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Request for Review

Dear Sirs,

Please find below the response to the request for review formulated for the CDM project with the registration number 1468. In case you have any further inquiries please let us know as we kindly assist you.

Yours sincerely,

Javier Castro
Carbon Management Service

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Response to the CDM Executive Board

Issue 1

The DOE is requested to confirm how it has assessed the suitability of the benchmark, and to confirm with what level of assurance it can state that an IRR of 12.14% is an insufficient return for this project to proceed without the incentive of the CDM.

Response by TÜV SÜD

Suitability of the benchmark: The benchmark used is taken from "the Methodology and Parameters for Financial Evaluation of Construction projects (3rd Edition, published in 2006)", hereafter referred to as "the Methods and Parameters". This book is published by the National Development and Reform Commission and Ministry of Construction in China and is widely used by the relevant authorities in China for assessing the financial viability of potential new projects.

The project will generate power by utilizing coal mine methane (CMM) that is currently vented. The uncertainty relating to volumes and concentration of CMM released from the mine will lead to high risks for power generation, which are generally out of the control of the power generation facility operator. Although the Project is a power generation project, given that the core investment focus of the project owner is the coal mining industry, the sectoral benchmark of the coal mining industry is adopted. The reasons are as follows:

- According to "the Methods and Parameters", 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 the project and risk, the sectoral benchmark IRR of its own core business will be applied[1].
- This is a conservative assumption, since the mining industry has little experience in power generation and this adds significant risk to their investment decision compared to energy sector. They would therefore expect higher returns than they would normally expect from an investment in their core business. And also they would certainly expect higher return from a power plant than the energy sector due to additional risk due to lack of experience.

Therefore, using the sectoral benchmark of the coal mining industry rather than benchmark of the power sector is reasonable.

There are two benchmarks for the IRR of the coal mining sector available: one is the project IRR of 13% (before tax), another is equity IRR of 15% (equity IRR after tax). In the investment analysis for this project, the equity IRR benchmark of 15%[2] is used as the benchmark, since there is only one potential project developer of the proposed project.

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[1] Methods and Parameters for Economic Assessment of Construction Project (version 3), published by NDRC and Construction Ministry, December 2006, paragraph 2, point 2, page 197.

[2] Methods and Parameters for Economic Assessment of Construction Project (version 3) page 204

TÜV SÜD has assessed and validated the appropriateness of the benchmark by checking the reference document (IRL.

Finally, previous CMM projects that are now registered with the CDM Executive Board have used a variety of benchmarks from a number of different sources. The benchmarks used for the project IRR range from 8% to 13.5% (after tax). For this project, as the equity IRR is calculated, the project participants used an alternative benchmark from an official source.

Level of assurance: According to regulation No.6 in Chapter 4 of Annex II of the "Methodology and Parameters", only when the internal rate of return of a project exceeds the sectoral benchmark IRR, will the proposed project be considered financially feasible. The IRR of 12.14%, being less than the benchmark of 15% would be insufficient return for the project to proceed without the additional income from the CDM.

Further, an IRR of 12.14% is based on a calculation that assumes consistent volumes of CMM and that all gas extracted is of a concentration sufficient for it to be used for power generation. In reality, the volume and concentration (and therefore amount of electricity generated) will fluctuate significantly according to the amount of coal mined and other factors outside the control of the power plant operator. It is likely therefore that in reality the amount of power generated will be lower than expected and the IRR would not be as high as 12.14%. The CDM was therefore a key factor in deciding to proceed with the project (see response to issue 3).

Finally, compared with other projects that have been the project owner has invested into in recent years, the IRR without CDM revenue for this project is significantly lower than would have been expected. Evidence from 2 previous projects was checked by DOE:

- Project 1: increasing production capacity of a coal mine, IRR is 32%
- Project 2: by-product of coal mining activity, IRR is 15.1%

This further demonstrates that the 15% benchmark has been consistently applied by the project owner in the past and that this project would not have been deemed a viable investment without the additional revenue from the CDM. Therefore we can confirm with a reasonable level of assurance that the investment would not have been realized without the revenues from CDM.

Issue 2

The DOE shall confirm the suitability of the input values used in the investment analysis

Response by TÜV SÜD

The majority of the input values used in the investment analysis were taken from the Feasibility Study Report for the project carried out by the Jilin Coal Mining Design Institute. The FSR was formulated by a government-accredited third party and, in accordance to Chinese procedures, assumptions and data sources for the economic evaluation are based on relevant national standards and criteria. The FSR was then assessed by designated independent experts and finally approved by Jilin Development and Reform Committee. The values are considered to be reliable and suitable.

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Further evidence for capital costs was presented to the DOE in response to a comment during GSP for the project. This confirmed that actual capital costs for the project are higher than those given in the FSR and that therefore the values used in the PDD are conservative.

Finally, comparing O&M costs in the FSR for the project and for other registered CDM CMM PDDs, it can be seen that the costs presented for this project are consistent with other projects and therefore are reasonable[3].

There are four key differences between the financial analysis in the FSR and that in the PDD:

- The value for annual power generated used in the PDD is given by the project owner and is based on actual amounts of power generated during trial operation of the project.
- The value for bus bar tariff is the actual bus bar tariff and evidence for this was provided to the DOE during validation.
- The financial analysis in the FSR includes a cost for the CMM used for power generation. This cost was removed for the financial analysis in the PDD to be conservative.
- The financial analysis in the FSR is based on a project operational lifetime of 13 years and includes additional repair costs for the last 4 years of operation of the gen sets. In the PDD the financial analysis was calculated based on a 9 year lifetime for well 2 and a 7 year lifetime for well 3. This is the actual expected remaining lifetime of the wells according to the project owner and evidenced in the FSR page 4, table 1-1-1.

However, removing these changes and calculating the IRR according to the FSR, the equity IRR for the project is 5.69%, lower than the value in the PDD and the benchmark (see revised financial analysis spreadsheet).

Issue 3

The project activity start date in the PDD is prior to the date of validation. Therefore the DOE is requested to explain why it has not raised a corrective action request regarding the inclusion of evidence of the prior consideration of the CDM in section B.5 of the PDD. The DOE should further describe how the start date of the project activity has been validated.

Response by TÜV SÜD

Prior consideration of CDM: Section B5 of the PDD (page 22) states that the intention to register the project under the CDM was a determining factor in the decision to proceed with the project. This was demonstrated by the following evidence that was presented to the DOE during the validation site visit and was submitted to the Executive Board with the Request for Registration:

- Northeastern Coal Industry Environmental Protection Research Institute, Application for CMM development agent in CDM projects (12 September 2005)

[3] O&M costs for the Liaoyuan project are 327,000 RMB each year/ MW installed. For the Yangquan project, O&M costs are 292,000RMB each year/ MW installed and for the Shanxi Liulin project, O&M costs are 721,000RMB/ MW installed.

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- Jilin Coal Industry Bureau, Approval for the application from Northeastern Coal Industry Environmental Protection Research Institute as CMM development agent of Jilin Province (30 September 2005)

To clarify, the CDM co-operation agreement between the Northeastern Coal Industry Environmental Protection Research Institute and Liaoyuan Coal Mining Group Co. Ltd. dated February 2006 was also presented to the DOE. Consideration of CDM was also given in the FSR for the proposed project.

Start date of the project activity: the start date in the PDD (section C1) is given as 8 July 2006. This date was shown on the formal construction report, which is approved by a third party (namely Liaoyuan Project Construction Quality Supervising Party). This document was presented to the DOE during validation.

Issue 4

Further evidence is required to support the exclusion of option 5 (captive power generation) as it is not clear why importation of electricity from the grid cannot be used as a back-up to the captive generation.

Project Participants' response

Whether grid connected or captive power units, there are a number of prohibitive barriers facing CMM fired power projects in China. These include:

- Financing barriers: projects are unattractive to investors because (i) Chinese enterprises have a lack of funds to invest in such projects and many schemes are too small to attract financial institutions[4] (ii) it is not core business of the coal mines who tend to support coal fired power generation for their electricity needs and investment in coal production.
- Purity Uncertainty: CMM production is linked to mining production and therefore the purity or flowrates are not under the control of the gas engine operator. This can lead to times when the gas supply is not >30% and therefore below the minimum safety threshold for use by the gas engine[5]. This uncertainty increases investment risks which are not compensated for in the return.
- Technology barriers: Power generation from CMM has a low market share in China and involves certain risks due to equipment performance and management uncertainty. Power generation from CMM would also be a new area of business for Liaoyuan Mining Group, and therefore carries higher risks.
- Barriers due to prevailing practice: of the CMM that is used in China, most is distributed via pipelines to mining communities and neighboring cities for industrial and domestic use[6]. There are few CMM power generation schemes in China because local authorities and min-

[4] Energy Sector Management Assistance Program (the World Bank Group), A Strategy for Coal Bed Methane (CBM) and Coal Mine Methane (CMM) Development and Utilization in China, 2007. Available at http://web.worldbank.org/external/projects/main?pagePK=64256111&piPK=64256112&theSitePK=40941&menuPK=115635&entityID=000020953_20070828093241&siteName=PROJECTS

[5] Ibid

[6] China Coalbed Methane Clearinghouse, Methane to Markets Partnership Coal Mine Methane Project Opportunities in China, May 2006. Available at http://www.methanetomarkets.org/events/2006/coal/docs/china.pdf (p5)

ing enterprises often only consider residential consumers a priority, due to the social requirements. Although gas drainage is increasingly installed in coal mines in China for safety reasons, CMM utilization is not an essential part of mine construction.

Therefore, due to these barriers, option 5 (use for additional captive power generation) can be excluded as well as option 4 (use for additional grid power generation, i.e. the Project undertaken without being registered as a CDM project).

Further, as demonstrated in step 5, section B.4 of the PDD, for option 4 (additional grid connected power generation i.e. the project not implemented as a CDM project), the levelizsed cost of electricity production is 0.536 RMB/ kWh. For a project with captive power generation with grid electricity as a back up (option 5), the levelised costs of electricity production would be the same as there is no change in the key parameters for the two scenarios. For both scenarios, therefore, the levelised cost of electricity production is higher than purchasing electricity from the grid and neither can be considered the baseline scenario.

Finally, according to the Article 441 of the China Coal Mine Safety Regulations (2005 Edition), there must be 2 sources of electricity supplying power for coal mines (e.g. two grid connections or one grid connection and one onsite captive power supply). Either of the two electricity sources must be able to satisfy the entire electricity demand of the entire coal mining activity. Therefore, option 5 (captive power generation) would not be allowed according to Chinese safety regulations, if the power supplied is not sufficient to meet the entire power demand of the coal mine - even with back-up supply from the grid.

Response by TÜV SÜD

There are two reasons why this answer has been accepted by the DOE:

1) According to China Coal Mine Safety Regulations the captive power plant must be able to deliver the entire power demand of the coal mine even without back-up from the grid. This cannot be achieved with this technology as explained above.
2) The captive power scenario has been excluded by calculating the levelised costs as required by the methodology.

Issue 5

Further evidence is required to support the suitability of the 13% discount rate applied in the levelised cost of electricity calculation as this value differs from the benchmark used in the additionality assessment and differs from common benchmarks used in China for power generation

Project Participants' response

The discount rate used is taken from "the Methodology and Parameters for Financial Evaluation of Construction projects (3rd Edition, published in 2006)", hereafter referred to as the "Methods and Parameters". This book is published by the National Development and Reform Commission and Ministry of Construction in China and is widely used by the relevant authorities in China for assessing the financial viability of potential new projects.

As discussed in the response to issue 1, the project will generate power by utilizing coal mine methane (CMM) that is currently vented. The uncertainty relating to volumes and concentration of CMM released from the mine will lead to high risks for power generation, which are generally out of the control of the power generation facility operator. Although the Project is a power generation project, given that the core investment focus of the project owner is the coal mining industry, the sectoral benchmark of the coal mining industry is adopted.

There are two benchmarks for the IRR of the coal mining sector available in the "Methods and Parameters": one is Project IRR of 13% (project IRR before tax), another is equity IRR of 15% (equity IRR after tax). In the investment analysis for this project, the equity IRR benchmark of 15%[7] is used as the benchmark, since there is only one potential project developer of the proposed project. For the levelised cost calculation, the 13% (before tax) benchmark is used as the discount rate, as no taxes or loans are included in the formula for calculating the levelised cost.

Response by TÜV SÜD

The discount rate is for the electricity production based on CMM. Hence, the discount rate source used is justified.

Issue 6
The monitoring plan should contain separate entries to ensure that the parameters related to the two wells are reported separately.

Project Participants' response

See revised PDD, section B7.1.

Response by TÜV SÜD

This will be submitted with the updated PDD.

[7] Methods and Parameters for Economic Assessment of Construction Project (version 3) page 204