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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 1656. In case you have any further inquiries please let us know how we can kindly assist you.

Yours sincerely,

Javier Castro
Carbon Management Service

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Response to the CDM Executive Board

Question 1

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

Response by PP

The data employed in the IRR calculation come from Financial Evaluation Report (FER), which was completed by *Shandong Province Metallurgical Design Institute*. This entity is an independent organization which is qualified to compile design reports for Iron & Steel projects (it has obtained the “Engineering Consulting Design Certificate” issued by the National Development and Reform Commission). Therefore, the data employed in the IRR calculation is reasonable and credible.

The Pre-assessment Report (PR) of the project was developed in May 2004 by *Shandong Province Metallurgical Design Institute*. The IRR in the PR is 4.4%, so the project faces high investment risk. Due to the high investment of coke dry quenching equipments and steam turbine generators and low IRR in PR, the project owner decided to implement CDM application to overcome these barriers. Therefore, the Technology and Resource Department of Laiwu Iron & Steel Group Corp. (“**Laigang**”) submitted a CDM application letter to Laigang on July 15, 2004. Then on August 9, 2004 Laigang adopted the documentation submitted by the Technology and Resource Department of Laigang to develop this project as CDM project. And then, Laigang submitted CDM application to the local Government on August 24, 2004 and on September 16, 2004 the local Government approved the application. Later on April 8, 2005 Laigang consigned Beijing Tianqing Power International CDM Consulting Co., Ltd (“**Consultant**”) to develop the CDM application. It can be concluded that: the project owner did consider seriously the potential revenue of CDM to proceed with the project. CDM has played a very important and crucial role in the successful implementation of the project.

At the same time, Laigang consigned *Shandong Province Metallurgical Design Institute* to compile the Feasibility Study Report (FSR), which was completed in September 2005, and the IRR in FSR was only 4.38%, but the IRR will be improved by CDM revenue. And then on May 30, 2006, the FSR has been approved by the local DRC (Development and Reform Commission). Considering FSR and CDM income, the project owner decided to proceed with the investment in the project. Therefore, the project owner signed the Project Commencement Report with the construction company on April 22, 2006, and the project started to construction on June 2, 2006, and then the project owner signed the equipment purchase agreement on October 27, 2006.

After the project owner acquired the Approval of FSR which can prove the project was in line with laws and regulations of China, the Consultant began to write PIN and seek for potential buyers. In 2006, the Consultant contacted RWE Power AG and recommended the project to

RWE. After market research and project study, RWE signed a LOI with the project owner on May 22, 2007.

In June 2007 the Consultant and the project owner submitted the application letter of CDM to China DNA. And in July 2007 the project was listed on China DNA official website as approved and the LOA (paper version) was issued in August 2007. And then, on September 18, 2007 TÜV SÜD performed on-site interviews. Please see the detailed time line in the table below.

Table 1 Key Events of the Project

Date (dd-mm-yyyy)	Key Event
5-2004	The PR of the project was developed by <i>Shandong Province Metallurgical Design Institute</i> .
15-7- 2004	Due to the high investment of coke dry quenching equipments and steam turbine generators and low IRR in PR, the Technology and Resource Department of Laigang submitted a CDM application letter to Laigang.
9-8-2004	Laigang adopted the documentation submitted by the Technology and Resource Department of Laigang to develop this project as CDM project.
24-8-2004	Laigang submitted a CDM application letter to the local Government.
16-9-2004	Local Government approved the application.
8-4-2005	Laigang consigned Beijing Tianqing Power International CDM Consulting Co., Ltd to develop the CDM application.
9-2005	Feasibility Study Report (FSR) was completed by <i>Shandong Province Metallurgical Design Institute</i> and approved by the local DRC (Development and Reform Commission). However the IRR in FSR was still low, but the IRR will be improved by CDM revenue. Therefore, considering the FSR and CDM income, the project owner made a final decision to proceed with the investment in the project.
22-4-2006	the project owner signed the Project Commencement Report with the construction company
2-6-2006	the project started to construction
27-10-2006	The project owner signed the equipment purchase agreement.
22-5-2007	The project owner and RWE signed LOI.

6-2007	The Consultant and the project owner submitted application letter of CDM to China DNA.
7-2007	The project was listed on the China DNA's official website as approved.
26-8-2007	The LOA (paper version) of China was issued.
18-9-2007	TÜV SÜD performed on-site interviews.
3-2007	Financial Evaluation Report (FER) was completed by <i>Shandong Province Metallurgical Design Institute</i> .
12-2007	The first generator started operation.
22-2-2008	The final validation report was issued by TÜV SÜD.
3-3-2008	The project was submitted to registration by TÜV SÜD.

From the above table, it is clearly shown that the time line of main events leading up to the start of operation. The events in the above table clearly demonstrate that the project owner seriously consider the potential of CDM revenues before the starting activities of the project activity. CDM played a crucial role in overcoming the barriers towards the implementation of the proposed project activity.

The project is consistent with the guidance of EB 38:

In March 2007, nearly one and a half years after FSR, due to show the actual investment more objectively and reflect the updated situation of the project, in the beginning of 2007 the project owner consigned the *Shandong Province Metallurgical Design Institute* to make the FER. To integrate the latest situation of the project into PDD, the Consultant completed the PDD based on FER. And then the project received the final validation report on February 22, 2008. The project was submitted to registration on March 3, 2008.

On March 14, 2008 the guidance of EB 38 Meeting report was issued. According to the guidance of EB 38 paragraph 54, even if the data in FSR (2005) have been adopted, the project still meets EB's requirement.

According to the key events of the project in Table 1, it can be concluded that the project owner seriously consider CDM before the start of the construction of the project based on either PR or latter FSR which was approved by the local DRC. In a word, in accordance with the guidance of EB 38 paragraph 54, the project is an eligible and high-quality CDM project activity.

The values of FER are more applicable to the project:

As the statement above, it has shown that the values in FER presented objectively the actual investment and reflect the updated situation. Besides, the IRR of FSR (4.38%) is lower than the one of FER (5.52%) due to the increase of the investment and internal settlement price.

Therefore, FER can show the actual investment more objectively and conservatively, so the values of FER were still employed to calculate the IRR in PDD.

Further clarification:

In order to cross-check the reasonability of the main parameters for IRR calculation, we made below clarification:

To prove the conservative of the assumption from FER, the assumption from FER can be compared with the actual data (for 25MW generator, because the first generator of 25MW started operation in December 2007).

Table 2 the Designed Data in FER and Actual Data

	Value in FER	Actual Value	Comment
Annual utilization hours	7,200 h	6,496 h (the first 25MW generator has been operation for 8 months and the actual utilization hours is 2,165.2 h, so annual utilization hours is 6,496 h)	The annual utilization hour used in investment analysis is more conservative than the data of actual operation.
Electricity price	0.35 Yuan/kWh (internal settlement price, without VAT)	0.305612 Yuan/kWh Without VAT(power purchase invoice)	The price used in FSR is more conservative than the price for purchase form grid in the PDD, the price for purchase form grid has been employed
Total investment	450,995,800Yuan RMB	The actual investment is 235,749,210 Yuan RMB for 25MW generator ¹ , therefore the estimated actual investment for the project is about 471,498,420Yuan RMB	The lower total investment of 450,995,800Yuan RMB has been used, it is conservative.

¹ Final Accounting report for the 25MW generator and the investment also can be cross-checked by the equipment purchase invoices and Project Construction Agreements.

Therefore, it can be concluded that the input values used in the financial analysis is more conservative than the actual operation situation.

In conclusion, the project is consistent with the requirement of EB 38 paragraph 54.

Response by DOE

The input values used in the investment analysis are found to be reasonable and are consistent with the Financial Evaluation report.

The chronology of the key events related to the project is as follows:

Description	Date	Remarks
Pre-assessment Report (PR)	May 2004	IRR – 4.4%
Feasibility Study Report (FSR)	September 2005	IRR – 4.38%
Construction start date	22 nd April 2006	
Financial Evaluation Report (FER)	March 2007	IRR – 5.52%
Validation start	July 2007	
Final Validation Report (VR)	February 2008	
EB-38 Guidance	March 2008	

As per EB 38 paragraph 54:

“where project participants rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed project activities, DOEs are required to ensure that:

1. 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.
2. 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.
3. 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.”

We hereby confirm the following:

1. The FSR has been the basis of decision making taking CDM revenues into account. The values used in the PDD and the FSR are not fully consistent. The values in the PDD have been taken from the FER and are fully consistent with it. There are inconsistencies observed between the input values in the FSR and the FER/PDD and the appropriateness of the same has been validated as follows:

Description	FSR	FER / PDD	Percentage change	Remark
Investment (ten thousand Yuan)	43049.28	45099.58	4.76%	Increase in the total cost based on revised estimates although after start

RMB)				date but giving a fair representation of the actual scenario.
Grid price (Yuan RMB/kWh) – Excluding VAT	0.33	0.35	6.06%	Higher than the FSR and thus found to be more conservative and acceptable.

2. The FER has been accepted as the basis of investment analysis in the PDD as it represents a higher IRR (5.52%) as compared to the FSR (4.38%) and also to maintain the consistency in the documentation. Further the IRRs in both the documents are well below the benchmark IRR (13%).
3. Further the input values have also been validated based on the invoices, grid power purchase price, local regulations and have found to be reasonable and acceptable.

The documents supporting CDM consideration and input values are being submitted as follows:

1. CDM Projects Application letter to Laigang-English and Chinese version dated 15-7-2004 as Annexure-1
2. Approval of CDM Projects Application by the Government- English and Chinese version dated 16-9-2004 as Annexure-2
3. Feasibility Study Report dated September 2005 as Annexure-3
4. Financial Evaluation Report dated March 2007 as Annexure-4

Question 2

Further clarification is required on how the DOE has validated the investment and technological barriers.

Response by PP

a. Response for the investment barrier

Firstly, according to above description, the IRR of the project is lower than benchmark. Therefore, without CDM revenue, the project faces obvious financial barriers.

Secondly, in recent years, the Chinese economic continues to develop and grow rapidly, and the demand for iron and steel is increasing dramatically, thus the overriding task of Laigang at this stage is to expand and strengthen its core field. However, this project is not the core field of Laigang, also the implementation of this project will need large amount of initial investment. Laigang would have preferred to invest on the enlargement of production scale and the improvement of manufacture technology capability, rather than the investment on the project as using waste heat for power generation. Therefore, even till now the project owner still cannot

acquire loan from bank, because it is not the core business of Laigang, the bank was not willing to support this project.

But, now, the above investment analysis can prove the additionality sufficiently, so the barrier analysis is only as supplementary and additional information to prove additionality. As such barrier analysis will not be applied; the project participant agrees to remove this section.

b. Response for the technological barrier

During the operation, the project faces technological barriers (as described in the PDD) which can be verified by on-site interviewing with workers, and these barriers exist in actual operation, but it is difficult to provide the evidences published by a third party.

However, the above investment analysis (IRR) can prove the additionality sufficiently, so the technological barrier will not be taken as a way to demonstrate the additionality, just as additional information to prove additionality. As such barrier analysis will not be applied; the project participant agrees to remove this section.

Response by DOE

The additionality of the project has been demonstrated through Investment analysis. Earlier the barriers were validated through anecdotal evidence. Further since the additionality is convincingly demonstrated through investment analysis, the PP agrees to remove the barrier analysis from the revised PDD.

Question 3

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

Response by PP

As discussed in the PDD and subsequently confirmed in the final validation report, scenarios (c), (d), (e) and (f) have been excluded. Therefore, the only remaining baseline options are scenarios (a) and (b). We will continue to compare baseline scenarios (a) with (b) as follows.

According to Tool for the Demonstration and Assessment of Additionality (version 03, because the project has been uploaded in March, 2008, so at that time, we use the additionality tool version 03, which can lead to the same conclusion as version 05), this Tool provides three investment analysis methods: Simple cost analysis (Option I), investment comparison analysis (Option II) and benchmark analysis (Option III).

Option I: simple cost analysis

In the PDD, we excluded simple cost analysis first. So here, we only discuss the investment comparison analysis (Option II) or the benchmark analysis (Option III).

Option II: investment comparison analysis and Option III: benchmark analysis

According to Annex 45 Guidance on the Assessment of Investment Analysis (Version 02), the paragraph 15 states *“if the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services, a benchmark analysis is not appropriate and an investment comparison analysis shall be used. 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”* and *“the benchmark approach is therefore suited to circumstances where the baseline does not require investment or is outside the direct control of the project developer, i.e. cases where the choice of the developer is to invest or not to invest”*.

Therefore, investment comparison analysis (Option II) is not applicable because the alternative to the project activity is the importing electricity from a grid.

Therefore, benchmark analysis (Option III) was applicable and employed in the PDD..

The project is additional as per the benchmark analysis (IRR):

According to the calculation in PDD, the equity IRR of the project without CDM revenue is 5.52% which is lower than the threshold rate of 13%. Based on the threshold revenue rate of the financial evaluation of the iron & steel industry of China, the Equity IRR of a steel industry project should not be lower than the threshold of 13%. Therefore, the continuation of grid electricity imports and venting waste heat into the atmosphere is a more economically attractive alternative than the project activity undertaken without CDM.

The project is additional as per the comparison analysis (NPV):

However, in order to further demonstrate that the continuation of grid electricity is a more economically attractive alternative, we compare these **two scenarios** by the comparative analysis of NPV and subsequent levelized cost. As for NPV analysis, the cost of the continuation of grid electricity imports (scenario I) has been compared with the cost of the project activity undertaken without CDM (scenario II). To provide equivalent amount of electricity as scenario I, the following components of the costs in scenario II has to be included: initial investment cost, annual operation cost and tax saving. The tax saving in two scenarios are different because of different pre-tax deduction (depreciation has been considered in scenario II for tax saving calculation). Meanwhile, the levelized cost has also been calculated to further compare the above two scenarios.

The discounting rate in the both scenarios is the benchmark rate of 13%. Please find below comparative NPV and levelized cost

Table 3 NPV and Levelized Cost of Two Scenarios

Scenarios	NPV 10,000 RMB)	(Unit: Yuan	Levelized Cost(Yuan RMB/kWh)
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The continuation of grid electricity imports	-48,008.75	0.2345
Project activity undertaken without CDM	-56,690.27	0.2769

Note: More detail could be found in IRR calculation sheets.

By the comparative analysis of NPV, it can be concluded that NPV for scenario I is greater than that for scenario II. Also for levelized cost, it could be seen in the above table that the levelized cost of scenario I is much lower than that of scenario II.

It can be concluded that the continuation of grid electricity imports and venting waste heat into the atmosphere (scenario I) is a more economically attractive alternative than the project activity undertaken without CDM (scenario II). Therefore, it can be confirmed that the continuation of grid electricity imports is indeed the baseline scenario.

In order to further demonstrate the above conclusion, the fluctuation of grid price and O&M cost has been considered.

- For grid price, the maximum increasing rate of 2% from 2000 to 2006 (Shandong Province Electricity Supply Sector) has been adopted for conservative purpose.
- For O&M cost, the average increasing rates of coal ,water, N₂ and salary are 9%, 7.26%, 4.43%, and 14.36% respectively from 2000 to 2006 (Shandong Province Electricity Supply Sector). The minimum average increasing rate of 4.43% has been adopted for conservative purpose.

It can be found that if the grid price increases, the other price indexes of O&M costs would increase further.

All the above data come from public official website of local government. (<http://www.stats-sd.gov.cn>).

Table 4 Various Price Indexes Fluctuations (Last Year=100)

Item	2000	2001	2002	2003	2004	2005	2006	Average	Max
Grid Price	100.4	100.7	99.9	100.2	100.1	102	101.6	0.70%	2.00%
Coal	97.3	115	115.2	102.1	124.8	111	97.6	9.00%	24.80%
Water	118.3	108.4	104.5	105.5	104.6	104.9	104.6	7.26%	18.30%
N ₂	104.2	100.1	96.7	106.5	114.3	108.4	100.8	4.43%	14.30%
Salary	113.7	113.4	117	108.6	111.6	122.3	113.9	14.36%	22.30%

Information source: <http://www.stats-sd.gov.cn/2007/tjsj/tjsj.asp?lbbm=1>

The NPV and levelized cost of two scenarios with price fluctuations has been calculated as follows:

Table 5 NPV and Levelized Cost of Two Options with Price Fluctuations

Scenarios	Increasing rate	NPV (Unit: 10,000 Yuan RMB)	Levelized Cost(Yuan RMB/kWh)
The continuation of grid electricity imports	Increasing rate of grid price is 2%	-52,997.79	0.2589
Project activity undertaken without CDM	Increasing rate of O&M cost is 4.43%	-62,247.70	0.3041

Note: More detail could be found in IRR calculation sheets.

It can be found in the above table, even with the fluctuation of grid price and O&M cost, scenario I is still more economically attractive than scenario II.

It is clear that scenario I is the most economically attractive; therefore, the baseline is indeed the continuation of grid electricity imports.

Response by DOE

According to “Tool for the demonstration and assessment of additionality /Version 03”, benchmark analysis was used for the investment analysis of this project. As far as alternatives 1, the IRR without CDM revenues is 5.52% only, which is much lower than the benchmark value (13%). Thus it was concluded that the project is not attractive from a financial point of view.

Alternative 2 is the continued situation of the present state. It needs no additional investment and faces no prohibitive barrier and is also most economically attractive, so it is considered as the baseline scenario.

Further the levelized cost analysis has also been submitted by the PP for the two alternatives. The analysis has been validated and shows that buying power from grid is cheaper than the project activity based power. Thus the baseline scenario would be grid based power. The levelized cost analysis is being submitted (Annexure-5)

Question 4

Further clarification is required on how the DOE has validated the suitability of the calibration frequency.

Response by PP

The electricity imported by the project will be measured through national-level standard electricity metering instruments. The metering instruments can be accepted to be calibrated every

five years in accordance with the “*Verification Regulation of Electrical Energy Meters with Electronics (JJG596-1999)*” and will have an accuracy class of 0.5. We already provide the *JJG596-1999* and Calibration Certificates of the meters to DOE. Until now, *JJG596-1999* is still applicable and valid in China. Therefore, the calibration frequency of every five years is in line with national laws and regulations of China, which is legal and effective.

However, considering the more accurate calibration, the project owner will calibrate the meters annually according to the Technical Administrative Code of Electric Energy Metering (DL/T448-2000).

Response by DOE

The calibration frequency was validated based on the document JJG596-1999 being submitted as Annexure-6.

Further the PP agrees to revise the calibration frequency to annually based on the National Standard DL/T448-2000.