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| | Rachel Zhang | Rachel .Zhang@tuev-sued.de | | | |

**Request for Review**

Dear Sirs,

Please find below the response to the review formulated for the CDM project with the registration number 2007. In case you have any further inquiries please let us know how we can kindly assist you.

Yours sincerely,

Rachel Zhang
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 to the investment analysis as per the guidance of EB 38 paragraph 54, in particular paragraph 54 (c).**

## Response by PP

The approved Feasibility Study Report (FSR) was the basic reference for investment decision. The FSR was completed on August 6, 2006 by the independent and certified "Hebei Electric Power Design & Research Institute"(It has obtained a "grade A" in electric power design industry issued by the Ministry of Construction of the People's Republic of China and a " grade A" in engineering investigation industry issued by the National Development and Reform Commission).

The FSR was approved on September 26, 2006 by Hebei Development and Reform Commission and two months prior to the start date of the project which was on November 28, 2006 when the equipment purchase agreement was signed. Therefore the input values from the approved FSR have not materially changed in the period between the approval of the FSR and the investment decision.

Except the feed-in-tariff, all input values are cited from the FSR of the project. On November 6, 2006, the project owner got the Reply Letter from Hebei Provincial Price Bureau on the Feed-in-tariff of Hebei Haixing 49.5 MW Wind Farm which demonstrated the approved tariff will be far lower than the expected tariff in FSR. Hence, the project owner decided to develop the project as a CDM project and signed the agreement with Hebei CDM Project Office on November 16, 2006.

In China, an approval letter of FSR is issued by the government only after the report passes the public assessment of the sector experts designated by the government. Therefore, the input values from the FSR of Haixing project had been confirmed by the specific local and sector experts (The FSR of Haixing project was approved on November 6, 2006 by Hebei Development and Reform Commission). Among all the values four are the key ones as below:

1) The Total Static Investment:

The first turbine of Haixing project was operated on April, 25, 2008 and the wind farm began to commercial operation in October, 2008. Therefore, the static investment at the time of the investment decision can be cross checked using the actual data.

According to the Audit Report[1] of Completion Budget of Haixing 49.5 Wind farm project, the actual total static investment is 547.05million yuan till November 30, 2008, which is higher than

[1] Audit Report of Completion Budget of Haixing 49.5 Wind farm project Issued by Hebei Zhengxiang Certified Public Accountants Co., Ltd on December 10, 2008.

541.06 million RMB in the PDD. Hence, the static total investment in PDD requesting for registration is conservative.

2) The Feed-In-Tariff

According to the approval letter for the tariff of the Renewable energy power projects in Hebei Province etc. by NDRC (FAGAiJIAGE[2007]No.1260), the Feed-in-Tariff of Haixing wind farm is 0.61yuan/kwh (including VAT) before the accumulated total utilization time reaches 30,000hours and after 30,000 hours, the wind farm will adopted the average feed-in-tariff of local power grid. So, the approved tariff is the same with the one in the PDD.

3) The annual O&M costs

The annual O&M costs mainly include maintenance costs, wage and welfare, material cost and other costs. The annual O&M cost in the PDD was coming from the FSR which has been confirmed by local sectors experts designated by Hebei Development and Reform Commission. According to the Study on the pricing policy of wind power in china[2], the Annual O&M cost /investment (O/I) is usually 1.5% in the first ten years and 2% in the other years. The O/M of the proposed project is 1.21% in the first five years and 1.71% in the other years. Therefore, the O&M cost are assumed to be conservative.

Furthermore, the annual O&M cost has very little effect on the impact of IRR. Therefore, it is an insensitive factor for the wind power projects, and its change can hardly impact IRR.

4) The Annual Power Supply

The operational hours of Haixing project is estimated to be 2323 hours per year. This value is mainly influenced by the turbine availability, grid availability and the wind speed. For the Haixing project, it is assumed in the PDD and FSR that the turbine availability and grid availability is maximized. So, the main factor to determine the output is the wind speed. The wind speed used in the FSR is sourced from the on-site wind data measurements from March of 2005 to March of 2006 and with reference of the historical wind speeds between 1971 and 2005 measured by Haixing Meteorological Station.

The calculations for the Haixing project are carried out using professional WASP software (www.wasp.dk) designed for wind energy, which is used by wind developers and turbines manufacturers worldwide.

In addition, A study[3] on wind power generation on seashore of Huanghua Area shows that the average annual operational hours is 2191hours, the maximum is only 2329hours and the minimum is 2148hours. Huanghua is adjacent to Haixing County (the geographic map from Google Earth is shown below) where the CDM project locates. The seashore located in two counties are all tidal flat and the two counties have the same effective wind power density[4]. So, the operational hours of Haixing project is optimistic value.

[2] Study on the Pricing Policy of Wind Power in China Issued by Chinese Renewable Energy Industries Association and Green peace on October,2006 Page 52,table 20

[3] Hebei Electric Technology, 2001,No.5, Page 2-3

[4] http://news.chinanewenergy.com/html/20081010/36750.html

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In a word, based on the facts listed above, the input values from the FSR are valid and applicable.

## Response by DOE

All input data except the tariff in the investment analysis are taken from FSR (Feasibility Study Report), which was completed in August 6, 2006. The project owner got the confirmation regarding the actual tariff from local price bureau on November 6, 2006 (IRL33 of the validation report). Lower tariff than that expected in FSR leads to a low IRR without financial attraction. After seriously considering CDM, the project owner made the investment decision of the proposed project along with the equipment contract signed (i.e. November 28, 2006). In other words, the date when the equipment purchasing contract has been signed is considered by the PP as the date to make the investment decision. The time between the completion of investment analysis and investment decision is very short and TÜV SÜD can confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed. Therefore, the requirements of part (a) of the EB38 §54 are fulfilled.

As mentioned above, the input values were consistently derived from the FSR, except the tariff. The applied tariff was evidenced by letter from Hebei Province Price Bureau (IRL33 of our validation report) and validated by NDRC Approval of tariff (IRL22 of our validation report). TÜV SÜD can confirm that the adopted one is appropriate and valid, hence, the requirements of part (b) of the EB38, §54 are also completely fulfilled for this project.

TÜV SÜD has experienced local experts to confirm that the input values from the FSR are valid and applicable at the time of the investment decision. The input values have also been vali-

dated by comparing the figures with statistical figures from 175 wind farm projects in China (registered or under validation).

**Total Static Investment**
It is presumed to be 541.06 million RMB in the FSR. The investment per MW was calculated at about 10.93 million RMB/MW, which are slightly higher than the average cost of 10 million RMB/MW. As the proposed project is the first wind farm constructed on tidal flat, additional cost were needed in order to dig deeper foundation for each power unit. The estimated investment in FSR is deemed to be reasonable, which has also been proven by Audit report of Completion Final Account from a third-party accounting firm. According to this audit report, the project completed the construction on August 7, 2008 and the actual static investment has reached 547.05 million RMB, higher than that of in the FSR. As evidence the audit report of completion final account has been checked by the local Audit team of DOE.

**Annual O&M costs**
It only accounts for 1.21% of total investment in the first five years and 1.71% in following years and does not treated as the sensitive parameter in the FSR. The statistic study published by Danish Wind Industry Association (http://www.windpower.org/en/tour/econ/oandm.htm) and Study Report of China Wind Farm Price Policy were used for the cross check. According to the first evidence, the range of the operation cost is around 1.5% to 2% per year of the investment. From the Study Report of China Wind Farm Price Policy, the operation cost is generally 1.5% of the investment in the first ten years and 2% in the following years. Therefore, the operational cost is considered to be plausible.

**Power supply of the plant**
The operation hour of the proposed project is 2323 hours. The load factor was calculated at 26.5%, which is slightly higher than the average load factor of Chinese wind parks based on TÜV SÜD's internal statistics (i.e. 25%), but still within standard deviation.The power supply of the proposed project is derived from 35years historical wind data from nearby Meteorological Station and 12 months on-site wind measurement. The long term wind data, on-site measured wind data and the 3rd party design institute, the Hebei Electric Power Design & Research Institute are considered to be reliable sources for the power projection. A study from nearby Huanghua area also justifies the estimated power supply of the project activity. The study was available for the local Audit team of DOE and the information has been checked. Annual power supply (114.999GWh/y) from FSR is deemed to be realistic and credible for this wind farm.

**Tariff**
In China, non-concession wind farm project will adopt the tariff approved by the government. According to the timeline of the project activity, the project owner got a letter regarding the tariff from Hebei Province Price Bureau on November 6, 2006 (IRL33 of the validation report) before the project owner made the decision to implementing the project with CDM. The local price bureau confirmed in its letter that the tariff of the proposed project is 0.61RMB/KWh (include VAT) for the first 30,000 operating hours and average tariff of local power grid dominated by coal-fired power plants after 30,000 hours. This tariff is also demonstrated by later tariff approval from NDRC (IRL22 of the validation report). Hence, TÜV SÜD deems that the applied tariff in the PDD is appropriate and valid.

In summary, TÜV SÜD checked the applied values thoroughly and based on its local and sectoral expertise, TÜV SÜD confirms that the criteria of EB38, §54 is also fulfilled successfully.

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## Question 2

**The DOE/PP are requested to justify the selection of "similar activities" in the common practice analysis considering that the total capacity of the project activity is 49.5 MW, which implies that a selection of projects in the range 25 - 75 MW would have been more appropriate.**

## Response by PP

According to the Statistics of Chinese Wind Energy Installed Capacity in 2006[5] all wind farm projects located in Hebei province are listed in the following table 1.

**Table 1 The project located in Hebei province and listed in the Statistics of Chinese Wind Energy Installed Capacity in 2006**

| Project Title | Commisioning Date | Capaci-ty(MW) | Notes |
|---|---|---|---|
| **Zhangbei huicailiang** | Dec,1998 | 9.85 | Early project |
| **Fengning yuershan** | Sep,2004 | 1.2 | Small test wind farm |
| **Chengde Hongsong** | Nov,2005 | 50.1 | Carbon financed |
| **Shangyi Damanjing** | July,2005 | 34.5 | Carbon financed |
| **Chengde Songshan** | Nov,2006 | 49.5 | CDM Project |
| **Chengde Huifeng** | Under construc-tion | 49.5 | Applying for CDM |
| **Shangyi Manjing East** | Sep,2006 | 49.5 | CDM Project |
| **Zhangbei Manjing** | Dec,2005 | 45 | CDM Project |
| **Kangbao Wolongtu-shan** | Oct,2006 | 30 | CDM project |
| **Zhangbei Mijiagou** | Dec,2006 | 49.5 | CDM Project |
| **Guyuan** | Under construction | 30.6 | CDM project |

Zhangbei Huicailiang is an early project which was operated before 2002. Fengning Yuershan is a small test wind farm and is different to the Haixing project which is a commercial wind farm applying for CDM. Therefore, except for Zhangbei huicailiang and Fengningyuershan, the projects listed in the table 1 are all considered as the similar project activities of Haixing project and is the same as these listed in PDD. Their installed capacities are in the range 30-50.1MW. When the installed capacity of the similar project activities is identified in the range 25-75MW, we will get the same result with the one in PDD.

[5] http://www.cwea.org.cn/download/display_info.asp?cid=2&sid=&id=19

Chengde Hongsong and Shangyi Damanjing met the standards of Voluntary Carbon Standard and have gotten the carbon financing from the Voluntary market. The other similar projects listed in the table 1 are either CDM projects or applying for CDM.
The existence of these similar projects in Table 1 does not contradict the claim that the proposed project activity is financially unattractive. Therefore, the proposed project activity is not the common practice.

**Response by DOE**

At the time of validation, the Wind farm Capacity Statistics 2006 from China Wind Energy Association is the latest available official data source which is used by the validation team for verification. TÜV SÜD found all wind farm projects listed in this statistics except Fengning Yuershan Windfarm (test project with 1.2MW capacity) and the projects operated before 2002 have been included into common practice analysis. The biggest installed capacity of operational wind farm projects in Hebei Province is only 51.5MW.The selection of the similar projects deems to be appropriate. Among indentified similar projects, most of the projects are CDM projects which have been verified by UNFCCC website. The remaining two projects: Chengde Hongsong wind project and Shangyi Damanjing project have enjoyed the financial support from voluntary carbon credits. Therefore TÜV SÜD can conclude that there are essential distinctions between the proposed project and existing similar projects (except those seeking CDM benefits) and the existing similar projects does not call into question that the proposed project is not the common practice.

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## Question 3

**The DOE is requested to further explain how it has validated the elimination of the alternatives to the baseline scenario of the project activity.**

## Response by PP

There are four steps to identify alternatives to the project activity:

1. Identification of the alternative scenarios.
2. Analyzing the technical feasibility of the alternative scenarios
3. Excluding options that do not comply with legal and regulatory requirements.
4. Identifying that among the alternatives that do not face any prohibitive barriers, the most economically attractive alternative should be considered as the baseline scenario.

**Step 1. Identification of the alternative scenarios.**
To provide the same output or services comparable with the proposed CDM project activity, these alternatives are to include:
**Alternative 1)** Construction of a fossil fuel-fired power plant with equivalent installed capacity.
**Alternative 2)** The proposed project not undertaken as a CDM project activity but as a commercial project.
**Alternative 3)** Construction of a power plant using other renewable energy with equivalent installed capacity
or annual electricity generation.
**Alternative 4)** Provision of equivalent annual power generation by the grid which the proposed project is connected to.

**Step 2 analyzing the technical feasibility of the alternative scenarios**

Besides wind energy, other kinds of energy like solar PV, geothermal, biomass and hydro are the possible grid-connected renewable energy technologies that could be applied in China. Due to the technology development status and the high cost for power generation, solar PV[6], geothermal[7] and biomass[8] of the similar installed capacity as the proposed project are alternatives far from being attractive investment in the grid in China. Only hydropower projects have the investment return rate that can compete over that of wind power projects in China. However, the hydro resource are located in the mountain regions in Hebei province[9] and the project area is located in plain[10]. there is no commercially exploitable hydro power resource which can provide same electricity generation output of the proposed project activity.Therefore, alternative3) is not feasible. Alternative 1)、2）、4）are all feasible in technology.

**Step3 excluding options that do not comply with legal and regulatory requirements.**

6 http://scitech.people.com.cn/GB/5347113.html
7 http://www.crein.org.cn/view/viewnews.aspx?id=20080131103909265
8 http://www.sdpc.gov.cn/zjgx/t20071123_174054.htm
9 http://www.newenergy.org.cn/Html/00811/11100822894.Html
10 http://www.czwmb.gov.cn/czgk/czgk.asp

According to the applicable laws and regulations of China, the alternative 1) should be eliminated, because it does not comply with the national regulation for controlling small scale coal-fired power plant. To provide the same output as the proposed project, the alternative coal power plant which has the capacity less than 50 MW, is categorized as the small scale coal power plant and should be shut down according to the regulations from The National Development and Reform Commission. According to this regulation[11], the coal power plant under 50 MW should be shut down and the construction of coal power plant under 135 MW will be forbidden within the connected area.

Therefore, alternative 1) is not feasible.

Both alternative 2) and alternative 4) are complying with the applicable laws and regulations.

**Step 4 Identifying that among the alternatives that do not face any prohibitive barriers, the most economically attractive alternative should be considered as the baseline scenario.**

Based on the Investment Analysis (**See B.5 in the PDD**), the proposed project is not financially attractive without the revenues of CERs. Alternative 2) is not feasible, thus not the baseline scenario.

In conclusion, the practical and feasible baseline scenario is Alternative 4), the provision of equivalent amount of annual electricity supply by the grid into which the proposed project is connected to. Therefore the baseline scenario of the proposed project is the provision of equivalent amount of annual electricity supply by the North China Power Grid.

## Response by DOE

As stated by the PP above, 4 technically feasible alternatives to the project activity have been identified in the PDD.

**Alternative 1: Construction of a fossil fuel-fired power plant with equivalent installed capacity.**

In China, coal-fired power plants under 135 MW are forbidden to construct (http://www.gov.cn/gongbao/content/2002/content_61480.htm). Hence alternative 1 is not in line with Chinese legal and regulatory requirements;

**Alternative 2: The proposed project without CDM**

Alternative 2 is not feasible due to lack of financial attraction. The IRR without CDM is only 6.38%, lower than the benchmark of 8% (see financial analysis in B.5 of the PDD).

[11] Notice on Strictly Prohibiting the installation of coal-fired generators with the capacity of 135MW or below issued by the general office the state council, decree no.2002-6

**Alternative 3: Construction of other renewable energy power plant with equivalent capacity or power output**

As per TÜV SÜD experience on power generation technology and resources in Hebei province and China, investing on solar PV, geothermal and biomass power plant has barriers due to higher costs and lack of financial attraction. In addition, shortage of relevant resources at project site and available technology are also main encumbrance for other renewable energy application. The technology to construct a solar PV power plant with the equivalent scale as the proposed project is not feasible at all in China. At present, the biggest solar PV power plant put into commercial operation in China (Shanghai Lingang solar PV power plant) is only 1.08MW with about 1 million KWh annual power output. For geothermal power plant, only high temperature geothermal resources above 150°C can be used for power generation, but the high temperature geothermal resources in China are mainly located in Tibet and Yunnan and the biggest installed capacity so far is only 25.18MW with 0.1 billion KWh annual power output. Therefore it is not feasible to construct a geothermal power plant at project site. For Biomass power plant, high cost of fuel source and technology difficulties such as high temperature corrosion on boiler and etc. prove to be not realistic choice for project owner. For Hydropower plant, the project site belongs to drought area and lack of water resources, it is also not a realistic choice.

**Alternative 4 Provision of equivalent annual power output by North China Power Plan**

TÜV SÜD confirms that only alternative 4 has no any barriers and can be taken as the baseline scenario of the proposed project which reasonably represents the anthropogenic emissions that would occur in the absence of the proposed project activity.

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## Question 4

**The DOE/PP are requested to justify the basis for changing the ex-ante emission factor from the original PDD submitted for stakeholder consultation to 1.0755 tCO2/MWh.**

## Response by PP

The ex-ante emission factor of 1.0205t$CO_2$/MWh in the original PDD submitted for stakeholder consultation was announced by NDRC on December 15, 2006 and the emission factor of 1.0755 t$CO_2$/MWh was announced by NDRC on August 9$^{th}$, 2007. In addition, the latest emission factor was announced on July 18$^{th}$, 2008, but the latest emission factor was under checking by DOE when the project was requested for registration in EB. Therefore, we adopted 1.0755 t$CO_2$/MWh as the emission factor in PDD according to the principle that the latest data should be applied.

## Response by DOE

The baseline emission factor adopted by the GSP version of PDD was 1.1205 t$CO_2$/MWh. The source was from NDRC issued on December 25th 2006. During the validation process, NDRC issued the new emission factors on August 9th 2007 and the OM and BM factor are 1.1208 t$CO_2$/MWh and 0.9397 t$CO_2$/MWh respectively. Based on this, the calculated baseline emission factor of wind farm projects is 1.0755 t$CO_2$/MWh. TÜV SÜD verified the calculation process of new NDRC emission factors and quoted data sources and concluded the values are conservative and applicable (see validation report Page 11). Therefore, PP was required to revise the PDD with the latest NDRC emission factors. The baseline emission factor in the PDD version of submission to registration is more conservative than that of GSP version and also in line with that published by DNRC. TÜV SÜD can confirm that it is reasonable and acceptable to adopt 1.0755 t$CO_2$/MWh as the baseline emission factor of the proposed project.