

To: UNFCCC Secretariat
Martin-Luther-King-Strasse 8
D-53153 Bonn
Germany

10th April, 2009

Dear Members of the CDM Executive Board,

Please find below our response to the issue raised by review of the **“Yichun Xiaochengshan Wind Power Project”** (UNFCCC Ref. No. 2312).

1. Further clarification is required on how the DOE has validated the credibility and appropriateness of the investment analysis, in particular, the discrepancy of the assumed tariff in the FSR (0.6176 RMB/kWh, excluded VAT) versus the tariff applied in the investment analysis (0.5622 RMB/kWh, excluded VAT).

Re:

The input values used in the investment analysis in the PDD are all sourced from the officially approved FSR, which was developed by the accredited consultancy institution (Xinjiang Windpower Design Institute) in April 2006, except the tariff. The tariff in PDD is from the propositional letter issued by the Planning and Statistic Bureau of Dailing District dated 20th December 2006 before the time of investment decision taken by the project owner on 30th December 2006, and prior to the project starting date (10th February 2007).

The credibility and appropriateness for the discrepancy of the assumed tariff in the FSR (0.6176 RMB/kWh, excluded VAT) versus the tariff applied in the investment analysis in PDD (0.5622 RMB/kWh, excluded VAT) could be illustrated below:

1. The tariff in FSR was assumed following the general two methods (the methods are described below) applied in China to determine the assumed tariff in the FSR. So it is reliable and credible along with the other critical parameter such as the total investment, annual O&M cost and annual power generation in FSR.
 - A) According to *NDRC Regulation about Wind Power Project Development*¹, the tariff in FSR was predicted following the principle that the tariff should ensure the Project IRR of the proposed project to reach the sectoral benchmark (8% for electric power industry) and guarantee the investment return rate. The assumed tariff in FSR is a critical point for the project developer to evaluate whether the project is financially attractive. This principle is appropriate for the special case when there is no public available reference about the tariff in certain province when the FSR was prepared.
 - B) If there is public available information such as the guiding tariff provided by the government, the designer would also refer to the tariff above to assess the economic feasibility of the project in the FSR.

For the proposed project, the design institute didn't obtain public available information in Heilongjiang province in April 2006 when the FSR was prepared, and thus adopted Method A to estimate the tariff of the proposed project in FSR.

2. Although the FSR has been approved by Heilongjiang DRC on 1st September 2006, according to the *NDRC Regulation about Wind Power Project Development*, the FSR approval from the

¹ NDRC Regulation about Wind Power Project Development, July 4th 2005, No. [2005]1204

government is an authorization of the legality of projects, including the exploit right of developer, the capacity of projects, the location and investment of projects. The actual tariff would be finally determined by PPA which was negotiated between the project owner and the grid company based on the guiding in-grid tariff from the government.

The guiding tariff of Chinese wind power project is based on *the Method for the Tariff of Grid-connected Electricity Generation from Renewable Sources and Management of Apportionment of Expenses*. This method gives a provision that the guiding tariff is confirmed by the price regulating department of the government by considering the status of the local wind resource, the status of the local economical development, the condition of the construction and the tariff obtained by competitive bidding process for tendering projects. By this principle, the government provided a guiding tariff according to the latest price level in the region, which was in the range of 0.5622-0.5806 RMB/kWh excluding VAT².

For the project owner, the guiding tariff from the government is an important factor for the negotiation with the Grid Company to get a contract tariff in the PPA. And this tariff is the latest and most reliable data when the investment decision was made. Hence the regional guiding tariff was more applicable than the assumed tariff in FSR, and had been used by the developer to make the investment decision. In conclusion, the tariff applied in the investment analysis in PDD reflected the actual situation the project developer facing when the investment decision was made.

2. *The DOE is requested to further clarify the suitability of the input values to the investment analysis as per the requirements of EB 38 paragraph 54(c) guidance.*

Re:

The all input parameters used in the financial analysis of this proposed project in PDD are taken from the feasibility study report (FSR) developed by Xinjiang Windpower Design Institute in April 2006 and approved by Heilongjiang Development and Reform Commission on 1st September 2006.

The FSR was approved on 1st September 2006, thus it is less than four months prior to the date when the investment decision was made on 30th December 2006. Given this relative short period of time between approval of the FSR and the decision to proceed with the project activity, it is unlikely in the context of the project that the input values except the tariff would have materially changed. The tariff in FSR was substituted by the more applicable guiding tariff. Thus, it is suitable to apply the values in FSR and the guiding tariff to make the investment decision to implement the project.

As per the requirements of EB 38 paragraph 54(c) guidance, the four major factors for investment analysis, i.e., total investment, annual electricity generation, tariff, and O&M cost have all been crosschecked with other independent evidences. Since the project has been put into operation in March 2008, we would like to crosscheck the parameters in investment analysis with the actual values of the proposed project.

Total investment

The total investment sourced from FSR, which was prepared by an independent qualified entity, and has been approved by Heilongjiang DRC. All the input values in the investment analysis are valid and applicable at the time when the investment decision was made. We have examined 4

² http://www.xlgl.gov.cn/ggfw/tzz/tscy/dian/200705/t20070525_11554.html
http://www.hebwj.gov.cn/upfiles/xy_col32gjc_20070718164220007126.htm
http://jgs.ndrc.gov.cn/zcfg/t20080218_192021.htm
http://jgs.ndrc.gov.cn/zcfg/t20080813_230722.htm

similar projects to the proposed project (listed in table 1) and calculated their investment per kW installed capacity. As table 1 indicated, compared with the data reported for other similar proposed CDM projects in the Heilongjiang province, the total investment is within the acceptable range. The average investment level is calculated as 9,157Yuan/kWh. With this investment ratio, the proposed project's IRR will be calculated as 5.82%, more lower than the benchmark requirement (spreadsheet attached as annex 1). So the total investment in FSR is credible and appropriate to make investment decision.

Tariff

Evidenced with the sales invoice, the actual executive tariff in electric power transaction is the same as the guiding tariff issued by the government which was adopt in PDD. Generally, the government guiding tariff (0.5622Yuan/kWh excluding VAT) should be applied within the 30,000 hour operation period. The tariff for the second period (i.e. after 30,000 hour operation) was guided to be the average tariff in Heilongjiang power grid. Currently, the average tariff in Heilongjiang province is 0.3226Yuan/kWh excluding VAT, so it is conservative to calculate the IRR regarding the tariff 0.3226Yuan/kWh in the second period as the same tariff 0.5622Yuan/kWh in first period.

O&M

The O&M cost sourced from FSR, which was prepared by an independent qualified entity, and has been approved by Heilongjiang DRC. All the input values in the investment analysis are valid and applicable at the time when the investment decision was made. Compared with the data reported for other similar proposed CDM projects in the Heilongjiang province, the O&M costs is within the acceptable range.

Table 1: Similar projects to the proposed project

No.	Project No.	Project	Average Ratio of annual O & M costs against investment	Investment per kW installed capacity (Yuan/kW)	Predicted Annual operation hour in FSR (h)
1	2200	Heilongjiang Huanan Hengdaishan West Wind Power Project	3.93%	8,276	2070
2	2056	Heilongjiang Huanan Hengdaishan east Wind Power Project	4.3%	8,809	2081
3	0906	Heilongjiang Huafu Muling Wind Farm Project	2.75%	11,185	2232
4	2035	Heilongjiang Yilan Maanshan Wind Power Project	3.58%	8,361	2070
			Average 3.64%	9,157	2113
	2312	Yichun Xiaochengshan Wind Power Project	3.9%	8,372	2038

We have also examined 4 similar projects to the proposed project (listed in table 1) and calculated their average ratio of annual O&M costs against the total investment. The average ratio is calculated as 3.64%. With this average ratio, the proposed project's IRR will be calculated as 7.01%, still lower than the benchmark requirement (spreadsheet attached as annex 2).

Average annual output

According to FSR, the annual output is estimated basing on the twenty-years weather statistic data from 1986 to 2005 provided by local meteorological station, first using professional software WAsP to select the rich wind source area, then using software WindFarm to optimize the location of each turbine for maximize power generation. This method and professional software have been used in many projects in China, so the calculated annual output is credible, accurate and appropriate to be used in the investment decision. Compared with the projects in table 1, the average annual operation hour is 2113, which is a little higher than the one in FSR of the proposed project. Even with the average annual operation hour, the project's IRR is 7.53%, which is still lower than the benchmark.

3. The DOE is further requested to clarify how it has validated the investment analysis, in particular, the inflation rate applied to the O&M costs, at the same time that the tariff is fixed throughout the 20-year investment analysis period

Re:

As our response to the former two questions, the appropriateness of the input values used in the investment analysis, including four major factors, i.e. the investment, the tariff, O & M costs and the generation output, had been seriously validated by DOE.

- 1) Particularly regarding the escalation for the O & M costs, further clarification are provided in the following:
 - a) The O & M costs of the project are composed of five kinds of costs - maintenance costs, annual salaries for the employees, insurance premium of fixed assets, material fee and other costs. The increase in the maintenance costs results in an increase in the O & M costs, as the rest parameters are set basically fixed in the operation period, as shown in table 2.

Table 2: The O & M costs of the proposed project (Unit: 10000 Yuan RMB)

Years	2	3	4	5	6	7	8	9	10	11	12	13
Maintenance costs	619	650	683	717	753	790	830	871	915	960	1008	1059
Annual salaries	140	140	140	140	140	140	140	140	140	140	140	140
Insurance premium	167	167	167	167	167	167	167	167	167	167	167	167
Material fee	49	49	49	49	49	49	49	49	49	49	49	49
Other costs	247	247	247	247	247	247	247	247	247	247	247	247
O & M costs	1222	1253	1285	1319	1355	1393	1432	1474	1517	1563	1611	1661

Years	14	15	16	17	18	19	20	21
Maintenance costs	1112	1167	1226	1287	1351	1419	1490	1564
Annual salaries	140	140	140	140	140	140	140	140
Insurance premium	167	167	167	167	167	167	167	167
Material fee	49	49	49	49	49	49	49	49
Other costs	247	247	247	247	247	247	247	247
O & M costs	1714	1770	1828	1890	1954	2022	2093	2167

- b) Based on economic evaluation code (Methodology and Parameters of Economic Evaluation on Construction Projects), economic evaluation in FSR should be conducted on fixed price level (i.e. benchmark price) throughout the whole operation period **without the influence of Price Inflation**. But the adoption of the fixed price level in FSR does not mean that the annual O&M cost could not be escalated. It has been clearly stated in the economic evaluation code that the maintenance costs could have a discontinuous change, with an increase over the operation period³.

Moreover, the Price Inflation is positive related with and the reflection of the macroscopic economy, because the GDP increasing rate was predicted to be over 7% in the future according to the Chinese National Development Programming⁴, the Price Inflation will increase accordingly. So it's conservative and appropriate to set the annual salaries for the employees, insurance premium of fixed assets, material fee and other costs fixed, **excluding the influence of Price Inflation**, in FSR.

Adoption of the escalating in maintenance cost has nothing to do with the inflation, and fully consistent with the evaluation code in China, i.e. under the benchmark price and could have a discontinuous increase during the operation period. The escalating in maintenance cost, in our opinion, is for the mechanical reason that the equipments should be aging.

- c) By examining the latest five registered CDM wind power projects from China at EB (listed in the table below), it is noted that 3 out of 5 projects have adopted an escalating operating cost method, which in China is also common.

Table 3: latest five registered CDM wind power projects from China at EB⁵

No.	Project No.	Project	Does the O & M cost escalate during the operation period?	Does the fixed tariff applied throughout the 20 years investment analysis period?
1	2021	Shandong Haiyang Qiwershan Wind Power Project	No	Yes
2	2149	Diaobingshan New-built 49.5MW Wind Power Station Project	Yes	Yes
3	1992	Expansion Project of Huadian Inner Mongolia Huitengxile Wind Farm	No	Yes
4	2018	Baihubao 33.75MW Wind Power Generation Project in Shanxi Province	Yes	Yes
5	2200	Heilongjiang Huanan Hengdaishan West Wind Power Project	Yes	Yes
			3 out of 5 projects	5 out of 5 projects

³ Methodology and Parameters of Economic Evaluation on Construction Projects

⁴ <http://finance.people.com.cn/GB/1037/4167363.html>

- d) Due to the short history of wind power development in China (only about ten years) and the unavailability of a unified national standard on valuing the operating costs. The operating costs (or O&M costs), particularly the maintenance costs included, have been usually predicted by the experienced experts in the design institutes based on the project-specific situation: e.g. climate, traffic condition, geographic factor etc. As the design institute for wind power projects contains a number of experts covering wide field (e.g. wind resource evaluation, generation optimizing, electricity transmission, construction and economic evaluation, etc), its FSR, itself is on the basis of expertise. FSR has also to be validated by the sectoral experts before it could be approved. Therefore, the technology applied and the values set in the FSR could be trusted.

In the operation period, the equipment will certainly be aging, the failure rate will increase, and some parts will be replaced, consequently the maintenance costs will have an increase. So the maintenance rate in FSR was increased annually, the suitability of the increasing rate has been approved by the experts panel and the Heilongjiang DRC.

- e) It is in our opinion that if a fixed rather than an escalating operating cost is used in the entire operation period in investment analysis, when the cumulative total operating expenses remain the same, the project's IRR will have a decrease. The reason is that the use of fixed operating cost will reduce net cash flow in the initial operation years, leading to the project's IRR decrease. For the proposed project, if the fixed O&M cost (16.26 Million RMB) is used instead, the Project IRR would be 6.66%, lower than the original value 6.95% (spreadsheet attached as annex 3). Therefore, adoption of escalating O & M costs deems to be conservative.

Given above that compliance with the economic evaluation code in China, the conservativeness of with an escalating O & M cost, and the comparison with other wind power projects, the adoption of an escalating O & M cost and the value of the O&M cost are all appropriate.

- 2) The reason for the adoption of fixed tariff throughout the 20-year investment analysis period is analyzed below:
- a) Generally, the government guiding tariff (0.5622Yuan/kWh excluding VAT) should be applied within the 30,000 hour operation period (first period). The tariff for the second period (i.e. after 30,000 hour operation) was guided to be the average tariff in Heilongjiang power grid.
 - b) The tariff in the first period is the tariff determined in PPA, it is a contract tariff and has legal effect, so it will definitely remain unchanged in the contract period.
 - c) Moreover, According to *Trend for Chinese Wind Power Tariff*, since 2002, the tariff for wind power projects in China is fleetly decreasing because of the implementation of tendering mechanism and the localization of the wind turbines production, which consequently decreased the investment cost of the wind farms. Under a full-competent commercial environment, the wind power in-grid tariff is gradually lowering down⁶. Hence, to set the tariff in first period as stable is conservative.
 - d) Currently, the average tariff in Heilongjiang province is 0.3226Yuan/kWh excluding VAT, so it is conservative to calculate the IRR regarding the tariff

⁵ <http://cdm.unfccc.int/Projects/registered.html>

⁶ *Trend for Chinese Wind Power Tariff*, published in 2005, by expert Liangzhipeng.

- in the second period as the same tariff in first period.
- e) The result of tariff sensitivity analysis shows that the needed tariff after 30000-hour operation (second period) to reach the benchmark of 8% should increase 94.5% (spreadsheet attached as annex 4). That means the needed tariff after 30,000-hour operation should reach up to 0.6247 RMB/kWh (excluding VAT) if the IRR reach the benchmark.

However, Heilongjiang power grid is dominated by the thermal power plants. The thermal power generation in 2006 is 183,890,005MWh which constitute 93.6% of the total power generation, and more than the proportion 91.7% in 2005, so the average tariff in the grid should also be dominated by the thermal power tariff. Furthermore, the benchmark thermal power tariff in Heilongjiang is only 0.30RMB/kWh (including VAT) and 0.305 RMB/kWh (including VAT) only increased by 0.005 RMB/kWh per two years due to the fuel price increasing or Price Inflation, the benchmark thermal tariff twenty years later can be only increased to 0.355 RMB/kWh calculated at this rate, so it is very unlikely for the actual tariff after 30000-hour operation for the project to have a increase from 0.3226 RMB/kWh to 0.6247 RMB/kWh.

- f) As table 3 shown, most of the wind projects in China adopted the fixed tariff in FSR.

In conclusion, it is credible and appropriate to apply a fixed tariff without the influence of Price Inflation throughout the investment analysis period.

Best regards,

Guo Huidong
Longyuan (Beijing) Carbon Asset Management Technology Co.,LTD.
Add: Floor 7, Tower C, International Investment
Building, No.6-9 Fuchengmen North Street,
Xicheng District, Beijing 100034, P. R. China
Tel: 01066091321