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Request for Review

Dear Sirs,

Please find below the response to the review formulated for the CDM project with the registration number 1709. 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

Question 1

The DOE shall describe how the reliability of the input values used in the investment analysis has been validated in accordance with the guidance of EB 38 paragraph 54.

AND

Question 2

The start date of the project activity should be as per the CDM glossary of terms.

AND

Question 3

Further clarification is required on how the DOE has validated the baseline determination, in particular that the continuation of grid electricity imports is a more economically attractive alternative than the project activity undertaken without CDM.

Referring to Question 1

"Response by Project Participant"

This project was submitted for registration on 5th March 2008, prior to release of the guidance from EB38 on 14th March 2008. Hence the guidance was not explicitly known by the DOE when the submission was made.

Nevertheless the input values can be shown to be line with the guidance of EB38 paragraph 54 which states that the DOE must demonstrate that:

(a) The FSR has 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.

The FSR was approved on 24th October 2006. The start date – final investment decision – for the project is 6th July 2007, date of signing EPC contract (see question 2 below). During this 9 month period a change of equipment supplier was negotiated but this made only a tiny difference to total fixed investment, as described below and evidenced by the supplied copy of the EPC contract. No other input values materially changed during this period of less than one year. This demonstrates that the FSR was the basis for the investment decision.

The original Carbon Asset Development Agreement (CADA) was signed on 15 September 2006; although this was before finalisation of the FSR, the draft content of the FSR was used as the basis for the CADA, as per the trust deed document agreed with the Design Institute and supplied with this response.

(b) The values used in the PDD and associated annexes are fully consistent with the FSR, and where inconsistencies occur the DOE should validate the appropriateness of the values.

There are the following minor inconsistencies between the FSR and the figures used in the investment analysis. The reason for validating these changes is explained as follows:

Item	Values in PDD&FA (10 ⁴ RMB)	Values in FSR (10 ⁴ RMB)	Explanation
Operation and Maintenance costs (O&M)	2,448	2,893	See below
Working capital	543	652	Consequence of O&M cost difference, see below
Total Investment	17,329	17,309	0.1% difference due to equipment supplier change
Sales Revenue	5,190	6,072	Consequence of excluding sales tax from power tariff, income tax calculated separately

A breakdown of individual cost items making up operation and maintenance costs is as follows:

Item	Values in FA/PDD (10 ⁴ RMB)	Values in FSR (10 ⁴ RMB)	Explanation
Fuel & Power	802	986	<i>total</i>
Fresh Water	108	108	no difference
Electricity	491	575	Used tariff without tax; tax is included separately in IRR calculation
Desalination Water	103	103	no difference
Other	100	200	Conservative measure
Salary & Welfare	129	129	no difference
Annual Maintenance & Other Costs	1517	1778	Conservative measure ; justification of amount below
Total	2448	2893	<i>total</i>

(c) On the basis of its specific local and sectoral expertise, confirmation is 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.

Key data to substantiate are as follows:

- è **Electricity tariff assumption.** The electricity tariff used (0.399 RMB/kWh before tax, 0.467RMB/kWh after tax) is justified using the supplied scanned invoice for power supplied to Anyang Iron and Steel, where the tariff is quoted as 0.468RMB/kWh. This very small difference makes no material difference to the analysis.

- è **Total Fixed Investment.** Total investment is 173.29m RMB. The EPC contract is provided to justify the capital investment on equipment.
- è **Operation and Maintenance costs.** Total operational expenses, including fuel and power costs, maintenance, staffing and overhead are 24.48m RMB per year. This is equivalent to 14.1% of total fixed investment (TFI). Maintenance costs represent 7% of TFI and staffing and overhead represent 2.5% of TFI. The maintenance costs are slightly higher than for standard power generation projects. The reasons for this are that no other similar projects are currently operating in the Central China region, so higher than usual costs are expected for failures and unanticipated problems, and that the high heat recovery rate of the equipment involved is expected to lead to higher costs for maintenance on the sinter plant itself (see letter provided). Staff costs are justified by the breakdown in personnel required for all CDM projects underway at Anyang Iron and Steel, as provided by Anyang Labour and Social Security Bureau
- è **Quantity of electricity generated.** The technical rated output of the turbine and generator trains employed by this project is 18MW, as stated in the technical specifications in the FSR and PDD, relative to the nameplate capacity of 20MW. When assumed to operate for 8000 hours per year (about 91% of the time), and at an average load factor of 90%, this gives a gross output of 130GWh per year. Once auxiliary electricity consumption is taken into account, this drops to 117.7GWh per year. These loading factors (91% of hours at 90% of maximum load) are high for a waste heat power generation unit of this sort. Experience has shown similar projects to generate less electricity in reality than was planned at the design stage. These assumptions are therefore conservative.
- è **Project Lifetime.** The project lifetime is assumed to be 10 years plus 1.5 years of construction. This is in accordance with the EB39 Annex 35 guidance, when it is stated that "In general a minimum period of 10 years and a maximum of 20 years will be appropriate".

Response by TÜV SÜD

In assessing the input values used in the investment, TÜV SÜD has followed a 4-step approach:

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

a) All the input parameters used in the financial analysis are taken from the feasibility study report (FSR), which was developed by the WISDRI Engineering & Research Inco., and approved by the Henan Provincial Development and Reform Commission in October 2006. WISDRI Engineering & Research Inco. is accredited by relevant national authorities and has based its assumptions in line with national guidance.

This has been checked and verified during validation. The input parameters used in the financial analysis can thus be considered information provided by an independent and recognized source.

Step 2: Confirmation that the values used in the PDD and investment analysis are fully consistent with the FSR

TÜV SÜD compared the input parameters for the financial analysis included in the PDD and investment analysis with the parameters stated in the FSR, and was able to confirm that most of the values applied are fully consistent with the sources.

Differences occurred in 4 cases:

Item	Values in PDD&FA (10 ⁴ RMB)	Values in FSR (10 ⁴ RMB)
Operation and Maintenance costs (O&M)	2,448	2,893
Working capital	543	652
Total Investment	17,329	17,309
Sales Revenue	5,190	6,072

In the Feasibility Study report of the design institute an IRR of 6.98 % was calculated. Hence even when all input values of the IRR would be applied the IRR would be below the benchmark.

Step 3: Assessment of the period of time between the finalization of the FSR, the purchase proposal and the investment decision:

On June 10th 2006 a preliminary design report was issued by WISDRI Engineering & Research Incorporation Limited. Based on this co-development agreement with the project developer was issued in September 2006. This has been evidenced by the "trust deed" of Sintering Plant Waste Gas Recovery for Generation Project Feasibility Study Report.

The FSR was approved in October 2006, and the full project implementation began in July 2007.

The period of 9 month between the FSR approval and the actual project implementation can be explained by the change of the equipment supplier. The change of equipment supplier lead to slightly higher investment costs (an increase of 0.1%), which are stated above.

The operational costs taken for the IRR analysis are lower than assumed in the FSR. This can be considered as a conservative approach.

The different Sales Revenues are the consequence of excluding 17% VAT tax from power tariff. This approach is reasonable and correct.

The audit team is of the opinion, that the input values from the FSR were still reasonable to assume and that the FSR has been the basis of the decision to proceed with the investment in the project.

Step 4: Cross-check of the parameters used in the financial analysis with the parameters used by other similar projects

The accreditation of WISDRI Engineering & Research Inco has been checked and validated. The input parameters used in the financial analyses were compared with the data reported for other similar proposed CDM projects in the same industry sector, i.e. 20 Waste Heat Recovery projects in the Steel Sector.

The specific investment costs of 8,6 Mio. RMB/MW are above the average of 7.3 Mio. RMB/MW. The operational costs are 7.1% of the investment costs slightly higher compared to 6.5% average. This difference can be explain due to the fact that the comparison has been made against projects in the same industry sector but none of them are a waste heat recovery from a sinter plant, even though it is still in the normal range for this kind of activities in the sec-



tor. The grid tariff is the same as the average (0.399 RMB/kWh versus 0.400 RMB/kWh excluding 17% VAT). The operational hours are higher than the average (6500h versus 6000h). Additional the total investment has been crosschecked with "EPC contract"; dated July 2007. The input value in the IRR calculation is consistent to the value stated in this contract. Although the specific investment is higher than the average, the total investment can be considered as plausible.

The grid tariff has been crosschecked with the actual electricity purchase invoices from Anyang Steel group. The input value of RMB0.467 Yuan/kWh is nearly consistent with the average electricity price paid of RMB0.468 Yuan/kWh by the Anyang Steel Company. Hence it can be considered as plausible.

Taxes have been crosschecked with government requirements and can be considered as valid and applicable.

Operational hours have been compared with operational hours of projects in the same industry sector. They are considered to be in an applicable range. Additional the operational hours have been cross checked with the calculation in the FSR. The values are consistent.

The staff costs have been evidenced by Anyang Labour and Social Security Bureau and can be considered as plausible.

By additionally applying our sectoral competence and local expertise, TÜV SÜD was able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project at the time of the final investment decision.

Referring to issue 2

Response by Project Participant

The start date for the project will be 6th July 2007, date of signing the EPC contract, as permissible by the CDM glossary of terms.

Response by TÜV SÜD

In the PDD submitted for registration, the construction starting date in September 2007 has been chosen as the project starting date. To be in line with the CDM glossary, the starting date of the project activity was rescheduled to 6th July 2007, which is the date when the EPC contract was signed.

TÜV SÜD can confirm that before 6th July 2007 no serious action concerning the project activity was done. Hence the starting date of July 6th is correct.

Referring to question 3:

Response by Project Participant

The investment analysis in the PDD demonstrates that the project is not financially attractive when compared to the baseline scenario since the savings made by not purchasing power from the grid are already included in the economic analysis.

However to further elaborate this point the project participant has prepared a levelised cost analysis the project and baseline scenarios. This has been done through a Net Present Value of the costs of the two scenarios and a subsequent evaluation of the levelised cost of both. This is presented below in the tables overleaf: For comparison of these two scenarios the different tax situations have been considered. This is due to the fact that scenario of the project activity (scenario 1) without CDM includes a capital investment and the scenario of purchasing electric-

ity from the grid (scenario 2) does not. For scenario 1 there is a capital allowance for the depreciation and amortization of the capital cost. For both scenarios 1 and 2 income tax will be due. Income tax is due on net income and in scenarios 1 and 2 this will be different and there is a tax benefit in having higher annual costs i.e. less tax will be paid. In other words net annual income will be less when there are higher annual costs and therefore income tax will also be less. Conversely, when net annual income is higher then so are the taxes.

A discount rate of 13% is used for the sinter project scenario as this is the accepted benchmark for iron and steel sector investments. A discount rate of 10% is used for the baseline grid electricity scenario as this is the accepted benchmark for the power sector.

The tables overleaf show that the levelised cost of power generation obtained for scenario 2 is 334 RMB/MWh. This is much less than the levelised cost for scenario 1, which is 395RMB/MWh. Therefore the rational decision is to continue to purchase power and as such it can be confirmed that the baseline is indeed purchase of power from the grid and not the proposed project undertaken without the CDM. This assessment further demonstrates the additionality of the project and is compliant with Sub-step 2b: Option II Apply investment comparison analysis.

Power Generation for scenario 1

Discount factor for scenario 1: 13%

[illegible]

Scenario 1. Anyang Sinter

[illegible]

Power Generation for scenario 2

Discount factor for scenario 2: **10%**[illegible]

Scenario 2. Power Purchase

[illegible]

Response by TÜV SÜD

The economical analysis of Anyang Iron & Steel Co., Ltd. to implement a Sinter Machine waste Heat Recovery project, was based on benchmark analysis during the investment decision. The above described "levelised costs analysis" was conducted to answer to this request for review.

The above stated levelised cost analysis has been conducted to fulfil the methodological requirement as stated in the Request for Review. This analysis has been validated and shows that scenario 1 (generating electricity at the Anyang Iron & Steel Plant) has higher levelised cost 395 RMB/MWh than scenario 2 (purchasing electricity from the grid) 334 RMB/MWh. In this scenario the project owner would continue purchase from grid since this option is more economically feasible.

Input values to this analysis are similar to the analysis presented earlier. These input values were already validated during validation process.

The method of comparison is appropriate in our opinion since it clearly presents the price to get an unit off electricity (kWh) in both scenarios.

The discount rate used for project scenario is same as benchmark and is considered to be very appropriate. The discount rate for "purchase from grid" is 10%, which is consistent with the benchmark of electricity generation projects in China. The discount rate can be considered as very appropriate.

Furthermore, the fact, that two different discount rates for two different project scenarios were chosen is very appropriate in the opinion of the audit team.

Increase in grid tariff will mean that OM costs should also be increased in same proportion.

However, if in a grid tariff analysis, the grid price is increased by 10%, keeping O&M costs of project same, the grid scenario is economically non attractive. Hence the analysis is robust.

Additional the scenario to continue purchase from grid does not require high initial investment and no further risks, where as the development of the project includes both. Hence the baseline scenario should be purchasing electricity from the grid.