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Att: CDM Executive Board

Your ref.:

Our ref.:

Date:

CDM Ref 1792

MLEH/HP

28 September 2009

Response to requests for review of project activity “Hebei Shangyi Manjing North Wind Farm Project” (1792)

Dear Members of the CDM Executive Board,

We refer to the issues raised by the requests for review by three Board members regarding project activity 1792 “Hebei Shangyi Manjing North Wind Farm Project” and would like to provide the following initial responses to the issue raised.

Comment 1: The DOE is requested to explain the suitability of the tariff used in the investment analysis and the reasons for the decline in tariffs applicable to wind projects exporting electricity to the same grid, and provide an opinion as to whether the net return to the investor has been reduced as a result of the reduction in tariffs, or whether the net return has been unaffected as a result of other changes such as investment costs.

DNV Response:

1) Suitability of the tariff used in the investment analysis

DNV checked the tariff notifications^{1 2 3} issued by NDRC to confirm that the tariff of wind farm projects was referred to as a two-phase tariff: a first phase tariff within 30,000 hours of operation and a second phase tariff after 30,000 hours of operation. The first phase tariff will be set fixed as approved by NDRC, and the second phase tariff should be the average tariff of the local grid, which is significantly lower than the first phase tariff.

At the time the FSR was being compiled in June 2007, the proposed project had not received the tariff approval yet. The latest available on-grid tariff of the nearby wind farms in Hebei province was approved as 0.54 RMB/kWh by NDRC on 8 June 2007¹. Hence the latest approved on-grid

¹ Fa Gai Neng Yuan [2007]1260

² Fa Gai Jia Ge [2007]3303 by NDRC dated 3 December 2007

³ Fa Gai Jia Ge [2008]1876 by NDRC dated 23 July 2008

tariff of 0.54 Yuan/kWh (including VAT) was used as the estimated tariff in the FSR of the proposed project. The tariff of 0.54 RMB/kWh was used in the investment analysis in the PDD for the whole operational lifetime (both of the first phase and the second phase), which was considered to be conservative and appropriate by DNV. Additionally, in the two subsequent tariff notifications by NDRC on 3 December 2007² and on 23 July 2008³, the tariff of wind farms in the same area in Hebei province was maintained at 0.54 RMB/kWh, indicating that the assumed first phase tariff is suitable for the investment analysis.

For the second phase tariff, China Electricity Price executive report 2007 issued by State Electricity Regulatory Commission of People's Republic of China was verified by DNV to confirm that the average on-grid tariff of Hebei province in 2007 was 0.3453 Yuan/kWh⁴, lower than that (0.54 RMB/kWh) used as the second phase tariff in investment analysis in the PDD, which was considered to be conservative.

All evidences have been provided and verified, and DNV considers that 0.54 RMB/kWh, the most recent tariff available at the time of preparing the FSR, is reasonable and conservative to be used in the investment analysis in the PDD.

2) Reasons for the decline in tariffs applicable to wind projects exporting electricity to the same grid, and provide an opinion as to whether the net return to the investor has been reduced as a result of the reduction in tariffs, or whether the net return has been unaffected as a result of other changes such as investment costs

The wind farm projects located in Hebei Province, having the similar grid structure, geological and transportation conditions, as well as similar economic developing status, will be connected to the Hebei Grid. The approved electricity tariffs of all wind farms built or under construction are listed in the following table⁵.

Year	Project title	Tariff (with VAT) Yuan/kWh	Reference
prior to March 2002	Zhangbei Changcheng 9 MW wind farm (construction finished in 1998) ⁶	0.65	Ji Jia Ge ⁷ [2002]242 issued by NDRC in February 2002
	Chengde Hongsong 3.6 MW wind farm (construction finished in 2001) ⁸		
March 2002	the Electric Power Sector Reform Program		
2006	Chengde Hongsong wind farm	0.6	Ji Jia Guan Zi [2006]57 ⁹ issued by Price Bureau of Hebei province In June 2006
	Guohua Shangyi Manjing wind farm	0.6	
	Hebei Shangyi Manjing East Wind Farm	0.6	

⁴ China Electricity Price executive report 2007 issued by State Electricity Regulatory Commission of People's Republic of China

⁵ The report of statistics of wind power installed capacity in China (2007) by Professor Shi Pengfei

⁶ <http://www.wp-forum.cn/ArticleShow.asp?nid=2713E111-173F-4C22-A6FF-CEB7719F4ABB>

⁷ <http://www.fjjg.gov.cn/fjwj/jgfw/gjjgzc/webinfo/2002/02/1187774415686122.htm>

⁸ <http://hbrb.hebnews.cn/20050617/ca503582.htm>

⁹ http://www.hebwj.gov.cn/upfiles/xy_col13super_20060703152016007126.htm

	Zhangbei Manjing Wind Farm	0.6	
	Zhangbei Mijiagou 49.5 MW Wind Farm	0.6	
	Hebei Kangbao Wolongtushan 30 MW Wind farm	0.6	
2007	CECIC HKC Danjinghe Wind Farm	0.5006	2008 Wind Power Report ¹⁰
2007	Guyuan 30.6 MW Wind farm	0.54	Fa Gai Jia Ge [2007]1260 ¹ issued by NDRC in June 2007
	Hebei Shirensan Wind farm	0.54	
	Hebei Chengde Songshan Wind farm	0.54	
	Hebei Wanquan Yulong Wind farm	0.54	
	Hebei Yuxian Kongzhongcaoyuan 49.5MW Wind Farm Project	0.54	
	Hebei Chongli Qingsanying 49.3 MW Wind Farm	0.54	
	Hebei Haixing 49.5MW Wind Farm	0.61	
2007	Hebei Shangyi Manjing West Wind Farm	0.54	Fa Gai Jia Ge [2007]3303 ² issued by NDRC in December 2007
	Hebei Weichang Zhangjiawan Wind farm	0.54	
	Hebei Weichang Longyuan Construction Investment Shanwanzi Wind farm	0.54	
2007	Hebei Chengde Yudaokou wind Farm	0.551	2008 Wind Power Report ¹⁰
2008	CECIC Zhangbei Dayangzhuang Wind Farm	0.54	Fa Gai Jia Ge [2008]1876 ³ issued by NDRC in July 2008

In March 2002, the State Council issued the Notice of Electric Power Sector Reform Program to undertake the power sector reform in China. The reform was to divide the former single national power company into regional companies and separate generation and distribution responsibilities, and also market forces were introduced into the industry.

Before the Electric Power Sector Reform Program in March 2002, there were two experimental wind farms (Changcheng Wind Farm with capacity of 9 MW and Chengde Hongsong Wind Farm Phase I with capacity of 3.6 MW) in the Hebei province. As first of this kind, the tariff (0.65 Yuan/kWh, VAT included) of these two projects, approved by the Provincial Administration Bureau⁷ is not comparable to subsequent projects.

According to the notification issued by NDRC on 4 July 2005, it is stipulated that the rate of domestic production of wind turbines should not be less than 70%¹¹. Under this rule, the domestic production of wind turbines in China was encouraged which resulted in a production increase of wind turbines and relatively lower production costs of domestic manufacturers in terms of same

¹⁰ 2008 Wind Power Report

¹¹ <http://www.86wind.com/info/detail/34-6754.html>, Fa Gai Neng Yuan [2005]1204

model (capacity) compared to the costs of imported turbines. The increase of domestic production is also of benefit to the reduction of maintenance costs of wind power plants.

At the same time, to further encourage the wind power development, in March 2007 the state council issued Enterprise Income Tax Law with a decrease of income tax rate from 33% to 25%¹².

Along with the government's policies to promote the wind power industry, the development of wind farm projects in China has rapidly increased and thus the investment cost for wind farms have declined in relative terms. Local government issued tariff notification with tariff of 0.60 Yuan/kWh in 2006. In June 2007 NDRC reassessed the price level of the feed-in tariffs and issued the new tariff notifications [Fa Gai Jia Ge [2007]1260]¹ with a tariff of 0.54 Yuan/kWh. After these notifications, the consequent notifications [Fa Gai Jia Ge [2007]3303]² in December 2007 and [Fa Gai Jia Ge [2008]1876]³ in July 2008 showed that the tariff is kept stable as 0.54 Yuan/kWh in Hebei Province.

Based on the information presented above, it can be concluded that most of projects in Hebei province have received the same tariff after 2007, 0.54 RMB/kWh, which has been unified till now. However, a few projects were installed in the early years which received slightly higher levels of feed-in tariffs. The possible reasons for the slight reduction in the tariff are the maturing of the sector, the introduction of domestic turbines, and the stated policy of encouraging the increased competitiveness of wind compared to conventional fossil fuel generation. The changes in the tariff have not had an adverse affect on the economic viability of these projects. There have been a large volume of projects.

Therefore, the validation team is of the opinion that the net return has not been materially affected due to other changes discussed above. On the contrary, the incentives on investment of wind power projects have been increased and there are large quantities of wind power projects have gone ahead in the most recent years.

Furthermore, even if the highest previous tariff of 0.61 RMB/kWh in Hebei province since the Electric Power Sector Reform Program is used in the investment analysis of the proposed project, the IRR would be 7.25%, still lower than the benchmark. The IRR is calculated as follows:

1. The first phase tariff as 0.61 Yuan/RMB (the highest previous tariff of 0.61 RMB/kWh in Hebei province since the Electric Power Sector Reform Program)
2. The second phase tariff is referred to 0.3453 Yuan/kWh, which was consistent with the average on-grid tariff of Hebei province in 2007⁴

The IRR calculation is provided and verified to be appropriate. In addition, the IRR will touch the benchmark if the tariff is assumed to be 0.645 RMB/kWh.

Above all, DNV considers that the applied tariff to the proposed project can be appropriate and conservative to assess the additionality of the proposed CDM project activity, and the incentives for investment in wind farms are not reduced.

Comment 2: The DOE should further substantiate the validation of the following input values in line with VVM para. 111 (c) and 112 (a): total investment, O&M costs and tax rates.

VVM paragraph 111 (c): On the basis of its specific local and sectoral expertise, confirmation is provided, by cross-checking or other appropriate manner, that the input values from the FSR are

¹² Enterprise Income Tax Law issued by State Council dated 16 March 2007

valid and applicable at the time of the investment decision.

VVM paragraph 112 (a): Describe in detail how the parameters used in any financial calculations have been validated.

The project IRR of the proposed project activity is 6.5% (after tax) without CDM, which is lower than the benchmark of 8% (after tax). This shows that the project is not financially attractive for investors. According to the VVM paragraph 111 (c) and paragraph 112 (a), DNV has validated the input parameters used in the investment analysis as follows:

Step 1: Assess the sources of the input parameters

A Feasibility Study Report (FSR) in China is required to be developed by a third party accredited for this task directly by the government. An approval letter of the FSR is issued by the government only after it passes the public assessment of the sector experts designated by the government. It is DNV's opinion that a FSR can be regarded as an accurate and trustworthy source of information coming from a recognized entity once it has the approval letter from the government.

All the input parameters used in the financial analysis of this project activity are taken from the FSR developed by Beijing Jikedian Renewable Energy Development Center in November 2007 and approved by Development and Reform Commission of Hebei Province on 27 February 2008¹³. These evidences have been provided to DNV during the validation phase.

Step 2: Confirm that the values used in the PDD are fully consistent with the FSR

DNV compared all the input parameters for the financial analysis included in the PDD with the parameters stated in the FSR and was able to confirm that all the values applied are consistent with the value stated in the FSR. DNV was able to confirm the validity and reliability of these evidences.

Step 3: Assess the period of time between the finalization of the FSR and the investment decision

The FSR was developed by Beijing Jikedian Renewable Energy Development Center in November 2007 and approved by Development and Reform Commission of Hebei Province dated 27 February 2008¹³. The starting date of the project is on 20 March 2008, which is the date when the wind turbines purchase contract was signed. Given the sufficiently short time of one month between the starting date of the project activity and the approval of the FSR, it is reasonable to assume that the FSR has been (a) the basis of the decision to proceed with the investment in the project and that, (b) it is unlikely in the context of the underlying project activity that the input values would have materially changed.

Step 4: Cross-check the parameters used in the financial analysis with the parameters used by other similar projects

Step 4a: Cross-check the total investment cost, the O&M cost and the O&M cost relative to total investment cost

DNV cross-checked the total investment cost, the O&M cost and the O&M cost relative to total investment cost with the data reported for other similar proposed CDM projects with same and

¹³ Feasibility Study Report (FSR) of the proposed project by Beijing Jikedian Renewable Energy Development Center in November 2007 and the approval letter by Development and Reform Commission of Hebei Province dated 27 February 2008.

similar total installed capacity (49.5MW and 49.3MW) and generation technology in the Hebei Province, as shown in the following table:

reference No	project title	installed capacity (MW)	investment (million yuan)	O&M cost (million yuan)	O&M cost/investment
0842	Hebei Shangyi Manjing East Wind Farm Project	49.5	468.66	23.0	4.91%
0845	Zhangbei Mijiagou 49.5 MW Windfarm Project	49.5	481.42	10.1	2.10%
0877	Hebei Chengde Songshan Wind Farm Project	49.5	411	17.0	4.14%
1855	CECIC Zhangbei Dayangzhuang Wind Farm Project	49.5	378.17	13.82	3.65%
1873	Hebei Chengde Huifeng Windfarm Project	49.5	534.525	12.4	2.32%
2040	Hebei Shangyi Manjing West Windfarm Project	49.5	455.668	12.43	2.73%
2067	Hebei Shirensan Wind Power Project	49.5	490.44	25.53	5.21%
2088	Hebei Yuxian Kongzhongcaoyuan 49.5MW Wind Farm Project	49.5	522.95	10.75	2.06%
2140	Hebei Chongli Qingsanying 49.3MW Wind Farm Project	49.3	509.56	11.36	2.23%
1895	CECIC Zhangbei Gaojialiang Wind farm Project	49.5	437.86	6.56	1.50%
1715	Hebei chengde fengze wind farm project	49.5	503.33	13.92	2.77%
2125	Guohua Hebei Huanghua wind farm project	49.5	491.93	12.70	2.58%
average			473.79	14.13	3.01%
1792	the proposed project	49.5	437.18	10.65	2.44%

It can be seen from the table above that the total investment cost of 437.18 Million Yuan for the proposed project is within the range of the total investment cost and less than most of other similar projects in Heibei Province. The O&M cost of 10.65 Million Yuan for the proposed project is within the range of the O&M cost and less than most of other similar projects in Heibei Province. And also, the O&M cost relative to total investment cost of 2.44% is within the range and less than most of other similar projects in Heibei Province. Hence, the total investment cost, the O&M cost and the O&M cost relative to total investment cost are deemed to be reasonable in Hebei Province.

Step 4b: Cross-check the tax rates

DNV cross-checked the tax rates such as the Value added tax^{14 15}, the income tax¹⁶, the education tax¹⁷ and the city building tax¹⁸ for the proposed project, and confirms that all the tax rates used in

¹⁴ <http://www.chinatax.gov.cn/n480462/n480513/n480919/index.html> , State Administration of Taxation, National VAT Law

¹⁵ <http://www.chinatax.gov.cn/n480462/n480513/n480949/n644690/1013032.html>, State Administration of Taxation, 50%-off discount on VAT for wind power projects

¹⁶ <http://www.chinagender.com/html/ZC/200809/25-132.html>

¹⁷ http://www.law-lib.com/law/law_view1.asp?id=99771

the financial analysis of the proposed project are consistent with the financial parameters in the FSR and in line with the relevant regulations of the tax rates by the government.

Therefore, DNV confirms that the input values are in accordance with the VVM paragraph 111 (c) and 112 (a) requirements.

Comment 3: The PP/DOE are requested to amend the emission factor and emission reduction calculations using data which was available at the time of commencing validation.

The emission factor of the proposed project activity has been amended from 1.0548 tCO₂/MWh (at the time the PDD was submitted for registration) to 1.0637 tCO₂/MWh, which is the correct value for the emission factor at the time of commencing validation.

DNV re-checked the emission factor as follows:

The baseline emission factor for the project is determined *ex-ante* as a combined margin, consisting of the operating margin (OM) and build margin (BM) according to “*Tool to calculate the emission factor for an electricity system*” of version 1.1. The grid emission factor of the North China Power Grid (NCPG) is determined *ex-ante* for the 7 years crediting period following ACM0002 version 8, based on the most recent information available at the time when the PDD was web-hosted on 4 July 2008. It has been calculated as the weighted average of the operating margin and the build margin (0.75 : 0.25).

The emission factor in the PDD published for global stakeholder consultation on 4 July 2008 was calculated to be 1.0755 tCO₂/MWh. This value was determined by using data from the China Electrical Power Yearbooks 2002-2006, the China Energy Statistical Yearbooks 2004-2006 and the default values from the 2006 IPCC Guidelines for National Greenhouse gas Inventories.

However, at the time of web-hosting the PDD the latest data vintage available was from 2006, derived from China Electric Power Yearbook 2007 and China Energy Statistical Yearbook 2007. Thus, the emission factor has been updated during validation and the value in the PDD submitted for registration was 1.0548 tCO₂/MWh, based on data from the China Electrical Power Yearbooks 2003-2007, the China Energy Statistical Yearbooks 2005-2007 and the 2006 IPCC Guidelines for National Greenhouse gas Inventories.

Also, the weights estimated using installed capacity in place of annual electricity generation (95.64%) and the fraction of fuels (coal 98.932%, natural gas 0.975%, oil 0.093%) in NCPG were used for emission factor calculation in the PDD submitted for registration. It is acknowledged that this value was not available at the time of web-hosting the PDD.

Therefore, following this request for review, the emission factor will be updated as follows:

Country specific data for the net calorific value of each type of fossil fuel, country specific data for emission factors for the fuel and the statistic data for fuel consumption, IPCC 2006 default values for the oxidation factor of each type of fossil fuel and the total electricity delivered to the NCPG were selected and deemed reasonable.

According to the data from China Electric Power Yearbook 2003-2007, the low-cost/must-run resources constitute less than 50% of the total grid generation. Therefore, the OM is justified to calculate using the “simple OM” method. Aggregated generation and fuel consumption data are used due to the fact that more specific data for the power plants are not available in the NCPG (option C). The OM was calculated to be 1.1169 tCO₂e/MWh as a generation weighted average

¹⁸ <http://202.108.90.130/chinatax/jibenfa/jibenfa0401.htm>

for the years 2004, 2005 and 2006.

Because plant specific fuel consumption and electricity generation data are not publicly available in China and following a deviation request of the baseline methodology of AM0005 accepted by the Executive Board, the build margin (BM) emission factor for this project was calculated to be 0.9041 tCO₂e/MWh according to the following assumptions made:

- Use of capacity additions from the years 2004 to 2006, reaching 21.75% of the total installed capacity;
- Use of weights estimated using installed capacity in place of annual electricity generation. Thermal power plants account for 94.53% of the total installed capacity additions in this period. Since specific data for each technology is not available, the fraction of fuels (coal 98.93%, natural gas 0.97% and oil 0.09%) was estimated from the CO₂ intensity for the fuels used in the NCPG;
- Use of the efficiency level of the best technology commercially available in the provincial/regional or national grid of China, as a conservative proxy, for each fuel type in estimating the fuel consumption. This is 35.82% for coal power plants and 47.67% for oil power plants and gas power plants.

The resulting combined margin emission factor is 1.0637 tCO₂e/MWh, and the annual electricity delivered to the NCPG is expected to be 105 090 MWh. Hence, the total emission reductions from the project are estimated to be on the average 111 784 tCO₂e per year over the selected 7 year crediting period. The baseline emission estimate can be replicated using the data and parameter values provided in the PDD and supporting files submitted for registration. The data sources mentioned have been verified by DNV. In summary, the GHG calculations are complete and transparent, and their accuracy has been verified.

We sincerely hope that the Board find our elaboration on the above satisfactory.

Yours faithfully
for DET NORSKE VERITAS CERTIFICATION AS



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