



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

DET NORSKE VERITAS
CERTIFICATION AS
Climate Change Services
Veritasveien 1
NO-1322 Høvik
Norway
Tel: +47-6757 9900
Fax: +47-6757 9911
<http://www.dnv.com>
NO 945 748 931 MVA

Att: CDM Executive Board

Your ref.:
CDM Ref: 2312

Our ref.:
JDMA/MARFI/BRINKS

Date:
23 April 2009

Response to requests for review of the project “Yichun xiaochengshan wind power project” (CDM Reference No. 2312)

Dear Members of the CDM Executive Board,

We refer to the requests for review raised by three Board members regarding project activity “Yichun xiaochengshan wind power project” (UNFCCC reference number 2312) and would like to provide the following initial response to the issue raised.

Question 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).

DNV response:

DNV has verified all the input values used for the IRR calculations in the PDD submitted for registration. By checking the FSR and relevant approval of the FSR, it has been confirmed that the input values like total investment, operational lifetime, annual O&M expenses, installed capacity, estimated annual electricity generation, rate of residual life of the assets, taxes etc. have been sourced from the feasibility study report (FSR) developed by an accredited designing institute (Xinjiang Wind Power Design Institute) in April 2006¹ and approved by the Development and Reform Commission of Heilongjiang Province on 1 September 2006.

*DNV has validated the credibility and appropriateness of the investment analysis as follows:
Step 1: Assess the sources of the input parameters and confirm the consistency of the values*

All input parameters except the tariff used in the financial analysis of the proposed project activity are taken from the feasibility study report (FSR) developed by the Xinjiang Wind Power Design Institute in April 2006¹ and approved by the Development and Reform Commission of Heilongjiang Province on 1 September 2006. The tariff is sourced from the propositional letter of the Planning & Statistical Bureau of Dailing District in Yichun City issued on 20 December 2006². Information contained in the FSR and the propositional letter can thus be considered

¹ Xinjiang Wind Power Design Institute, Feasibility Study Report, April 2006

² Planning & Statistical Bureau of Dailing District, propositional letter, 20 December 2006

information provided by an independent and recognised source. It is verified and deemed reliable that this information was available at the time the decision was made to proceed with the project activity (i.e. the start date when the construction contract was signed on 10 February 2007).

DNV has compared the input parameters for the financial analysis included in the PDD with the parameters stated in the FSR and the propositional letter and was able to confirm that the values applied are consistent.

Step 2: Assess the period of time between the finalization of the FSR and the investment decision

The FSR was approved on 1 September 2006 and the propositional letter was issued on 20 December 2006, less than five months prior to the decision to proceed with the project activity (i.e. the start date of the project) which was on 10 February 2007. Given this relative short period of time between the approval of the FSR, the issuance of the propositional letter and the decision to proceed with the project activity, it is unlikely in the context of the project that the input values would have materially changed. It is thus reasonable to assume that the FSR and the propositional letter have been the basis for the decision to proceed with investing in the project.

Step 3: Cross-check the parameters used in the financial analysis with the parameters used by other similar projects

The input parameters used in the financial analysis, such as investment costs per MW, electricity tariff, PLF and percentage of O&M costs relative to total investment costs, were compared with the data reported for other similar proposed CDM projects in the Heilongjiang Province. Hence, DNV was able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project.

For the issues regarding 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), DNV would like to provide the following clarification:

In general, when necessary information regarding the tariff for wind power in the region is not available to the public, the tariff used in the FSR is determined according to the relevant method for the compilation of the FSR for wind power projects. As stated in the Method of Compiling Pre-Feasibility Study Report for Wind Power Projects issued by NDRC of China on 30 September 2003³, the tariff is determined by considering the financial benchmark rate of return and relevant requirements.

The FSR for the proposed project activity was developed in April 2006 according to rules for designing FSRs for wind farms⁴, a FSR guidance document⁵ and a national standard⁶. As confirmed by experts in renewable energy⁷ in China, the determination of the tariff in the FSR for wind power projects is generally governed by two main factors, namely i) the time of FSR preparation and ii) the availability of public information related to wind power prices in the region.

³ Method of Compiling Pre-Feasibility Study Report for Wind Power Projects issued by NDRC of China on 30 September 2003

⁴ Methodology of Feasibility Study Report on Wind Farm Project (Document No. DRC Energy [2005]899) http://www.windpower.org.cn/news/links/js_2005_0525_3.pdf

⁵ Methodology and Calculation Standard of Budget Estimation on Feasibility Study Report of Wind Farm Project (Document No. DRC Energy [2005]899) (http://www.windpower.org.cn/news/links/js_2005_0525_2.pdf)

⁶ Methodology of wind energy resource assessment for windfarms, (<http://www.cechina.cn/eletter/standard/wind/GBT18710-2002.pdf>) and Methodology of wind energy resource measurement for windfarms, (<http://www.windpower-china.cn/files/GBT%2018709-2002.pdf>)

⁷ Hongliang Xu (Wind Power Expert, Deputy Chairman of Wind Power at Tsinghua University, Board Chairman of China Fulin Windpower Engineering Co., Ltd), Xiaosheng Yang (Renewable Sources Electricity Generation Specialization Committee) and Zhihong Wei (Professor, Institute of Nuclear and New Energy Technology, Tsinghua University) explained the tariff formation process in FSR

However, at the time the FSR for the proposed project was prepared in 2006, general documents on the price determination, such as the unified guiding price information for the assessment of the feasibility of wind projects in Heilongjiang province, were not publicly available. Thus, DNV has confirmed by checking the FSR of the proposed project, that the tariff for the specific project activity is the tariff at which the project IRR reaches the benchmark rate of return of 8% of the electric power industry³. As clarified by the renewable energy experts, a tariff of 0.6176 RMB/kWh is needed so that the IRR of the project reaches the benchmark of 8% and the project becomes financially attractive.

The tariff in the financial analysis in the PDD submitted for registration is the actual tariff used for assessing the financial attractiveness of the project. The propositional letter issued by the Planning & Statistical Bureau of Dailing District in Yichun City on 20 December 2006 specified that the tariff will be 0.5622 RMB/kWh (excluding VAT)², and this tariff was considered in the investment analysis presented in the PDD. This value was determined by taking into account the regional wind resources, power grid status, local economic development and the construction condition of the proposed project.

As confirmed by the Method for the Tariff of Grid-connected Electricity Generation from Renewable Sources and Management of Apportionment of Expenses issued by NDRC of China on 4 January 2006, the tariff of Chinese wind power projects is based on the guiding tariff of the government. The price regulating department of the State Council confirms the guiding tariff to be in accordance with the tariff obtained by competitive bidding. In recent years, the price regulating department of the State Council has started to confirm the local guiding tariff for wind power projects in particular regions by considering the status of the local wind resource, the status of the local economical development, the condition of the construction and other comprehensive index and referring to the tariff obtained by competitive bidding at the same time. The guiding tariff will be the basis for the tariff negotiated between the project owner and the grid company.

The price documents issued by the government respectively on 18 April 2007, 9 June 2007 and 3 December 2007 show that the guiding tariff of other similar wind projects in the same power grid is 0.5622-0.5806 RMB/kWh (excluding VAT)⁸. Hence, the tariff proposed by the local price department is comparable and very close to the tariff of the proposed project activity.

Furthermore, it is worth to mention that the actual tariff of the project activity of 0.5622 RMB/kWh (VAT excl.) in the purchasing power agreement (PPA) signed in July 2008 is negotiated by the project owner and the Northeast Grid Company based on the guiding tariff of 0.5622 RMB/kWh (VAT excl.) endorsed by the Notice of NDRC dated 23 July 2008⁹.

However, since the guiding tariff for the project was not yet issued by the government at the time of the investment decision for the proposed project, it is considered to be applicable and credible that the tariff for decision is adopted as the estimated electricity tariff of 0.5622 RMB/kWh (excl. VAT), issued by the Planning & Statistical Bureau of Dailing District in Yichun City on 20 December 2006.

It is in DNV's opinion that all the input values and investment analysis in the PDD is appropriate and credible. In particular, the tariff is appropriate for the analysis of the proposed project's economical feasibility at the time of investment decision.

⁸ http://www.xlgl.gov.cn/ggfw/tzz/tscy/dian/200705/t20070525_11554.html
http://www.hebj.gov.cn/upfiles/xy_col32gjc_20070718164220007126.htm
http://jgs.ndrc.gov.cn/zcfg/t20080218_192021.htm

⁹ http://jgs.ndrc.gov.cn/zcfg/t20080813_230722.htm

Question 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.

DNV response:

All the input values to the investment analysis are cross checked according to the requirements of EB 38 paragraph 54 (c) as follows:

Based on the sector expertise and database public available, the input parameters used in the financial analysis were compared with the data reported for other similar proposed CDM projects in the Heilongjiang Province, such as investment costs per MW, electricity tariff, annual power output and percentage of O&M costs relative to total investment costs. Thus, DNV was able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project.

Since the tariff has been further clarified above, other key parameters such as investment cost, O&M cost, the annual power output (PLF) are further cross-checked and clarified as follows:

Investment cost:

Referring to the bulletin of State Electricity Regulatory Commission on 27 September 2007, the average investment cost per capita of the wind power projects is 9 266 RMB/kW. The investment cost per kilowatt of wind power projects with a unit capacity of 1.5 MW is 9,791 RMB/kW. For the proposed project with a unit capacity of 0.85 MW, the investment cost per kilowatt is 8 579 RMB/kW. It is demonstrated that the investment cost per kilowatt for the proposed project is lower than the average investment cost per capita of the wind power projects in China and this is conservative.

O&M cost:

The average O&M cost for the proposed project is calculated as 3.95% of the investment cost. By checking other similar wind power projects in the Heilongjiang province, the average investment cost range from 2.75% to 4.3%. Thus, that the O&M cost of the project activity is considered to be reasonable.

The annual power output:

It is known that the wind power output is not only based on the installed capacity of the proposed project, but depending on the wind resources and wind speed at the project site, the arrangement of the wind turbine generators etc.

DNV can confirm that the annual electricity output in the FSR is estimated based on the 20 year weather statistic data from 1986 to 2005, which was obtained through the professional software 'WAsP' to determine the richest wind source area and through the software 'WindFarmer' to optimize the location of each turbine in order to maximize the power generation. The annual power output is positive correlative with the wind speed and as confirmed by FSR analysis, the average wind speed tendency was decreasing over the past twenty years (1986-2005).

By checking Methodology of Feasibility Study Report on Wind Farm Project (Document No. DRC Energy [2005]899) and Methodology of wind energy resource assessment for wind farms (GBT18710-2002), it is confirmed that the output assessment in the FSR is in line with the requirements of the regulations.

Thus, DNV can confirm that all the input values to the investment analysis have been validated as per the requirements of EB 38 paragraph 54(c) guidance.

Question 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.

DNV response:

As clarified above, all input values (such as tariff, investment cost, O&M cost and the generation output) used in the investment analysis have been validated and DNV can confirm that all input values in the investment analysis are valid and appropriate at the time when the investment decision was made.

The O&M cost escalation rate is not related to inflation, but to technical issues related to increased maintenance costs for aged wind mills compared to newer wind mills. This is considered to be reasonable and clarified as follows:

The method for the adoption of O&M cost escalation rate based on the fixed price assumption for the financial analysis is in line with the relevant regulations in China

It is common practice that O&M costs include maintenance costs, annual salaries for the employees, insurance premium of fixed assets, material fee and other costs. All costs mentioned above are from the FSR of the proposed project activity, which was approved on 1 September 2006. This has been confirmed by DNV during the validation phase.

Among the above costs, all data was fixed during the project's operational lifetime except the maintenance cost. It was clearly stated in the FSR that maintenance cost will be 1.5% of investment cost for the 1st year of operation, $1.5\% \times 1.05$ for the 2nd year, $1.5\% \times 1.05^2$ for the 3rd year, $1.5\% \times 1.05^{n-1}$ for the nth year and $1.5\% \times 1.05^{19}$ for the 20th year.

In document "Methodology and Parameters of Economic Evaluation on Construction Projects (third edition)", it was mentioned that the economic evaluation is conducted on fixed price level (i.e. benchmark price) throughout the whole operation period, which is not considering the influence of inflation. It is also mentioned that the maintenance costs could have a discontinuous change, with an increase over the operation period. This implies that variable O&M can be selected for investment analysis. Actually, the materials and salary for employee has been increased in recent years in China. DNV was able to confirm that the escalation of O&M for investment analysis in FSR of the project is fully consistent with the relevant regulations in China.

Comparison with other projects in investment analysis approach

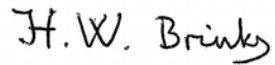
By comparing the latest five registered CDM wind power projects in China, it is demonstrated that three of them adopted an escalating operating cost method. The detail information has been stated in the project participant's response and DNV has checked the relevant information available on the UNFCCC website. Therefore, DNV considered the O&M escalation selection is appropriate.

If the O&M cost of the proposed project is assumed to be fixed during the entire operation period at the average of the O&M costs for the 20 year period, the IRR will decrease from 6.95% to 6.66%. Therefore, it is considered to be more conservative to adopt the method of escalating O&M costs rather than using fixed O&M costs.

Based on above explanation and justification, DNV can be able to confirm that the escalating O&M cost based on the fixed price used for investment analysis are in compliance with the relevant regulations in China and considered to be appropriate.

We sincerely hope that the Board accepts our aforementioned explanations.

Yours faithfully
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Hendrik W. Brinks
Technical Director for CDM
Climate Change Services



Ma Jiandong
Project Manager
Climate Change Services