



**CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 02 - in effect as of: 1 July 2004¹**

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1 The PDD form Version 02 has been updated according to UNFCCC/CDM-EB 19 report Annex 14: Revised guidelines for completing the project design document (CDM-PDD), the proposed new methodology: baseline (CDM-NMB) and the proposed new methodology: monitoring (CDM-NMM), Version 03, taking into effect on 13 May 2005. See <http://cdm.unfccc.int/meetings/019/eb19repan14.pdf>.

**SECTION A. General description of project activity.****A.1 Title of the project activity:**

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Hebei Kangbao Wolongtushan 30 MW Wind Farm Project**Version number of the document: 02****Date: 15/01/2007****A.2. Description of the project activity:**

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The Hebei Kangbao Wolongtushan 30 MW Wind Farm Project (hereafter referred to as the project) is sited on the Wolongtu Mountain which is in the Kangbao County, Zhangjiakou City of Hebei province, P.R.China. The Project has geographical coordinates with east longitude of 41°51' and north latitude of 114°28'. The objective of the Project is to utilize the wind power for generating electricity which will be sold into the North China power grid. The total installed capacity of the Project is 30 MW with 40 sets of turbines with a unit capacity of 750 kW (Goldwind-S50//750). The estimated electricity output to the North China power grid is 57,946 MWh per year.

The Project clearly fits into the development priority of China. The Project will not only supply renewable electricity to grid, but also contribute to sustainable development of the local community, the host country and the world by means of:

- reducing greenhouse gas emissions compared to a business-as-usual scenario;
- helping to stimulate the growth of the wind power industry in China;
- reducing the emission of other pollutants resulting from the power generation industry in China, compared to a business-as-usual scenario;
- creating local employment opportunities during the project construction and operation period;
- promoting the development of local tourism industry.

A.3. Project participants:

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Participants to the project activity are the following:

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
P.R.China (host)	Hebei Construction Investment Zhangjiakou Wind Energy Co, Ltd (Project owner)	No
The Netherlands	Energy Systems International B.V.	No

(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.

More detailed contact information on the Participants is provided in Annex 1.

A.4. Technical description of the project activity:**A.4.1. Location of the project activity:**

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A.4.1.1. Host Party(ies):

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The Host Country is the People's Republic of China.

A.4.1.2. Region/State/Province etc.:

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Hebei province.

A.4.1.3. City/Town/Community etc:

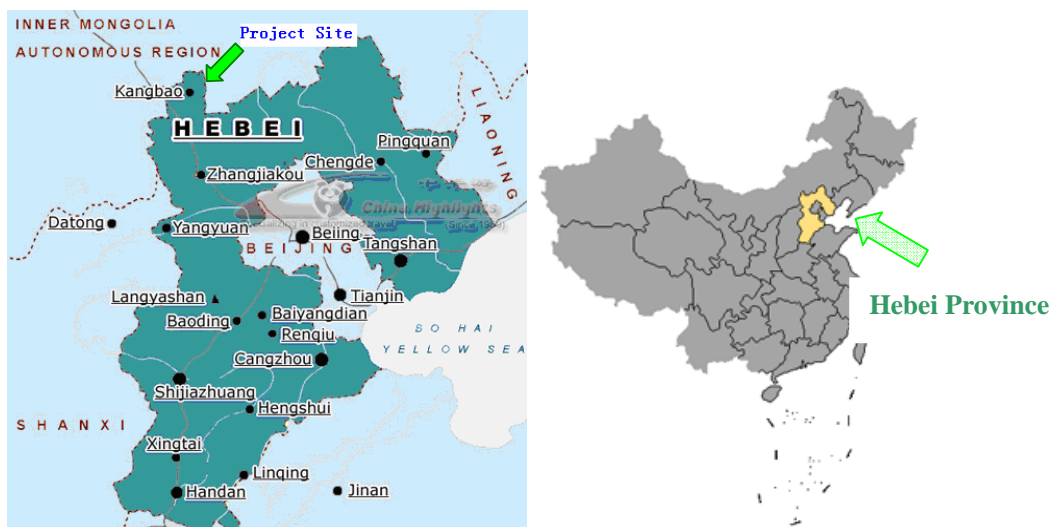
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Zhangjiakou City.

A.4.1.4. Detail of physical location, including information allowing the unique identification of this project activity (maximum one page):

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The Project is located in Kaobao County, Zhangjiakou city of Hebei province, P.R.China. The Project has geographical coordinates with east longitude of 41°51' and north latitude of 114°28', and is crossed by Hua(de)-Kang(bao) road. Figure 1 shows the location of the Project. All of the 40 sets of wind turbines are sited on Wolongtu Mountain.²

Figure 1: location of the Project³**A.4.2. Category(ies) of project activity:**

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This category would fall within sectoral scope 1: energy industries (Renewable source).

² Refer to <Feasibility report of Kangbao Wolongtushan wind farm project>

³ Source from http://www.chinahighlights.com/map/hebei_map.html

**A.4.3. Technology to be employed by the project activity:**

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According to the meteorological data of Wolongtu Mountain Meteorological Station, the project site has abundant wind resource. The annual average wind speed at 55m height is 9.2m/s with stable wind direction. The total installed capacity of the Project is 30 MW with 40 sets of turbines with a unit capacity of 750 kW (Goldwind-S50/750). The estimated electricity output to the North China power grid is 57,946 MWh per year, the annual average operating hour is 2000 h. The Project adopts the Goldwind S50/750 kW type turbines manufactured by Goldwind Science and Technology Co.,Ltd⁴.

The Project involves no technology transfer from abroad.

A.4.4. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed CDM project activity, including why the emission reductions would not occur in the absence of the Project activity, taking into account national and/or sectoral policies and circumstances:

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The project owner is hard to get any income besides power generation. Compared to those typical grid-connected fossil fuel-fired power plants connected into North China power grid, the Project has obvious disadvantages including higher cost in per kW installation, higher initial capital investment and shorter annual operating hours. The IRR of the total investment of the Project is only 7.47%. The Project is unfeasible in terms of economic and commercial considerations. Therefore it is not attractive to investors. In the absence of the additional revenues, possibly from the CER sales, the Project will have the difficulties in operation and the GHG emission reductions generated by the Project is unlikely to occur.

Based on CDM Project, financial index of the Project can be improved with CER sales revenues, which guarantees the successful implementation of the Project. Therefore the Project activity can achieve greenhouse gas (GHG) emission reductions by avoiding CO₂ emissions from the electricity generation of those fossil fuel-fired power plants connected to North China power grid.

A.4.4.1. Estimated amount of emission reductions over the chosen crediting period:

The first crediting period of this project is 7 years, the amount of annual and total emission reductions are estimated in the following table⁵:

⁴ Refer to <Feasibility report of Kangbao Wolongtushan wind farm project>

⁵ The first crediting period is estimated to begin at 15th Apr 2007.



Years	Annual estimation of emission reductions in tonnes of CO₂e
2007	59,089
2008	59,089
2009	59,089
2010	59,089
2011	59,089
2012	59,089
2013	59,089
Total estimated reductions (tonnes of CO₂e)	413,623
Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tonnes of CO₂e)	59,089

A.4.5. Public funding of the project activity:

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There is no public funding from Annex I Parties for this Project.

**SECTION B. Application of a baseline methodology.****B.1. Title and reference of the approved baseline methodology applied to the project activity:**

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ACM0002.ver 06 – “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” and “Consolidated monitoring methodology for grid-connected electricity generation from renewable sources”. For more information regarding the methodology please refer to <http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>.

The *Tool for the Demonstration and Assessment of Additionality* ver 02.

B.1.1. Justification of the choice of the methodology and why it is applicable to the project activity:

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Wind power generation technology is a renewable electricity generation technology which displaces fossil fuel-fired power generation technology to supply electricity to the grid. Therefore the Project applies the consolidated baseline methodology ACM0002 approved by CDM EB to determine the project baseline and calculate GHG emission reductions achieved by wind power generation.

The Project meets all applicability conditions of the consolidated baseline methodology ACM0002 as follows:

- 1) The Project involves the electricity capacity additions from wind power plant.
- 2) The Project does not involve switching from fossil fuels to renewable energy at the site of the project activity.
- 3) The geographic and system boundaries for the North China power grid can be clearly identified and information on the characteristics of the North China power grid is available⁶.

According to the consolidated baseline methodology ACM0002, the consolidated baseline methodology ACM0002 is applied in compliance with the consolidated monitoring methodology ACM0002 and the additionality of the Project is demonstrated and assessed by using the *Tool for the Demonstration and Assessment of Additionality* approved by CDM EB.

Data and information used in the PDD of the Project are mainly from the *Feasibility Study Report* of the Project and the *Notification on Determining Baseline Emission Factor of China’s Grid* made publicly available on the website of China’s DNA (<http://cdm.ccchina.gov.cn/web/NewsInfo.asp?NewsId=1235>) on Dec.15th, 2006.

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B.2. Description of how the methodology is applied in the context of the project activity:

GHG emission reductions of the Project were calculated based on the consolidated baseline methodology ACM0002.

Baseline emission factors of operating margin ($EF_{OM,y}$) and build margin ($EF_{BM,y}$) were calculated based on the data of the North China power grid which include installed capacity, electricity output and

⁶ Detailed information of the grid in China can be obtained from the China Electric Power Yearbook, the China Energy Statistical Yearbook and the Notification on Determining Baseline Emission Factor of China’s Grid made publicly available on the website of China’s DNA (<http://cdm.ccchina.gov.cn/>) on October 17th, 2006.



consumption of different types of fuels of all plants. The baseline emission factor (EF_y) is calculated as a combined margin (CM) of $EF_{OM,y}$ and $EF_{BM,y}$, according to the following three steps:

Step 1 Calculate the Operating Margin Emission Factor(s)

Following methods can be used according to ACM0002:

- (a) Simple OM, or
- (b) Simple adjusted OM, or
- (c) Dispatch Data Analysis OM, or
- (d) Average OM.

Each method is explained as following.

Method (a) Simple OM

The simple OM method can only be used where low-cost/must run resources constitute less than 50% of total grid generation in: 1) average of the past 5 years, or 2) based on long-term average for wind power and hydro power electricity generation. Among the total electricity generations of the North China power grid which the Project is connected into, the amount of low-cost/must run resources accounts for about 4.3% in 1999, 4.9% in 2000, 4.6% in 2001, 4.2% in 2002, and 3.5% in 2004⁷, all less than 50%. Thus, the method (a) Simple OM can be used to calculate the baseline emission factor of operating margin ($EF_{OM,y}$) for the Project.

Method (b) Simple adjusted OM

Due to the commercialization of social economic development in China, grid data of National power groups is less transparent for business competition reason. The basic data of annual grid dispatch curve is hardly available neither regional nor provincial, therefore option (b) can not be used in this proposed project.

Method (c) Dispatch Data Analysis OM

Dispatch data analysis OM method should be the first choice if the dispatch data are available, because the method can truly reflect the substitutable relationship between the amount of electricity output from power plants of the baseline grid and that from the Project activity and the emission reductions generated. However, Method (c) cannot be adopted for the Project because of unavailability of the dispatch data of the North China power grid, similar reason as method (b).

Method (d) Average OM

Method (d) can only be used when 1) low-cost/must run resources constitute more than 50% of total grid generation and 2) detailed data required by applying method (b) and method (c) is unavailable. Among the total electricity generations of the North China power grid which the Project is connected into, the

⁷ <China Electric Power Yearbook> 2001-2005

Data of 2000 refers to

<http://hvdc.chinapower.com.cn/membercenter/yearbookcenter/viewarticle.asp?user=yearbook&articleid=10000853>

Data of 1999 refers to

<http://hvdc.chinapower.com.cn/membercenter/yearbookcenter/viewarticle.asp?user=yearbook&articleid=10001194>



amount of low-cost/must run resources accounts for about 4.3% in 1999, 4.9% in 2000, 4.6% in 2001, 4.2% in 2002, and 3.5% in 2004, all less than 50%. Therefore method (d) cannot be applied to the Project.

Determination and explanation of selected method

Method (a) is the favourable one to be applied in this project. In accordance with the consolidated baseline methodology ACM0002, the Simple OM emission factor ($EF_{OM, simple, y}$) is calculated ex ante.

The formula of $EF_{OM, simple, y}$ calculation is

$$EF_{OM, simple, y} = \frac{\sum_{i,j} F_{i,j,y} \cdot COEF_{i,j}}{\sum_j GEN_{j,y}} \quad (1)$$

where:

$F_{i,j,y}$ is the total amount of fuel i (in a mass or volume unit) consumed by province j in year(s) y ,

$COEF_{i,j,y}$ is the total amount the CO₂ emission coefficient of fuel i (tCO₂/mass or volume unit of the fuel), taking into account the carbon content of the fuels (coal, oil and gas) used by province j and the oxidation rate of the fuel in year(s) y , and

$GEN_{j,y}$ is the electricity output (MWh) supplied to the grid by province j .

The CO₂ emission coefficient $COEF_i$ then obtained from equation (2) as

$$COEF_i = NCV_i \cdot EF_{CO_2, i} \cdot OXID_i \quad (2)$$

where:

NCV_i is the net calorific value (energy content) per mass or volume unit of a fuel i ,

$OXID_i$ is the oxidation factor of the fuel (see 1996 Revised IPCC guidelines for default values),

$EF_{CO_2, i}$ is the CO₂ emission factor per unit of energy of the fuel i .

When there exists net electricity imports ($COEF_{i,j, imports}$) from a connected electricity system within the same host country(ies), use the emission factor(s) of the specific power plant(s) from which electricity is imported, if and only if the specific plants are clearly known, or the emission factor of the exporting grid, if the specific plants are not clearly known.

The data on electricity generation and auxiliary electricity consumption are obtained from the *China Electric Power Yearbook* from 1998 to 2005. The data on different fuel consumptions for power generation and the net caloric values of the fuels are obtained from the *China Energy Statistical Yearbook* from 2000 to 2005. The emission factors and oxidation factors of the fuels adopted are obtained from Table 1-2 and Table 1-4 of the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Workbook*.

The Simple OM emission factor ($EF_{OM, y}$) of the North China power grid is calculated as 1.0585 tCO₂e/MWh (see Annex 3 for details).

Step 2 Calculate the Build Margin Emission Factor ($EF_{BM, y}$)

According to the consolidated baseline methodology ACM0002 using equation (3):



As the generation-weighted average emission factor (tCO₂/MWh) of a sample of power plants *m*, as follows:

$$EF_{BM,y} = \frac{\sum_{i,m} F_{i,m,y} \cdot COEF_{i,m}}{\sum_m GEN_{m,y}} \quad (3)$$

where:

$F_{i,m,y}$ is the amount of fuel *i* (tCe) consumed by relevant power source *m* in year(s) *y*,

$COEF_{i,m,y}$ is the CO₂ emission coefficient of fuel *i* (tCO₂/tCe), taking into account the carbon content of the fuels (coal, oil and gas) used by relevant power source *m* and the percent oxidation of the fuel in year(s) *y*, and

$GEN_{m,y}$ is the electricity (MWh) delivered to the grid by source *m*.

Project participants can choose between one of the following two options:

Option 1. Calculate the Build Margin emission factor ($EF_{BM,y}$) ex-ante based on the most recent information available on plants already built for sample group *m* at the time of PDD submission was selected for the Project. The power plant capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.

Option 2. For the first crediting period, the Build Margin emission factor $EF_{BM,y}$ must be updated annually ex-post for the year in which actual project generation and associated emissions reductions occur. For subsequent crediting periods, $EF_{BM,y}$ should be calculated ex-ante, as described in option 1 above. The sample group *m* consists of either the five power plants that have been built most recently or the power plants capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.

Option 1. Calculate the Build Margin emission factor ($EF_{BM,y}$) ex-ante based on the most recent information available on plants already built for sample group *m* at the time of PDD submission was selected for the Project.

According to the consolidated baseline methodology ACM0002, the sample group *m* consists of either (1) the five power plants that have been built most recently, or (2) the power plant capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently. It is suggested that the sample group that comprises the larger annual generation should be used.

Consider of data availability, EB accepts the following deviation in application of methodology AM0005⁸:

- 1) Use of capacity additions during the last 1~3 years for estimating the build margin emission factor for grid electricity.
- 2) Use of weights estimated using installed capacity in place of annual electricity generation.

And it is suggested to use the efficiency level of the best technology commercially available in the provincial/regional or national grid of China, as a conservative proxy.

Since methodology AM0005 has been replaced by the consolidated methodology ACM0002, the

⁸ [Http://cdm.unfccc.int/Projects/Deviations](http://cdm.unfccc.int/Projects/Deviations).



deviation above is also applicable to the consolidated methodology ACM0002.

Since data of installed capacities can not be separated to coal based, oil based and gas based in North China power grid at present, BM is calculated with following steps:

Step a. Calculate the power generation emissions for solid, liquid and gas fuel and each share of total emissions based on the *Energy Balance Table* of the most recent year.

Step b. Calculate emission factor for thermal power of each grid based on the result of Step a. and the efficiency level of the best technology commercially available in China.

As far as North China power grid is concerned, there is some oil consumption for fuel-fired power plant, CO₂ emission from the oil in North China power grid in total emission of the grid account for 0.58% in 2002, 0.48% in 2003, and 0.12% in 2004; CO₂ emission from the gas in North China power grid in total emission of the grid account for 0.09 % in 2002, 0.34 % in 2003, 0.58 % in 2004. Based on above data, a conclusion can be given that oil and gas fuel take little proportion in North China power grid.

Since most of the liquid and gas fuel consumption in North China power grid are for start-ups of coal-fired power stations, the sample selection of best technology commercially available on power generation from liquid and gas fuel is not feasible in North China power grid. Considering the portion of CO₂ emission from liquid and gas fuel in North China power grid is very small, which is 0.7% in 2004, $EF_{Thermal}$ is considered as $EF_{Coal,Adv}$. As a simple and conservative method, the $EF_{Thermal}$ is discounted by multiplying a coefficient 99.30% (100% subtract the proportion of CO₂ emission from liquid and gas fuel).

The data on different fuel consumptions for power generation and the net caloric values of the fuels are obtained from the *China Energy Statistical Yearbook* from 2000 to 2005. The emission factors and oxidation factors of the fuels adopted are obtained from the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Workbook*.

With reference to the *Notification on Determining Baseline Emission Factor of China's Grid*, published on 15th, Dec, 2006, refer to <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1051.pdf>, 336.66 gCe/kWh is determined as the efficiency level of the best technology commercially available in China for coal-fired power generators.

Therefore, the $EF_{Thermal}$ is revised as 0.9072 tCO₂e/MWh.

Step c. Calculate BM of the grid based on the result of Step b and the share of thermal power of recent 20% capacity additions.

$$EF_{BM,y} = \frac{CAP_{Thermal}}{CAP_{Total}} \times EF_{Thermal} \quad (4)$$

Where CAP_{Total} is total capacity additions while $CAP_{Thermal}$ is capacity additions of thermal power.

The Simple BM emission factor ($EF_{BM,y}$) of the North China power grid is calculated as 0.9034 tCO₂e/MWh.

Step 3 Calculate the Baseline Emission Factor EF_y



Based on the consolidated baseline methodology ACM0002, the baseline emission factor (EF_y) is calculated as the weighted average of the operating margin emission factor ($EF_{OM,y}$) and the build margin emission factor ($EF_{BM,y}$), as

$$EF_y = w_{OM} \cdot EF_{OM,y} + w_{BM} \cdot EF_{BM,y} \quad (5)$$

According to ACM0002, the default weights for wind farm project are as follows: w_{OM} is 0.75 and w_{BM} is 0.25.

$$EF_y = 0.75 \times 1.0585 + 0.25 \times 0.9034 = 1.0197 \text{ (tCO}_2\text{e/MWh)}.$$

In conclusion,

The operating margin emission factor is 1.0585 t CO₂ e /MWh;

The build margin emission factor is 0.9034 t CO₂ e /MWh;

The baseline emission factor is 1.0197 t CO₂ e /MWh;

The annual electricity output is 57946 MWh;

The annual emission reductions are 59,089 tCO₂e.

The total emission reductions for the first 7 years' crediting period are determined to be 413,623 tCO₂e.

All the explanation and calculation process of each parameter can be found in Annex 3.

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B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity:

The baseline scenario of the Project is identified and demonstrated by using the Step 1 and Step 2 of the *Tool for the Demonstration and Assessment of Additionality* approved by CDM EB.

Step 0: Preliminary screening of projects started after 1 January 2000 and prior to 31 December 2005.

The Project is not above described type of project that starts before the date of registration and account emission reduction prior to the start of the crediting period.

The Project is not financial attractiveness in feasibility period, the IRR of total investment would not reach benchmark and has barriers to be set up.

CDM was introduced to the Project owner on 22nd, July, 2005, in Hebei CDM Conference.

Potential CERs revenue can help the project to be financial attractive. So the project owner had considered CERs revenue to be the project income, and accelerate the beginning of its construction⁹.

The construction period started from 16th, Oct., 2005.

The validator did the on site validation on 18th, June, 2006.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

The objective of the Step 1 is to define realistic and credible alternatives to the project activity(s) that can be the baseline scenario through the following sub-steps:

⁹ Source from news published on <Hebei Daily>, 25th, July, 2005

***Sub-step 1a. Define alternatives to the project activity:***

Plausible and credible alternatives available to the Project that provide outputs or services comparable to the proposed CDM project activity include:

Alternative I: Construction of a fuel-fired power plant with equivalent amount of annual electricity supply;

Alternative II: The Project activity not undertaken as a CDM project activity;

Alternative III: Construction of a power plant using other sources of renewable energy with equivalent amount of annual electricity supply; and

Alternative IV: Provision of an equivalent amount of annual power output by the grid into which the Project is connected.

The terrain of the project site area is flat, which is not suitable for development of hydropower project. In China, biomass power generation technology is still in the demonstration phase and can bring only poor economic benefits, which can not be operated without support from the national policies¹⁰. Since there exist no economically exploitable hydro or biomass resources with a commensurate scale within the area of the Project. Alternative III is not feasible.

Sub-step 1b. Enforcement of applicable laws and regulation

For Alternative I, considering the same annual electricity supply, the alternative baseline scenario for the Project should be a fuel-fired power plant with installed capacity lower than 15 MW. Further, as the Project is a grid-connected wind power generation project, the alternative baseline scenario must be a grid-connected fuel-fired power generation project. However, according to China's regulations, construction of fuel-fired power plants with the installed unit capacity lower than 135 MW is prohibited in the areas which can be covered by large grids such as provincial grids¹¹. For these reasons, the possible alternative baseline scenario of building a fuel-fired power plant with an installed capacity lower than 15 MW conflicts with China's current regulations. Therefore, Alternative I is not feasible.

For Alternative II, the Project activity not undertaken as a CDM project activity satisfies China's regulations.

For Alternative IV, the installed capacity of the North China power grid for both the existing power plants and the power plants to be built in a foreseeable future satisfies China's regulations, which is also economically feasible.

Therefore Alternative II and Alternative IV are analyzed in Step 2 as potential project alternatives. According to the analysis in below, the project is not financial attractive, so Alternative II is not feasible. According to current policies and regulations in China electric-energy market, providing the same capacity and electricity supply from North China power grid is feasibility, therefore Alternative IV is finally determined to be the baseline scenario.

Step 2. Investment analysis

¹⁰ Tentative Management Measures for Price and Sharing of Expenses for Electricity Generation from Renewable Energy, Document No. NDRC Energy[2006]13.

¹¹ Notice on Strictly Prohibiting the Installation of Fuel-fired Generators with the Capacity of 135 MW or Below issued by the General Office of the State Council, decree no. 2002-6.



The purpose of this step is to determine whether the project activity is economically or financially less attractive than Alternative II without an additional revenue/funding, possibly from the sale of certified emission reductions (CERs). The investment analysis was conducted in the following steps:

Sub-step 2a. Determine appropriate analysis method

The *Tool for the Demonstration and Assessment of Additionality* suggests three analysis methods which are simple cost analysis (Option I), investment comparison analysis (Option II) and benchmark analysis (Option III). Since the Project will earn revenues not only from the CERs sales but also from electricity sales, the simple cost analysis method is not appropriate. Investment comparison analysis method is only applicable to projects whose alternatives are similar investment projects. The Alternative IV of the Project is the North China power grid rather than new investment projects. Therefore Option II is not appropriate. The Project will use benchmark analysis method (Option III) based on the consideration that benchmark IRR of the power sector is available.

Sub-step 2b. Apply benchmark Analysis (Option III.)

According to the *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects*, the financial benchmark rate of return (after tax) adopted by the Project is 8% for the IRR of total investment. On the basis of above benchmark, calculation and comparison of financial indicators are carried out in sub-step 2c.

Sub-step 2c. Calculation and comparison of financial indicators

(1) Basic parameters for calculation of financial indicators

Based on the feasibility study report of the Project, basic parameters for calculation of financial indicators are as follows¹²:

Installed Capacity:	30MW
Estimated annual electricity output:	57,946MWh
Electricity tariff:	0.600 RMB/KWh (with VAT)
Crediting period:	7 years
Expected CERs Price:	8 Euro/tCO ₂ e
Project Operational Lifetime:	20years
Static Total investment:	275,090,000 Yuan RMB
Loan period:	15 years
Interests of the loan:	6.12%
Annual O & M cost:	5,615,000 Yuan RMB
Income tax rate :	33%
Sales tax and surtax :	298300 Yuan RMB

Detail of IRR calculation is provided in Annex 5.

(2) Comparison of the financial benchmark of IRR of total investment for the Project

¹² Data from <Feasibility report of Kangbao Wolongtushan wind farm project> and <Modification on financial evaluation of Feasibility report of Kangbao Wolongtushan wind farm project>

In accordance with the benchmark analysis (Option III), if the financial indicators (such as IRR) of a project are lower than the benchmark, the project is not considered as financially attractive. Based on the data above, without CERs sales revenues, the IRR of total investment of the Project is 7.47%, which is lower than the benchmark (8%). The Project is not financially attractive.

Sub-step 2d. Sensitivity analysis

For the project, following financial parameters were taken as uncertain factors for sensitive analysis of financial attractiveness:

- ◆ Static total investments
- ◆ Annual electricity output
- ◆ Electricity tariff, (Yuan/KW.h),with VAT
- ◆ Annual O&M cost

Since the impact of electricity tariff (with VAT) on total investment is the same to the impact of annual electricity output, only the impacts of static total investment, annual O&M cost and electricity tariff (with VAT) of the Project on IRR of total investment were analyzed. The results of sensitive analysis of three indicators of the Project are shown in Table 1 and Figure 3.

Table 1. IRR of total investment sensitivity to different financial parameters of the Project (without CERs sales revenues)

Parameter	-10%	0	+10%
Static total investment (%)	8.73	7.47	6.33
Annual O&M cost (%)	7.76	7.47	7.18
Electricity tariff (withVAT) (%)	6.12	7.47	8.68

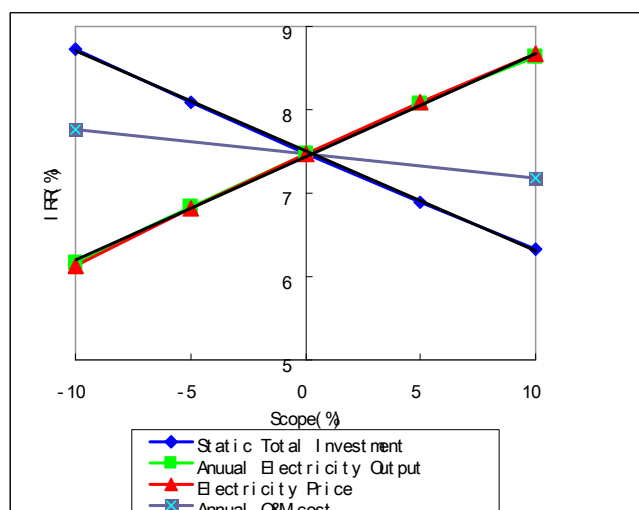


Figure 3. IRR of total investment sensitivity to different financial parameters of the Project (without CERs sales revenues)

Based on the relationship shown in Figure B-1, we can calculation that the IRR can reach the benchmark 8%, in case of the variation range of the *electricity tariff/ annual electricity output* reaches +4.53%, or the *static total investment* reaches -4.51%. However, it could not happen in the project, because:



Since the Project will be finished very soon, its static total investment will not be changed much. Therefore, the Static total investment could not be reduced 4.51%. The detail will be provided in validation and verification time.

The project owner has got an agreement with the Grid Company about the electricity price, which is 0.600 RMB/KWh (with VAT). Thus the Electricity tariff could not be raised by 4.53%. The detail will be provided in validation and verification time.

Based on the agreement signed with the Grid Company, the Electricity output is not only determined by the electricity generation, but also by the requirement of its Grid Company, which means, even if the project's electricity generation raises 4.53%, for some reason, its Grid Company could not allow it to connect to Grid, thus, the electricity output could not raised 4.53%. In addition, the electricity output in feasibility study is a forecast data of accurateness, which according to the average power of wind, the rate of the wind, the data of other wind farm project in same condition¹³, thus, the electricity output could not raise 4.53% normally.

Therefore, the IRR of total investment of the Project could not reach the benchmark and the additionality of the Project would not be influenced.

In conclusion, the practical and feasible baseline scenario is Alternative IV, the provision of equivalent amount of annual electricity supply by the grid into which the Project is connected. Therefore the baseline scenario of the Project is the provision of equivalent amount of annual electricity supply by the North China power grid.

Step 4. Common practice analysis

Sub-step 4a. Analyze other activities similar to the project activity:

Wind farm projects which were put into operation before 31st Dec. 2005 in Hebei Province are listed in Table2.

Table 2 Wind farm projects put into operation before 31st Dec. 2005 in Hebei Province¹⁴

Name	Total No. of the wind farm (Tai)	Total capacity of the wind farm(KW)
Zhangbei wind farm project	24	9850
Chengde wind farm project	88	53700
Fengning wind farm project	2	1200
Shangyi Manjing wind farm project fist phase	23	34500
Zhangbei Manjing wind farm project	6	9000

Sub-step 4b. Discuss any similar options that are occurring:

Among the wind farm projects listed in Table 2:

¹³ Refer to <Feasibility report of Kangbao Wolongtushan wind farm project>

¹⁴ Source from<Stat. of domestic wind farm installation capacity in 2005>, Shipengfei.
<http://www.cses.org.cn/nywzbody.asp?id=9>



The installed capacity of wind farm project takes little proportion in recent three years in Hebei province, which is 0.07% in 2004, 0.07% in 2002, and 0.06% in 2001¹⁵. Therefore, wind farm project is not a common technique for power generation in Hebei province. Besides:

Zhangbei wind farm project was put into operation before 1999, due to the reformation of China electricity system in 2000¹⁶, project put into operation before 2000 will not impact the additionality of the proposed Project.

Fengning wind farm project, with installation capacity is 1.2MW(2×0.6MW), which capacity is much smaller than the proposed Project. Thus it was faced less technical difficulties and enjoyed less annual O&M cost.

Chengde wind farm project and Shangyi Manjing wind farm project-first phase are all in the process of finding carbon finance help as known from the project owners.

Zhangbei Manjing wind farm project is registered successfully as CDM project in 23rdMar 2006¹⁷.

Hebei Guyuan 30.6 MW Wind farm projects and Zhangbei Mijiagou Wind Farm Project, which are put into construction in Hebei Province, are developing as CDM Project¹⁸.

In sum, existing wind farm projects will not impact the additionality of the Project.

Step 5. Impact of CDM registration

If the Project can be successfully registered as a CDM project, the CERs sales revenues will

- guarantee the loan payback, supplement the high investment of the Project and significantly improve the financial indicators of the Project;
- be one of the sources to serve as the maintenance fund for wind turbines therefore to guarantee the successful implementation of the Project.

Considering of the CERs sales revenues (calculated with EURO 8/tCO₂e, 7 yrs×3 crediting period), the IRR of total investment of the Project will be significantly improved to reach benchmark, as shown in Table 3.

Table 3 IRR of the Project¹⁹

	Project IRR
Without revenue of CERs	7.47%
With revenue of CERs	9.72%

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the project activity:

¹⁵ Data refers to *China Electric Power Yearbook 2005,2003 & 2002*

¹⁶ <http://www.bjbusiness.com.cn/20060807/yaowen30.htm>

¹⁷ Source from <http://cdm.unfccc.int/Projects/registered.html>

¹⁸ Source from <http://cdm.ccchina.gov.cn/web/NewsInfo.asp?NewsId=1322>

¹⁹ Data from <Feasibility report of Kangbao Wolongtushan wind farm project> and <Modification on financial evaluation of Feasibility report of Kangbao Wolongtushan wind farm project>, detail of IRR calculation is provided in Annex 5.



>>

North China power grid covers six provinces–Beijing, Tianjin, Hebei, Shanxi, Inner Mongolia and Shandong Province. The project site is located at Hebei province. The electricity generation of this project will transmit into local grid, and then transmit to North China power grid.²⁰

Because of the following reasons, the project boundary is determined as ‘North China power grid’ in this project activity:

- 1) The project site is located at Hebei province. Hebei provincial grid is one of the main transmission networks of North China power grid. Its power generation is managed and dispatched by North China power grid.
- 2) The relationship between North China power grid and other China Power Grid is listed in below table²¹.

Year	Electricity output(MW)	Input from other Grid(MW)	(%)
2002	377617637	2905200(from Northeast China power grid)	0.77 %
2003	429609286	4244380(from Northeast China power grid)	0.99 %
2004	493687660	4514550(from China Central Power Grid)	0.91%

It shows North China power grid is a stable and relatively independent regional grid with sample and clear grid system boundary;

- 3) Since North China power grid has been a stable regional grid for several years, its basic data of electricity generation, electricity dispatch and other grid related information has been recorded historically, and those data was officially published by government so they are public available.

Therefore, North grid is determined as the Project boundary.

B.5. Details of baseline information, including the date of completion of the baseline study and the name of person (s)/entity (ies) determining the baseline:

Details of baseline information are attached in Annex 3. This baseline study was completed on 12/19/2006. Contact information for the baseline determination.

Name/origination	Project participate Yes/No
Millennium Capital Services 1202 Jinbao Office Building 89 Jinbao Street Dongcheng District, Beijing 100005 P.R.China Tel: +86(10) 85221916 Fax: +86(10) 85221906	No.

²⁰ Refer to <Feasibility report of Kangbao Wolongtushan wind farm project>

²¹ Reference from *China Electric Power Yearbook 2005*



SECTION C. Duration of the project activity / Crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

The starting date of operation of the project is 01/01/2007.

C.1.2. Expected operational lifetime of the project activity:

The operational lifetime of this project is 20 years.

C.2 Choice of the crediting period and related information:

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

The starting date of the first crediting period is on 15/04/2007.

C.2.1.2. Length of the first crediting period:

Length of the first crediting period of this project is 7 years.

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

Not applicable

C.2.2.2. Length:

Not applicable

>>

**SECTION D. Application of a monitoring methodology and plan****D.1. Name and reference of approved monitoring methodology applied to the project activity:**

ACM0002 - “Consolidated monitoring methodology for grid-connected electricity generation from renewable sources” Version 06 .See
<http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>.

D.2. Justification of the choice of the methodology and why it is applicable to the project activity:

The application of ACM 0002 monitoring methodology to the Project is justified as following:

- ✓ Electricity capacity addition is from Wind sources.
- ✓ This proposed project doesn't involve switching from fossil fuels to renewable energy at the site of the project activity.
- ✓ North China power grid can be seen as the project electricity system, whose geographic and system boundaries can be clearly identified and information on the characteristics of the grid is available.

The monitoring methodology shall be used in conjunction with the approved ACM0002 baseline methodology, which was adopted by the Project in section B

**D.2.1. Option 1: Monitoring of the emissions in the project scenario and the baseline scenario**

Kangbao Wolongtushan wind farm project is a zero emission electricity generation activity without any assistant construction and no GHG discharge from the proposal activity. Therefore there are no entries to the following table D.2.1.1.

D.2.1.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:

ID number <i>(Please use numbers to ease cross-referencing to D.3)</i>	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	Comment

D.2.1.2. Description of formulae used to estimate project emissions (for each gas, source, formulae/algorithm, emissions units of CO₂ equ.)

So Epy=0

D.2.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary and how such data will be collected and archived :

The project activity is a grid-connected zero-emissions renewable electricity generation plant that would not be implemented otherwise.

The project activity only reduces carbon dioxide (CO₂) through substitution of the North China power grid electricity generated by fossil fuel power plant by electricity of wind power generation.

No other GHGs reductions such as methane (CH₄) and nitrous oxide (N₂O), which happen under assistant activities of transportation, storage and extraction from the project activity and/or from the North grid are accounted.



ID number (Please use numbers to ease cross-referencing to table D.3)	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
1 EGy	Electricity	Electricity supplied to the North China power grid by the Project	MWh	m	hourly measurement and monthly recording	100%	Electronic data will be kept for 2 years following the end of the crediting period	Electricity supplied by the project to the grid

D.2.1.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO₂ equ.)

>>

In accordance with ACM0002 baseline methodology for grid-connected electricity generation from renewable source, ACM0002 monitoring methodology is used to monitor parameter of the North China power grid. Simple OM baseline emission factor of the North China power grid is determined ex-anti with the data vintages from year 2002-2004, which are the most recent statistics available at the time of PDD submission.

Simple OM emission factor:

The process of calculation of Simple OM emission factor is listed in B2.Step 1.
More details for calculation of Simple OM emission factor is shown in Annex 4.

BM emission factor:

The process of calculation of BM emission factor is listed in B2.Step 2.
More details for calculation of BM emission factor is shown in Annex 4.

Combined margin emissions factor:

The process of calculation of combined margin emissions factor is listed in B2.Step 1.

**D. 2.2. Option 2: Direct monitoring of emission reductions from the project activity (values should be consistent with those in section E).**

Kangbao Wolongtushan wind farm project is a zero emission electricity generation activity without any assistant construction and no GHG discharge from the proposal activity. Therefore there are no entries to the following table D.2.2.1.

D.2.2.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.2.2.2. Description of formulae used to calculate project emissions (for each gas, source, formulae/algorithm, emissions units of CO₂ equ.):

>>

Kangbao Wolongtushan wind farm project is a zero emission electricity generation activity without any assistant construction and no GHG discharge from the proposed activity. Therefore no formula was used to calculate GHG emissions from the Project.

So Epy=0

The project does not claim any indirect emission reductions from activities carried out outside the temporal and/or geographical boundaries of the project, therefore no significant net leakage was identified. Data to monitor leakage will not be collected nor archived. So there is no entry to tables D.2.3.1

**D.2.3. Treatment of leakage in the monitoring plan****D.2.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project activity**

ID number (Please use numbers to ease cross-referencing to table D.3)	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

According to monitoring methodology ACM0002, leakage is not considered for this project.

D.2.3.2. Description of formulae used to estimate leakage (for each gas, source, formulae/algorithm, emissions units of CO₂ equ.)

The project does not claim any indirect emission reductions from activities carried out outside the temporal and/or geographical boundaries of the project; therefore no significant net leakage was identified. Data to monitor leakage will not be collected nor archived. So there is no formula used to estimate leakage. Therefore the leakage is zero.

D.2.4. Description of formulae used to estimate emission reductions for the project activity (for each gas, source, formulae/algorithm, emissions units of CO₂ equ.)

>>

The annual emission reductions E_{Ry} for the project activity are calculated as the baseline emissions minus the project emissions. Being the project a zero-emission activity the final GHG emission reductions are calculated as follows:

$$ER_y = E_{By} - E_{py} = (E_{gy} * E_{fy}) - L_y$$

According to ACM0002, the project emission is zero, the emission reduction is equal to baseline emission BE_y.



D.3. Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored		
Data (Indicate table and ID number e.g. 3.1.; 3.2.)	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
D2.1.3.1	Low	<i>The kWh output from each wind turbine will be monitored and recorded at the on-site control centre using a computer system. The project operator is responsible for recording this set of data. Measurements are being continuously recorded by the on-site computer system, and then the output will be aggregated so that monthly electricity output can be shown. Electricity sales invoices will also be obtained as an additional check. This data set will be provided by the project company from its normal recording system. Calibration of Meters & Metering should be implemented according to national standards and rules. And all the records should be documented and maintained by the project owner for DOE's verification.</i>

D.4 Please describe the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects, generated by the project activity.

>>

The Project will be monitored as described in follow:

Data handling: A transparent system for the collection, computation and storage of data, including adequate record keeping and data monitoring systems is established. The system allows automated recording and reporting of data.

Quality assurance;

1. Hebei Construction Investment Zhangjiakou Wind Energy Co. Ltd designated a system manager to be in charge of and accountable for the generation of CERs including monitoring, record keeping, computation and recording of CERs, audits and verification.
1. The project manager will officially sign off on all worksheets used for the recording and calculation of CERs.
2. Well-defined protocols and routine procedures, with good, professional data entry, extraction and reporting procedures will make it considerably easier for the auditor and verifier to do their work.
3. Proper management processes and systems records will be kept by the project. The auditors can request copies of such records to judge compliance with the required management systems.

Training

Required capacity and internal training will be equipped to the operational staff and the monitoring staff to enable them to undertake the tasks required by this Monitoring plan. Appropriate staff training will be provided before the project starts operating and generating CERs.

Reporting:

Monthly reporting and annual reporting (electronic and hard copies) will be prepared as needed for audit and verification purposes.

- Monthly summary of continuous measurement data for electricity supplied to the grid by the project
- All documentation regarding sales to the grid will be collated in hard copy for inspection

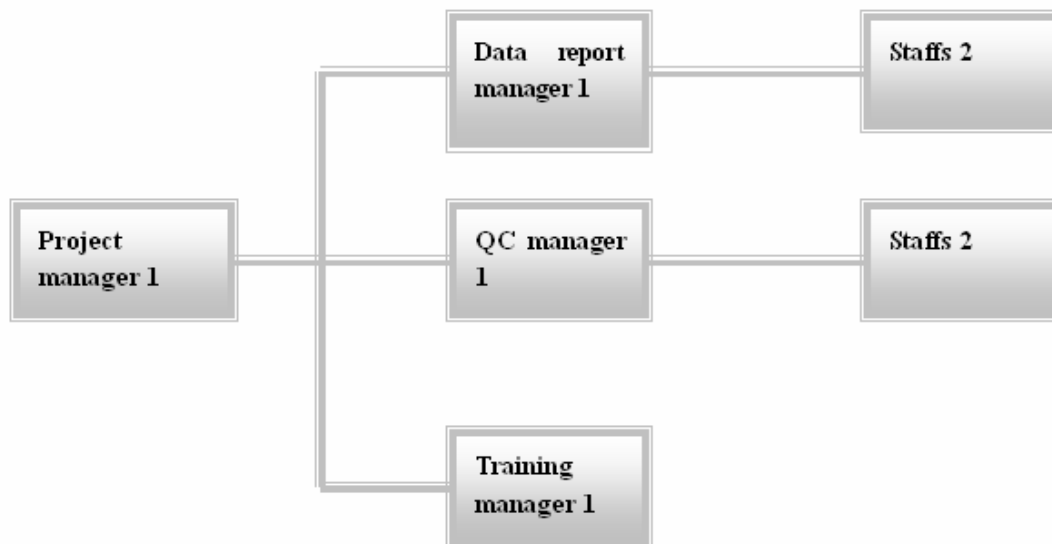


Figure D1. Monitoring system flow chart of the proposed project.

The contents of the manual are highlighted as follows:

- Generation introduction
- Project integrate management
- Monitoring procedure
 1. Installation, measurement and calibration of equipment and meters.
 2. Data monitoring
 - 1) Monitoring of electricity supply
 - 2) Monitoring of electricity generation
 3. Calculation of emission reductions
- Management process
 1. QA & QC
 - 1) Electricity supply to Grid
 - 2) Emergency
 2. Data management systems



3. Verification of monitoring results
4. Personnel training
5. Efficiency evaluation

The contents of the manual are listed in Annex 4.

D.5 Name of person/entity determining the monitoring methodology:

Name/origination	Project participate Yes/No
Millennium Capital Services 1202 Jinbao Office Building 89 Jinbao Street Dongcheng District, Beijing 100005P.R.China Tel: +86(10) 85221916 Fax: +86(10) 85221906	No

**SECTION E. Estimation of GHG emissions by sources**

Kangbao Wolongtushan wind farm doesn't produce any direct GHG emissions, and therefore no formula is provided here for the estimation of GHG emissions by source.

E.2. Estimated leakage:

Firstly, there are no assistant plants constructed for the Project. Hence there is no leakage from additional project activity. Secondly, the project does not claim any indirect emission reductions from activities carried out outside the temporal and/or geographical boundaries of the project such as the fuel handling of extraction, transportation and storage, therefore no significant net leakage was identified. So there is no formula used to estimate leakage and the leakage is zero.

E.3. The sum of E.1 and E.2 representing the project activity emissions:

As described, the sum is zero.

E.4. Estimated anthropogenic emissions by sources of greenhouse gases of the baseline:

Emission reduction of the Project is estimated as the annual electricity generation multiplies the baseline emission factor. The annual electricity generation is monitored by monitoring methodology and the baseline emission factor is assessed according to operating margin emission factor and build margin emission factor of the Project.

$$\text{Emission reduction} = \text{Annual electricity output} \times \text{Baseline emission factor}$$

The annual electricity delivered to the grid of the Project is 57,946 MWh,

The estimated baseline emission factor is 1.0197 t CO₂e /MWh

Therefore the annual emission reduction is calculated as 59,089 tonnes of CO₂e, and

The emission reduction of the first crediting period is estimated to 413,623 tonnes of CO₂e²².

E.5. Difference between E.4 and E.3 representing the emission reductions of the project activity:

Because of the assumption that there are no GHG emissions by sources produced and no leakage occurred, the estimated anthropogenic emissions by sources of greenhouse gases of the baseline are just the represented project activity emissions.

²² See calculation in Annex 3.

**E.6. Table providing values obtained when applying formulae above:**

Year	Estimation of the project activity emission reductions (tones of CO2 e)	Estimation of baseline emission reductions (tones of CO2 e)	Estimations of leakage (tones of CO2 e)	Estimation of emission reductions (tones of CO2 e)
2007 ²³	0	59,089	0	59,089
2008	0	59,089	0	59,089
2009	0	59,089	0	59,089
2010	0	59,089	0	59,089
2011	0	59,089	0	59,089
2012	0	59,089	0	59,089
2013	0	59,089	0	59,089
The first crediting period of 7 years (tones of CO2 e)			413,623	

>>

²³ The first crediting period is estimated at 15th Apr 2007.

**SECTION F. Environmental impacts****F.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:**

The project owner entrusted a third party of environment assessment institute to develop the EIA report during the project planning stage. The institute conducted the EIA report in July 2005. The report was approved by the local EPA. Summary of the result from the EIA report is as below:

*Analysis of environmental impacts during construction duration***Atmospheres**

The largest impact scope of dust emission is 420 meters lee. The closest distance between construction site and local village is 500 meters. Therefore, there is not so much environmental impact on local air quality.

Noise

Noise during construction is mainly caused by equipment installation and operation. Since the closest distance between construction site and local village is 500 meters, the noise is acceptable during the construction.

Solid waste

There will be at most 700 staffs work on site. They will create 1.1 ton solid waste per day. The waste will be collected and moved to close landfill plant periodically.

Hydro

Waste water is mainly produced by daily water discharged by workers. Minimum amount of waste water will be discharged directly on the earth. There is no surface water at the project site. So the discharged waste water will be absorbed by earth or vaporized. Therefore surface water will not be polluted.

Ecological impact

There is no endangered species live in this area. The project owner will strictly control the on-site construction scope, take vegetation protection into account; meanwhile, restore vegetation generation based on restoration framework, so it will not influence the ecological environment very much.

*Analysis of environmental impacts after put into production***Hydro**

The treated waste water of the project site fulfil standard of<water quality standard of agricultural irrigation>(GB5084-1992). The project owner will prepare one pump to treat waste water. After pumped, the waste water will be composted after decomposed by anaerobic bacteria in septic tank, which will cause little impact on surface water quality.

**Noise**

The Project will produce noise to surrounding areas between 37.1-41.0dB (A) after the project put into production. This is acceptable noise level. Consider that there is no other noise source in the villages nearby, the background noise level is relative low. So the operation noise of the Project can be within level I of <Urban area environmental noise standard>. It will not cause negative impact to local inhabitants.

Electromagnetism impact

Wind farm operation will create electromagnetism. However, its density is very low and the electromagnetism is far from local residents area, so it will not cause health damage to local people.

Ecological impact

Through strengthening supervision, local landscape will be restored. Animals will come back. The project site is not within the migrate channel of local Aves; therefore, the operation of this project will only have positive impact on local ecological environment. Also, this wind farm will become a new scene spot to local tourism.

F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

The official EIA done by local environmental bureau proves that it is feasible to set up the Project activity. No significant environmental impacts are considered by the project sectors.

**SECTION G. Stakeholders' comments**

>>

G.1. Brief description how comments by local stakeholders have been invited and compiled:

There is no residence living within 5km from the project location through investigation at pre-feasibility stage (It is further confirmed by DOE at on-site validation on 18th, June, 2006).

After the Project was put into construction, on 25th Apr.2006, the Project owner published an opinion invitation letter on the board of the a stock farm, which is the nearest place from the Project site, for 10 business days to invite public comments on the construction and environmental impacts after putting into production.

Meanwhile, on 8th May.2006, a meeting was held in the office of Kangbao Government to complete a survey of people's opinion and Several Communities' opinion on this wind farm construction and its environmental impacts after putting into production. Stakeholder involved in this project includes:

Government: Kangbao Country Development and Reform Bureau

NGOs: Hebei Province Electricity Power Design Institute

Enterprise : Sanmianjing Stock Farm

Inhabitants: Inhabitants from Kangbao Country

Others: the Project owner

Comments received through these surveys are summarized as follows. The commission of local village issued a support letter for the Project.

G.2. Summary of the comments received:

We know from the outcome of the survey, people almost agreed this wind farm's construction will actively promote local wind farm development, decrease environment pollution and improve local environmental quality. In addition, the construction of this wind farm will facilitate with the optimization of society structure, economic and culture development in the area close to the wind farm. Abundant supply of electricity power could promote the development of third industry in local. It has potential political and economic impacts on building local society which aims at well living standard.

In addition, after the public comments invitation letter were published for 10 business days, the stock farm committee collected all the suggestions from the stakeholders. It is suggested that the implementation of the project would not only utilized the water resources for power generation but also achieving the GHG mitigation by substituting the fossil-fuel power generation. The electricity generated by the proposed projects would be supplied for residential and industrial use. Knowing that the project would not bring any environmental pollution to local environment, all stakeholders agree on the project.

In addition,

- Wind power project, as a renewable project, is conducive to improving the environment and reducing pollution of the area.
- As there is no residence living within 5 km from the project location, the construction of the project will not have negative impacts on the well-beings of local residents.
- The construction and operation of the project can accelerate the development of transportation, construction material and construction-related industries in the area driving its economy forward.



G.3. Report on how due account was taken of any comments received:

No negative comments received.

Both the survey and invitation result indicated that all the interviewees and participants agreed that the construction of the Project highly promote the improvement of landscape prospective in this area, create a new tourism spot, and promote local economic development. Detail of the result will be available upon validation request.

Annex 1**CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY**

Organization:	Hebei Construction Investment Zhangjiakou Wind Energy Co.,Ltd
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Represented by:	Mr. Huang
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Salutation:	-
Last Name:	Huang
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Represented by:	Paul Kaufman
Title:	-
Salutation:	Mr.
Last Name:	Kaufman
Middle Name:	-
First Name:	Paul
Department:	-
Mobile:	-
Direct FAX:	(86-021) 5450 4666
Direct tel:	(86-021) 5450 4666
Personal E-Mail:	Paul_Kaufman @energysystemsintl.com



Annex 2

INFORMATION REGARDING PUBLIC FUNDING

There is no public funding from Annex I Parties for the Project.

Annex 3**BASELINE INFORMATION**

Data recommended in the *Notification on Determining Baseline Emission Factor of China's Grid* for the North China power grid are adopted for the Project to determine the Simple OM emission factor ($EF_{OM,y}$) (see Table A1-A7) and the Build Margin emission factor ($EF_{BM,y}$) (see Table A8-A12).

The following tables summarise the numerical results from the equations listed in the approved methodology ACM0002 (version 6). The information provided by the tables includes data, data sources and the underlying calculations.

Table A1. Electricity generation of the North China power grid in 2002

	Electricity generation (MWh)	Auxiliary electricity consumption (%)	Electricity delivered to the grid (MWh)
Beijing	17886000	7.95	16464063
Tianjin	27263000	7.08	25332779.6
Hebei	100970000	6.72	94184816
Shanxi	82256000	7.98	75691971.2
Inner Mongolia	51382000	7.93	47307407.4
Shandong	124162000	6.79	115731400.2
Total			374712437.4

Data source: *China Electric Power Yearbook 2003*.

Table A2. Electricity generation of the North China power grid in 2003

	Electricity generation (MWh)	Auxiliary electricity consumption (%)	Electricity delivered to the grid (MWh)
Beijing	18608000	7.52	17208678
Tianjin	32191000	6.79	30005231
Hebei	108261000	6.5	101224035
Shanxi	93962000	7.69	86736322
Inner Mongolia	65106000	7.66	60118880
Shandong	139547000	6.79	130071759
Total			425364906

Data source: *China Electric Power Yearbook 2004*.

Table A3. Electricity generation of the North China power grid in 2004

	Electricity generation (MWh)	Auxiliary electricity consumption (%)	Electricity delivered to the grid (MWh)
Beijing	18579000	7.94	17103827
Tianjin	33952000	6.35	31796048
Hebei	124970000	6.5	116846950
Shanxi	104926000	7.7	96846698
Inner Mongolia	80427000	7.17	74660384
Shandong	163918000	7.32	151919202
Total			489173110

Data source: *China Electric Power Yearbook 2005*.



Table A4. Calculation of simple OM emission factor of the North China power grid in 2002

Energy	Unit	Beijing A	Tianjin B	Hebei C	Shanxi D	Inner Mongolia E	Shandong F	Total Fuel G=A+B+C +D+E+F	Emissi on factor (tC/TJ) H	Oxidat ion rate (%) I	NCV (MJ/t or 1000m ³) G	Emission (tCO ₂ e) K=G*H*I*J*44/10000
Coal	10 ⁴ t	691.84	1052.74	4988.01	4037.4	3218	5162.86	19150.84	25.8	98	20908	371208174.5
Cleaned coal	10 ⁴ t	0	0	0	0	0	80.71	80.71	25.8	98	26344	1971179.968
Other washed coal	10 ⁴ t	3.43	0	65.2	135.56	0	106.32	310.51	25.8	98	8363	2407436.829
coke oven gas	10 ⁸ m ³	0.17	1.71	0	0.75	0.16	0.04	2.83	13	99.5	16726	224500.0238
Other gas	10 ⁸ m ³	15.82	0	7.34	0	10.35	0	33.51	13	99.5	5227	830739.3673
Crude oil	10 ⁴ t	0	0	0	0	0	14.98	14.98	20	99	41816	454769.0717
Gasoline	10 ⁴ t	0	0	0	0	0	0.65	0.65	18.9	99	43070	19206.87269
Diesel	10 ⁴ t	0.26	2.35	4.12	0	1.6	10.02	18.35	20.2	99	42652	573896.3513
Fuel oil	10 ⁴ t	13.94	0.04	1.22	0	0.42	20.33	35.95	21.1	99	41816	1151411.233
Refinery gas	10 ⁴ t	0	0	0.27	0	0	0	0.27	18.2	99.5	46055	8256.698951
Natural gas	10 ⁸ m ³	0	0.55	0	0	0.02	0	0.57	15.3	99.5	38931	123867.2104
Other energy	10 ⁴ t	0	0	0	0	1.1	15.92	17.02	0	0	0	0
Net electricity import from the Northeast China power grid (MWh)									2905200			
Average emission factor of the Northeast China power grid (tCO₂e/MWh)									1.1163291			
Total emission of the North China power grid (tCO₂e)									382216597			
Fossil power supply of the North China power grid (MWh)									377617637			
OM emission factor of the North China power grid (tCO₂e/MWh)									1.0121789			

Data sources: China Energy Statistical Yearbook (2000-2002).



Table A5. Calculation of simple OM emission factor of the North China power grid in 2003

Energy	Unit	Beijing A	Tianjin B	Hebei C	Shanxi D	Inner Mongolia E	Shandong F	Total Fuel G=A+B+C+D+E+F	Emission factor (tC/TJ) H	Oxidation rate (%) I	NCV (MJ/t or 1000m ³) G	Emission (tCO ₂ e) K=G*H*I*J*4 4/12/10000
Coal	10 ⁴ t	714.73	1052.74	5482.64	4528.5	3949.32	6808	22535.94	25.8	98	20908	436822883.4
Cleaned coal	10 ⁴ t	0	0	0	0	0	9.41	9.41	25.8	98	26344	229820.3878
Other washed coal	10 ⁴ t	6.31	0	67.28	208.21	0	450.9	732.7	25.8	98	8363	5680747.688
Coke	10 ⁴ t	0	0	0	0	2.8	0	2.8	29.5	98	28435	84397.73393
coke oven gas	10 ⁸ m ³	0.24	1.71	0	0.9	0.21	0.02	3.08	13	99.5	16726	244332.1814
Other gas	10 ⁸ m ³	16.92	0	10.63	0	10.32	1.56	39.43	13	99.5	5227	977500.8431
Crude oil	10 ⁴ t	0	0	0	0	0	29.68	29.68	20	99	41816	901037.7869
Gasoline	10 ⁴ t	0	0	0	0	0	0.01	0.01	18.9	99	43070	295.490349
Diesel	10 ⁴ t	0.29	1.35	4	0	2.91	5.4	13.95	20.2	99	42652	436286.327
Fuel oil	10 ⁴ t	13.95	0.02	1.11	0	0.65	10.07	25.8	21.1	99	41816	826325.7251
Refinery gas	10 ⁴ t	0	0	0.27	0	0	0.83	1.1	18.2	99.5	46055	33638.40313
Natural gas	10 ⁸ m ³	0	0.5	0	0	0	1.08	1.58	15.3	99.5	38931	343351.2148
Other energy	10 ⁴ t	9.83	0	0	0	0	39.21	49.04	0	0	0	0
Net electricity import from the Northeast China power grid (MWh)									4244380			
Average emission factor of the Northeast China power grid (tCO₂e/MWh)									1.10992			
Total emission of the North China power grid (tCO₂e)									451291526			
Fossil power supply of the North China power grid (MWh)									429609286			
OM emission factor of the North China power grid (tCO₂e/MWh)									1.0504697			

Data sources: China Energy Statistical Yearbook (2004).



Table A6. Calculation of simple OM emission factor of the North China power grid in 2004

Energy	Unit	Beijing A	Tianjin B	Hebei C	Shanxi D	Inner Mongolia E	Shandong F	Total Fuel G=A+B+C+D+E+F	Emission factor (tC/TJ) H	Oxidation rate (%) I	NCV (MJ/t or 1000m ³) G	Emission (tCO ₂ e) K=G*H*I*J*4 4/12/10000
Coal	10 ⁴ t	823.09	1410	6299.8	5213.2	4932.2	8550	27228.29	25.8	98	20908	527776527.1
Cleaned coal	10 ⁴ t	0	0	0	0	0	40	40	25.8	98	26344	976919.8208
Other washed coal	10 ⁴ t	6.48	0	101.04	354.17	0	284.22	745.91	25.8	98	8363	5783167.065
Coke	10 ⁴ t	0	0	0	0	0.22	0	0.22	29.5	98	28435	6631.250523
coke oven gas	10 ⁸ m ³	0.55	0	0.54	5.32	0.4	8.73	15.54	13	99.5	16726	1232766.915
Other gas	10 ⁸ m ³	17.74	0	24.25	8.2	16.47	1.41	68.07	13	99.5	5227	1687509.064
Diesel	10 ⁴ t	0.39	0.84	4.66	0	0	0	5.89	20.2	99	42652	184209.7825
Fuel oil	10 ⁴ t	14.66	0	0.16	0	0	0	14.82	21.1	99	41816	474656.87
Refinery gas	10 ⁴ t	0	0.55	1.42	0	0	0	1.97	18.2	99.5	46055	60243.32197
Natural gas	10 ⁸ m ³	0	0.37	0	0.19	0	0	0.56	15.3	99.5	38931	121694.1015
Other energy	10 ⁴ t	9.41	0	34.64	109.73	4.48	0	158.26	0	0	0	0
Net electricity import from the Northeast China power grid (MWh)									4514550			
Average emission factor of the Northeast China power grid (tCO₂e/MWh)									1.1518			
Total emission of the North China power grid (tCO₂e)									543504173			
Fossil power supply of the North China power grid (MWh)									493687660			
OM emission factor of the North China power grid (tCO₂e/MWh)									1.1009069			

Data sources: China Energy Statistical Yearbook (2005).

Table A7. Generation Weighted Average OM factor

Year	2002	2003	2004	generation weighted average OM
OM (tCO ₂ e/MWh)	1.0122	1.0505	1.1009	1.0585



Table A8. Data and result of Step a. and Step b.

Calculate with table A6 in annex 3, the coal sharing of total thermal fuels in 2004 is 99.30%.

Refer to the statement in Step b and *Notification on Determining Baseline Emission Factor of China's Grid*²⁴,

336.66 gCe/kWh is taken as the efficiency level of the best technology for coal-fired power generators.

The electricity generation efficiency is 36.35%,

The emission factor of coal is 25.8 tc/TJ,

The oxidation rate is 98%.

Therefore, $EF_{Coal} = =$ is 0.9136 tCO₂/MWh.

Refer to the statement in Step b. and above data, the revised $EF_{Thermal}$ is 0.9072 tCO₂/MWh

Table A9. Installed capacity of the North China power grid in 2004

	Beijing	Tianjin	Hebei	Shanxi	Inner Mongolia	Shandong	Total
Thermal power (MW)	3458.5	6008.5	19932.7	17693.3	13641.5	32860.4	93594.9
Hydro power (MW)	1055.9	5	783.8	787.3	567.9	50.8	3250.7
Nuclear power (MW)	0	0	0	0	0	0	0
Wind power and Other (MW)	0	0	13.5	0	111.8	12.4	137.7
Total (MW)	4514.4	6013.5	20730	18480.5	14321.2	32923.6	96983.2

Data source: China Electric Power Yearbook 2005

Table A10. Installed capacity of the North China power grid in 2002

	Beijing	Tianjin	Hebei	Shanxi	Inner Mongolia	Shandong	Total
Thermal power (MW)	3407.5	6245.5	16745.7	14327.8	9778.7	25102.4	75607.6
Hydro power (MW)	1038.5	5	775.9	795.3	592.1	50.8	3257.6
Nuclear power (MW)	0	0	0	0	0	0	0
Wind power and Other (MW)	0	0	13.5	0	76.6	0	90.1
Total (MW)	4446	6250.5	17535.1	15123.1	10447.4	25153.1	78955.2

Data source: China Electric Power Yearbook 2003

²⁴ <http://cdm.ccchina.gov.cn/>



Table A11. Installed capacity of the North China power grid in 2001

	Beijing	Tianjin	Hebei	Shanxi	Inner Mongolia	Shandong	Total
Thermal power (MW)	3412.5	5632	16474.9	13415.8	8898.3	20957.7	68791.3
Hydro power (MW)	1058.1	5	742.6	795.9	566.2	56.2	3224
Nuclear power (MW)	0	0	0	0	0	0	0
Wind power and Other (MW)	0	0	9.9	0	46.7	0	56.6
Total (MW)	4470.6	5637	17227.4	14211.8	9511.2	21013.9	72071.9

Data source: China Electric Power Yearbook 2002

Table A12. Calculation of BM emission factor of the North China power grid

	Installed capacity in 2001 (MW) A	Installed capacity in 2002 (MW) B	Installed capacity in 2004 (MW) C	Capacity additions from 2001 to 2004 (MW) D=C-A	Share in total capacity additions
Thermal power	68791.3	75607.6	93594.9	24803.6	99.58%
Hydro power	3224	3257.6	3250.7	26.7	0.10%
Nuclear power	0	0	0	0	0.00%
Wind power and Other	56.6	90.1	137.7	81.1	0.32%
Total	72071.9	78955.2	96983.2	24911.3	100%
Share in total installed capacity of 2004	74.31%	81.41%	100%	25.69%	

Calculate with formula (4),

$$EF_{BM,y} = \frac{CAP_{Thermal}}{CAP_{Total}} \times EF_{Thermal} = 99.58\% \times 0.9072 = 0.9034 \text{ tCO}_2/\text{MWh}$$



Annex 4

MONITORING PLAN

Generation introduction

Monitoring plan determines the target distribution and time arrangement of monitoring, to ensure the true, maintainable and measurable GHGs of CDM project can be monitored, recorded and reported. This is the key procedure to determine the CERs. According to monitoring plan, monitoring system should be reliable, conservative and comprehensive, this system should have the function of data evaluation, measurement, collection and monitoring, meanwhile provide true, reliable and conservative CERs monitoring and calculation process & result to DOE when doing the project verification. This procedure will ensure the authenticity of CERs from CO2 reduction to the CERs buyers.

The staffs who are responsible for monitoring should strictly follow the monitoring plan. They should effectively and truly report the project CERs.

Project integrate management

The monitoring plan of Hebei Kangbao Wolongtushan 30 MW Wind Farm Project will be executed by the project owner, meanwhile guided by MCS, and verified by DOE. To ensure the smooth implementation of the monitoring plan, the project owner established clear monitoring system.

The monitoring system organization chart is shown in figure 1.

The monitoring activity involves 8 employments which include 1 project manager. The project manager is responsible for the implementation and monitoring of the monitoring activity. There are 3 departments organized for data report, quality control and training. There is 1 manager responsible for data report and quality control department by 1 of each. There is also 4 staffs work in these two departments by 2 of each. The manager will take charge of the employment administration, as well as the operation implementation and monitoring; staffs will carry on the concrete assignment based on the guide of their manager. The training department has 1 manager who is responsible for the entire training process of the project. The monitoring system flowchart of this project is shown in figure 1.

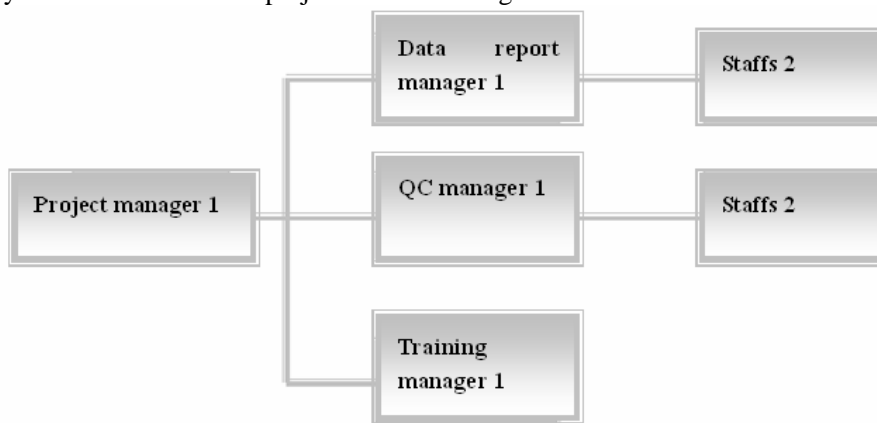


Figure 1 monitoring system flowchart of the proposed project for CDM

Monitoring procedure

1 . Installation, measurement and calibration of equipment and meters.

The CDM monitoring of this project is mainly focused on the monitoring of electricity supply to grid E2, the monitoring system is shown in figure 2.

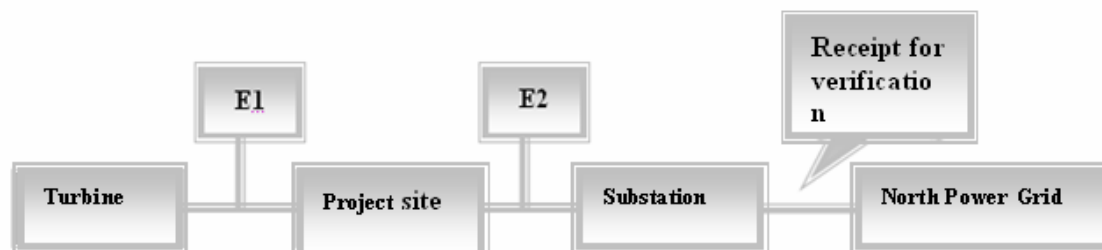


Figure 2. CDM monitoring system

Unit electricity generation by each turbine E1 will be online monitored by the automatic system. The computer system will automatically obtain data and save it. The project owner will establish the monitoring system. The equipment and meters will be calibrated every year according to national standard to ensure its accuracy.

Electricity supply to grid of this project E2 will be monitored by ammeter. The equipment and meters will be calibrated every year according to national standard to ensure its accuracy.

Project electricity supply to North Power grid from substation will be monitored by Grid Company. Electricity supply receipt will be provided for verification.

Table 1 lists detail information of equipment and meter used in this project. Brochures of all equipments and meters are kept by project manager. The copies are kept by each department. All staffs can take a view on when necessary. All the brochures are available for DOE validation and verification.

Table1 Equipments used in this project

No.	Equipment	Type	Precision	Installation position	Functionary
E2	Ammeter	DSSD341	0.2S	project site-substation	Grid company

2 . Data monitoring

As shown in table 2, this project mainly focuses on the monitoring of project electricity supply E2 and unit electricity generation E1.

1) Monitoring of electricity supply

Electricity supply to grid of this project (E2) is monitored by ammeter. Electricity sales invoices will also be obtained as an additional check. The two data is provided by the grid company. These two references of electricity deliver to grid will be double checked by each other. Calibration of Meters & Metering should be implemented according to national standards and rules. And all the records should be documented and maintained by the project owner for DOE's verification.

2) Monitoring of electricity generation



Unit electricity generation by each turbine E1 will be online monitored by the automatic system, and is automatically obtained and saved by its network.

3 . Calculation of emission reductions

Emission reduction of the project is calculated by Millennium Capital Services, as the consultant of the project. To ensure the transparency and conservative, an excel table is used for calculation, with all relative data and calculate process provided. Meanwhile, source of default value is provided for DOE verification.

Emission reduction of the project is calculated by project assistant from Millennium Capital Services. To ensure its conservativeness and accuracy, the calculation process is also double checked and saved by project manager from Millennium Capital Services.

Management process

1 . QA & QC

QA&QC, including data monitoring, maintenance and storage, will be modified according to operation status and verification requirement.

1) Electricity supply to Grid

Electricity supply to grid of this project (E2) is monitored by ammeter. The data is stored both in Grid company, on-site and in Construction Investment Zhangjiakou Wind Energy Co, Ltd. In addition, the data is sent to Millennium Capital Service for storage and analysis at the beginning of each month.

Unit electricity generation by each turbine will be online monitored by the automatic system., and is automatically obtained and saved by its computer system. The data is stored both on operation site and in Construction Investment Zhangjiakou Wind Energy Co, Ltd.

Project electricity supply to North Power grid from substation will be monitored by Grid Company. Electricity supply receipt will be provided for double check each year.

2) Emergency

There are no GHG emissions when the electricity generation system stops working.

All the equipments and meters are calibrated each year by project owner, according to national standard to ensure its precision. A spare meter is used for monitoring data in case of the original one not work.

Calibration of the meter used for monitoring electricity supply to grid (E2)of this project is implemented by Grid company and project owner each year. The report of its calibration will be kept by Grid company and Project owner, as well as Millennium Capital Services.

Calibration of the meter used for monitoring electricity generation by each turbine is implemented by project owner each year. The report of its calibration is kept by project owner.

2 . Data management systems



Data management systems are used to keep monitoring data. It is the key step in monitoring process. The emission reductions cannot be verified, if the monitoring data is not kept well.

The original data and the final results, as well as all the information and relative data are kept in The original data and the final results, as well as all the information and relative data are kept electronically and in paper, and are listed by document name, content summary for check and other use. Reference and website address are also provided for DOE verification.

All relative documents are kept by the monitoring group and at least have 1 copy.

Documents required in monitoring and verification is listed in Table 3.

Table 3 Documents required in monitoring and verification

Items	Documents	Contents	Source from	Keep in
1	PDD, including electronic data table and documents (assumptions, data forecast and monitoring plan, etc)	Expressions of emission reduction and monitoring contents	Project owner and Millennium Capital Services	Project owner and Millennium Capital Services, as well as website of UNFCCC
2	Information of equipments used in project	Instruction of all equipments used, as Table 1 listed	Project owner	Project owner and Millennium Capital Services
3	Monitoring management	Operational manual of monitoring management	Project owner	Project owner and Millennium Capital Services
4	Management of staff in monitoring group	Name and responsibility of monitoring group	Project owner	Project owner and Millennium Capital Services
5	QA & QC	Equipments and national and industry standards	the project owner	Project owner and Millennium Capital Services
6	Experience of person in monitoring and calculation group	Major, title of a technical post, working experience	Project owner	Project owner and Millennium Capital Services
7	The report on monitoring and checking of the electricity delivered by the Project to the grid	Record based on monthly meter reading and electricity sales receipts/records	the project owner	Project owner and Millennium Capital Services
8	Record on maintenance and calibration of metering equipment	Reasons for maintenance and calibration and the precision after maintenance and calibration	the project owner	Project owner and Millennium Capital Services
9	Calculation and record of project emission reductions	Calculation based on monthly monitoring data	Millennium Capital Services and the project owner	Project owner and Millennium Capital Services



10	Training record	Training time, place, personnel and content	Project owner	the project owner
11	Monitoring report	CO ₂ emission reduction calculation	the project owner	the project owner
12	Letter of confirmation	Confirmation of monitoring and calculation data and procedure above	the project owner	Confirmation of monitoring and calculation data and procedure above
13	Project Management Record (including data collection and management system)	Comprehensive and true reflection of the management and the operation of the Project	Project owner	Project owner and Millennium Capital Services

3 . Verification of monitoring results

Verification of monitoring results is a necessary part of all CDM projects. The main purpose of verification is to verify the achievement of GHG reduction independently. The verification frequency of the project will be done based on the Project owner request..

The main steps of verification are listed below:

- ◆ The project owner signs agreement with the DOE that conducts the verification, and stick to the verification schedule according to the request of the buyer and CDM EB in the crediting period. Hebei Construction Investment Zhangjiakou Wind Energy Co, Ltd will make the preparation in advance and support the verifiers and relevant personnel to achieve the verification work in high quality and efficiently.
- ◆ Hebei Construction Investment Zhangjiakou Wind Energy Co, Ltd will offer the complete information according to the DOE's request before and during the verification process. The consultant of the project, Millennium Capital Services, will make inner inspection together with Hebei Construction Investment Zhangjiakou Wind Energy Co, Ltd every year before the DOE verification.
- ◆ Hebei Construction Investment Zhangjiakou Wind Energy Co, Ltd will inform its employees to cooperate with the DOE verifiers to finish the visit and to faithfully answer all questions raised by the verifiers about emission reductions.

The consultant of the project, Millennium Capital Services, as the contactor of DOE verification, will be in charge of revising the monitoring plan according to the verification content every year.

4 . Personnel training

The monitoring plan need to be execute by qualified professionals, thus Project owner will train the relevant personnel 3 months before the project operation.



The training will make sure the relevant personnel to master the necessary mechanical, electric and installing knowledge, know well the working principle and the fundamental structure of wind power generator, understand the reasons of common malfunction and the corresponding solving methods, expertly use the automatic monitoring system and understand the request of CDM on the monitoring system.

Project owner will organize professional training periodically to improve the professional skill of the operators after the project operation.

The fresh employees have to receive training on relevant CDM knowledge, monitoring requirements of CDM projects and project operation skills. The employees shall not take up their jobs unless they have passed the examination.

Personnel training will be implemented by the project manager, and be achieved with the cooperation of team leaders. If personnel alternation happens, the worker taking over should be ensured to receive the same training.

In summary, the monitoring plan of the project will be executed by the project owner, under the supervision of the project consultant, Millennium Capital Services, according to detail requirements from EB on monitoring, validation and verification to ensure the emission reduction can be monitored, recorded and reported accurately.

5 . Efficiency evaluation

To assess whether the project can reach the anticipative efficiency on the Feasibility Study Report, the project owner, Project owner, together with the project consultant, Millennium Capital Services, evaluate the electricity delivered to the grid, project power generation and power generation of each generator in the end of every year.

The evaluation results will be stored by both parties as the reference for next year.



Annex 5 IRR CALCULATION

Cash Flow Without CDM Revenue		Unit: ×10000 Yuan rmb																				
Items																						
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
1.sub-total of cash inflows		0	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	4316
1.1 Electricity Sale			3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477
1.2 Fixed Assets Depreciation																						749
1.3 Current Assets																						90
1.4 CDM revenue																						
2.sub-total of cash outflow		27509	681	590	590	590	590	590	590	639	745	776	817	853	891	932	976	1542	1542	1542	1542	1542
2.1 Fixed Assets		27509	0																			
2.2 Current Assets			90																			
2.3 O&M Cost			562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562
2.4 Sales tax & surtax			29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
2.5 Income Tax									49	154	186	227	263	301	342	386	951	951	951	951	951	951
2.6 General Cost																						
2.7 Depreciation																						
2.8 Accounting Fee																						
2.9 Interest Of Long Term																						
2.10 Interest Of Current A																						
3、 Total Cash Flow		-27509	2796	2886	2886	2886	2886	2886	2886	2837	2732	2701	2660	2624	2585	2544	2501	1935	1935	1935	1935	2774
4、 Accumulative Cash Flow		-27509	-24713	-21826	-18940	-16054	-13167	-10281	-7395	-4557	-1825	875	3535	6159	8744	11288	13789	15724	17659	19595	21530	24304
IRR	7.47%																					

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Cash Flow With CDM Revenue																						
Unit: ×10000 Yuan rmb																						
Items	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
1.sub-total of cash inflows		0	3832	3950	3950	3950	3950	3950	3950	3950	3950	3950	3950	3950	3950	3950	3950	3950	3950	3950	3950	4316
1.1 Electricity Sale			3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477
1.2Fixed Assets Depreciati																						749
1.3 Current Assets																						90
1.4 CDM revenue			355	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473
2.sub-total of cash outflow		27509	681	590	590	590	590	590	590	639	745	776	817	853	891	932	976	1542	1542	1542	1542	1542
2.1 Fixed Assets		27509	0																			
2.2Current Assets			90																			
2.3 O&M Cost			562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562
2.4 Sales tax & surtax			29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
2.5 Income Tax										49	154	186	227	263	301	342	386	951	951	951	951	951
2.6 General Cost																						
2.7 Depreciation																						
2.8Accounting Fee																						
2.9Insterest Of Long Term																						
2.10 Interest Of Current A																						
3、 Total Cash Flow		-27509	3151	3359	3359	3359	3359	3359	3359	3310	3205	3174	3133	3097	3058	3017	2974	2408	2408	2408	2408	2774
4、 Accumulative Cash Flo		-27509	-24358	-20999	-17639	-14280	-10921	-7561	-4202	-892	2313	5487	8619	11716	14774	17792	20766	23174	25582	27990	30398	33173
IRR	9.72%																					

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