM	106			

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PDD ensure that:					
6.3.3.1. the list of alternatives includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity?	VVM	106	Yes.	OK	OK
6.3.3.2. the list contains all plausible alternatives that the DOE, on the basis of its local and sectoral knowledge, considers to be viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity?	VVM	106	Yes.	OK	OK
6.3.3.3. the alternatives comply with all applicable and enforced legislation?	VVM	106	Yes. The alternatives which do not comply with applicable and enforced legislation are eliminated in the Step 2 of the Section B.4 of the PDD.	OK	OK
6.4. Investment analysis	VVM	108-114			
6.4.1. Has investment analysis been used to demonstrate the additionality of the proposed CDM project activity?	VVM	108	Yes	OK	OK
6.4.2. If yes, does the PDD provide evidence that the proposed CDM project activity would not be:	VVM	108			

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6.4.2.1. the most economically or financially attractive alternative?	VVM	108	No	OK	OK
6.4.2.2. economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs)?	VVM	108	Yes The result of the IRR calculation shows that the IRR of the project without the revenue from the sales of CERs is lower than the benchmark, and the project activity is not financially feasible without the CERs revenue.	OK	OK
6.4.3. Was this shown by one of the following approaches?	VVM	109			
6.4.3.1. The proposed CDM project activity would produce no financial or economic benefits other than CDM-related income. Document the costs associated with the proposed CDM project activity and the alternatives identified and demonstrate that there is at least one alternative which is less costly than the proposed CDM project activity.	VVM	109	No.	OK	OK
6.4.3.2. The proposed CDM project activity is less economically or financially attractive than at least one other credible and realistic alternative.	VVM	109	No.	OK	OK
6.4.3.3. The financial returns of the proposed	VVM	109	Yes	OK	OK

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CDM project activity would be insufficient to justify the required investment.					
6.4.4. Is the period of assessment limited to the proposed crediting period of the CDM project activity?	EB 62	Ann 05	No. The period of assessment 19-year (including one year for construction) is not limited to the proposed fixed crediting period of the CDM project activity.	OK	OK
6.4.5. Does the project IRR or equity IRR calculations reflect the period of expected operation of the underlying project activity (technical lifetime), or - if a shorter period is chosen - include the fair value of the project activity assets at the end of the assessment period?	EB 62	Ann 05	Yes. The residual value of the project activity assets at the end of the assessment period of 5% included.	OK	OK
6.4.6. Does the IRR calculation include the cost of major maintenance and/or rehabilitation if these are expected to be incurred during the period of assessment?	EB 62	Ann 05	Yes	OK	OK
6.4.7. Do the project participants justify the appropriateness of the period of assessment in the context of the underlying project activity, without reference to the proposed CDM crediting	EB 62	Ann 05	The period of assessment is justified according to the Feasibility Study, on which the investment analysis based, without reference to the proposed CDM crediting period.	OK	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
period?					
6.4.8. Does the cash flow in the final year include a fair value of the project activity assets at the end of the assessment period?	EB 62	Ann 05	Yes. The residual value of the project activity assets at the end of the assessment period of 5% included.	OK	OK
6.4.9. Has the fair value been calculated in accordance with local accounting regulations where available, or international best practice?	EB 62	Ann 05	Yes. It is in accordance with the regulation Guoshuihan No. [2005]883, Notice on clarification of regulating implementation time of the rate of residual value of fixed assets, issued by China State Administration of Taxation.	OK	OK
6.4.10. Does the fair value calculations include both the book value of the asset and the reasonable expectation of the potential profit or loss on the realization of the assets?	EB 62	Ann 05	Yes. It includes both the book value of the asset and the reasonable expectation of the potential profit or loss on the realization of the assets.	OK	OK
6.4.11. Was depreciation, and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, added back to net profits for the purpose of calculating the financial indicator (e.g. IRR, NPV)?	EB 62	Ann 05	Depreciation and other non-cash items such as loan repayment have not been added back to net profits for the purpose of calculating the IRR.	OK	OK
6.4.12. Has taxation been included as an expense in the IRR/NPV calculation in	EB 62	Ann 05	Yes	OK	OK

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cases where the benchmark or other financial indicator is intended for post-tax comparisons?			Taxation has been included from the net cash flow when calculating the post-tax IRR.		
6.4.13. Are the input values used in all investment analysis valid and applicable at the time of the investment decision taken by the project participant?	EB 62	Ann 05	Yes. The PP has made CDM consideration on 02/06/2008 based on the Feasibility Study which has been finalized in Apr.2008 and approved on 09/05/2008. As the FSR has been completed by an independent and certified institute and approved by local government, and the period of time between the FSR and the investment decision is sufficiently short, the FSR, therefore, can be considered as an independent and realistic assessment of the proposed project activity, including the parameters listed and used as input values in the IRR calculation.	OK	OK
6.4.14. Is the timing of the investment decision consistent and appropriate with the input values?	EB 62	Ann 05	Yes	OK	OK
6.4.15. Are all the listed input values been consistently applied in all calculations?	EB 62	Ann 05	Yes	OK	OK
6.4.16. Does the investment analysis reflect the economic decision making context at point of the decision to recommence the project in the case of project activities for which implementation ceases after the	EB 62	Ann 05	N.A. The investment analysis is conducted at the point of the decision to start implementation, other than recommencement.	OK	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
commencement and where implementation is recommenced due to consideration of the CDM?					
6.4.17. Have project participants supplied the spreadsheet versions of all investment analysis?	EB 62	Ann 05	Yes The IRR spreadsheet has been provided.	OK	OK
6.4.18. Are all formulas used in this analysis readable and all relevant cells be viewable and unprotected?	EB 62	Ann 05	Yes	OK	OK
6.4.19. In cases where the project participant does not wish to make such a spreadsheet available to the public has the PP provided an exact read-only or PDF copy for general publication?	EB 62	Ann 05	N.A.	OK	OK
6.4.20. In case the PP wishes to black-out certain elements of the publicly available version, is it justifiable?	EB 62	Ann 05	N.A.	OK	OK
6.4.21. Was the cost of financing expenditures (i.e. loan repayments and interest) included in the calculation of project IRR?	EB 62	Ann 05	No loan in the Project.	OK	OK
6.4.22. In the calculation of equity IRR, has only the portion of investment costs which is financed by equity been considered as	EB 62	Ann 05	Project IRR has been calculated.	OK	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the net cash outflow?					
6.4.23. Has the portion of the investment costs which is financed by debt been considered a cash outflow in the calculation of equity IRR? (this is not allowed)	EB 62	Ann 05	N.A.	OK	OK
6.4.24. Was a pre-tax benchmark be applied?	EB 62	Ann 05	No.	OK	OK
6.4.25. In cases where a post-tax benchmark is applied, is actual interest payable taken into account in the calculation of income tax?	EB 62	Ann 05	N.A. No interest accrue for there is no loan in the Project.	OK	OK
6.4.26. In cases where a benchmark approach is used is the applied benchmark appropriate to the type of IRR calculated?	EB 62	Ann 05	Yes As per Interim Rules on Economic Assessment of Electric Power Engineering Retrofit Projects, the benchmark project IRR adopted by the Project is 8% (post tax), which is popular in electricity industry.	OK	OK
6.4.27. Has local commercial lending rates or weighted average costs of capital (WACC) selected as appropriate benchmarks for a project IRR?	EB 62	Ann 05	N.A.	OK	OK
6.4.28. Has required/expected returns on equity selected as appropriate benchmark for	EB 62	Ann 05	N.A.	OK	OK

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an equity IRR?					
6.4.29. In case benchmarks supplied by relevant national authorities selected is it applicable to the project activity and the type of IRR calculation presented?	EB 62	Ann 05	Yes As per Interim Rules on Economic Assessment of Electric Power Engineering Retrofit Projects, the benchmark project IRR adopted by the Project is 8% (post tax), which is popular in electricity industry.	OK	OK
6.4.30. In the cases of projects which could be developed by an entity other than the project participant is the benchmark applied based on parameters that are standard in the market?	EB 62	Ann 05	N.A.	OK	OK
6.4.31. Whether a company-specific benchmark or a benchmark based on parameters that are standard in the market is suitable in the context of the underlying project activity?	EB 62	Ann 05	N.A.	OK	OK
6.4.32. Have internal company benchmarks/expected returns (including those used as the expected return on equity in the calculation of a weighted average cost of capital - WACC) been applied in cases where there is only one possible project developer?	EB 62	Ann 05	N.A.	OK	OK

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6.4.33. In such cases, have these values been used for similar projects with similar risks, developed by the same company or, if the company is brand new, would have been used for similar projects in the same sector in the country/region?	EB 62	Ann 05	N.A.	OK	OK
6.4.34. Has a minimum clear evidence of the resolution by the company's Board and/or shareholders been provided to the effect as above?	EB 62	Ann 05	N.A.	OK	OK
6.4.35. Has a thorough assessment of the financial statements of the project developer - including the proposed WACC - to assess the past financial behavior of the entity during at least the last 3 years in relation to similar projects been conducted?	EB 62	Ann 05	N.A.	OK	OK
6.4.36. If a company internal benchmark is used, is it derived from the Capital Asset Pricing Model (CAPM)?	EB 62	Ann 05	N.A.	OK	OK
6.4.37. If yes, are the resulting benchmarks consistently used by the company in the past?	EB 62	Ann 05	N.A.	OK	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
6.4.38. If the benchmark is based on parameters that are standard in the market, is the cost of equity determined either by: (a) selecting the values provided in Appendix A; or by (b) calculating the cost of equity using best financial practices, based on data sources which can be clearly validated by the DOE, while properly justifying all underlying factors.	EB 62	Ann 05	N.A.	OK	OK
6.4.39. If a company internal benchmark is used, are the values in the table in Appendix A used, as a simple default option?	EB 62	Ann 05	N.A.	OK	OK
6.4.40. If a company's internal benchmark is used for the expected return on equity, is the cost of debt based on the weighted average cost of debt financing of the legal entity owning the CDM project activity?	EB 62	Ann 05	N.A.	OK	OK
6.4.40.1. For loans, is the weighted average cost of outstanding long-term debt used?	EB 62	Ann 05	N.A.	OK	OK

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6.4.40.2. For bonds, is the weighted average yield of the bonds during the last three months prior to the submission of the CDM-PDD for validation or prior to the investment decision, whichever is earlier, used? The use of bonds to determine the cost of debt is only appropriate for corporate bonds issued in the host country of the CDM project.	EB 62	Ann 05	N.A.	OK	OK
6.4.40.3. In cases where the debt finance structure of the project is not yet available (e.g. a letter of intent for debt funding is not available), the cost of debt can be assumed as the commercial lending rate in the country or the yield of a 10 year bond issued by the government of the host country or, if this is not available, the bond with the maturity which is closest to 10 years. The following should be documented in the CDM-PDD:	EB 62	Ann 05	N.A.	OK	OK

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6.4.40.3.1. (a) for bonds: the key parameters of the bond including the time of maturity, yield, registration issuance in the financial system and set-up in the market;	EB 62	Ann 05	N.A.	OK	OK
6.4.40.3.2. (b) for loans from a financial institution: the contract of lending between the financial institution and the legal entity owning the assets of the project activity, or, in absence of the contract, a letter from the bank stating its intention to award the loan and the key terms for the loan;	EB 62	Ann 05	N.A.	OK	OK
6.4.40.3.3. (c) for debt financing from a parent company: the transfer of capital to the legal entity, documented with the contract of lending between the parent company and the legal entity owning the assets of the project activity and/or the parameters of the corporate bonds as mentioned above.	EB 62	Ann 05	N.A.	OK	OK

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6.4.40.3.4. This latter option is only valid for corporate bonds issued in the host country of the CDM project activity.	EB 62	Ann 05	N.A.	OK	OK
6.4.41. If the benchmark is based on parameters that are standard in the market, is the cost of debt calculated as the cost of financing in the capital markets (e.g. commercial lending rates and guarantees required for the country and the type of project activity concerned), based on documented evidence from financial institutions with regard to the cost of debt financing of comparable projects?	EB 62	Ann 05	N.A.	OK	OK
6.4.42. In cases where this data is not available, is the commercial lending rate in the host country used to calculate the cost of debt.	EB 62	Ann 05	N.A.	OK	OK
6.4.43. If a company's internal benchmark is used for the expected return on equity, is the percentage of debt financing and equity financing reflect the long-term debt/equity finance structure of the legal entity owning the assets of the project	EB 62	Ann 05	N.A.	OK	OK

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activity?					
6.4.43.1. If: (a) the legal entity owning the assets of the project activity has balance sheets audited by a third party within two years prior to the submission of the CDM-PDD for validation; and (b) the accounting books of the legal entity reflect at least the total value of all the assets needed for the project activity. Is the percentage determined based on the latest balance sheet provided under local fiscal/accounting standards and rules?	EB 62	Ann 05	N.A.	OK	OK
6.4.43.2. If the debt/equity finance structure is not yet available, 50% debt and 50% equity financing may be assumed as a default.	EB 62	Ann 05	N.A.	OK	OK
6.4.44. Is the benchmark based on parameters that are standard in the market?	EB 62	Ann 05	N.A.	OK	OK
6.4.44.1. If yes, is the typical debt/equity finance structure observed in the sector of the country used?	EB 62	Ann 05	N.A.	OK	OK

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6.4.44.2. If such information is not readily available, 50% debt and 50% equity financing may be assumed as a default.	EB 62	Ann 05	N.A.	OK	OK
6.4.45. Has an investment comparison analysis and not a benchmark analysis used when the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services?	EB 62	Ann 05	N.A. Benchmark analysis has been used.	OK	OK
6.4.46. Have variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues been subjected to reasonable variation (positive and negative) and the results of this variation been presented in the PDD and be reproducible in the associated spreadsheets?	EB 62	Ann 05	Yes. Without CER revenues, the IRR of the Project is -0.45%. That return is much lower than the benchmark IRR of 8%. Therefore the Project is not economically viable. It is clear that when Total investment, Annual Power Supply/Power Tariff change within the scope of $\pm 10\%$, the IRR of the Project will remain below 8%, the benchmark IRR.	OK	OK
6.4.47. Have a corrective action been raised for a variable to be included in the	EB 62	Ann 05	Yes	OK	OK

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sensitivity analysis which constitute less than 20% and have a material impact on the analysis ?			The O&M cost is a variable which constitutes less than 20% but has a material impact on the analysis, for which the sensitivity analysis has been conducted.		
6.4.48. Is the range of variations selected is reasonable in the project context?	EB 62	Ann 05	Yes	OK	OK
6.4.49. Does the variations in the sensitivity analysis at least cover a range of +10% and -10%, unless this is not deemed appropriate in the context of the specific project circumstances?	EB 62	Ann 05	Yes. The sensitivity analysis of Total investment, Annual O&M Cost and Annual Power Supply/Power Tariff has covered the range of $\pm 10\%$.	OK	OK
6.4.50. In cases where a scenario will result in the project activity passing the benchmark or becoming the most financially attractive alternative, is an assessment done of the probability of the occurrence of this scenario in comparison to the likelihood of the assumptions in the presented investment analysis, taking into consideration correlations between the variables as well as the specific socio-economic and policy context of the project activity?	EB 62	Ann 05	N.A.	OK	OK

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6.4.51. Was the plant load factor defined ex-ante in the CDM-PDD according to one of the following options:	EB 48	Ann 11	N.A. The PLF is available for the project activities applying ACM0002 and AMS-I.D, and other methodologies related to renewable energy generation.	OK	OK
6.4.51.1. The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval?	EB 48	Ann 11	N.A.	OK	OK
6.4.51.2. The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company)?	EB 48	Ann 11	N.A.	OK	OK
6.4.52. Was a thorough assessment of all parameters and assumptions used in calculating the relevant financial indicator, and determine the accuracy and suitability of these parameters using the available evidence and expertise in	VVM	111	The parameters and assumptions used in calculating the relevant financial indicator are sourced from Feasibility Study, which is finalised by the institute. Bureau Veritas Certification has thoroughly assessed all the parameters and assumptions and determined the accuracy and suitability of these parameters using the available	CL-11	OK



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relevant accounting practices conducted?			<p>evidence and expertise in relevant accounting practices conducted.</p> <p>CL-11 Please demonstrate the tariff of the Project is reasonable.</p> <p>The tariff of the project is source from FSR, which is carried out by the third authorized party in April 2008. Thus the tariff in the FSR is credible at the time of decision making.</p> <p>In 2008, the bus-bar tariff in Shanxi Province was 0.2754 RMB/kWh (VAT included). Several new grid connected CMM power generations adopted this tariff at that time. See the following website links of Shanxi Price Bearua:</p> <p>http://www.sxprice.gov.cn/sy/jgzc/20090205/092544.html</p> <p>http://www.sxprice.gov.cn/sy/jgzc/20090103/174664.html</p> <p>And on 13/03/2008, the PP and the grid company held the meeting for the Project about the power connection issues and tariff. And the tariff of 0.285RMB/kWh has been initially confirmed by both sides.</p> <p>The Project adopted 0.285 RMB/kWh (VAT included) is conservative.</p>		

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			The validation team has analyzed the statistics of the registered CMM projects in Shanxi Province, and found the highest applicable tariff is 0.38 RMB/kWh (incl. VAT, eg. UNFCCC Ref.3876); Even applying the highest tariff 0.38RMB/kWh in the Project, the Project IRR is 5.69%, still lower than the benchmark.		
6.4.53. Were the parameters cross-checked against third-party or publicly available sources, such as invoices or price indices?	VVM	111	The parameters used in the IRR calculation are cross-checked against third-party or publicly available sources.	OK	OK
6.4.54. Were feasibility reports, public announcements and annual financial reports related to the proposed CDM project activity and the project participants reviewed?	VVM	111	Feasibility Study and its approval have been reviewed. Public announcements including the PDDs and IRR calculation spreadsheets of the registered similar projects on the website of the UNFCCC, and the official regulations regarding the taxes, residual value, electricity tariff, etc. have been reviewed.	OK	OK
6.4.55. Was the correctness of computations carried out and documented by the project participants assessed?	VVM	111	Yes The IRR spreadsheet has been assessed.	OK	OK
6.4.56. Was the sensitivity analysis by the project participants to determine under what conditions variations in the result would occur, and the likelihood of these	VVM	111	Yes the IRR of the Project could reach the benchmark 8% if one of the following conditions is achieved:	OK	OK

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conditions assessed?			<ul style="list-style-type: none"> -The total investment is decreased by at least 41%; -The annual O&M cost is decreased by at least 75.2%; -The power tariff (including VAT)/ annual power supply is increased by at least 49.4%. 		
6.4.57. Is the type of benchmark applied suitable for the type of financial indicator presented?	VVM	112	<p>Yes</p> <p>As per Interim Rules on Economic Assessment of Electric Power Engineering Retrofit Projects, the benchmark project IRR adopted by the Project is 8% (post tax), which is popular in electricity industry.</p>	OK	OK
6.4.58. Do any risk premiums applied determining the benchmark reflect the risks associated with the project type or activity?	VVM	112	<p>N.A.</p> <p>The benchmark is not selected as the government bond rates, increased by a suitable risk premium.</p>	OK	OK
6.4.59. To determine this, was it assessed whether it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark by:	VVM	112		-	-
6.4.59.1. assessing previous investment decisions by the project participants involved?	VVM	112	N.A.	OK	OK
6.4.59.2. determining whether the same benchmark has been applied?	VVM	112	N.A.	OK	OK
6.4.59.3. determining if there are verifiable	VVM	112	N.A.	OK	OK

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circumstances that have led to a change in the benchmark?					
6.4.60. Did the project participants rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed CDM project activities?	VVM	113	Yes	OK	OK
6.4.61. If yes:	VVM	113			
6.4.61.1. has the FSR been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed?	VVM	113	Yes. The PP has made CDM consideration on 02/06/2008 based on the Feasibility Study which has been finalized in Apr.2008 and approved on 09/05/2008. As the FSR has been completed by an independent and certified institute and approved by local government, and the period of time between the FSR and the investment decision is sufficiently short, the FSR, therefore, can be considered as an independent and realistic assessment of the proposed project activity, including the parameters listed and used as input values in the IRR calculation.	OK	OK
6.4.61.2. Are the values used in the PDD and associated annexes fully consistent with the FSR?	VVM	113	Yes	OK	OK
6.4.61.3. If not, was the appropriateness of the	VVM	113	N.A.	OK	OK

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values validated?					
6.4.61.4. On the basis of its specific local and sectoral expertise, is confirmation provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision?	VVM	113	Bureau Veritas Certification has checked the evidence provided and confirms that the input values from the FSR are valid and applicable at the time of the investment decision on the basis of its specific local and sectoral expertise. Pending on CL-11.	Pending	OK
6.5. Barrier analysis	VVM	115-118			
6.5.1. Has barrier analysis been used to demonstrated the additionality of the proposed CDM project activity?	VVM	115	N.A.	OK	OK
6.5.2. If yes, does the PDD demonstrate that the proposed CDM project activity faces barriers that:	VVM	115			
6.5.2.1. prevent the implementation of this type of proposed CMD project activity?	VVM	115	N.A.	OK	OK
6.5.2.2. do not prevent the implementation of at least one of the alternatives?	VVM	115	N.A.	OK	OK
6.5.3. Are there any issues that have a clear direct impact on the financial returns of the project activity, other than: risk	VVM	116	N.A.	OK	OK

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related barriers, for example risk of technical failure, that could have negative effects on the financial performance; or barriers related to the unavailability of sources of finance for the project activity? {If yes, these issues cannot be considered barriers and shall be assessed by investment analysis. [Refer to (6.3) above]}					
6.5.4. Were the barriers determined as real by:	VVM	117			
6.5.4.1. assessing the available evidence and/or undertaking interviews with relevant individuals (including members of industry associations, government officials or local experts if necessary) to determine whether the barriers listed in the PDD exist?	VVM	117	N.A.	OK	OK
6.5.4.2. ensuring that existence of barriers is substantiated by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics?	VVM	117	N.A.	OK	OK
6.5.4.3. Is existence of a barrier	VVM	117	N.A.	OK	OK

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substantiated only by the opinions of the project participants? (If yes, this barrier cannot be considered as adequately substantiated)					
6.5.5. Were the barriers determined as preventing the implementation of the project activity but not the implementation of at least one of the possible alternatives by applying local and sectoral expertise to judge whether a barrier or set of barriers would prevent the implementation of the proposed CDM project activity and would not equally prevent implementation of <i>at least one of</i> the possible alternatives, in particular the identified baseline scenario?	VVM	117	N.A.	OK	OK
6.6. Common practice analysis	VVM	119-121			
6.6.1. Is this a proposed large-scale project activity?	VVM	119	Yes	OK	OK
6.6.2. If yes, is it a first-of-its kind project?	VVM	119	No.	OK	OK
6.6.2.1. Is the project is the first in the applicable geographical area that	EB 63	Ann 11	No.	OK	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
applies a technology, that is different from any other technologies able to deliver the same output and that have started commercial operation in the applicable geographical area before the start date of the project; and					
6.6.2.2. Have the project participants selected a crediting period for the project activity that is “a maximum of 10years with no option of renewal”?	EB 63	Ann 11	Yes The PP selected a crediting period for the project activity of “a maximum of 10years with no option of renewal”.	OK	OK
6.6.3. If not, was common practice analysis carried out as a credibility check of the other available evidence used by the project participants to demonstrate additionality?	VVM	119	Yes The common practice analysis has been conducted on the Global Methane International Coal Mine Methane Projects Database.	OK	OK
6.6.4. Was it assessed whether the geographical scope (e.g. defined region) of the common practice analysis is appropriate for the assessment of common practice related to the project activity’s technology or industry type? (For certain technologies the relevant region for assessment will be local and	VVM	120	Yes The common practice analysis has been conducted in geographical scope of China.	OK	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
for others it may be transnational/global.					
6.6.5. Was a region other than the entire host country chosen?	VVM	120	No.	OK	OK
6.6.6. If yes, was the explanation why this region is more appropriate assessed?	VVM	120	N.A.	OK	OK
6.6.7. Using official sources and local and industry expertise, was it determined to what extent similar and operational projects (e.g., using similar technology or practice), other than CDM project activities, have been undertaken in the defined region?	VVM	120	Yes	OK	OK
6.6.8. Are similar and operational projects, other than CDM project activities, already "widely observed and commonly carried out" in the defined region?	VVM	120	No All the CMM projects are applying for CDM projects or were registered as CDM projects.	OK	OK
6.6.9. If yes, was it assessed whether there are essential distinctions between the proposed CDM project activity and the other similar activities?	VVM	120	N.A.	OK	OK
7. Monitoring plan	VVM	122-124			
7.1.1. Does the PDD include a monitoring plan?	VVM	122	Yes	OK	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
7.1.2. Is this monitoring plan based on the approved monitoring methodology applied to the proposed CDM project activity?	VVM	122	Yes, the MP is based on ACM0008 Version 07.	OK	OK
7.1.3. Were the list of parameters required by the the selected methodology identified?	VVM	123	Yes	OK	OK
7.1.4. Does the monitoring plan contains all necessary parameters?	VVM	123	Yes	OK	OK
7.1.5. Are the parameters clearly described?	VVM	123	Yes, refer to section 3.19-3.20	OK	OK
7.1.6. Does the means of monitoring described in the plan comply with the requirements of the methodology?	VVM	123	Yes, refer to section 3.19-3.20	OK	OK
7.1.7. Are the monitoring arrangements described in the monitoring plan feasibl within the project design?	VVM	123	Yes, refer to section 3.19-3.20	OK	OK
7.1.8. Are the following means of implementation of the monitoring plan sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified:	VVM	123			
7.1.8.1. data management procedures?	VVM	123	Yes, refer to section 3.19-3.20	OK	OK
7.1.8.2. quality assurance procedures?	VVM	123	Yes, refer to section 3.19-3.20	OK	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
7.1.8.3. quality control procedures?	VVM	123	Yes, refer to section 3.19-3.20	OK	OK
8. Sustainable development	VVM	125-127			
8.1. Does the CDM project activity assists Parties not included in Annex I to the Convention in achieving sustainable development?	VVM	125	The CDM project activity assists China in achieving sustainable development through reducing emission, providing working opportunities, etc.	OK	OK
8.2. Does the letter of approval by the DNA of the host Party confirm the contribution of the proposed CDM project activity to the sustainable development of the host Party?	VVM	126	Pending on CAR-4 Yes	Pending	OK
9. Local stakeholder consultation	VVM	128-130			
9.1. Were local stakeholders (public, including individuals, groups or communities affected, of likely to be affected, by the proposed CDM project activity or actions leading to the implementation of such an activity) invited by the PPs to comment on the proposed CDM project activity prior to the publication of the PDD on the UNFCCC website?	VVM	128	During the environmental impact assessment process in Jun.2008, public comments had been invited to evaluate the Project, which is prior to the publication of the PDD on the UNFCCC website on 11/10/2011.	OK	OK
9.2. Have comments by local stakeholders that can reasonably be considered relevant for	VVM	129	Yes The questionnaires have been checked.	OK	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the proposed CDM project activity been invited?					
9.3. Is the summary of the comments received as provided in the PDD complete?	VVM	129	Yes	OK	OK
9.4. Have the project participants taken due account of any comments received and described this process in the PDD?	VVM	129	No negative comments have been received on the project. Moreover, the local community possesses strong positive comments on the effects that the proposed project will make on the local economy and infrastructure. In addition, to reduce the impacts on the local environment produced from the construction of the project, the PP will take the environmental protection measures in accordance with the EIA.	OK	OK
10. Environmental impacts	VVM	131-133			
10.1. Have the project participants submitted documentation on the analysis of the environmental impacts of the project activity?	VVM	131	Yes. The environment impact assessment and its approval have been submitted.	OK	OK
10.2. Have the project participants undertaken an analysis of environmental impacts?	VVM	132	Yes	OK	OK
10.3. Does the host Party require an environmental impact assessment?	VVM	132	Yes	OK	OK
10.4. If yes, have the project participants undertaken an environmental impact	VVM	132	Yes. The environment impact assessment has been finalized	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
assessment?			Jun.2008 and approved on 30/06/2008.		

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Table 2 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. To checklist question in table 1	Summary of project owner response	Validation team conclusion
CAR-1 The LoA of all the parties has not yet been presented.	1.1	<p>The DNA of China has issued a Letter of Approval (No.3725) in Feb.2012, authorizing Shanxi Fenxi Coal Mine Methane Development Ltd. as the Project Participant for the Project in China.</p> <p>✍ The DNA of China has issued a Letter of Approval (No.3725) in Feb.2012 authorizing Shanxi Fenxi Coal Mine Methane Development Ltd. as the Project Participant and confirms that Shanxi Fenxi Coal Mine Methane Utilization Project contributes to China's Sustainable development.</p> <p>The DNA of Netherland has issued a Letter of Approval (2012ANL606) on 02/04/2012, authorizing Timing Carbon UK Ltd as the Project Participant.</p> <p>The DNA of France has issued a Letter of Approval (12-0288 II 5E JBBter) on 26/04/2012, authorizing EDF Trading Limited as the Project Participant.</p>	Bureau Veritas Certification has checked the LoAs and found authentic. Hence, CAR-1 is closed.
CAR-2 (1) Clarification on the discrepancy of emission	3.8	(1) According to the Table A-1 of the PDD, 8*500kW gensets in Duhumao Power Station is planned to be operated at the beginning of 2014, which causes shortage of emission reductions	Bureau Veritas Certification has checked the PDD version 03, and found the estimated emission

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<p>reductions in 2013 and the other year should be provided.</p> <p>(2) The value of emission reductions in 2014 is inconsistent with the table in section B.6.4.</p>		<p>in 2013 in total.</p> <p>(2) We apologize for this typo. It is revised in the Section A 4.4. As 16*500kW gensets in Guojiashan Power Station is planned to be implemented in two phases, the second phase (8*500kW) will be operated at the beginning of 2015. Thus, the estimated emission reductions in 2014 should be 413,799tCO₂e which is less than that of 2015.</p> <p>PO has provided an implementation plan of the proposed project to DOE.</p>	<p>reduction in 2013 is reasonable and the emission reductions in 2014 have been revised to consistent.</p> <p>Thus, the CAR-2 is closed.</p>
<p>CL-1</p> <p>The exact geo-coordinates of the project sites should be provided in the PDD.</p>	3.5.2	<p>The exact geo-coordinates of four stations are provided respectively in the PDD.</p>	<p>Bureau Veritas Certification has checked the geo-coordinates information in the PDD version 03, and found consistent with the onsite measurement.</p> <p>Thus, the CL-1 is closed.</p>
<p>CL-2</p> <p>A description of how environmentally safe and sound technology, and know-how, is transferred to the Host Party is required.</p>	3.7.1	<p>No technology transfer involved in the Project.</p>	<p>Bureau Veritas Certification has checked the contracts of the main equipments and found the information in revised PDD is appropriate.</p> <p>Thus, the CL-2 is closed.</p>
<p>CL-3</p> <p>The main manufacturing technologies and parameters of all the reciprocating engines</p>	3.7.3	<p>The parameter of all the Gas-Fired Reciprocating Engines has been provided.</p> <p>And the main manufacturing technologies and parameters are</p>	<p>Bureau Veritas Certification has checked the contracts of the main equipment and found the information in revised PDD is</p>



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have not been provided in the PDD.		added in Section A 4.3.	consistent. Thus, the CL-3 is closed.
CL-4 The suitability of the electricity supplied to the grid should be clarified.	3.7.3	<p>The annual supplied power of the Project and the operation hour of 6000h (annual utilization hours of 6000hours) was determined based on the information from FSR, which was developed by an accredited third party (Shandong Shengli-Power Machinery Gas-fired Power Engineering Design & Consulting Co., Ltd.) contracted with the PP and approved by Shanxi Development and Reform Committee. Therefore, Bureau Veritas Certification confirms that the operation hour determined in the FSR is credible.</p> <p>As per the technical contracts of the Gas-Fired Reciprocating Engines, the continuous power rate of the engines is 560kW for the 650kW engines (Model: 650GF6-W2), and 430kW for the 500kW engines (Model: 500GF1-3PWW). Thus the annual power generated by the Project will be 102,720MWh $(= (560\text{kW} \times 6 + 430\text{kW} \times 32) \times 6000\text{h})$.</p> <p>Considering the pumps, fans and other auxiliary facilities applied in the Project, the electricity self-consumption rate has been determined in the FSR as 8.528%.</p> <p>Therefore, the electricity supplied to the NCPG is 93,690MWh $(= 102,720\text{MWh} \times (1 - 8.528\%))$.</p>	Bureau Veritas Certification has checked the FSR against the technical contracts of the engines and the relevant statistics, and found the electricity supplied to the grid is credible and reasonable. Thus, the CL-4 is closed.
CL-5 As described in the PDD, part of CMM is still vented in the	5.2.2.3	Not all the extracted CMM will be transmitted to the power engines. Only part of CMM will be captured by the project and sent to the power engines, while all the CMM captured by the project	Bureau Veritas Certification has checked the revised PDD and found appropriate.

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Project, please clarify the requirements of the methodology have been met.		will be utilized for power generation. The remaining share of the CMM will still be vented as it is in the baseline scenario. The original description in the PDD is revised to be more accurate and meet the requirement of the methodology.	Thus, CL-5 is closed.
CL-6 Regarding as the options for energy production, some possible options are absent in the analysis, especially applying another fuel	5.4.1.1	In energy production alternative, construction of a renewable power plant with equivalent amount of electricity is added. Renewable power plants including hydro, wind, biomass and solar plants are discussed in step 4. And the scenario 7 Heat supply by the CMM gas boiler has been added in the PDD.	Bureau Veritas Certification has checked the revised PDD and found appropriate. Thus, CL-6 is closed.
CL-7 Regarding the regulation GB21522-2008, which requires that CMM of concentration $\geq 30\%$ cannot be released directly to the atmosphere without utilization or flaring, please clarify why the baseline option i Venting is not eliminated.	5.4.1.2	According to extraction reports of Hexi, Shuangliu and Zhongxing coal mines, CMM extracted from the coal mines are of low CH_4 concentration ($< 30\%$), which is not regulated in GB21522-2008. Venting extracted CMM is the continuation of CMM treatment practice before the proposed project was implemented. Thus, it is not eliminated. Extraction reports are provided to DOE.	Bureau Veritas Certification checked the CH_4 concentration report for the three coal mines in 2011, and found that the concentration is lower than 30%. Thus, CL-7 is closed.
CL-8 (1) For there are some captive power plants in China, the reason to exclude alternative	5.4.1.4	(1) The revision has been made in the revised PDD and no barrier has been identified, and the alternative v has been excluded in step 5. The NPV of scenario v is $-2,185(10^4 \text{ RMB})$, which is lower than that of scenario i (zero).	Bureau Veritas Certification has checked the revised PDD, the IRR/NPV calculation sheet and found appropriate.

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scenario v should be clarified. (2) The elimination of alternative scenario vi should be further clarified.		(2) The revision has been made in the revised PDD and the scenario alternative vi has been excluded in step 5. The NPV of scenario alternative vi is -1,280 (10^4 RMB), which is lower than that of scenario alternative i (zero). Thus, alternative scenario vi has been excluded.	Hence CL-8 is closed.
CL-9 Some main parameters, such as the heat supply, heat price, debt-equity ratio, should be presented in the PDD.	6.1.20.2	Parameters including heat supply, heat price are all added in Table B-4 of the PDD. These parameters are all sourced from FSR. No debt involved in the Project as per the approved FSR.	Bureau Veritas Certification has checked the revised PDD and found the main parameters have been presented as per the approved FSR. Thus, CL-9 is closed.
CL-10 CDM Consultation Agreement with CAMCO should be provided to DOE.	6.2.8.2.1	It was provided to DOE.	Bureau Veritas Certification has checked the agreement and confirmed the information in the PDD. Thus, CL-10 is closed.
CL-11 Please demonstrate the tariff of the Project is reasonable.	6.4.52	The tariff of the project is source from FSR, which is carried out by the third authorized party in April 2008. Thus the tariff in the FSR is credible at the time of decision making. In 2008, the bus-bar tariff in Shanxi Province was 0.2754 RMB/kWh (VAT included). Several new grid connected CMM power generations adopted this tariff at that time. Please see the following website links of Shanxi Price Bureau: http://www.sxprice.gov.cn/sy/jgzc/20090205/092544.html	By checking the tariff notification in Shanxi Province, Bureau Veritas Certification has the opinion that the tariff applied in the PDD is reasonable and appropriate. Thus, CL-11 is closed.



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		<p>http://www.sxprice.gov.cn/sy/jgzc/20090103/174664.html</p> <p>On 13/03/2008, the PP and the grid company held the meeting for power connection and tariff issues. On the meeting, tariff of 0.285RMB/kWh was initially confirmed by both sides. Thus, the proposed project adopted 0.285 RMB/kWh (VAT included) is reasonable and conservative.</p>	
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APPENDIX B: Statistics of the registered CMM Power Generation and/or WHR Project in Shanxi Province

Ref	Title	Technology	Capacity (MW)	Operational Hours	Total Investment (10 ⁴ RMB)	Specified Investment (RMB/kW)	O&M cost (10 ⁴ RMB)	Ratio of O&M Cost and Investment	Power Generation (MWh)	Continuous Power Rate	Power Self-consumption Rate
1230	Shanxi Liulin Coal Mine Methane Utilization Project	Power Generation	12	7200	3604	3003	865	24.0%	71712	0.83	5%
1900	Duerping Coal Mine Methane Utilization Project	Power Generation +Waste Heat Recovery (WHR)	12	7000	14771	12309	417.3	2.8%	83320	1	2.30%
1896	Jincheng Sihe Coal Mine CMM Generation Project	Power Generation +WHR	120	6860	79320	6610	5960	7.5%	823200	1	0
1801	Shanxi Datuhe Coal Mine Methane Utilization Project	Power Generation +WHR	17	6000	7816.21	4598	1584.26	20.3%	71400	0.7	4.76%
1928	Jincheng Fengrun CMM Utilisation from Nine Mines in Jincheng City Shanxi Province China	Power Generation	24	7200	8138.53	3391	1844.716	22.7%	119774	0.69	0
3190	Shaqu 14 MW CMM Power Generation Project in Shanxi	Captive Power	14	6500	6736.83	4812	945.23	14.0%	63700	0.7	5%

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Ref	Title	Technology	Capacity (MW)	Operational Hours	Total Investment (10 ⁴ RMB)	Specified Investment (RMB/kW)	O&M cost (10 ⁴ RMB)	Ratio of O&M Cost and Investment	Power Generation (MWh)	Continuous Power Rate	Power Self-consumption Rate
	Province (Phase I)										
3200	Qinxin CMM Power Generation Project	Captive Power	6	7000	4680	7800	804.08	17.2%	33600	0.8	8.50%
3266	Yangquan Yinying Coal Mine Methane (CMM) Power Generation Project of Yangquan City, Shanxi Province, P.R.China	Power Generation +WHR	5	6000	2265	4530	451	19.9%	24000	0.8	2.35%
3195	Shaqu Coal mine CMM to power generation Phase 2 Project	Power Generation +WHR	62	6500	40435	6522	3660.5	9.1%	345867	0.9	5%
3016	Yangquan Nanmei (Group) Co., Ltd. Coalmine Methane Utilization Project	Power Generation +WHR	10	8000	7430	7430	999	13.4%	48000	0.75	5.22%
3179	Jincheng Chengzhuang 18 MW coal mine methane power generation project	Power Generation +WHR	18	6700	14135	7853	3252	23.0%	120600	1	0
3194	Lanhua Daning Coal Mine Methane Power Generation Project, Shanxi Province, P.	Power Generation +WHR	35	7000	22582	6452	4291	19.0%	237600	0.97	6.80%

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Ref	Title	Technology	Capacity (MW)	Operational Hours	Total Investment (10 ⁴ RMB)	Specified Investment (RMB/kW)	O&M cost (10 ⁴ RMB)	Ratio of O&M Cost and Investment	Power Generation (MWh)	Continuous Power Rate	Power Self-consumption Rate
	R. China										
4534	Shanxi Wangpo Low Concentration Coal Mine Methane Utilization Project	Power Generation	7	6000	5902	8431	730	12.4%	36120	0.86	5.33%
4098	Shanxi Herui Coal Mine Methane Power Generation Project	Power Generation +WHR	45	6000	33620	7471	5272	15.7%	255360	0.95	0
3876	Duanwang CMM Power Generation Project	Power Generation +WHR	4	6800	2720.24	6801	383.23	14.1%	21760	0.8	10%
MAX		-	-	8000	-	12309	-	24.0%	-	1	10%
MIN		-	-	6000	-	3003	-	2.8%	-	0.7	0%
The Project		Power Generation +WHR	19.9	6000	16763.35	8424	1392.61	8.3%	102,720	0.86	8.528%