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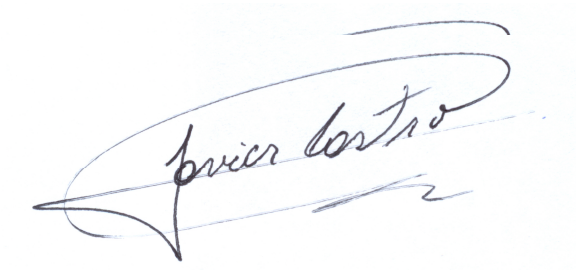
Request for Review

Dear Sirs,

Please find below the response to the review formulated for the CDM project with the registration number 1659. 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

Considering that the investment being made is in the power industry, further substantiation that the benchmark reflects the risk profile of this project activity is required.

AND

Issue 2

Further clarification is required on how the DOE has validated the suitability of the input values, as per EB 38 paragraph 54.

AND

Issue 3

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

Referring to Issue 1

Response by Project Participant

According to the Additionality Tool “The benchmark is to represent standard returns in the market, considering the specific risk of the project type”. The project is the waste heat recovery for power generation project in cement industry, the benchmark for cement industry has been chosen as:
1. The project developer Hunan Niuli Cement Co., Ltd.’s main business is situated in the cement industry, while it has no experiences in power generation sector. From the investor’s point of view, the benchmark for cement industry should be used as the benchmark when it invests projects. Because if the IRR for a project is lower than the benchmark in cement industry, the project owner will not invest in this project and it would rather expand its cement production as the cement production makes profit.
2. The benchmark chosen should consider the specific risk of the project, which links to the cement production. The waste heat used comes from the clinker production process. Thus the operation of the clinker production line will affect the operation of the proposed project directly. Furthermore, the fluctuation in the cement market will have an impact on the cement production of this plant, which will also affect the power generation of the proposed project.
3. According to the 'Project Economic Evaluation Methods and Parameters' (3 edition, page 119), the selection of the benchmark should fully consider the risk which the project will have. It also states that when a project owner invests in a project with key characteristics of another sector rather than its own core business, and has little experience of these characteristics and

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the project risk, the sectoral benchmark IRR of its own core business will be applied.[1] In the proposed project, the risk in the operation and production of the cement production lines is the main risk which the proposed project will face. Thus the sectoral benchmark for cement industry has been chosed according to 'Project Economic Evaluation Methods and Parameters' (3 edition, page 202).
From above we can conclude that, for investing a power generation project in cement industry, it is reasonable and appropriate to use the benchmark of the cement industry.

Response by TÜV SÜD

A benchmark contains two parts. One part is the returns from standard investment and the second part is the risk that is connected to these kind of projects.
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 waste heat from Clinker Production in the Cement Industry that is currently vented. The uncertainty relating to volumes of waste heat released from the cement plant 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 Cement industry, the sectoral benchmark of the Cement 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[2].
- This is a conservative assumption, since the cement 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 Cement industry rather than benchmark of the power sector is reasonable.

There are two benchmarks for the IRR of the cement sector available: one is the project IRR of 11% (before tax), another is equity IRR of 12% (equity IRR after tax). In the investment analysis for this project, the equity IRR benchmark of 12%[3] is used as the benchmark, since there is only one potential project developer of the proposed project.

[1] Project Economic Evaluation Methods and Parameters' 3 edition, published by China’s National Development and Reform Commission and Construction Ministry, December 2006, page 197.

[2] 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.

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

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These answers have been published for another request for review (project 1468) and were then accepted by the EB.

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

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 7.25% for Xiangtan and 7,62% for Changde, being less than the benchmark of 12% would be insufficient return for the project to proceed without the additional income from the CDM.

The project developer Hunan Niuli Cement Co., Ltd's main business is situated in the Cement industry. If a project is below the sectoral benchmark of the Cement industry, it will be rejected and an expansion of the cement plant will be rather implemented.
The benchmark chosen should consider the specific risk of the project. In this case the project is connected to the Cement Sector. The operation of the clinker production line will affect the proposed project. The risk in the operation and production of the cement production line are transferred to the proposed project. Furthermore, there exists no specific benchmark for "waste heat usage". And the benchmark of electricity generation does not include the risk factor connected to the project.
The "the Methods and Parameters" were available during the consideration of CDM for this project. Hence they are applicable. In this third version, no generic benchmark is given for the electricity generation sector.
The interim rules were applied to use a benchmark of 8% for power industries. In our opinion, since the publication of "the Methods and Parameters" vers. 3, it is more relevant than interim rules. For the reasons mentioned above, the DOE can confirm that the chosen benchmark is applicable and suitable.

Referring to issue 2

Response by Project Participant

The input values in the IRR calculation of the proposed project are from the FSR and the explanation by the FSR design institute. The FSR was completed in June of 2007 and the explanations by the FSR design institute were also given in June of 2007. The FSR and the explanation are conducted by Hunan Guolian Procurement Consultation Co., Ltd., which is accredited to conduct project proposal, feasibility study report, project application report, etc, by the National Development and Reform Commission. The construction of the two stations started in January and May 2008 respectively. The period of time between the finalization of the FSR and the investment decision is sufficiently short, and the input values are valid and applicable at the time of investment decision and are the basis of investment decision.

Regarding the annual net electricity generation, the explanations are as below:
For Xiangtan, according to the FSR and the explanation by the FSR design institute, the effective generating power is 6009kW. This is also substantiated by the articles in cement industry, for example, Present Status and Prospect on Pure Cold Heat Recovery Steam Generation in Gement Industry published on Boiler Manufacturing, Feb. 2007 and the Analysis of the Waste

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Heat Utilization for Power generation in Dry Method Cement Production line published on China Ceramic, May 2005, in which it states that for a 5000tons/day cement line, the average effective generating power is 6102kW, and the minimum and maximum are 4380kW and 7035kW respectively. The FSR, explanation by the FSR design institute and the articles have been provided to TS. The annual net generation is 42864000kWh, considering the self consumption rate of 5%, the annual operation hour is 7508hours. Comparing to the common design annual operation time 7000 hours[4] for the WHR projects in cement plants using domestic equipments, the annual operation design time is reasonable.
For Changde, according to the explanation by the FSR design institute, the effective generating power is 3300kW. This is substantiated by the articles in cement industry, for example, the Cement low temperature waste heat power generation technology and current status, Construction Material Development, 2007, No.1, in which the commissioned low temperature WHR for power generation projects in China are listed. In the statistic, six of them are 2500tons/day and the installed capacities are 3MW. The annual net generation of the proposed project is 23803000kWh, considering the self consumption rate of 5%, the annual operation hours is 7592hours, which is also reasonable.

For the electricity price, the invoices of the electricity buy have been provided to the DOE. The electricity price is RMB0.4188Yuan/kWh (excluding VAT), which is the same as that in the PDD.

Response by TÜV SÜD

In assessing the input values used in the investment, TÜV SÜD has followed following approach:

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) except the net electricity generation and expense of production material which are from “Explanation of WHR project of Hunan Niuli Cement Co., Ltd.” and “Explanation of cost expense of WHR project in Xiangtan Cement Plant and Changde Cement Plant”.
The FSR and the explanations are conducted by Hunan Guolian Procurement Consultation Co., Ltd., and have been approved in July of 2007 by the Hunan province economic commission. Hunan Guolian Procurement Consultation Co., Ltd. is accredited by the National Development and Reform Comission 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.

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. After minor corrections in the validation stage (please refer to CAR1 in the Validation Report) and considering the additional explanations of the Design institute, TÜV SÜD was able to confirm that the values applied are fully consistent with the sources.

[4] The evidences have been provided to TS

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

The input parameters used in the financial analyses were compared with the data reported for other similar proposed CDM projects in the region, i.e. one other Waste Heat Recovery projects in Henan province.
The total investment has been crosschecked with “The General Contract Project Management agreement for the Waste Heat Recovery Project for the 5000t/d Cement Production Line of Zhumadian Yulong Tongli Cement Co. Ltd”; which has the same capacity as this project, where we had actual invoices. The investment for Changde and Xiangtan can be considered as plausible because it is significant lower.
The grid tariff has been crosschecked with electricity purchase invoices from the Niuli Cement Co., Ltd. The input value of 0.49 Yuan/kWh including VAT and 0,4188 Yuan/kWh can be considered as plausible.
Taxes have been crosschecked with government requirements and can be considered as valid and applicable.
The project has an actual capacity of 13,5 MW. This involves a 9MW capacity at Xiantang and a 4,5 MW capacity at Changde Cement Plant.
According to recent analysis published by the China Academic Journal “Analysis of the Waste Heat Utilization for Power Generation in Dry Method Cement Production line”, China Cement, 2007.5, there are three possibilities for projects which apply domestic equipments in 5000t/d clinker production lines. It is 4380kW, 6102 kW, and 7035 kW. Given the analysis of the design institute and also the, “Cement low temperature waste heat power generation technology and current status”, published by the China Academic Journal an effective power generation of 6100kW can be applied for a clinker production line of 5000t/d. And as it is the average between 4,4MW and 7 MW it was chosen.
For a 2500t/d clinker production line there exist two possibilities 3,0 MW or 4,5 MW. Taking the analysis of the design institute that 3,3 MW can be produced, 4,5 MW have been installed.
TÜV SÜD has checked and validated the documents mentioned above. They are valid and applicable for this project.
In other validated project (1624) with the same capacity we observed that generation capacity was assumed as 8 MW for 9 MW installed capacity. This was more efficient equipment and hence costlier than the project equipment. The demand for steam turbines and generators were high in recent years. The supply cannot meet the demand. The producers which produce more efficient equipments have been booked in advance for a long time. To avoid project delaying, products from other producers have been chosen in this project.
Furthermore, the amount of waste heat, composition and temperature depends on the raw materials and the fuels used. The fuel in clinker production are different. The characteristic and the quality of the coal are different, thus the waste heat generated after combustion are different. Hence the electricity generation will be different.
Considering the full installed capacity of the plant (13,5 MW) the operational hours are low (6612 hours for Changde and 6267 hours for Xiangtan).
Considering that only 3,3 MW and 6,1 MW can be used in this project, the equipment will be operating for 7573 hours for Changde and 7394 hours for Xiangtan. These have been compared with operational hours of projects in the same industry sector, the operational hours for 3,3MW and 6,3 MW can be considered to be in an applicable range.
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.

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Referring to issue 3

Response by Project Participant

1. The method of economic analysis chosen is the NPV analysis based on cash flows. The new guidance on the Assessment of Investment Analysis states in para 14 that "If the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate. "The benchmark analysis shows an IRR 7.25% for Xiangtan project and an IRR 7.62% for Changde project which are below the benchmark (12%).
2. In the Section B.4 of the PDD, it has been discussed that alternatives 3, 4 and 5 face the barriers of laws and regulations, resources insufficiency, technology and finance. Thus these alternatives are excluded when identifying the baseline scenario. Alternative 1 and 2 are the only two possible baseline scenarios that cannot be eliminated due to prohibitive barriers. These two scenarios thus have to be compared with an economic comparison in order to determine the appropriate baseline scenario. In accordance with the investment comparison analysis (Option II), alternative 1 (the project activity) is considered financially less attractive than alternative 2 (Equivalent electricity import from the grid) if the NPV of alternative 1 is more negative than alternative 2. As can be seen from the submitted excel file, for Xiangtan project the NPV of alternative 1 is minus RMB 123984700 Yuan and the NPV for alternative 2 is minus RMB 119720800 Yuan. For Changde project, the NPV for alternative 1 is minus RMB 69248300Yuan and for alternative 2 is minus RMB 66483300Yuan. Thus, in line with the methodology, it can be concluded by this economic analysis that scenario 2 is the most plausible baseline scenario. The baseline scenario has been identified as alternative 2 "continuation of equivalent import of electricity from Central China Power Grid".

Response by TÜV SÜD

The economical analysis of Hunan Niuli Cement Co. limited to implement a WHR project, was based on benchmark analysis during the investment decision.
The above described "comparison analysis" was conducted to answer to this request for review.
The above stated comparison 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 Changde amd Xiangtan Cement Plant) has lower NPV -123 million RMB for Xiangtan and -69 million RMB for Change than scenario 2 (purchasing electricity from the grid) -119 million RMB for Xiangtan and -66 million RMB for Changde. 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" should ideally be lower than project scenario, because it does not involve risks similar to the project. However to evaluate the two

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scenarios under similar circumstances we are of the opinion that the same discount rate should be used.
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 5%, keeping O&M costs of project same, the grid scenario is not economically attractive. We are of the opinion, that a tariff increase will be connected with an overall costs rise. Indeed the electricity tariff will rise slower, as it is governmental controlled, whereas the other costs are market controlled.
With this an increase of only the electricity tariff is unrealistic..
Additionally 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.