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Response to Request for Review

Dear Sirs,

Please find below the response to the request for review formulated for the CDM project with the registration number 1695. 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:

Further clarification is required on how the DOE has validated the suitability of use of fixed input values in the investment analysis throughout the period of assessment.

Response by TÜV SÜD:

According to the PDD requesting for registration, most of the input values used by PPs to demonstrate the lack of financial feasibility for the proposed project, have been taken from the Preliminary Design Report issued on July 2004 by the design institute "JV Company of Beijing Capital Steel Group". According to the assessment performed by the validation team regarding the suitability of use of fixed input values in the investment analysis it can be stated that this approach is in compliance with what is defined in the "Economic Evaluation Method and Parameters for Construction Projects (Second Edition)" which explicitly states that the price used to calculate the IRR should be the fixed current price; the document accordingly defines the benchmark IRR to be used and to be compared to IRR estimated in terms of fixed values.

It's therefore confirmed that the investment analysis has been performed by the PPs according to a consistent and evidenced approach; previous experiences on similar projects allow to further sustain that the reference document "Economic Evaluation Method and Parameters for Construction Projects (Second Edition)" is an authoritative and recognized source and that this approach is appropriate to perform the investment analysis for the proposed project activity.

Response by the Project Participants:

The input values used in the investment analysis are taken from Preliminary Design Report (PDR) for Coke Dry Quenching (CDQ) Waste Heat Recovery for Power Generation Project of Wugang No. 9 and 10 Coke Ovens (hereafter as "the project") issued in July 2004 by JV Company of Beijing Capital Steel Group., which is an independent organization which is qualified to compile design reports for metallurgic projects and architecture projects (it has obtained A grade in metallurgic projects and architecture projects, both issued by National Construction Bureau). Further, the PDR had been approved by the local Development and Reform Commission. Therefore, the input values in the IRR calculation are appropriate, credible and reliable.

PDR financial analysis was complied according to the "Economic Evaluation Method and Parameters for Construction Projects (Second Edition)". In this economic evaluation guidance, it is mentioned that the price used to calculate the IRR should be the fixed current price. Therefore, using of the fixed input values in the investment analysis is reasonable and appropriate. In contrary, it would not be appropriate to calculate an IRR with variable input values and compare this to the benchmark of 11% provided in the above mentioned benchmark guidance document, as this benchmark IRR (according to the benchmark document itself) should be compared to an IRR calculated with fixed and real input value. The benchmark guidance document does not provide a benchmark IRR for IRRs calculated based on variable input values.

The IRR calculation employs fixed real input values (as opposed to nominal terms^[1]). The use of fixed real input values (such as electricity price and Annual operating cost) is common prac-

[¹] Nominal value refers to any price or value expressed in money of the day, as opposed to real value. The latter adjusts for the effect of inflation.



tice in China and is as described above in accordance with guidance such as the “Economic Evaluation Method and Parameters for Construction Projects (Second Edition)” for the preparation of feasibility studies which demonstrates that the benchmark is defined in real terms and therefore the application of fixed real input values is appropriate.^[2] The IRR calculation compares the real IRR with a real benchmark which in both cases takes out the effects of general price increases due to inflation.

In addition, In order to further demonstrate the fixed input value of financial analysis is appropriate and reasonable, the cross-check of important parameters has been considered.

➤ Electricity Price

To avoid any confusion, we will first shortly provide an overview of relevant electricity prices:

- * The electricity price in the PDR is 0.35 Yuan RMB/kWh (excluding VAT, 0.4095 Yuan RMB/kWh including VAT).
- * In 2004, the internal electricity settlement price for electricity supply to the internal electricity system of Wuhan Iron and Steel (group) Co. (hereafter as “Wugang”) is 0.256 Yuan RMB/kWh (including VAT).
- * The electricity purchasing price from grid (proved by electricity purchasing invoices) was 0.43 Yuan RMB/kWh (including VAT) in 2004, which is the CDM decision time and investment decision time.

The baseline scenario is the continuation of import of electricity from grid (61.85%) and the existing coal-fired captive power plant generating electricity (38.15%). Therefore the weighted average electricity price should be $(0.6185 \cdot 0.43 + 0.3815 \cdot 0.256) = 0.3636$ Yuan RMB/kWh (including VAT). To ensure a conservative approach, the electricity price used in the PDD for the IRR calculation, is 0.43 Yuan RMB/kWh (including VAT). This is conservative, as a higher electricity price leads to an overestimation of the IRR.

As explained above, according to the Economic Evaluation Method and Parameters for Construction Projects (Second Edition), the price used for the IRR calculation should be the fixed current price (as in our approach) in order to be able to compare the calculated IRR to the 11% benchmark.

For the IRR calculation the electricity price has been assumed a fixed input value (see also explanation above in the introduction why this is appropriate). An analysis of the actual development of the electricity price over time is hampered by the fact that the power sector in China has undergone several regulatory changes and consistent electricity price data over a longer period is not available. It is however expected that the electricity price will be adjusted in the future to correct for inflation and therefore the assumption that the electricity price will develop proportionally to the rate of inflation (as done in the IRR calculation assuming fixed real input values) can be considered reasonable. However, as any of such corrections for inflation would lag behind actual inflation, assuming that electricity prices will be corrected for inflation instantaneously, as is done in our analysis (i.e. assuming a fixed flat electricity price in accordance with the definition of the benchmark), implies that actual real revenues from the sale of power are somewhat overstated and the IRR calculation likely leads to a conservative interpretation of the additionality requirements.

It can be concluded that 1) the employed electricity price of 0.43 RMB/kWh is conservative as it leads to an overestimation of the IRR compared to the actual value, 2) that the electricity price in our calculation is assuming a fixed and real electricity price which is in accor-

^[2] The application of a fixed electricity price for the financial calculation is appropriate in case both the input values and the benchmark are defined in real terms and when there is no expectation that the change in the nominal value of the input parameters will differ significantly from the rate of inflation.



dance with the definitions in the benchmark guidance document, and 3) that employing a fixed real electricity price in the IRR calculation is likely more conservative than employing a variable flexible electricity price.

➤ Electricity Supply

According to the PDR, the electricity supply of the project is 21,687MWh. And according to the electricity record of the project in 2007, the electricity supply of the project is only 14,706.08MWh, which is much lower than the designed value in the PDR. Therefore the fixed input value of electricity supply is reasonable and conservative.

➤ Static Total Investment

In the IRR calculation of the project, the static total investment is 84,120,000 Yuan RMB based on the PDR which was issued in 2004. In accordance with the Economic Evaluation Method and Parameters for Construction Projects (Second Edition), a fixed value for Static Investment is used to analysis the financial situation of the project.

According to the financial list of Wugang, the actual Static investment of the project was 140,344,146.28 Yuan RMB ^[3] up to September 2007, which is significantly above the estimated 84,120,000 Yuan RMB in the PDR which is used as input value in the IRR calculation.

It can be concluded that, 1) in accordance with the requirement in the benchmark document, a fixed input has been used as input value, and that 2) this value is conservative (i.e. leading to an overestimation of the IRR) as the actual Static Investment cost is higher than this actual value.

➤ Annual Operating Cost

In the IRR calculation of the project, the annual operating cost is estimated as 8,718,800 Yuan RMB. According to the cost accounting sheet of the project over 2007, the actual annual operating cost of the project is 17,332,100 Yuan RMB which is significantly above the estimated input values used in the financial calculation in the PDD. The input value is therefore conservative as is leads to an overestimation of the IRR.

In accordance with the Economic Evaluation Method and Parameters for Construction Projects (Second Edition), a fixed value for Annual operating cost is used to analysis the financial situation of the project. Besides the fact that the approach of fixed input values is in accordance with the benchmark requirements, this approach is also conservative as is leads to an overestimation of the IRR compared to a calculation based on variable input values. To demonstrate this we will look at expected annual operating cost developments and compare this to inflation.

Therefore, using of the fixed current price value is conservative. In addition, the annual operating cost in the IRR calculation includes material cost, fuel and power cost, salary and fund, and some other cost. For annual operating cost, the price of water, N₂, coke oven gas and some medicament and salary fluctuation will be considered as below.

From the analysis above, it can be concluded that all fixed input values in the IRR calculation is reasonable and conservative. And actually most of the input value is fixed and is impossible to fluctuant much. Among the input value of the IRR calculation, only electricity price and annual operating cost maybe fluctuant in the future. In order to further demon-

[³] The actual static investment had been validated during validation and it had been mentioned in the PDD.



strate the above conclusion, the fluctuation of electricity price and annual operating cost has been considered.

Table 1 Various Price Indexes Fluctuations (Last Year=100)

| Item | | 2002 | 2003 | 2004 | 2005 | 2006 | Max or Min |
|-----------------------------|--------|-------|-------|--------|--------|-------|------------|
| Electricity Price | | 100.8 | 100.9 | 102.4 | 104.2 | 102.8 | 2.2% |
| Annual Operating Cost | Coal | 111.6 | 107.0 | 115.9 | 118.2 | 105.8 | |
| | Water | 106.2 | 105.3 | 104.1 | 104.0 | 106.4 | |
| | N2 | 97.6 | 103.4 | 110.2 | 108.5 | 100.4 | |
| | Salary | 115.1 | 113.3 | 114.8 | 115.4 | 114.5 | |
| Total Annual Operating Cost | | 7.63% | 7.25% | 11.25% | 11.53% | 6.78% | 6.78% |

Information source: <http://www.stats.gov.cn/tjsj/ndsj/>

- For electricity price, the maximum annual increasing rate of 2.2% from 2002 to 2006 has been adopted for conservative purpose.
 - For Annual operating cost, the minimum annual increasing rates of total operating cost is 6.78% from 2002 to 2006, it is conservative.
- All the above data come from public official website of national government. (<http://www.stats.gov.cn/tjsj/ndsj/>)

From the above it is clear that annual operating cost is increasing (and can be expected to keep increasing) more rapidly than electricity price increasing, and therefore the approach taken in our IRR calculation which is in accordance with the benchmark guidance (i.e. assuming fixed and real input values) is conservative compared to assuming variable input values, as fixed and real input values lead to an overestimation of the IRR compared to assuming variable input values.

It can be concluded that 1) the estimated input value for annual operating cost is conservative as it is lower than the actual annual operating cost during the first year of operations and therefore leads to and overestimation of the IRR, 2) that the annual operating cost has been assumed fixed over the period of assessment, and that this is in accordance with the requirements in the benchmark guidance document, and that 3) the assumption of fixed real annual operating cost is conservative compared to assuming variable annual operating cost over the period of assessment.

In conclusion, the use of fixed input values as input values in the IRR calculation is:

- 1) Conservative as comparison to actual values over the first year of operation demonstrates that the estimated values in the IRR calculation systematically lead to an overestimation of the IRR compared to the actual values;
- 2) Employing fixed and real input values is in accordance with the requirements in the benchmark guidance document providing the 11% benchmark, and;
- 3) Assuming fixed and real input values for annual operating cost and electricity price is conservative compared to employing variable input values, as annual operating cost is increasing (and can be expected to keep increasing) more rapidly than electricity price increasing,



Issue 2:

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

Response by TÜV SÜD:

The additionality of the project has been demonstrated through investment analysis. It is found out that the barrier analysis is not appropriate when re-assessing the project. Further since the additionality is convincingly demonstrated through investment analysis, the PPs agrees to remove the barrier analysis from the revised PDD.

Response by the Project Participants:

Firstly, according to above description, the IRR of the project is lower than the 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 Wugang at this stage is to expand and strengthen its core field. However, this project is not the core field of Wugang, also the implementation of this project will need large amount of initial investment. Wugang 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 Wugang, the bank was not willing to support this project.

But, now, the 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.

Issue 3:

The DOE should provide evidence of continuing and real actions taken to secure CDM status for the project activity in parallel with its implementation (EB41, Annex 46, para. 5(b) guidance).

Response by TÜV SÜD:

According to the EB41, Annex 46, paragraph 5(b) guidance:

“5. Proposed project activities with a start date before 2 August 2008, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, are required to demonstrate that the CDM was seriously considered in the decision to implement the project activity. Such demonstration requires the following elements to be satisfied:

(b) The project participant must indicate, by means of reliable evidence, that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation.

Evidence to support this should include, inter alia, contracts with consultants for CDM/PDD/methodology services, Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds), evidence of agreements or negotiations with a DOE for validation services, submission of a new methodology to the CDM Executive Board, publication in newspaper, interviews with DNA, earlier correspondence on the project with the DNA or the UNFCCC secretariat;



According to this further assessment, the following events have been evidenced to prove that continuing and real actions were taken to secure CDM status according to the above mentioned requirements:

Table 2 Key events in the context of the CDM application process

| Date | Key event | Evidence | Comment and relevance in the CDM context |
|------------------------------|---|---|---|
| May 20 th , 2004 | The planning department of Wugang decided to apply for CDM project status | Requesting for Instructions to Start CDM Projects in Wugang. | The decision to instruct the CDM application was taken by the planning department of Wugang according to the information available at the time about the lack of financial feasibility for the project: a previous Pre-evaluation Report (PR) issued on February 2004, stated a low IRR of 7.03% which was much lower than the sectoral benchmark of 11%. |
| May 23 rd , 2004 | Wugang signed a cooperation intent with Beijing Xielisi Environment Protection Co., Ltd. (Xielisi) | The Development Intention Letter on Clean Development Mechanism Projects | With the cooperation agreement Wugang assigned Xielisi the task to develop the CDM application for some waste energy recovery projects including the proposed project. |
| July 8 th , 2004 | Wugang issued a CDM projects application request to the local government | Requiring Support to Apply Projects as CDM Projects by Wuhan Iron and Steel (Group) Co. | The CDM application request to the local government was issued by Wugang for some waste energy recovery projects including the proposed project. |
| July 18 th , 2004 | Wugang received a CDM application approval from the local government | The Response Letter for Supporting the Projects of Wuhan Iron and Steel (Group) Co. to Apply CDM Projects by People's Government of Qingshan District | People's Government of Qingshan District, Wuhan City, approved the CDM application for some waste energy recovery projects including the proposed project. |
| May 18 th , 2005 | The project owner signed Cooperation Contract with Tianqing Power International CDM consulting Co., Ltd. (TQ Power) | Wuhan Iron and Steel (Group) Co. CDM project cooperation contract | According to the fact that Xielisi was not able to expeditiously fulfil its task, the project owner signed a cooperation agreement with Beijing Tianqing Power International CDM consulting Co., Ltd. (TQ Power) to develop the project activity as a CDM. The agreement |



| | | | |
|-----------------------------------|--|---|---|
| | | | refers to some waste energy recovery projects including the proposed project. |
| September 14 th , 2005 | PDD Writing Contract was signed between Wugang and TQ power. | CDM project design document cooperation contract | The project owner signed the PDD writing contract with TQ Power The contract refers to some waste energy recovery projects including the proposed project. |
| February 20 th , 2006 | Wugang and TQ power started discussing the selecting of buyers. | Wugang CDM project application table | The table exemplifies three potential CERs buyers suggested by TQ Power for the proposed project activity and for some other waste energy recovery projects in the hands of Wugang. |
| July 2006 | ENEL initiated the discussion and negotiations with the project owner on several energy efficiency projects including the proposed one | Statement by ENEL Trade SpA (dated 5 th December 2008) | The document prepared by the buyer (ENEL Trade SpA) is a statement which confirms the events as outlined during the assessment in terms of period/date of initial contact with Wugang and starting date of the due diligence on 28 th August 2006 by ENEL Trade SpA. |
| December 18 th , 2006 | The stakeholder consulting meeting was held for CDM application. | Wugang 9, 10#CDQ project stakeholder consulting meeting record | The consultation meeting was held with reference to some waste energy recovery projects including the proposed project. |
| March 20 th , 2007 | Wugang signed Letter of Intent (LoI) with the ENEL | Letter of Intent (between ENEL Trade SpA and Wugang) | The LoI was signed after the completion of the due diligence performed by ENEL Trade SpA. |
| July 5 th , 2007 | The PDD of the project started global stakeholder process for validation on the website of UNFCCC. | GSP starting date on UNFCCC website | The validation activity started with the GSP. On September 2007 TÜV SÜD performed the on-site audit. |
| May 5 th , 2008 | The ERPA with ENEL Trade SpA was signed | ERPA between Wuhan Iron and Steel (Group) Co. and ENEL Trade SpA | With this agreement was formalized the purchase of the emission reductions of the proposed project by ENEL Trade SpA. |

The timeline of the events as evidenced during the on-site assessment and as confirmed with this further assessment DOE is confident that the information given is correct and in compliance with the actual situation and project history. All the above mentioned events have been substantiated by verifiable documents and evidences.



In particular has been evidenced how the main delays in the CDM application progress have been caused by an initial waste of time due to lack of experience of the first contracting consultancy company and by the time required to ENEL Trade SpA to perform the due diligence and to consequently sign the Letter of Intent. Nevertheless, according to the above, it's confirmed that continuous and real actions were taken by the PPs to secure the CDM status for the proposed project activity.

Response by the Project Participants:

After CDM decision of the project, the project owner started the application of CDM in parallel with its implementation. The key events are listed in the Table 2 below:

Table 3 Key Events for CDM Application

| Date | Key Event |
|--------------------|--|
| February 2004 | Pre-evaluation Report was developed by JV Company of Beijing Capital Steel Group. |
| May 20, 2004 | The planning department of Wugang decided to apply for CDM project status |
| May 23, 2004 | Wugang signed a cooperation intent with Beijing Xielisi Environment Protection Co., Ltd. (Xielisi) |
| June 1, 2004 | Equipment Purchasing Contract (the earliest starting date of the project activity) |
| July 2004 | PDR of the project was complete by JV Company of Beijing Capital Steel Group. |
| July 8, 2004 | Wugang issued a CDM projects application request to the local government |
| July 18, 2004 | Wugang received a CDM application approval from the local government |
| August 2004 | The coke oven 1# and 2# changed name as coke oven 9# and 10# |
| January 18, 2005 | The project start construction activities |
| May 18, 2005 | The Xielisi can not fulfill their responsibility for CDM application due to lack of experience and poor English capability. Therefore the project owner start to discuss the CDM application and signed Cooperation Contract with Tianqing Power International CDM consulting Co., Ltd. (TQ Power) |
| September 14, 2005 | PDD Writing Contract was signed between Wugang and TQ power. |
| February 20, 2006 | Wugang and TQ power started discussing the selecting of buyers. |
| August 28, 2006 | The buyer, ENEL trade SpA.(ENEL) visited Wugang for due diligence. |
| December 18, 2006 | The stakeholder consulting meeting was held for CDM application. |
| March 20, 2007 | Wugang signed Letter of Intent (LoI) with the ENEL |
| July 5, 2007 | The PDD of the project started global stakeholder process for validation on the website of UNFCCC. |
| September 2007 | DOE performed the on-site validation |
| October 16, 2007 | Wugang got the approval of CDM application from the website of China DNA |
| May, 2008 | Wugang signed ERPA with ENEL. |

The Pre-evaluation Report (PR) was completed by JV Company of Beijing Capital Steel Group in February 2004. In the PR, the IRR of the project is only 7.03% which is much lower than the benchmark. At that time, the project owner realized that the IRR of the project is low dramatically. After that, Wugang started find some financial way to improve the IRR of the project. After consulting with JV Company of Beijing Capital Steel Group (who know the CDM information



from an invite public bidding inform in the website of China International Center For Economic And Technical Exchanges), Wugang were aware that CDM project can improve the project financial situation through sale of CERs. After Wugang Planning department study on CDM for some time from the website above, they submitted the advisement of CDM application to the Wugang in May 20, 2004. And the leader of Wugang approved the CDM application quickly in May 26, 2004. At the same time, they connected with Xielisi. And Wugang had intent to cooperation with them on the CDM application of some waste energy recovery projects in Wugang. Only after this, the equipment purchasing contract was signed in June 1, 2004, which is the earliest starting date of the project activity.

The key events described above are all earlier than the earliest starting date (equipment purchasing contract). It is shown that Wugang had known about CDM very early. And due to the low IRR of the project, Wugang decided to apply CDM and quickly connected with the consulting enterprise. After that the project just started construction.

After Xielisi signed cooperation intent with Wugang, they started some documents collection work and prepared PIN for the project. And they suggested Wugang to apply local government to support their CDM application. Therefore, Wugang issued a CDM projects application request to the local government on July 8, 2004. And local government gave them an approval to support them to apply CDM on July 18, 2004 soon. After that, Xielisi had no any improvement for CDM application for Wugang for almost one year due to their limited experience and poor English capability. The project owner was not satisfied with the CDM application process of Xielisi. Considering the important role of the CDM revenues, the project owner had to decide to change Consult Company for accelerate the CDM application process for all Wugang CDM projects. Therefore, in May 2005, Wugang started discussing some cooperation issue with TQ Power. And on May 18, 2005, Wugang signed contract with TQ power for CDM application of several waste energy recovery projects including the project. After serious consideration, PDD writing contract was signed between Wugang and TQ power in September 2005. TQ power started collecting documentation and preparing for PINs and draft PDDs in the end of 2005. Since there is less experience for waste energy projects at that time in TQ power, it cost several months for TQ power to prepare the PINs and PDDs for all Wugang CDM projects. During this period, Wugang started to find an appropriate buyer in February 2006, and TQ power introduced ENEL to Wugang. After looking at the PDD of Wugang projects, ENEL showed great interest on the projects of Wugang in July 2006. ENEL started due diligence carefully, and in August 2006, ENEL visited Wugang for CDM projects and visited the project site. And then the stakeholder consulting meeting was held in Wugang Hotel in December 2006. After serious due diligence and price negotiation, ENEL finally signed Lol with Wugang in March 2007 for several Wugang projects including the project.

And then TQ power started preparing submitting the project to DNA. After several months, TQ power and the project owner submitted the project to DNA in August 2007. And October 2007, the LoA from Chinese DNA has been issued. In parallel with the application of LoA, TQ power also prepared the on-site validation of the project. And in September 2007, DOE performed on-site validation. Subsequently, the CDM application of the project was going on smoothly.

From the analysis above, it can be concluded that Wugang had known about CDM in early 2004, and CDM played a crucial function on the decision of implement of the project. And from 2004 to 2008, real and concrete actions to secure registration as a CDM project activity have been continuously taken in parallel with its implementation.



Issue 4:

The barriers to the project activity without the CDM should be further substantiated and if the barriers cannot be further substantiated, an economic comparison of the proposed baseline and the project activity without the CDM must be conducted.

Response by TÜV SÜD:

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 (a), the IRR without CDM revenues is lower than the benchmark value. Thus it was concluded that the project is not attractive from a financial point of view.

Alternative (b) is importing the necessary electricity from the local grid.

Alternative (d) is the continued situation of the present state, which is the use of both electricity from the captive power plant (38.15% of the total) and electricity supplied from the grid (61.85% of the total). As concluded, alternative (d) needs no additional investment and faces no prohibitive barrier and is also most economically attractive, so it is considered as the baseline scenario.

Furthermore the NPV and levelized cost analysis have also been submitted by the PP for the three alternatives.

The analysis has been verified according to the excel spreadsheet provided which is based on the validated assumptions and figures in terms of costs, tariffs and financial parameters.

As a result of the assessment, it is further confirmed that alternative (d) is cheaper than the project activity based power. Thus the baseline scenario would be the continuation of the situation of both import from the grid and generation from the captive power plant. The NPV and levelized cost analysis is being submitted.

Response by the Project Participants:

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

According to the "Tool for the Demonstration and Assessment of Additionality" and calculations in PDD, the pre-tax equity IRR of the project without CDM revenue is 9.89% which is much lower than the benchmark of 11%. Based on the benchmark 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 benchmark of 11%. Therefore, the project activity undertaken without CDM faces obvious financial barriers which are overcome through the prospects of CER revenues.

The project is also additional as per the comparison analysis (NPV and Levelized Cost):

However, in order to further demonstrate that baseline scenario "the continuation of import of electricity from grid(61.85%) and the existing coal-fired captive power plant generating electricity(38.15%)" is the most economically attractive alternative, three scenarios (a) "the project activity undertaken without CDM", (b) "importing electricity from grid" and (d) "the continuation of import of electricity from grid(61.85%) and the existing coal-fired captive power plant generating electricity(38.15%)" by the comparative analysis of NPV and subsequent levelized cost has been compared. As for NPV analysis, the cost of the continuation of import of electricity from grid and the existing coal-fired captive power plant generating electricity (scenario (d)), the cost of importing electricity from grid (scenario (b)), and the cost of the project activity undertaken without CDM (scenario (a)) has been compared. To provide equivalent amount of electricity as scenario (d) / (b), the following components of the costs in scenario (a) has to be included: initial investment cost, annual operation cost and tax saving. The tax saving in three scenarios



are different because of different pre-tax deduction (depreciation has been considered in scenario (a) for tax saving calculation). Meanwhile, the levelized cost has also been calculated to further compare the above three scenarios.

The discounting rate in the three scenarios is the benchmark rate of 11%. Please find below comparative NPV and levelized cost.

Table 4 NPV and Levelized Cost of Three Scenarios

| Scenarios | NPV (Unit: 10,000 Yuan RMB) | Levelized Cost (Yuan RMB/kWh) |
|---|--------------------------------|----------------------------------|
| (a): the project activity undertaken without CDM | -10,890.32 | 0.8078 |
| (b): importing electricity from grid | -3,884.13 | 0.2881 |
| (d): The continuation of import of electricity from grid (61.85%) and the existing coal-fired captive power plant generating electricity (38.15%) | -3,284.35 | 0.2436 |

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

By the comparative analysis of NPV, it can be concluded that NPV for scenario (b) and (d) are both greater than that for scenario (a). Also for levelized cost, it can be concluded that the levelized cost of scenario (a) is much higher than that of scenario (b) and (d). In addition, NPV for scenario (b) is lower than that for scenario (d). Also for levelized cost, the levelized cost for scenario (b) is lower than that for scenario (d).

It can be concluded that the continuation of import of electricity from grid (61.85%) and the existing coal-fired captive power plant generating electricity (38.15%) (Scenario (d)) is the most economically attractive alternative. Therefore, it can be confirmed that the continuation of import of electricity from grid (61.85%) and the existing coal-fired captive power plant generating electricity (38.15%) (Scenario (d)) is indeed the baseline scenario.

Furthermore, considering the fluctuation of electricity price and annual operating cost in Table 2, it can be concluded as follows:

- For electricity price, the maximum annual increasing rate of 2.2% from 2002 to 2006 has been adopted for conservative purpose.
- For Annual operating cost, the minimum annual increasing rates of total operating cost is 6.78% from 2002 to 2006, it is conservative.

Therefore, the NPV and levelized cost of three scenarios with price fluctuations has been calculated as follows.

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

| Scenarios | Increasing rate | NPV (Unit: 10,000 Yuan RMB) | Levelized Cost(Yuan RMB/kWh) |
|--|---|--------------------------------|------------------------------|
| (a): the project activity undertaken without CDM | Minimum increasing rate of Annual operating cost is 6.78% | -12,891.46 | 0.9562 |
| (b): importing electricity from grid | Maximum increasing rate of electricity price is 2.2% | -4,433.63 | 0.3289 |
| (d): The continuation of import of electricity | Maximum increasing | -3,748.30 | 0.2780 |



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|--|-----------------------------------|--|--|
| from grid (61.85%) and the existing coal-fired captive power plant generating electricity (38.15%) | rate of electricity price is 2.2% | | |
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Note: More detail could be found in IRR calculation sheets.

It can be found in the above table, even with the fluctuation of electricity price and annual operating cost, scenario (d) is also the most economic attractive scenario.

It is clear that scenario (d) is the most economically attractive option; therefore, the baseline is indeed the continuation of import of electricity from grid (61.85%) and the existing coal-fired captive power plant generating electricity (38.15%).