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Ref: Response to request for review of "Jincheng Sihe Coal Mine CMM Generation Project" (1896)

Mr. Sethi,

Mr. De Jonge,

Honorable Members of the CDM Executive Board,

In response to the request for review of "Jincheng Sihe Coal Mine CMM Generation Project" (1896), we bring to your kind attention the following initial clarifications and responses.

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.

1a. The input values for the investment analysis

The input values applied in the investment analysis are derived from the Feasibility Study Report (FSR) of the Jincheng Sihe CMM Generation Project (1896) (further referenced as "Jincheng Sihe CMM Project").[1] The FSR was developed by China Electric Design and Research Institute[2], a government accredited independent design organization. The assumptions of the investment costs, operational and maintenance costs, as well as other relevant economic parameters used in the FSR were made in accordance to the national standards. The FSR was then assessed by China National Engineering Consulting Corporation (independent expert organization designated by NDRC) and approved by the Development and Reform Commission of Shanxi Province[3]. The values are therefore reliable and suitable.

[1] China Electric Design and Research Institute (February, 2004), "FSR for JMC Sihe CMM Power Plant Project". Please also see the Table b-4 of the PDD (Version 7.7, 24/06/2008).
[2] Qualification rank: A. No.01005-sj, issued by National Ministry of Construction of P.R China.
[3] Approval of the feasibility study, Document no.: [2004]612, 19 October 2004.

1b. The suitability of 15% benchmark and the ADB loan conditions

Jincheng Anthracite Mining Corporation ("JMC"), the project owner and investor, is specialized in the coal mining. In 2004, coal mining activities accounted for about 78.9% of JMC revenues.[4] The JMC investment strategy is driven by the objectives of its coal mining business development. The focus on the coal mining as a core competence, through expanding mining activities and mining resources, was confirmed at the JMC General Manager Meeting in early 2004.[5]

The 15% threshold used by JMC for its investment decisions reflects the sectoral benchmark established by the China National Planning Commission and Ministry of Construction for activities in coal mining sector. This benchmark indicated in the "Methods and Parameters for Economic Assessment of Construction Project (Edition 2)" (further referenced as "Methods and Parameters, Ed.2), was applicable at the moment of investment decision for Jincheng Sihe CMM Project.[6]

The coal mining benchmark is suitable and conservative for the Jincheng Sihe CMM Project for the following reasons:

1. The project is a part of the Asian Development Bank CMM Demonstration Project in Shanxi Province targeting the latest available technologies, namely for CMM drainage and utilization of low concentration CMM in a gas engine for power generation. [7] The demonstration nature of the project inherently implied additional technological and implementation risks for JMC. In addition, the project implies higher operational risks due to the limited experience in power generation which is not a core business activity for JMC.
2. The use of the coal assets as collateral for the ADB loan as well as the need to use the guarantee from another coal mining group puts the core business assets and the cash flow of JMC at considerable risk.
3. The utilization of the CMM for power generation represents an additional technology risk in comparison to the natural gas-firing power plants.

In this context, the main focus of the investment analysis by JMC was to assess the ability of the project to service debt and its ability to reach the 15% benchmark specific to the coal mining sector in China. Thus, the project IRR approach (no taxes or loans included) was selected in the PDD. The "Methods and Parameters (Ed. 2)", clarifies that the sectoral benchmark should be used for the assessment of project investment and should be compared with the Financial IRR (FIRR). The FIRR refers to the "project return on the invested funds".[8] This is in line with the definition of the project IRR provided by the CDM EB in the "Tool for the demonstration and assessment of additionality (Version 05.2)".[9]

The JMC is systematically applying the sectoral benchmark of 15% for its investment decisions which is confirmed by following examples:

- Approval of the Zhaozhuang coal mining and selection project (2004). The feasibility study report of the Zhaozhuang project specifies that the 15% benchmark was applied.[10]

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[4] Shanxi Gouyuan (2005), Audit Report on JMC 2004 Financial Statement. Shanxi Guoyuan is an independent certified public accounting company.
[5] JMC General Manager Meeting Minutes No.8, February 10, 2004.
[6] "Methods and Parameters (Ed.2)", Chapter 1, Sect. 6 "Parameters for Economic Assessment", page 115.
[7] Loan Agreement (ordinary operations between People's Republic of China and Asian Development Bank), Coal Mine Methane Development Project, March 24, 2005, page 9.
[8] "Methods and Parameters (Ed.2)", pages 5, 6.
[9] CDM EB, "Tool for the demonstration and assessment of additionality, Version 05.2", Annex: Guidance on the Assessment of Investment Analysis, Version 02.
[10] Beijing Huayu Engineering Co. Ltd. of China National Coal Engineering Group, "Zhaozhuang Project FSR" (2003).

With the IRR of 18.2%, the project was approved by JMC management. After approval by the National Development and Reform Commission[11] the project was implemented.

- Rejection by the JMC of the Jinju Stainless Steel Pipeline Project (2004). The Jinju investment proposal consisted of construction of a stainless steel pipeline. The project was rejected by the decision of the General Manager Meeting given that it was not a part of the JMC core business and the project IRR was lower that 15% threshold.[12]
- In early 2004, the JMC general management requirement to use of the 15% coal mining sector threshold was confirmed for any new investment decisions[13].

The IRR of the Jincheng Sihe CMM Project is 11.74%. The sensitivity analysis validated by DNV confirmed that within the realistic range of variation of main economic parameters of the project, the IRR remains below the benchmark. Thus, the project is additional and would not be implemented without CDM revenues.

The ADB loan conditions:

The Asian Development Bank (ADB) loan of USD 72.03 Million[14] was provided to the Shanxi Government with the conditions described below and translated into following repayment conditions for JMC:

- Maturity of 24 years including a grace period of 4 years, an interest rate determined in accordance with ADB's LIBOR-based (London Interbank Offered Rate) lending facility and applicable charges and fees;
- Loan Repayment Guarantee Agreement between Shanxi Government (Financial Bureau of Shanxi Province) and JMC [15] requiring JMC to pledge its land and coal resources as collateral and to provide guarantees from another coal mining group in Shanxi province[16].

The JMC CMM utilization project is a part of the "Overall ADB CMM demonstration project in Shanxi Province".[17] 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.

As per requirements of the CDM framework, the ADB has confirmed that the loan does not result in a diversion of ODA and the funding for this project is separate from and is not counted towards its financial obligations[18].

[11] Approval of the Zhaozhuang Project by NDRC (04/2004).
[12] JMC General Manager Meeting Minutes No.8, February 10, 2004.
[13] JMC General Manager Meeting Minutes No.8, February 10, 2004.
[14] Loan Agreement (ordinary operations between People's Republic of China and Asian Development Bank), Coal Mine Methane Development Project, March 24, 2005.
[15] Loan Repayment and Collateral Agreement between Shanxi Government (Financial Bureau of Shanxi Province) and JMC.
[16] Loan Guarantee Agreement between Shanxi Government and Shanxi Lu'an Coal Group, 2006.
[17] Loan Agreement (ordinary operations between People's Republic of China and Asian Development Bank), Coal Mine Methane Development Project, March 24, 2005, page 9.
[18] Letter from ADB of No ODA Diversion, November 19, 2008.

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.

2a. Identification of most economically attractive baseline scenario, baseline conditions of the mines and the baseline usage of CMM.

In compliance with the ACM0008 (Version 03), the PDD (Version 7.7, 28/06/2008, Section B.4) considers all alternative scenarios for CMM extraction, treatment and for energy production available to JMC in view of identifying the baseline scenario.

The continuation of previous practice of combined CMM extraction options through ventilation, pre-mining and post-mining was selected as only feasible and legally acceptable alternative predominantly due to safety reasons. The relevant baseline conditions of Jincheng Sihe mine (e.g. content of VAM, utilization of pre-mining and post-mining extraction to comply with methane control requirements) was confirmed during the project validation.

The main arguments used to exclude alternative options for CMM/VAM treatment:

- *Investment barrier:* Options (ii) "Using/destroying ventilation air methane rather than venting it" and (iii) "Flaring of CMM" would not generate any revenues to recover correspondent investments into VAM destruction or new flaring equipment.
- *Market and infrastructure barrier:* Option (vi) "Additional heat generation" is not viable as no growth of internal demand on the mining site was projected. Option (vii) "Feed into gas pipeline" is not viable given dispersed nature of potential demand from small residential consumers that were not connected by any existing infrastructure to the mining site and were consuming more competitive coal.

All other alternatives are reflected in a remaining combined possible baseline scenario for CMM treatment (current situation at Sihe mine).

Two options for electricity production are in compliance with legal and regulatory requirements in China:

- (a) Purchase of electricity from the North China grid (Current situation);
- (b) CMM utilization for power generation (Project implementation without CDM).

In the current version of the PDD (Version 7.7 dated 28 June 2008), the Step 4 of the baseline identification lists two possible combined scenarios including respectively options (a) and (b) for electricity production.

In response to the CDM request, it should be clarified that the option (b) (Project implementation without CDM) is also facing prohibitive barrier for implementation and should be excluded at the Step 4 of the baseline identification. In fact, the investment and sensitivity analysis demonstrates that this option is not economically attractive and faces prohibitive financial barrier. As a result, it should be clarified that only one option (Scenario 1) - Continuation of the current situation – could be implemented without any prohibitive barriers and thus represents the baseline.

2b. CMM availability for power generation at the full capacity

The "FSR for JMC Sihe CMM Utilization"[19] (2004) assessed the availability of CMM for the power generation capacity of 120MW for Jincheng Sihe CMM Project. This FSR was developed by the Chongqing Branch of China Coal Research Institute. The FSR indicates that the full implementation of the advanced underground CMM drainage technology at Sihe mine, expected by 2009[20], will ensure the availability of CMM at about 250 Million m^3 per year.[21] This extraction rate can be maintained for 27 years according to the estimates of the resources available in the "CMM Resource Assessment Report for Sihe mine".[22]

The statistics of the Ventilation Department of Sihe Mine demonstrate that the actual rate of CMM drainage (including VAM, pre-mining and post-mining sources) was constantly increasing from 60.16 Million m^3 in 2003 to 191.32 Million m^3 in 2007 as a result of progressive implementation of the advanced underground CMM drainage technology (please see Table 1).[23]

Table 1- CMM Availability at JMC Sihe mine, 2003-2008.

Years	2003	2004	2005	2006	2007	2008 (est.)
CMM available, Million m^3	60.16	76.62	95.21	130.64	191.32	220.75

Source: Ventilation Department of Sihe Mine, "JMC Sihe Mine CMM Gas Extraction and Usage Volume Data Sheet".

The total CMM available from JMC Sihe Mine in 2008 is estimated at about 220.75 Million m^3. This is sufficient to cover the total needs in CMM of about 216 Million m^3 including[24]:

- the current use for the on-site heating and cooking (6.63 Million m^3 in 2006)
- the existing experimental 15MW power plant (27.65 Million m^3 in 2006);
- the Jincheng Sihe CMM Project 120 MW power plant (181.47 Million m^3 estimated for full capacity operation[25]).

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.

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[19] Chongqing Branch of China Coal Research Institute, "FSR for JMC Sihe CMM Utilization", (August 2004). The Chongqing Branch of China Coal Research Institute is an independent accredited organization.
[20] Loan Agreement (between P.R. of China and ADB), Coal Mine Methane Development Project, March 24, 2005, page 9.
[21] "FSR for JMC Sihe CMM Utilization", pages 29-30. Ventilation Department of Sihe Mine, "JMC Sihe Mine CMM Gas Extraction and Usage Volume Data Sheet".
[22] Chongqing Branch of China Coal Research Institute, "CMM Resource Assessment Report for Sihe mine" (1998).
[23] Ventilation Department of Sihe Mine, "JMC Sihe Mine CMM Gas Extraction and Usage Volume Data Sheet", actual JMC 2007 statistic data.
[24] "JMC Sihe Mine CMM Gas Extraction and Usage Volume Data Sheet".
[25] "FSR for JMC Sihe CMM Power Plant Project", page 124.

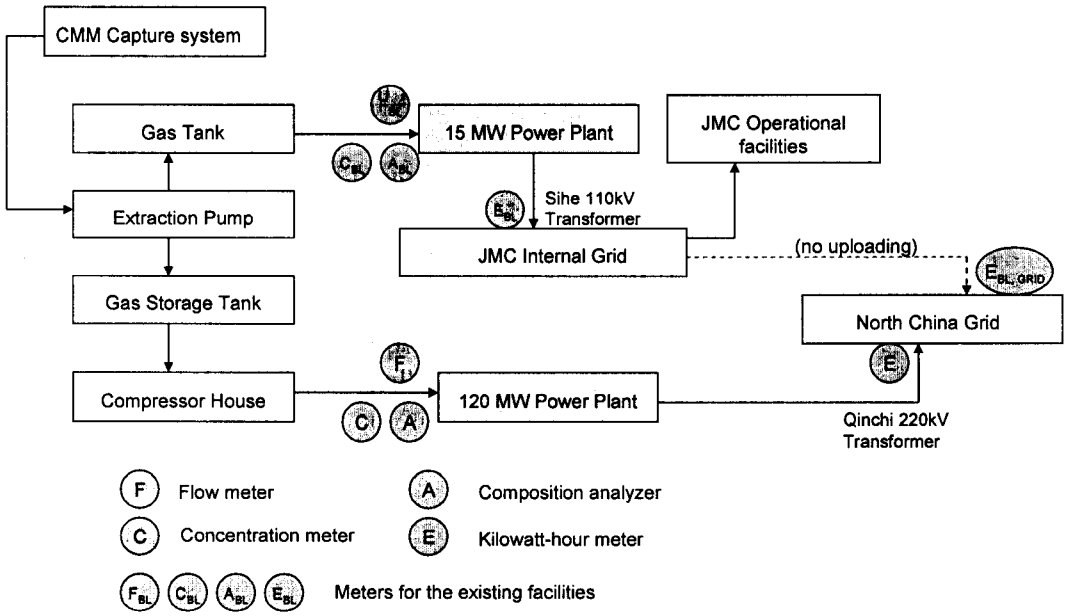
3a. Power generation and CMM consumption by the experimental 15MW power plant

The existing experimental 15MW power plant utilizing CMM at the Sihe mine generates electricity for the internal need of the Sihe mine (captive usage by JMC operational facilities). The electricity generated is supplied through the JMC internal 110 kV grid through the Sihe 110kV transformer station (please see Figure 1).

The electricity flows from 15MW and 120 MW power plants are separate: The JMC internal grid is connected to the North China Gird to comply with the Chinese grid requirements (however no uploading to the gird is taking place). The JMC internal grid is connected to the North China Grid in the point different from the Qinchi 220 kV transformer station (which is used as the monitoring point for the 120 MW plant as clarified below in 3d).

The figure 1 represents the generic diagram of flows and monitoring points of the new power plant and the existing 15MW experimental power plant.

Figure 1 - Flows diagram and monitoring points at Sihe mining site.



To monitor power generation and CMM consumption of the existing experimental 15MW power plant, the following monitoring equipment will be used by JMC:

- Electricity metering: electricity meters have been installed at the outlet of the existing 15MW power plant to continuously monitor the electricity generated. The electricity meters at the Sihe 110 kV transformer station are monitoring the electricity supplied to/imported from the internal JMC Power Grid.
- Gas concentration meter: to be installed at the inlet to the existing power plant. This meter will monitor the concentration of the CMM gas sent to the existing 15MW power plant.
- Gas flow meter: to be installed at the inlet to the existing power plant to meter the volume of CMM supplied to the existing 15 MW power plant.
- Separate meters to measure respectively the temperature and pressure of the CMM sent to existing power plant will be installed.

All the above monitoring equipment will be installed before the starting date of the crediting period. The accuracies of the equipment will be in compliance with the relevant national standards. The metering equipment will be maintained under JMC regular maintenance regime and calibrated and monitored according to the Chinese regulation and manufacturer specifications.

The relevant gas and electricity data will be monitored by JMC qualified staff. Data will be backed up and archived in two different locations, where it will be stored for the longer of two years longer than the crediting period or two years after the last issuance of CERs.

3b. Details of checking the flow and concentration meters.

Flow meters and concentration meters will be calibrated annually and regularly maintained to ensure accuracy. There is a dedicated control centre at the project site which will read all the measured parameters. JMC staff in charge of the monitoring will manually record the readings hourly and archive the data daily. The archived data will be sent to the CDM manager every month for his review.

The monthly checking and maintenance of the flow meter and concentration meter by JMC staff will include:

- Checking the physical appearance of the meters;
- Checking whether the shelters for these meter are in good condition;
- Checking the condition of the sensors and whether they are well connected and the connection lines are in good condition;
- Checking whether the lead-seal of these meters are in good condition.

3c. Consistency with the monitoring methodology in monitoring of methane fraction in CMM gas;

The percentage of methane (%) in CMM will be measured in volumetric units 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. These indicators will be used to normalize the measurements obtained from the gas analyzer. As a result, the concentration in mass of methane in extracted gas will be obtained.

The monitoring of the PC_{NMHC} can be clarified as follows:

- Gas samples will be extracted annually in accordance with relevant industry standard and procedures. The samples will be analyzed by a qualified laboratory, such as Shanxi Coal Research Institute.
- QA/QC procedures: A minimum of 3 samples will be collected in secure gas sample vessels, suitable for storage and transport to the laboratory. If one or more samples are found to be faulty (i.e. leaked) replacement samples will be taken. Scanned copies of the analyses will be backed up and archived in two different locations. The data will be stored for the longer of two years longer than the crediting period or two years after the last issuance of CERs.

3d. monitoring of electricity to be supplied to and imported from the grid for the project activity

Total amount of electricity generated from each power house installed by the project will be sent to the North China Power Grid. As clarified above in response to 3(a), the power generated by the existing 15MW experimental power plant is not supplied to the grid and is monitored separately.

The 220kV transformer station of the project power plant will be connected to Qinchi 220kV transformer station of the grid.

At the 220kV transformer station of the project power plant, 3 electricity meter cupboards (#1, #2, #3) are installed.

Meter cupboard #1. Four multi-function digital electricity meters (0.2 grade) are the Gate Meters installed by the Power Grid at the Project site. All the 4 meters are two-way digital meters so they can monitor the electricity supplied to and imported from the Grid. The functions of these meters (including 2 back-up meters) are as follows:

- monitoring the electricity supplied to/imported from the grid,
- monitoring the electricity through each of the two 220KV main transforming lines to the Power Grid.

The readings from these meters will not be the counted as the basis for invoicing and settlement with the Grid.

Meter cupboard #2. Four multi-function digital electricity meters (0.5 grade) installed by JMC. These 4 meters have the same functions as the 4 meters in cupboard #1, but have lower accuracy. These meters will be used for the internal performance review purpose only.

Meter cupboard #3. Eleven digital electricity meters (0.5 grade) with the following functions:

- monitoring the power generations from each of the 4 power houses (4 meters).
- monitoring the electricity consumed by 6 on-site workshops (compressor station, water pumping station, chemical water workshop and maintenance workshop),
- monitoring the total electricity used by the power plant and other on-site auxiliary needs.

The cupboard in Qinchi 220kV transformer station of the Power Grid (off-site). Two multi-function two-way electricity meters (0.2 grade): one main and one backup meter. These meters will monitor the electricity supplied to/imported from the Power Grid. These meters are installed and operated by the Grid company, responsible for the maintenance and annual calibration.

The readings from these 2 Gate meters will be used by the Grid to calculate power purchase payment by the Grid. The readings from these two Gate meters will be lower than that from the meters in cupboard #1 reflecting the transmission loss in 27 km line. The reading from these grid meters will be used in the project monitoring plan for calculation of the emission reductions which is conservative.

Sincerely,

Rama Chandra Reddy,
Acting Team Leader, Policy and Methodology Team
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