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Att: CDM Executive Board

Your ref.:  
 CDM Ref 1896

Our ref.:  
 Brinks/

Date:  
 27 November 2008

## Response to request for review of the project “Jincheng Sihe Coal Mine CMM Generation Project” (1896)

Dear Members of the CDM Executive Board,

We refer to the issues raised by the three requests for review by Board members regarding project activity “Jincheng Sihe Coal Mine CMM Generation Project” (UNFCCC reference number 1896) and would like to provide the following initial responses.

### **Comment 1:**

*The DOE shall further clarify how the input values for the investment analysis have been validated and confirmed, in particular the suitability of the 15% benchmark and if the loan from the Asian Development Bank is a soft loan.*

### **DNV Response:**

Because the main focus of the investment analysis by JMC was to assess the ability of the project to service debt, the project IRR was selected in the PDD. As discussed in the PDD and subsequently confirmed in the validation report, the project IRR was calculated as 11.74%, compared against a benchmark of 15%. The sensitivity analysis for a reasonable variation of the main economic parameters of the project showed that the project activity would not pass the benchmark or become more favorable than the alternative.

*Input values:* All of the input values for the investment analysis have been taken from the feasibility study report (FSR) for JMC Sihe CMM Power Plant Project of February 2004. The FSR was prepared by China Electric Design and Research Institute. This entity is an independent design organisation which is A class accredited by the Ministry of Construction of People’s Republic of China<sup>1</sup>. This accreditation is evidenced by the certificate within the project FSR. The FSR was approved by Shanxi Development and Reform Commission on 18 October 2004 and the approval documentation reiterates key investment criteria such as total investment cost. The FSR is therefore a reliable and independent source of information on which to base an investment decision. As part of the validation process DNV has also cross-checked the FSR values with the project investment analysis input values.

<sup>1</sup> Qualification rank: A. No.01005-sj, issued by National Ministry of Construction of P.R China.

As justified in the PDD and validated by DNV, the investment decision for the project was made on 24 March 2005, when the loan agreement between the Chinese government and the Asian Development Bank was signed. In order to ensure that FSR values were valid and applicable at the time of the investment decision, DNV during validation considered the time span of only five months between the FSR approval and the investment decision, and found it likely that the FSR formed the basis of the investment analysis.

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

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

*Benchmark:*

A 15% benchmark for project IRR is applied in the project.

Guidance from Chinese authorities: During validation, DNV confirmed the benchmark against guidance published by the Chinese government: The “Method and Parameters for Economic Assessment of Construction Projects” (version 2, published in 1993, valid until August 2006), was published by the China National Planning Commission and China Ministry of Construction and is widely used by the relevant authorities in China for assessing the financial viability of potential new projects. DNV can confirm that at the time of the investment decision for the proposed project activity, the publication stated that a benchmark of 15% should be applied for project IRR of construction projects *in the coal mining sector*.

The document further confirms that when a project owner invests in a project based on another sector rather than its own core business base, and has little experience in characteristics and risk of the project, the sectoral benchmark IRR of its own core business will be applied. Jincheng Anthracite Mining Corporation, the project owner and investor, is specialized in coal mining. DNV was able to verify that according to the Audit Report on JMC 2004 Financial Statement<sup>2</sup>, issued by an independent public accounting company in 2005, 78.9% of the company’s revenue in 2004 was from coal mining, while only 0.69% was from electricity generation. DNV therefore finds it reasonable that JMC applies a benchmark issued for construction projects in the coal mining sector.

The project participants have provided two examples that the 15% benchmark has been used in practice. In a managers’ meeting at JMC in February 2004, it was decided to reject the project “Jinju Stainless Steel Pipeline Project” due to its IRR which was lower than the 15% benchmark<sup>3</sup>. In addition, for the Zhaozhuang coal mining and selection project, DNV has verified that a 15% IRR benchmark was applied in the feasibility study report of the project, dated in 2003<sup>4</sup>. The project was considered to be financially feasible by JMC with the IRR of 18.2%. The project was implemented after the NDRC’s approval in 2004<sup>5</sup>.

<sup>2</sup> Shanxi Gouyuan (2005) Audit Report on JMC 2004 Financial Statement. Shanxi Guo Yuan CPA Firm

<sup>3</sup> JMC’s General Manager Meeting Minutes No.8 on 10 Feb 2004.

<sup>4</sup> Beijing Huayu Engineering Co. Ltd. of China National Coal Engineering Group, Zhaozhuang Project FSR (2003).

<sup>5</sup> Approval of the Zhaozhuang Project by NDRC (04/2004)

**Increased risk:**

The project participants argue that several factors increase the financial risk of the proposed project activity. The coal assets of JMC are used as collateral for the ADB loan<sup>6</sup>, and therefore the assets and the cash flow of JMC are subject to considerable risk in case of failure of the proposed project activity. DNV was able to verify these requirements against the Loan Repayment and Collateral Agreement between Shanxi Financial Bureau and JMC and finds the stated risk justified.

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

DNV concludes that the previous investment practice and the justification of the increased risks further support the assessment that the project IRR benchmark of 15% for construction projects in the coal and mining sector, given by the Chinese government, is indeed suitable for the proposed project activity.

***The Asian Development Bank loan:***

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

- The loan has a term of 24 years including a grace period of 4 years, an interest rate determined in accordance with ADB's LIBOR-based (London Interbank Offer Rate) lending facility and applicable charges and fees.
- The Loan Repayment Guarantee Agreement between Shanxi Province Financial Bureau and JMC<sup>7</sup> requires JMC to pledge its land and coal resources as collateral and to provide guarantees from another coal mining group in Shanxi province<sup>8</sup>.

The JMC CMM utilization project is a part of the overall ADB CMM demonstration project in Shanxi Province<sup>9</sup>. The main objective of the Project is the demonstration of latest technologies for CMM production, capture, and utilization which inherently implied high technological and implementation risks for JMC.

DNV has verified the document from ADB confirming that the loan does not lead to a diversion of ODA, and that the funding for the proposed CDM project activity is not counted towards its financial obligations.

***Comment 2:***

*The DOE shall further clarify how the most economically attractive baseline scenario are identified, especially how the DOE has confirmed the baseline conditions of the mines and the baseline usage of the CMM, including the CMM availability for the power generation at the full capacity*

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<sup>6</sup> Loan Repayment and Collateral Agreement between Shanxi Financial Bureau and JMC

<sup>7</sup> Loan Repayment and Collateral Agreement between Shanxi Financial Bureau and JMC.

<sup>8</sup> Loan Guarantee Agreement between Shanxi Government and Shanxi Lu'an Coal Group in 2006.

<sup>9</sup> Loan agreement (ordinary operations between People's republic of China and Asian Development Bank), Coal Mine Methane Development Project, 24 March 2005

We refer to the PDD section B.4, and validation report section 3.3 submitted with the request for registration.

In accordance with methodology ACM0008 version 3, the project participants had identified the possible baseline scenarios for extraction and usage of CMM, and for power production.

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

For usage of CMM, eight alternatives were identified. One alternative (captive power production) was ruled out by conditions in the power purchase agreement. Two alternatives were eliminated due to investment barriers: Using/destroying ventilation air methane rather than venting it, and flaring. DNV finds it justified that these could be ruled out because they would require investment with no possibility of generating revenue. Two other alternatives were ruled out due to market barriers: Additional heat generation, and Feed into gas pipeline. The validator from DNV had verified the situation of Sihe coal mine during the site visit and found it justified that there was no potential demand or infrastructure available for distribution of heat or gas. Continuation of venting and usage of the CMM for grid-connected power production were thus the remaining alternatives.

For power production, three alternatives were identified; of which one was ruled out because installing a coal-fired power plant of 120 MW is not in compliance with Chinese law. For power production, continuation of the current situation, and implementing the project without CERs, would be possible.

Combining alternatives, two possible scenarios were left: Continuation of the current situation, or implementation of the proposed project without CER revenue. However, it was demonstrated that the latter also faces a barrier, since it does not meet the IRR threshold (please refer to issue 1 above).

As a conclusion, the baseline scenario of continuation of the current situation was identified as the only alternative not facing any barriers.

#### *Availability of CMM:*

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

According to the FSR, the project power generation capacity of 120 MW will consume 181.47 Million cubic meter of methane (pure methane or equivalent) per year<sup>10</sup>. DNV has reviewed the source for this estimation, the FSR for JMC Sihe CMM Utilization<sup>11</sup> published in 2004 by the independent accredited organization Chongqing Branch of China Coal Research Institute.

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

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<sup>10</sup> "FSR for JMC Sihe CMM Power Plant Project", page 124.

<sup>11</sup> Chongqing Branch of China Coal Research Institute, "FSR for JMC Sihe CMM Utilization", (August 2004).

In the report it is estimated that the total amount of CMM possible to drain would be more than 6 800 Million m<sup>3</sup> of methane. JMC has invested in the installation of an improved drainage system. As a result, the CMM drainage at the Sihe coal mine has increased from 59.92 Million m<sup>3</sup> in 2003 to 191.32 Million m<sup>3</sup> in 2007<sup>12</sup>, The stable increase of CMM drainage during the last 5 years supports the estimation of a rate of CMM drainage of about 250 million m<sup>3</sup> per year reached by 2018. DNV has verified this estimate against the FSR for JMC Sihe CMM Utilization<sup>13</sup> and the Estimation for CMM Drainage from 2008 to 2018 by JMC Sihe Coal Mine<sup>14</sup>.

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

**Comment 3:**

*The PP/DOE should further clarify the following monitoring information:*

- (a) power generation and CMM consumption by the existing experimental 15MW power plant;*
- (b) details of checking the flow and concentration meters;*
- (c) consistency with the monitoring methodology in monitoring of methane fraction in CMM gas;*
- (d) monitoring of electricity to be supplied to and imported from the grid for the project activity.*

The project participants have provided further details on the monitoring setup in their response to the requests for review.

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

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

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

<sup>12</sup> JMC's original annual gas drainage statistics in 2003, 2004, 2005, 2006, 2007.

<sup>13</sup> Chongqing Branch of China Coal Research Institute, "FSR for JMC Sihe CMM Utilization", (August 2004).

<sup>14</sup> Estimation for CMM Drainage from 2008 to 2018 by JMC Sihe Coal Mine

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

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

b) Flow meters and concentration meters will be calibrated annually and maintained regularly to ensure accuracy. Responsible staff will manually record the readings hourly and archive the data daily. The archived data will be reviewed by the CDM manager. The flow meter and concentration meter will be checked and maintained monthly.

c) The percentage of methane in CMM will be measured in by a continuous gas analyzer, on wet basis. These data will be recorded hourly and archived daily. The temperature and pressure indicators will also be measured and recorded. PC<sub>NMHC</sub> will be monitored annually by a qualified laboratory.

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

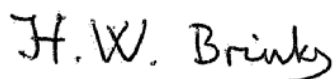
The meters at the transformer station of the project power plant will monitor the electricity supplied to/imported from the grid, the electricity consumed by on-site workshops and the total electricity used by the power plant. These will not be used for claiming CERs.

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

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

We sincerely hope that the Board accepts our aforementioned explanations.

Yours faithfully



Hendrik W. Brinks  
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for DET NORSKE VERITAS CERTIFICATION AS