



Voluntary Carbon Standard
Project Description Template

19 November 2007

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28 September 2010***



**CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006**

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

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Gansu Guazhou Daliangxi Wind Power Project

Version 5.0

27/04/2010

Revision history

Version Number	Date	Description and reason of revision
01	15/12/08	Initial Adoption
05	27/04/10	PDD updated based on corrections requirement from EB

A.2. Description of the project activity:

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The Gansu Guazhou Daliangxi Wind Power Project (hereafter referred to as the “Project”), developed by Gansu CGN Wind Power Co., Ltd, (hereafter referred to as the “Project Developer”) is a grid connected renewable energy project in Jiuquan city, Gansu Province, in the People’s Republic of China (hereafter referred to as the “Host Country”). It involves the installation of 33 turbines, each of which has a rated output of 1500 kW, providing a total installed capacity of 49.5 MW, with a predicted power supplied to the grid of 115,144 MWh per annum.

The purpose of the project is to generate power through wind energy thereby reducing greenhouse gas (GHG) emissions in electricity generation in the Northwest China Power Grid (hereafter referred to as the “Grid”). The Project Developer has obtained permission to sell generated electricity to the Gansu Power Grid which is an integral part of the Grid. The Grid is a coal-dominated power grid (please refer to annex 3). The electricity currently generated by the grid is relatively carbon intensive, with an operating margin emission factor of 1.1225tCO₂/MWh and a build margin emission factor of 0.6199tCO₂/MWh (see section B for further details). The project is therefore expected to reduce emissions of GHG by an estimated 114,781 tCO₂e per year during the first crediting period by displacing electricity from the Grid. The baseline scenario is the same as the scenario existing prior to the start of the implementation of the project activity: electricity delivered to the Grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

The project is contributing to sustainable development of the Host Country. Specifically, the project:

- Achieves GHG emission reductions by avoiding electricity generation from fossil fuel-fired power plants.
- Increases employment opportunities in the area where the project is located (approximately 5people¹ will be permanently employed for the project operation, and the construction of the project secures jobs in the construction sector) and thereby contributes to poverty alleviation.
- Enhances the local investment environment and therefore improves the local economy.

¹ Feasibility Study, p14-2



- Diversifies the sources of electricity generation, important for meeting growing energy demands and the transition away from diesel and coal-supplied electricity generation
- Makes greater use of renewable wind resources.

A.3. Project participants:

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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)
People's Republic of China (host)	Gansu CGN Wind Power Co., Ltd	No
United Kingdom of Great Britain and Northwestern Ireland	Credit Suisse International	No
United Kingdom of Great Britain and Northwestern Ireland	EcoSecurities International Limited	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.

Further contact information of project participants is provided in Annex 1.

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

The project is located near Guazhou County, Jiuquan City, Gansu Province, People's Republic of China (P. R. China)

A.4.1.1. Host Party(ies):

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P. R. China

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

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Gansu Province

A.4.1.3. City/Town/Community etc:

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Guazhou County

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 exact location of the project is defined using geographic coordinates obtained with a Global Positioning System (GPS) receiver: E 95°36'37" Longitude, N 40°42'55" Latitude. These geographic coordinates are for the centre of the wind farm.

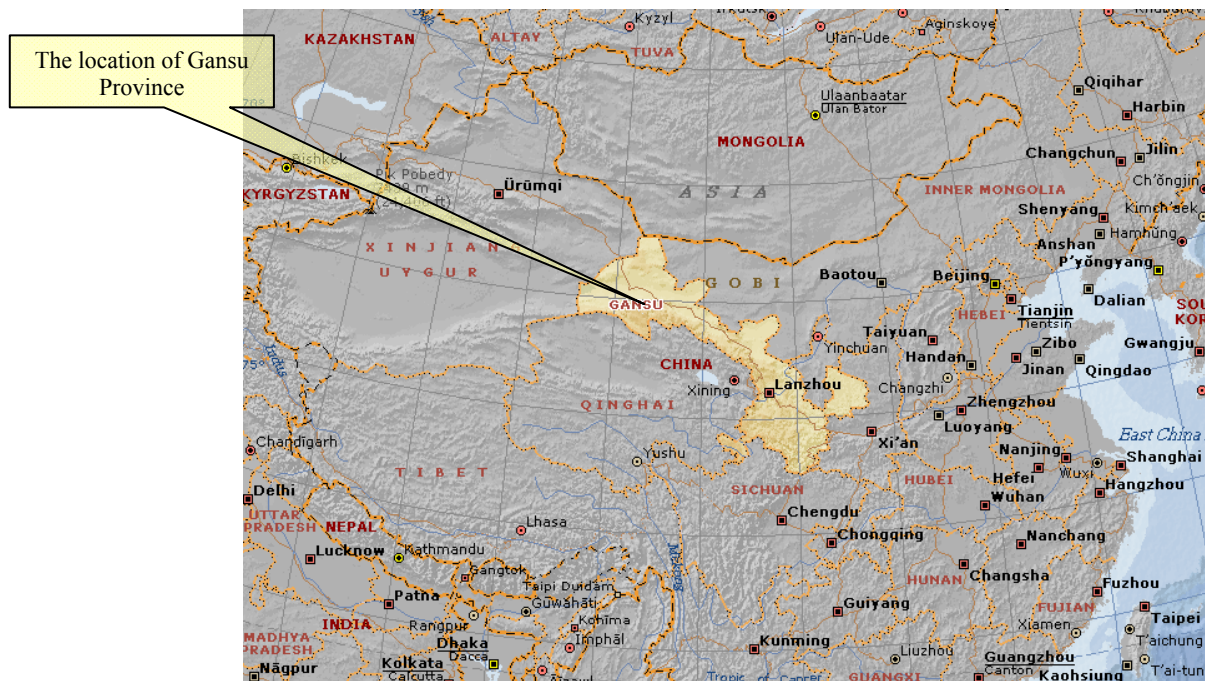


Figure A.4.1 The location of Gansu Province in China

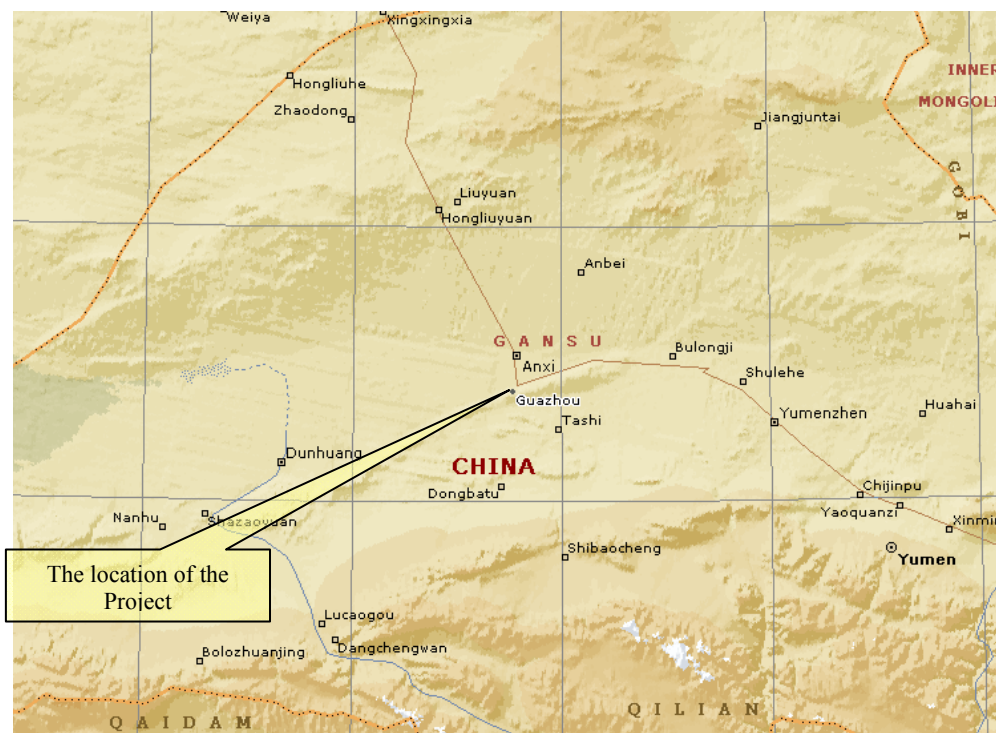


Figure A.4.2 The location of the Project

**A.4.2. Category(ies) of project activity:**

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According to Annex A of the Kyoto Protocol, this project fits in Sectoral Scope 1, Energy Industries (renewable/non renewable).

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

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The purpose of the Project is to utilize wind energy for electricity generation, thereby displacing CO₂ emissions from fossil fuel based electricity generation. The baseline scenario is the same as the scenario existing prior to the start of the implementation of the project activity.

The proposed project involves the installation of 33 wind turbines each of which with a rated capacity of 1,500 kW, providing a total capacity of 49.5MW. The expected annual electricity supply to the grid is 115,144MWh. The height of the rotor hub of all turbines is 61.5m. The average wind speed in the region is 7.54m/s at a height of 61.5m and 7.60m/s at a height of 65m².

According to the turbine layout, each turbine will be equipped with one transformer. The construction will also include an 110kV step-up substation. The power generated will be delivered to the step-up substation by 10kV transmission lines. The power in the 110kV step-up substation will be transmitted to Guazhou Substation. Then the electricity generated will be transmitted to the Northwest China Power Grid.

The main technical parameters of the proposed project are shown in Table A.4.3.1

Table A 4.3.1 Main technical parameters of the proposed project

	Value	Source
Installed capacity (MW)	49.5	Feasibility Study Report14-1
Operating time yearly (hours)	2,326	Feasibility Study Report1-3
Expected annual electricity supplied to the grid (MWh)	115,144	Feasibility Study Report1-3
Load factor (%)	27	Calculated based on the Feasibility Study parameters
Project lifetime (years)	20	Feasibility Study Report14-1
Wind Turbines		
Type	FD77A	Feasibility Study Report 5-5
No. of vanes	3	
Rated Power (kW)	1500	
Rotor diameter (m)	77	
Cut-in speed (m/s)	3	
Cut-out speed (m/s)	20	
Rated speed (m/s)	12.5	
Height of rotor hub (m)	61.5	
Manufacturer	Dongfang Steam Turbine Works	

² See FSR p1-2



* The Feasibility Study Report (FSR) was developed by an independent third party, the Northwest Design & Investigation Research Institute in December 2007, and was audited and approved by the local Government - Gansu Development and Reform Commission - on 19 May 2008. The approval document number is Ganfagainengyuan [2008]283.

The generator is produced by Dongfang Steam Turbine Works Company. All other items of equipment used in the Project are produced domestically (and the project developer is experienced in handling and operating this kind of equipment.) The Project involves no technology transferred from abroad.

A.4.4 Estimated amount of emission reductions over the chosen crediting period:

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Renewable crediting period (7×3 years) is adopted by the Project.

Table A.4.4 Estimated amount of emission reductions over the chosen crediting period

Years	Annual estimation of emission reductions in tonnes of CO_{2e}
2010	114,781
2011	114,781
2012	114,781
2013	114,781
2014	114,781
2015	114,781
2016	114,781
Total estimated reductions (tonnes of CO _{2e})	803,467
Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tonnes of CO _{2e})	114,781

Refer to section B.6.3 for further details on the quantification of GHG emission reductions associated with the project.

A.4.5. Public funding of the project activity:

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The project will not receive any public funding from Parties included in Annex I of the UNFCCC.

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

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1. The approved consolidated baseline and monitoring methodology ACM0002: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” Version 09, in effect as of 5 December 2008; and
2. The approved “Tool for demonstration and assessment of additionality”, Version 05.2, in effect as of EB 39; and
3. The approved “Tool to calculate the emission factor for an electricity system”, Version 02, in effect as of EB 50, are applied to the Project activity³.

More information about the methodology can be obtained at:

<http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>

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

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The Methodology ACM0002 (Version 09) is chosen and is applicable to the proposed project due to the following reasons:

- The project activity is the installation of wind power plant for electricity
- The project activity is connected to the Northwest China Power Grid (NWCPG). The geographic and system boundaries for this grid can be clearly identified and information on the characteristics of this grid are available.
- The project activity does not involve switching from fossil fuels to renewable energy at the site of the project activity.
- The project activity is not a biomass fired plant
- The project activity meets the applicability conditions of the ‘Tool to calculate the emission factor for an electricity system’ and the ‘Tool for the demonstration and assessment of additionality’.

The applicability criteria stated in methodology ACM0002 (Version 09) are met on the basis of the reasons above.

B.3. Description of the sources and gases included in the project boundary

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	Source	Gas	Included?	Justification / Explanation
Baseline	CO ₂ emissions from electricity generation in fossil fuel-	CO ₂	Yes	Main emission source.
		CH ₄	No	Minor emission source, excluded for simplification

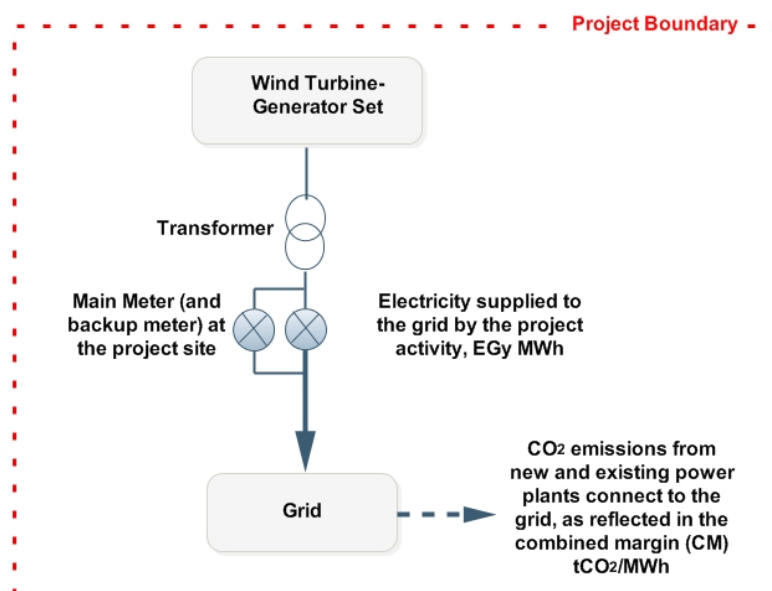
³ The “Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion” Version 1, in effect as of EB 32, is not applied to this Project, since ACM0002 refers to this Tool for geothermal projects and the proposed Project is a wind power project.



	fired power plants connected into the Northwest China Power Grid displaced due to the project activity	N ₂ O	No	Minor emission source, excluded for simplification.
Project Activity	Project Emission	CO ₂	No	The project is a wind power project and has not backup power. Project emissions should not be considered according to ACM0002.
		CH ₄	No	
		N ₂ O	No	

The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the Grid to which the Project is connected. NWCPG includes the Gansu, Shanxi, Qinghai, Ningxia and Xinjiang Power Grids.

Flow diagram of the project boundary



B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

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According to the description in the approved baseline methodology ACM0002, as the proposed project does not modify or retrofit existing electricity generation facilities, the baseline scenario is the following:

Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations in B.6.1.

Table B.4: Key Information and Data Used to Determine the Baseline Scenario

Variable	Value / Unit	Source
Operating Margin Emissions factor	1.1225tCO ₂ /MWh	Calculated from the



		China Energy Statistics Yearbooks 2005-2007 and the China Electric Power Yearbooks 2003-2007
Build Margin Emissions Factor	0.6199tCO ₂ /MWh	Calculated from the China Energy Statistics Yearbooks 2007 and the China Electric Power Yearbooks 2005-2007
Combined Margin Emissions Factor	0.99685 tCO ₂ /MWh	Calculated from the China Energy Statistics Yearbooks 2005-2007 and the China Electric Power Yearbooks 2003-2007
Power supplied to the grid by the project in year y	115,144MWh	Feasibility Study Report 1-3

The Project is the installation of a new grid-connected renewable power plant that connects with and delivers electricity to the NWCPG⁴. According to the “Tool to calculate the emission factor for an electricity system”, the delineation of grid boundaries of the Project is the NWCPG.

The analysis and description in B.5 and B.6 will support the baseline scenario identified above.

B.5. 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 (assessment and demonstration of additionality):

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The following steps are used to demonstrate the additionality of the project according to the latest version of the “*Tool for the demonstration and assessment of additionality* (version 05.2)” approved by the Executive Board.

Step 1. Identification of alternatives to the Project activity consistent with current laws and regulations

Sub-step 1a. Identification of alternatives to the project activity consistent with current laws and regulations

The following alternatives to the project scenario are considered:

Alternative 1: The proposed Project activity undertaken without being registered as a CDM project activity, i.e. the construction of a new wind power generation plant with an installed capacity of 49.5MW connected to the local grid, implemented without considering CDM revenues.

Alternative 2: Continuation of the current situation, i.e. electricity will continue to be generated by the existing generation mix operating in the grid.

⁴ <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1364.pdf>



Alternative 3: Construction of a thermal power plant with the same installed capacity or the same annual power output.

Alternative 4: Construction of a power plant using another renewable energy resource with the same installed capacity or the same annual power output.

Gansu Province lacks renewable sources, except wind resources. According to the Guidance Catalogue for the Renewable Energy Industry Development⁵, other renewable energy generation, like biomass, solar PV, wave/tide, or geothermal resources, are in the phase of technical research, and not widely adopted in China. Furthermore, as per the Feasibility Study Report, the project is located on a desert plain, so the hydropower resources and biomass materials lack in the area⁶. Therefore, *Alternative 4* is not realistic and credible and is not considered further in the assessment of the alternatives.

Sub-step 1b. Consistency with mandatory laws and regulations:

The Chinese power sector has undergone a transformation to a market-oriented system, therefore investment in a power generation project is an individual power project developer's decision based on the project return and risk profile⁷. There are no laws compelling the project developer to develop wind power plants, thus *Alternatives 1 and 2* identified are in line with all applicable laws and regulations.

The main sectoral policy relevant to this Project activity is the Renewable Energy Law of the People's Republic of China, which came into effect 1 January 2006 and aims to promote renewable energy in P.R. China. This Law demonstrates the Chinese Government's commitment to the development of renewable energy as part of the overall energy development strategy, and encourages grid-connected power generation from renewable sources. Nevertheless, there are no direct incentives such as financial grants, higher tariffs or subsidised loans available for these types of project.

In addition to the above, although energy efficiency and renewable energy were included in the agenda for the P.R. China's 11th Five-Year Plan (2006-2010), there is no legislative requirement to meet the projections under this Plan⁸.

According to the regulations related to power production in P. R. China, it is forbidden to build a thermal power station with an installed capacity lower than 135 MW⁹. Therefore, *Alternative 3* above is not in line with applicable laws and regulations, and will not be considered further.

Finally, *Alternative 4* is in compliance with legal and regulatory requirements; however, it is excluded from the list of potential baseline scenarios with reasonable explanation in sub-step 1a.

⁵ http://nyj.ndrc.gov.cn/zywx/t20060206_58771.htm

⁶ See FSR 3-1.

⁷ Source: State Council's Decision on Reforming Investment Approval Process, 16/07/2004.

⁸ See: Point Carbon. CDM & JI Monitor: *Chinese official defends additionality of renewables in CDM*. 21/03/2007

⁹ See the announcement which strictly forbids the construction of thermal power stations with an installed capacity lower than 135 MW published by the State Council office, Guo Ban Fa Ming Dian[2002] No.6

**Step 2. Investment Analysis*****Sub-step 2a. Determine appropriate analysis method***

According to the “Tool for the demonstration and assessment of additionality (version 05.2)”, three options can be applied to conduct the investment analysis. These are the simple cost analysis (Option I), the investment comparison analysis (Option II) and the benchmark analysis (Option III).

Since the proposed Project will generate financial and economic benefits other than CDM related income, through the sale of generated electricity, Option I (Simple Cost Analysis) is not applicable.

Since the alternative to the CDM project activity does not include investments of comparable scale to the project, Option III should be used.

Given that the project developer does not have alternative and comparable investment choices, benchmark analysis (Option III) is more appropriate than investment comparison analysis (Option II) for assessing the financial attractiveness of the project activity.

Sub-step 2b. Option III – Application of benchmark analysis

The likelihood of the development of this Project, as opposed to continued generation of electricity from the current electricity generation mix (i.e. its baseline), will be determined by comparing the Project IRR (without carbon) with benchmark rates available to a typical local investor.

With reference to *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects*, the financial benchmark rate of return (Project IRR) of the Chinese power industry is 8%, which is therefore the benchmark for the IRR of this Project and is used to assess the Project. The 8% benchmark was used to assess the proposed project in the Feasibility Study Report. This benchmark is widely used as the basis for decision making for power project investments in P. R. China and serves as the sectoral benchmark rate on total investment for wind projects.

According to the Feasibility Study Report, the main parameters used in the investment analysis are summarized in Table B.5.1.

Table B.5.1. Main parameters used in the investment analysis

Name	Value	Source
Installed capacity (MW)	49.5	Feasibility Study Report14-1
Total investment (RMB)	474,331,000	Feasibility Study Report14-2
Expected power supplied to the grid (MWh)	115,144	Feasibility Study Report1-3
Residual value	5%	Feasibility Study Report 14-1
Tariff, including VAT (RMB/MWh)	540	Feasibility Study Report14-2
VAT (%)	8.5	Feasibility Study Report14-3
Income tax (%)	25	Feasibility Study Report14-3
City Maintenance and Construction Tax	5	Feasibility Study Report14-3
Educational Surcharge Tax (%)	3	Feasibility Study Report14-3
Lifetime of project (years)	20	Feasibility Study Report14-1



Total operating costs (RMB)	209,379,000	Feasibility Study Report14-22
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The table below shows the financial analysis for the project activity, at the time that the decision to go ahead was made, with and without CDM financing. As shown, the Project IRR after tax was lower than the benchmark rate of return applicable.

Table B.5.2. Summary of project financial analysis with and without CDM revenue

IRR without CDM	6.71%
IRR with CDM	9.43 %

Details for calculating the IRR are provided in table B.5.3

The electricity tariff was taken from the Feasibility Study Report. The actual tariff approved by the government is the same as that in the FSR, and is outside the control of the project developer; therefore it was not possible to predict (with any accuracy) what would happen to the tariff in the future, hence using fixed input parameters is considered appropriate. Nevertheless the effect of increases in fixed parameters has been assessed in the sensitivity analysis (below).

A sensitivity analysis must be conducted to show whether the conclusion regarding the financial/economic attractiveness is robust to reasonable variations in the critical assumptions. All variables that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation. The sensitivity analysis was therefore done by altering the following parameters:

- Electricity Tariff
- Investment Costs
- Operating Costs
- Operating Hours/output

Table B.5.3 summarizes the results of the sensitivity analysis, showing the variation of each parameter needed to reach the 8% benchmark.

Table B.5.3. Results of the sensitivity analysis

	Variation of the parameter needed to reach the 8% benchmark
Operating Costs	-53.5%
Investment Costs	-10.1%
Electricity Tariff	+10.1%
Annual Operating Hours/annual output	+10.1%

These variations do not reflect a realistic range of assumptions for the input parameters of the financial analysis.

- **Operating costs:** Due to sustained increases in labor and raw material costs in China (See Figure B.5.1 and Table B.5.4 below), it is unlikely that the operating costs will reduce during the project lifetime Furthermore, according to the analysis of Morthorst, P.E., *Costs and prices. In Wind energy - the facts. An analysis of wind energy in the EU-25* Chandler, H. (ed.), (European Wind Energy Association, Brussels, 2004, p.93-110), operating costs of a wind farm in the first few years would be 2-3% and in later years 5% of investment costs. The annual operating cost of this

project is 2.26% of the static investment which is a reasonable range for the wind farms. As a result, a significant 53.5% decrease in operating costs is not realistic and the IRR would remain below 8% benchmark.

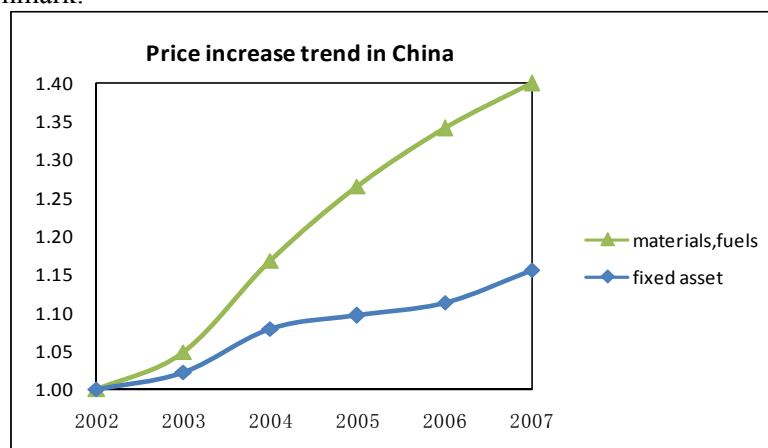


Figure B.5.1 Price index for fixed asset and materials (2002-2007)

- Source: Table 8-2, Chapter 8, China Statistical Yearbook 2008, issued by National Bureau of Statistics of China

Table B.5.4 Annual average salary in China (2000-2007)

	2000	2001	2002	2003	2004	2005	2006	2007
Salary (RMB)	9,371	10,870	12,422	14,040	16,024	18,364	21,001	24,932

Source: Table 4-23, Chapter 4, China Statistical Yearbook 2007, issued by National Bureau of Statistics of China

- **Investment costs:** A 10.1% of decrease in investment costs is very unlikely to happen, as it is much more likely that wind power projects will experience cost *increases* rather than cost decreases during construction, which in fact happened for the proposed Project¹⁰. This can be explained by the increase in the price of construction materials and of the staff salaries, due to inflationary pressures in China¹¹. These increases demonstrate that a decrease in investment costs is extremely unrealistic and that the IRR is not likely to reach the 8% benchmark.
- **Electricity tariff:** Electricity tariffs for wind projects in China are regulated at national level by the National Development & Reform Commission (NDRC), which sets a guiding tariff for each province. The guidance stipulates that the guiding tariff applies for the first 30,000 hours of operation of the project, after which the project must receive a tariff equivalent to the average tariff paid to all projects in the province. Since most power plants in the province are, and are likely to remain, thermal power plants, and since thermal power plants always receive a lower tariff than wind projects¹², the average tariff is considerably lower than the wind tariff.

The tariff adopted in the PDD (0.540 RMB/kWh, including VAT) is from the Feasibility Study Report which was finished in December 2007. This is the guiding tariff defined by NDRC for

¹⁰ <http://www.guazhou.gov.cn/ReadNews.asp?NewsID=7142>

¹¹ <http://www.stats.gov.cn/english/StatisticalCommunique/>

¹² http://www.ndrc.gov.cn/jggl/zcfg/t20060630_75092.htm

<http://www.gswj.gov.cn/detail.asp?LMID=2&ID=5823&Class=2261&FN=jgzc>

wind projects in Gansu Province in 2007¹³. According to the tariff notice set by the government in August 2009¹⁴, the tariff for the proposed Project is fixed as 0.540 RMB/kWh (including VAT) in the first 30,000 hours, the average tariff in the local grid is to be used after 30,000 hours. Since in the IRR calculations presented in this PDD, the fixed tariff (0.540 RMB/kWh) was used for the entire lifetime of the financial analysis in order to be conservative, a further 10.1% increase to the tariff for the proposed project is highly unrealistic. Therefore, the IRR is not likely to reach the benchmark due to an increase in electricity tariff.

- **Operating hours:** The expected operating hours of the proposed Project indicated in the Feasibility Study Report were calculated based on historical wind power data and electricity demand over the past 30 years, in which it shows that there are sufficiently strong wind speeds only in winter and spring, and that therefore 2,326 hrs is the most possible operating hours. As the operating hours were calculated based on historical data, assuming a 10.1% of increase in annual operating hours is illogical, and therefore the IRR is not likely to reach the benchmark from an increase in operating hours.

A variation of $\pm 10\%$ has been considered in the critical assumptions. Figure B.5.2 summarizes the results of the sensitivity analysis.

Table B.5.5 IRR results of sensitivity analysis

	-10%	0.00%	10%
Electricity Tariff	5.35%	6.71%	7.98%
Investment costs	7.99%	6.71%	5.69%
Operating costs	6.98%	6.71%	6.50%
Operating hours/Annual output	7.98%	6.71%	5.35%

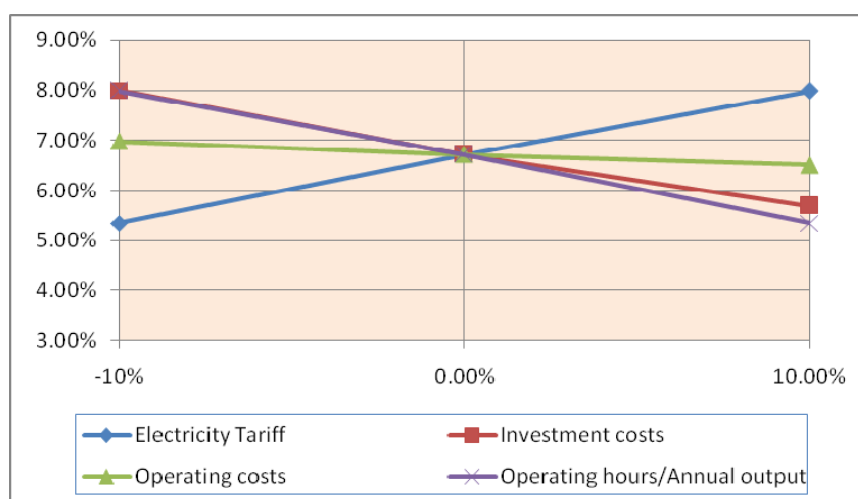


Figure B.5.2. Different parameters affecting the Project's IRR

These results show that only with highly unrealistic very favourable circumstances would it be possible to reach the Project IRR benchmark. In reality, circumstances typically occur more unfavourably than

¹³ See http://www.hebwj.gov.cn/upfiles/xy_col32gjc_20070718164220007126.htm (Fagaijiage[2007]1260)

¹⁴ See the on-grid tariff notice set by Gansu Province Price Bureau in August 2009 (Ganjiadianli[2009]197)



projected and the IRR would be even further away from the benchmark. We can conclude that the IRR is lower than the benchmark for a realistic range of assumptions for the input parameters of the sensitivity analysis, and therefore, that the Project is not financially attractive. This demonstrates that the project activity would not be implemented without the CDM.

Step 3. Barrier Analysis

The “Tool for the demonstration and assessment of additionality” (Version 05.2) states that project participants may choose to apply Step 2 (Investment analysis) or Step 3 (Barrier Analysis).

Step 3 is not used to demonstrate the additionality of the proposed Project.

Step 4. Common Practice Analysis

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

In line with the EB guidance on the additionality tool, other wind power projects that are currently operational in Gansu Province that are similar to the proposed Project activity are listed in Table B.5.6 below.

Firstly, the common practice analysis is limited to the provincial level, as the investment environment for each province differs (e.g. with regards to taxes, loan policy, and electricity tariffs¹⁵). In Gansu Province, the Provincial Government is responsible for taxes, loan policies etc., which are specifically applicable to the Province.

Furthermore, only the projects which were developed after 2002 are considered in the common practice analysis below. 2002 was a landmark year for the power industry in the Host Country. The power industry in the Host Country underwent a significant suite of reforms in 2002¹⁶. Chiefly, under the reforms, the China State Power Corporation was diversified into five separate regional grids in 2002, modifying the tariffs and permitted quantities of electricity supplied to the grid. As a result, the investment environment of power production projects in the Host Country changed significantly in 2002, and projects developed before 2002 cannot be considered similar to the proposed Project.

Table B.5.6 below shows wind power projects within Gansu Province that have been commissioned since 2002 without CDM support.

Table B 5. 6 Wind Farm Development in Gansu Province

Project name	Start of Operation	Total capacity (MW)	Special incentives
Yumen Phase I	2004	30.6	Higher tariff and lower investment per unit of installed capacity

Sources:

<http://www.cwea.org.cn/upload/20080324.pdf> (Wind Farms in China 2007 written by Shi Pengfei)

¹⁵ <http://www.gswj.gov.cn/>

¹⁶ See “Electric Power Reform”, 2003 Yearbook of China Electric Power, pp.10-14 .



<http://www.gskydl.com/fd.htm> (Yumen Phase I)

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

From the table above it can be found that there is only Yumen phase I wind project in Gansu Province, which started operating after 2002 without CDM support. Yumen phase I is a pilot project and the investment per kW phase I is 6,863 RMB/kW which is much lower than the proposed project (9,582 RMB/kW). Due to lower kW unit investment, Yumen phase I wind project is more financially attractive than the proposed project and does not face the same financial difficulties.

From 2000 to 2004, not a single wind power project was built by private developers in the province. Since 2005, more new wind farms started construction by different developers. However these are all being developed under the CDM and face similar financial barriers to the proposed project activity. Without CDM, new wind farms in Gansu province including the proposed project are not likely to be developed. It can therefore be concluded that previously implemented projects did not face the same barriers as this private sector developed project, and therefore the project can not be considered common practice.

To summarize, it has been demonstrated that the proposed project activity is additional and not (part of) the business as usual scenario. The above additionality analysis provides sufficient evidence that the registration of the project as CDM project can enable the project to overcome the high financial risk it faces.

In conclusion the proposed project shall be deemed to be additional according to ACM0002.

CDM consideration

The benefits of the CDM were a decisive factor in the decision to proceed with the project. Due to the obvious economic unattractiveness, CDM revenue was suggested to be considered during the FSR stage in December 2007. As per the FSR suggestion, the Project Developer decided to apply for CDM financing to implement the Project activity during a board meeting on 20th December 2007. In parallel, the project developer had started to take actions to secure CDM status for the project: they got in touch with EcoSecurities and Credit Suisse International to negotiate an Emission Reduction Purchase Agreement (ERPA), which was signed on the 29th January 2008. The CDM was also an important factor for securing finance for the Project; the Project Developer applied for a loan from the China Construction Bank, Guazhou Branch. The bank agreed to grant a loan to the Project Developer in April 2008 only when considering that the expected CER revenues that would be generated by the CDM Project would ensure that the loan would be paid back. The CDM revenues will help to mitigate the project's financial unattractiveness by providing additional cash flow and improving the IRR, thereby helping alleviate the economic and financial hurdles faced by the Project. In parallel with CDM progress, the Project Developer started to make preparation for the commencement considering the additional revenues that are likely to accrue from registration as a CDM project, and the Project finally started construction on 31th May 2008.

The timeline of the project activity and CDM consideration are summarised in Table B.5.6.

Table B.5.6 Timeline of the Project Activity and CDM Consideration

Project activity	Time	CDM consideration
Completion of FSR	12/2007	Emphasised that the project can be eligible as a CDM project



Board meeting minutes on CDM development ¹⁷	20/12/2007	All directors were determined to apply CDM to support the Project
	29/01/2008	ERPA signature between the Project Developer and Credit Suisse ¹⁸
The bank agreed to grant a loan to the Project Developer ¹⁹	30/04/2008	Has considered CDM revenue
Project Developer signed equipment purchase contract ²⁰	30/04/2008	Starting date of the project activity
	05/2008	Stakeholder consultation for the Project
Project Developer signed construction contract	06/05/2008	
Project started construction ²¹	31/05/2008	
Application for Host Nation Approval	10/2008	
Host Nation Approval	10/12/2008	China LoA
Validation Contract	15/01/2009	Validation contract signed
Validation Start	20/02/2009	Start of validation stakeholder comments period
Letters of Approval issued by UK's DNA	16/07/2009	LoAs

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

According to the latest version of ACM0002 (Version 09) and the tool to calculate the emission factor for electricity system, since the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.

The Project therefore applies the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.

This PDD uses the calculations published by the DNA of P. R. China²² to determine the Operating Margin (OM) emission factor²³ and the Build Margin (BM) emission factor²⁴ using the most recent data available.

¹⁷ See: Board meeting minutes of Gansu CGN Wind Power Co., Ltd

¹⁸ See: ERPA between Gansu CGN Wind Power Co., Ltd and Credit Suisse

¹⁹ See: letter granting a loan to Daliangxi Wind Project from China Construction Bank, Guazhou Branch

²⁰ See: Equipment purchase contract between Gansu CGN Wind Power Co., Ltd and Dongfang Steam Turbine Works Company

²¹ See the Approval of the construction by the Gansu Guangming Electric Engineering Consulting & Supervising Co. Ltd



The description below follows the steps of the latest version of the “Tool to calculate the emission factor for an electricity system” and focuses on the key process of the calculation of the emission factors. Please see Annex 3 for the baseline data underlying the calculations.

The “Tool to calculate the emission factor an electricity system (Version 02)” is applied in the context of the Project in the following seven steps:

- Step 1. Identify the relevant electricity systems
- Step 2. Choose whether to include off-grid power plants in the project electricity system
- Step 3. Select a method to determine the operating margin (OM)
- Step 4. Calculate OM emission factor according to the selected method
- Step 5. Identify the group of power plants to be included in the build margin
- Step 6. Calculate the build margin emission factor
- Step 7. Calculate the combined margin emission factor

Step 1. Identify the relevant electricity systems

P. R. China is divided into regional electricity systems which are defined by the DNA of P. R. China²⁵. The Project is located in the Gansu province which is connected to the Northwest China Power Grid (NWCPG). Therefore, the relevant electric power system is identified as the NWCPG. NWCPG do not import power from other grids.

Step 2. Choose whether to include off-grid power plants in the project electricity system

Following option is chosen to calculate the operating margin and build margin emission factor.

Option I: Only grid power plants are included in the calculation.

As the off-grid power generation is not significant in the Project boundary and the data is not available, option I is chosen, which corresponds to the procedure contained in the earlier versions of this tool.

Step 3. Select amethod to determine the operating margin (OM)

The “Tool to calculate the emission factor for an electricity system” offers four methods to calculate the OM emission factor ($EF_{grid,OM,y}$):

- a) Simple OM, or
- b) Simple adjusted OM, or
- c) Dispatch data analysis OM, or
- d) Average OM.

Of these procedures, Option (a) (Simple OM) is applied. This is because low-cost / must run resources constitute less than 50% of total grid generation in average of the five most recent years. From 2002 to

²² National Coordination Committee on Climate Change – National Development and Reform Commission (NDRC)

²³ See <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1358.xls> for the EF_{OM}

²⁴ See <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1374.pdf> for the EF_{BM}

²⁵ See <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/2008/20081230102527637.pdf>



2006 respectively, 23%, 19%, 21%, 27% and 23% of the electricity generated in the NWCPG came from low-cost / must run resources²⁶.

Power plants registered as CDM project activities are included in the sample group that is used to calculate the OM as long as the criteria for including the power sources in the sample group apply.

The “Tool to calculate the emission factor for an electricity system” offers the choice between two data vintages calculate the Simple OM emission factor ($EF_{grid,OMsimple,y}$):

- *Ex-ante* option: A 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation, without requirement to monitor and recalculate the emissions factor during the crediting period.
- *Ex-post* option: The year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

$EF_{grid,OMsimple,y}$ is calculated *ex-ante* using the data from 2004 to 2006, available in the China Energy Statistics Yearbooks 2005-2007 and the China Electric Power Yearbooks 2003-2007. This data vintage remains fixed during the crediting period.

Step 4. Calculate OM emission factor according to the selected method

The “Tool to calculate the emission factor for an electricity system” offers three options to calculate $EF_{grid,OMsimple,y}$:

- *Option A*: Based on the net electricity generation and a CO₂ emission factor of each power unit
- *Option B*: Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

Detailed data on the individual power plants connected to the NWCPG necessary for applying option A is not available; therefore, options A cannot be used. Since only nuclear and renewable power generation are considered as low-cost / must-run power sources and since the quantity of electricity supplied to the grid by these sources is known, option B is applicable and used to calculate the Simple OM emission factor.

$EF_{grid,OMsimple,y}$, using option B is calculated based on the net electricity supplied to the grid by all power plants serving the system, not including low-cost / must-run power plants / units, and based on the fuel type(s) and total fuel consumption of the project electricity system, as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{EG_{y,grid}} \quad (1)$$

Where:

- $EF_{grid,OMsimple,y}$ = Simple operating margin CO₂ emission factor in year y (tCO₂/MWh)
- $FC_{i,y}$ = Amount of fossil fuel type i consumed in the project electricity system in year y (mass or volume unit)
- $NCV_{i,y}$ = Net calorific value (energy content) of fossil fuel type i in year y (GJ / mass or volume unit) (country-specific values are used)
- $EF_{CO2,i,y}$ = CO₂ emission factor of fossil fuel type i in year y (tCO₂/GJ)

²⁶ China Electric Power Yearbooks 2003-2007; see Annex 3 for detailed calculation.



- $EG_{y,grid}^{27}$ = Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost / must-run power plants / units, in year y (MWh)
- i = All fossil fuel types combusted in power sources in the project electricity system in year y
- y = The three most recent years for which data is available at the time of submission of the CDM-PDD to the DOE for validation

$EF_{grid,OMsimple,y} = 1.1225 \text{ tCO}_2/\text{MWh}$
--

For detailed information, please see Annex 3.

Step 5. Identify the group of power plants to be included in the build margin

According to the “Tool to calculate the emission factor for an electricity system”, the sample group of power units m used to calculate the build margin consists of either:

- The set of five power units that have been built most recently, or
- The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.

However, due to the fact that data on electricity generation of each power plant / unit in the grid is currently not available in P. R. China (see Step 3), EB guidance on the estimation of the build margin in P.R. China can be applied for the purpose of defining the sample group²⁸. In accordance with the guidance, the build margin consists of the set of power capacity additions in the electricity system that comprises 20% of the system generation capacity (in MW) and that have been built most recently. The set of power capacity additions included in the build margin is determined as follows:

$$\frac{\sum_j CAP_{j,y-n}}{\sum_j CAP_{j,y}} > 20\% \quad (2)$$

- $\sum_j CAP_{j,y-n}$ = The aggregate incrementally installed power capacity of all kinds of power generation sources j (MW) in year $y-n$
- $\sum_j CAP_{j,y}$ = The aggregate incrementally installed power capacity of all kinds of power generation sources j (MW) in year y
- N = The number of years ($y-1, y-2, \dots, y-n$) which have to be considered to comprise 20% of the system generation capacity (in MW) and that have been built most recently

In the period from 2004 to 2006 (2006 being the most recent year for which data is available), the amount of power capacity additions made up over 20% of the total NWCPG generation capacity in 2006. Therefore $n = 2$.

²⁷ $EG_{y,grid} = \text{GEN} \times (1 - \text{rate of internal use by the power station})$. See Annex 3 and section B.6.2. for details.

²⁸ See: EB guidance on estimating the build margin for AM0005, consolidated in ACM0002 which refers to the Tool to calculate the emission factor for an electricity system

<http://cdm.unfccc.int/UserManagement/FileStorage/6POIAMGYOEDOTKW25TA20EHEKPR4DM> and http://cdm.unfccc.int/UserManagement/FileStorage/AM_CLAR_OEJWJEF3CFBP1OZAK6V5YXPQKK7WYJ



Since data on the electricity generation of each individual power plant / unit in the grid is not available in P. R. China, power plants registered as CDM project activities cannot be isolated and are taken into account in the build margin.

The “Tool to calculate the emission factor for an electricity system” offers the choice between two data vintages to calculate the BM:

- *Option 1.* For the first crediting period, the build margin emission factor is calculated *ex-ante* based on the most recent information available on units already built for sample group *m* at the time of CDM-PDD submission to the DOE for validation.
- *Option 2.* For the first crediting period, the build margin emission factor shall be updated annually, *ex-post*, including those units built up to the year of registration of the project activity

The BM emission factor ($EF_{grid,BM,y}$) is calculated *ex-ante* using the data from 2004 to 2006, available in the China Energy Statistics Yearbook 2007 and the China Electric Power Yearbooks 2005-2007. This data vintage remains fixed during the first crediting period and will be updated for the second crediting period.

Step 6. Calculate the build margin emission factor

According to the “Tool to calculate the emission factor for an electricity system”, $EF_{grid,BM,y}$ is the generation-weighted average emission factor of all power units *m* during the most recent year *y* for which power generation data is available. However, due to the fact that data on both electricity generation and emission factor of each power plant / unit in the grid is currently not available in P. R. China (see Step 3), EB guidance on the estimation of the build margin in P.R. China can also be applied for the purpose of estimating the BM emission factor²⁹ and $EF_{grid,BM,y}$ is calculated as follows:

$$EF_{grid,BM,y} = \frac{CAP_{thermal,y-n,y}}{\sum_j CAP_{j,y-n,y}} \times EF_{thermal,adv} \quad (3)$$

$EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year *y* (tCO₂/MWh)

$CAP_{thermal,y-n,y}$ = The incrementally installed power capacity of thermal power generation sources (MW) in the NWCPG in year *y* compared to that of year *y-n*

$\sum_j CAP_{j,y-n,y}$ = the aggregate incrementally installed power capacity of all kinds of power generation sources *j* (MW) in the NWCPG in year *y-n* compared to that of year *y-n*

$EF_{thermal,adv}$ = The emission factor of thermal power generation sources of the NWCPG with the efficiency level of the best commercially available technology in P. R. China, for *y* the most recent historical year for which power generation data is available

$EF_{Thermal,Adv}$ is calculated as follows:

$$EF_{Thermal,Adv} = \lambda_{Coal} \times EF_{Coal,Adv} + \lambda_{Oil} \times EF_{Oil,Adv} + \lambda_{Gas} \times EF_{Gas,Adv} \quad (4)$$

Where:

²⁹ See: <http://cdm.unfccc.int/UserManagement/FileStorage/6POIAMGYOEDOTKW25TA20EHEKPR4DM> and http://cdm.unfccc.int/UserManagement/FileStorage/AM_CLAR_OEJWJEF3CFBP1OZAK6V5YXPQKK7WYJ



$EF_{i,Adv}$ = The CO₂ emission factor of fuel i (tCO₂/MWh) using the best commercially available technology in P. R. China and taking into account the carbon content and the oxidation factor of fuel i ³⁰

$Coal$, Oil = Solid fuel, liquid fuel and gaseous fuel respectively
and Gas

λ_i = The weight of CO₂ emissions from fuel i fired power plants in the total CO₂ emissions from thermal power, using the most recent available data

And

$$\lambda_{Coal} = \frac{\sum_{i=Coal} FC_{i,y} \times EF_{CO_2,i,y}}{\sum_i FC_{i,y} \times EF_{CO_2,i,y}} \quad (5)$$

$$\lambda_{Oil} = \frac{\sum_{i=Oil} FC_{i,y} \times EF_{CO_2,i,y}}{\sum_i FC_{i,y} \times EF_{CO_2,i,y}} \quad (6)$$

$$\lambda_{Gas} = \frac{\sum_{i=Gas} FC_{i,y} \times EF_{CO_2,i,y}}{\sum_i FC_{i,y} \times EF_{CO_2,i,y}} \quad (7)$$

Where $FC_{i,y}$ and $EF_{CO_2,i,y}$ are defined as in equation 1.

$EF_{grid,BM,y} = 0.6199 \text{ tCO}_2/\text{MWh}$
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For detailed information, please see Annex 3.

Step 7. Calculate the combined margin emission factor

The combined margin (CM) emissions factor ($EF_{grid,CM,y}$) is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM} \quad (8)$$

Where:

$EF_{grid,CM,y}$ = Combined margin CO₂ emissions factor in year y (tCO₂/MWh)

$EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/MWh)

$EF_{grid,OM,y}$ = Operating margin CO₂ emission factor in year y (tCO₂/MWh)

w_{OM} = Weighting of operating margin emissions factor, which is 0.75 by default

w_{BM} = Weighting of build margin emissions factor, which is 0.25 by default

$EF_{grid,CM,y} = 0.75 \times 1.1225 + 0.25 \times 0.6199 = 0.99685 \text{ tCO}_2/\text{MWh}$

³⁰ See <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1374.pdf>



For detailed information, please see Annex 3.

Then baseline emissions (BE_y) are obtained as:

$$BE_y = EG_y \times EF_{grid,CM,y} \quad (9)$$

Where:

- BE_y = Baseline emissions in year y (tCO₂)
 EG_y = Electricity supplied by the project p to the grid in year y (MWh)
 $EF_{grid,CM,y}$ = Combined margin CO₂ emissions factor in year y (tCO₂/MWh)

Project emissions

According to the baseline methodology ACM0002, the GHG emission of the proposed project within the project boundary is zero. $PE_y=0$

Leakage

According to the baseline methodology ACM0002, the leakage of the proposed project is not considered,
 $L_y = 0$

Emission Reductions

The emission reductions (ER_y) are calculated as follows:

$$ER_y = BE_y - PE_y - L_y$$

Since the project emission and the leakage are considered as zero, the emission reduction is equal to baseline emission (BE_y).

$$ER_y = BE_y = EG_y \times EF_{grid,CM,y}$$

B.6.2. Data and parameters that are available at validation:

Data / Parameter:	EF_{OM}
Data unit:	tCO ₂ / MWh
Description:	Operating Margin Emission Factor
Source of data used:	Baseline Emission Factors for Power Grids in China, sourced from http://cdm.ccchina.gov.cn/
Value applied:	1.1225
Justification of the choice of data or description of measurement methods and procedures actually applied:	Calculated according to the updated Baseline Emission Factors for Power Grids in China based on “Tool to calculate the emission factor for an electricity system” and EB guidance
Any comment:	

Data / Parameter:	EF_{BM}
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Data unit:	tCO ₂ /MWh
Description:	Build Margin Emission Factor
Source of data used:	Baseline Emission Factors for Power Grids in China, sourced from http://cdm.ccchina.gov.cn/
Value applied:	0.6199
Justification of the choice of data or description of measurement methods and procedures actually applied:	Calculated according to the updated Baseline Emission Factors for Power Grids in China based on “Tool to calculate the emission factor for an electricity system” and EB guidance
Any comment:	

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO ₂ /MWh
Description:	Combined margin CO ₂ emission factor for the NWCPG
Source of data used:	Baseline Emission Factors for Power Grids in China, sourced from http://cdm.ccchina.gov.cn/
Value applied:	0.99685
Justification of the choice of data or description of measurement methods and procedures actually applied:	Calculated according to the updated Baseline Emission Factors for Power Grids in China based on “Tool to calculate the emission factor for an electricity system” and EB guidance
Any comment:	

Data / Parameter:	$FC_{i,y}$
Data unit:	t, m³
Description:	Amount of fossil fuel type <i>i</i> consumed in the project electricity system in year <i>y</i> (mass or volume unit)
Source of data used:	China Energy Statistics Yearbooks (2005-2007)
Value applied:	See Annex 3 for details
Justification of the choice of data or description of measurement methods and procedures actually applied :	Official released statistics; publicly accessible and reliable data source
Any comment:	

Data / Parameter:	$NCV_{i,y}$
Data unit:	MJ/t, kJ/m³
Description:	Net calorific value (energy content) of fossil fuel type <i>i</i> in year <i>y</i>
Source of data used:	China Energy Statistics Yearbook 2006
Value applied:	See Annex 3 for details
Justification of the choice of data or description of measurement methods and procedures actually applied :	Official released statistics; publicly accessible and reliable data source
Any comment:	

Data / Parameter:	$EF_{CO2,i,y}$
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Data unit:	tc_{o2}/TJ
Description:	CO ₂ emission factor of fossil fuel type <i>i</i> in year <i>y</i>
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value applied:	See Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	IPCC default value
Any comment:	

Data / Parameter:	GEN_{j,y}
Data unit:	MWh
Description:	The electricity generation by source <i>j</i> in year <i>y</i> of each province connected to the NWCPG.
Source of data used:	China Electric Power Yearbooks (2003-2007)
Value applied:	See Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Official released statistics; publicly accessible and reliable data source
Any comment:	

Data / Parameter:	<i>Rate of internal use by the power station</i>
Data unit:	%
Description:	The rate of internal use of power source <i>j</i> in each province connected to the NWCPG.
Source of data used:	China Electric Power Yearbooks (2005-2007)
Value applied:	See Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Official released statistics; publicly accessible and reliable data source
Any comment:	

Data / Parameter:	CAP_{j,y}
Data unit:	MW
Description:	The aggregate incrementally installed power capacity of all kinds of power generation sources <i>j</i> (MW) in the NWCPG in year <i>y</i>
Source of data used:	China Electric Power Yearbooks (2005-2007)
Value applied:	See Annex 3
Justification of the choice of data or description of measurement methods and	Official released statistics; publicly accessible and reliable data source



procedures actually applied :	
Any comment:	

Data / Parameter:	$CAP_{thermal,y-n,y}$
Data unit:	MW
Description:	The aggregate incrementally installed power capacity of thermal power generation sources (MW) in the NWCPG in year y compared to that of year $y-n$
Source of data used:	China Electric Power Yearbooks (2005-2007)
Value applied:	See Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Official released statistics; publicly accessible and reliable data source
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

The *ex-ante* emission reductions (ER_y) are calculated as follows:

$$ER_y = BE_y - PE_y - L_y$$

Where:

ER_y = Emission reductions in year y (tCO₂)

BE_y = Baseline emissions in year y (tCO₂)

PE_y = Project Emissions in year y (tCO₂)

L_y = Leakage emissions in year y (tCO₂)

Project emissions

The Project has not backup power. According to the baseline methodology ACM0002, the GHG emission of the proposed project within the project boundary is zero.

$$PE_y = 0$$

Leakage

According to the baseline methodology ACM0002, the leakage of the proposed project is not considered,

$$L_y = 0$$

$$ER_y = BE_y \text{ and } BE_y = EG_y \times EF_{grid,CM,y}$$

Therefore,

$$ER_y = EG_y \times EF_{grid,CM,y} = 115,144 \text{ MWh} \times 0.99685 \text{ tCO}_2/\text{MWh} = 114,781 \text{ tCO}_2\text{e}$$

**Table B.6.1** Key Information and Data Used to calculate the Baseline Emissions

	Per year (average)	7 years
Operating Margin Emissions Factor ($EF_{OM,y}$ in tCO ₂ /MWh)	1.1225	1.1225
Build Margin Emissions Factor ($EF_{BM,y}$ in tCO ₂ /MWh)	0.6199	0.6199
Baseline Emissions Factor ($EF_{grid,CM,y}$ in tCO ₂ /MWh)	0.99685	0.99685
Electricity supplied to the grid by the Project (EG_y MWh)	115,144	806,008
Baseline Emissions (BE tCO ₂)	114,781	803,467

B.6.4 Summary of the ex-ante estimation of emission reductions:

Year*	Estimation of project activity emissions (tonnes of CO ₂ e)	Estimation of baseline emissions (tonnes of CO ₂ e)	Estimation of leakage (tonnes of CO ₂ e)	Estimation of overall emission reductions (tonnes of CO ₂ e)
2010	0	114,781	0	114,781
2011	0	114,781	0	114,781
2012	0	114,781	0	114,781
2013	0	114,781	0	114,781
2014	0	114,781	0	114,781
2015	0	114,781	0	114,781
2016	0	114,781	0	114,781
Total (tonnes of CO ₂ e)	0	803,467	0	803,467

B.7 Application of the monitoring methodology and description of the monitoring plan:**B.7.1 Data and parameters monitored:**

Data / Parameter:	EGy
Data unit:	MWh
Description:	Net electricity supplied to the grid by the project
Source of data to be used:	Measured by the main meter installed at the output of the project site.
Value of data	115,144
Description of	Measured cumulatively, Monthly recording



measurement methods and procedures to be applied:	Two meters will be installed at the output of the project site, one as main meter and one as backup meter. The electricity exported to the Grid and imported from the Grid will be monitored by the main meter that is bidirectional. The net electricity supplied to the grid is calculated as the exported amount minus the imported amount.
QA/QC procedures to be applied:	Meters will be calibrated according to the relevant national standard. Data measured by the meters will be cross checked using electricity sales receipts. The accuracy of the measurement is ensured through calibration by a qualified party. The accuracy of the main meter will at least reach 0.5s.
Any comment:	Data will be archived at least for two years after the end of the crediting period, or the last issuance of CERs, whichever occurs later.

Please refer to Annex 4 for further background documentation

B.7.2 Description of the monitoring plan:

This section details the steps taken to monitor the GHG emissions reductions on a regular basis from the Gansu Guazhou Daliangxi Wind Power Project, in P.R.China.

The Monitoring set up for this project has been developed to ensure that from the start, the project is well organised in terms of the collection and archiving of complete and reliable data.

1. Monitoring Organisation

Roles and responsibilities will be defined for the relevant staff involved in CDM monitoring, and the prospect of nominating a responsible person will be considered. If appointed, the responsible person will have the overall responsibility for the monitoring system on this project.

A responsible person, or an appropriate senior manager, will manage the process of training new staff, ensuring trained staff perform the monitoring duties and that where trained monitoring staff are absent, the integrity of the monitoring system is maintained by other trained staff.

Records of trained CDM staff will be retained by the Project Developer.

A formal set of monitoring procedures such as training, data quality assurance and control, and relevant back-up procedures will be identified prior to the start of the crediting period. A description of these procedures is provided in Annex 4. It is important to note that these procedures may be based on existing on site practices.

2. Monitoring equipment and installation

Given that the emission factor is calculated *ex-ante*, and referring to the Monitoring Methodology ACM0002, the only data to be monitored is electricity supplied to the grid by the Project (detailed in B.7.1).

Two meters (one as main meter and one as backup meter, see paragraph B.3 page 8) located at the output of the project site will be used to obtain the amount of electricity supplied to the grid. The electricity



supplied to the Grid and imported from the Grid will be monitored by the main meter that is bidirectional. In the event of erroneous meter readings (where there are either data gaps, or data outliers present), data can be cross-checked against other invoices, bills, power generation statements, or other meters (back-up meter, etc). Relevant meters information and transaction details will be described in the Grid Entry Agreement signed by the Project Developer and the grid company.

Electricity meters should meet the relevant national standards at the time of installation. Records of the meters (type, make, model and calibration documentation) will be retained in the quality control system.

3. Data recording procedure, management and archiving

The monitoring steps are as follows:

- (1) Electricity will be monitored using continuous meters and recorded monthly via the main meter.
- (2) The Project Developer and the Grid Company will confirm the electricity transactions.
- (3) The records of meter readings and copies of sales receipts will be obtained to reflect the actual data of supplied electricity.
- (4) The project developer will archive the data electronically until two years after the end of the crediting period or the last issuance of CERs, whichever occurs later.

For details of the operational and management structure, please see Annex 4.

4. Quality Assurance and Quality Control

The quality of data will be maintained through the development of an overarching monitoring system. This system may include procedures used to double check data, for staff training, meter calibration, accreditation of the facility completing calibration, and adherence to relevant standards. Relevant operating procedures will be provided to relevant site staff, and the site staff will be supervised. Some other complementary procedures are further outlined in Annex 4.

B.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)

The application of the baseline study and monitoring methodology was completed on 20/10/2009. The entity determining the baseline study and the monitoring methodology and participating in the project as the Carbon Advisor is EcoSecurities International Limited, listed in Annex 1 of this document as a project participant.

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Detailed baseline information is attached in Annex 3.

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:**

>>

30/04/2008³¹

This is the date of the equipment purchase as per equipment purchase agreement, which is the date on which the project developer committed to expenditures related to the construction of the project. This is therefore the earliest date at which the implementation of the project began.

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

>>

20 years 0 months (as per the Feasibility Study report for the proposed project)

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 crediting period will start on 01/03/2010 or on the date of registration of the CDM project activity, whichever is later.

C.2.1.2. Length of the first crediting period:

>>

7 years

C.2.2. Fixed crediting period:**C.2.2.1. Starting date:**

>>

Not applicable

C.2.2.2. Length:

>>

Not applicable

³¹ See the equipment purchase agreement signed between Gansu CGN Wind Power Co., Ltd and Dongfang Steam Turbine Works Company

**SECTION D. Environmental impacts**

>>

D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

>>

According to clauses 13 and 19 of the Environmental Evaluation Law of the P. R. China, the project entity must analyse the environmental impacts of project activities in P. R. China before utilising natural resources and beginning project construction. The Project Developer therefore commissioned a third party, Northwest Mining Research Institute to conduct the required environmental impact assessment (EIA) on 5th March 2008, and the EIA report was audited and approved by the Gansu Environmental Protection Bureau in March 2008.

There is no transboundary impact related to the Project and there is no resettlement or relocation of population, buildings or public services required. Therefore social and environmental influences are considered partial, short-term and reversible.

Where impacts of the project were identified, mitigation measures were suggested and defined. The EIA highlights the following with regards to the Project, as shown in the following discussion.

Noise

The noise pollution mainly comes from the manual drills, cement mixers during construction period, and aerodynamic interaction between the wind and turbine blades during operation. The noise levels will be naturally attenuated by ambient conditions, and will remain within the 'Standards of Environmental noise of urban areas' (GB3096-93). It is stated in the EIA that the project location is far away from the nearest resident area. Therefore, the noise of the turbines will not affect the local residents.

Solid Waste

Most of the waste produced during the construction shall be landfilled or disposed of in an appropriate solid waste disposal site. The household waste will be collected and transported to municipal landfill plant or collected and sent to the local waste treatment station or refuse dump.

Electromagnetic impact

The operation of the wind farm will generate electromagnetic energy, however, the amount produced will be very small. Furthermore, the site of the Project is far from the residential area. Therefore, there is no significant electromagnetic impact to be expected.

Wastewater and sewage

The total amount of waste water and sewage from the operation of the project will be very small. Before wastewater and sewage from the construction and operational periods are discharged, they will be processed by using a sedimentation pond and septic tank in order to reach class one of the Chinese environmental standards, which indicates no impact on the surrounding environment.

Dust and Air Quality

The air impact during the construction period mainly comes from airborne dust produced by excavating, by land transportation vehicles, and some exhaust discharge from using and moving construction machinery. Regarding this problem, the project owner will use enclosed or semi-enclosed transportation vehicles to reduce dust, with strictly managed schedules and routes. Dust will also be mitigated by



strengthening construction controls, advocating ‘civilized construction’, and regularly spaying and cleaning the branch roads, material dump sites and other construction work surfaces.

Ecological impact

The proposed wind farm is located in an area of natural grassland. During the construction period, some vegetation will be affected, but this will be restored within a short period. The installation height of the turbines is lower than 100m, so there is not expected to be any significant effect on birds’ migration. The space between the turbines is 200m-300m, which will therefore not significantly affect bird flight. Meanwhile, the arrangement of rotors and transmission lines, and the design of the blades’ shape, colour, quantity and size has also been considered to match as far as possible the surrounding natural landscape and the local construction style. In conclusion, the construction work of this proposed project is not expected to affect the local ecological environment.

Given the environment of the project location, there is very little wildlife at the site, and no protected species has been detected. Therefore, there is no significant impact by the Project on the local ecology.

D.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:

>>

With mitigation controls planned as part of the project construction and EIA process, and the contribution made by the project to sustainable development at the local and national level, the project is expected to have an overall positive impact on the local and global environment. All negative environmental impacts are subject to mitigation measures as described above.

**SECTION E. Stakeholders' comments**

>>

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

>>

The stakeholder consultation for the Project activity took place in May 2008. The local stakeholders (i.e. government officers, local residents) were invited to submit comments on the Project activity by filling in a questionnaire sent out by the Project Developer. A notice about the same and also the questionnaires were put at the project management office around the project site.

The questionnaires included a technical description of the Project as well as a brief explanation of how the project activity mitigates climate change taking support of Kyoto Protocol's Clean Development Mechanism (CDM) Incentives, and brings other sustainable development benefits. The questions asked were as follows:

- What impacts do you think the CDM Project activity will have on the local ecological environment?
- What impacts do you think the CDM Project activity will have on employment in the local area?
- What impacts do you think the CDM project activity will have on your livelihood?
- What impacts do you think the CDM project activity will have on local economic development?
- What would be the overall effects of the construction and operation of the CDM Project?
- What is your attitude towards the construction of the CDM Project?

Twenty nine such questionnaires were sent to the stakeholders by the Project Developer. The stakeholders were all local residents. A full list of stakeholders consulted is available with the Project Developer.

E.2. Summary of the comments received:

>>

E.2.1 Questionnaires result summary

Item	Content	%
What impacts do you think the CDM project activity will have on the local ecological environment?	Positive impact	52%
	Negative impact	0%
	No impact	48%
	Both positive and negative impacts	0%
What impacts do you think the CDM project activity will have on employment in the local area?	Positive impact	83%
	Negative impact	0%
	No impact	17%
	Both positive and negative impacts	0%
What impacts do you think the CDM project activity will have on your livelihood?	Positive impact	76%
	Negative impact	0%
	No impact	24%
	Both positive and negative impacts	0%



What impacts do you think the CDM project activity will have on local economic development?	Positive impact	90%
	Negative impact	0%
	No impact	10%
	Both positive and negative impacts	0%
What would be the overall effects of the construction and operation of the CDM project activity?	Positive effect	90%
	Negative effect	0%
	No effect	10%
What is your attitude towards the construction of the CDM project activity?	Agree	100%
	Do not agree	0%

The survey received 97% participation (28 questionnaires returned out of 29). The survey shows the stakeholders believe that the proposed CDM project activity will have positive impacts on the local ecological, environmental, employment and social life. All stakeholders expressed their support for the proposed project. A full list of the filled-in questionnaires is available from the project developer.

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

>>

No negative comments have been received on the project.

**Annex 1****CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY****Project developer:**

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

This project will not receive any public funding.



Annex 3 BASELINE INFORMATION

Calculation of the Operating Margin(OM) Emission Factor of the Northwest China Power Grid

Table A1 CO₂ emissions from thermal power plants of the Northwest China Power Grid (2004)

Fuel Type	Unit	Shaanxi A	Gansu B	Qinghai C	Ningxia D	Xinjiang E	Subtotal F=A+... +E	EF (tc/TJ) G	NCV (MJ/t, kJ/m ³) H	CO2 emission (tCO ₂ e) I=G*H*F*44/12 /100 (mass unit) I=G*H*F *44/12 /10 (volume unit)
Raw Coal	10000t	2,428.7	1,595.9	322.8	1,270.1	1,240.9	6,858.4	25.8	20,908	135,652,074
Clean Coal	10000t						0	25.8	26,344	0
Other washed coal	10000t				102.64	10.5	113.14	25.8	8,363	895,096
Coke	10000t	0.78					0.78	29.2	28,435	23,747
Coke Oven Gas	10 ⁸ m ³		0.3				0.3	12.1	16,726	22,262
Other Coal Gas	10 ⁸ m ³	0.74	1.26				2	12.1	5,227	46,381
Crude oil	10000t	0.01				0.06	0.07	20	41,816	2,147
Gasoline	10000t	0.02					0.02	18.9	43,070	597
Diesel	10000t	2.16	0.36		0.05	0.41	2.98	20.2	42,652	94,141
Fuel Oil	10000t	0.01	0.69			0.3	1	21.1	41,816	32,352
LPG	10000t						0	17.2	50,179	0
Refinery Gas	10000t					3.26	3.26	15.7	46,055	86,430
Natural Gas	10 ⁸ m ³	1.61	0.59			6.27	8.47	15.3	38,931	1,849,873
Other petroleum products	10000t						0	20	38,369	0
other coking products	10000t						0	25.8	28,435	0
Other energy	10000tce		6.17			3.46	9.63	0	0	0
									subtotal	138,705,098

Data source: China Energy Statistics Yearbook 2005



Table A2 Electricity Generation of the Northwest China Power Grid (2004)

Province	Electricity generation (MWh)	Used by the power station (%)	Power output (MWh)
Shaanxi	44,439,000	7.5	41,106,075
Gansu	33,242,000	6.21	31,177,672
Qinghai	6,208,000	7.96	5,713,843
Ningxia	25,298,000	5.45	23,919,259
Xinjiang	22,752,000	9.07	20,688,394
Total			122,605,243

Data source: China Electric Power Yearbook 2005

Table A3 CO₂ emissions from thermal power plants of the Northwest China Power Grid (2005)

Fuel Type	Unit	Shaanxi A	Gansu B	Qinghai C	Ningxia D	Xinjiang E	Subtotal F=A+... +E	EF (tc/TJ) G	NCV (MJ/t, kJ/m ³) H	CO2 emission (tCO ₂ e) I=G*H*F*44/12 /100 (mass unit) I=G*H*F *44/12 /10 (volume unit)
Raw Coal	10000t	2,461.28	1,597	345.1	1,467.7	1,358.09	7,229.17	25.8	20,908	142,985,522
Clean Coal	10000t	16.22					16.22	25.8	26,344	404,225
Other washed coal	10000t	35.56			101.95	10.2	147.71	25.8	8,363	1,168,593
Coke	10000t	3.23					3.23	29.2	28,435	98,335
Coke Oven Gas	10 ⁸ m ³						0	12.1	16,726	0
Other Coal Gas	10 ⁸ m ³						0	12.1	5,227	0
Crude oil	10000t					0.18	0.18	20	41,816	5,520
Gasoline	10000t	0.02				0.01	0.03	18.9	43,070	895
Diesel	10000t	2.24	0.46	0.06		0.5	3.26	20.2	42,652	102,986
Fuel Oil	10000t	0.01	0.57			0.25	0.83	21.1	41,816	26,852
LPG	10000t						0	17.2	50,179	0
Refinery Gas	10000t					7.71	7.71	15.7	46,055	204,410
Natural Gas	10 ⁸ m ³	1.46	0.52	1.33		7.81	11.12	15.3	38,931	2,428,640
Other petroleum products	10000t						0	20	38,369	0
other coking products	10000t						0	25.8	28,435	0
Other energy	10000tce	8.24	1.3				9.54	0	0	0
									Subtotal	147,425,979

Data source: China Energy Statistics Yearbook 2006



Table A4 Electricity Generation of the Northwest China Power Grid (2005)

Province	Electricity generation (MWh)	Used by the power station (%)	Power output (MWh)
Shaanxi	41,100,000	7.16	38,157,240
Gansu	33,106,000	4.23	31,705,616
Qinghai	5,500,000	2.69	5,352,050
Ningxia	27,643,000	5.73	26,059,056
Xinjiang	26,560,000	8.8	24,222,720
Total			125,496,682

Data source: China Electric Power Yearbook 2006

Table A5 CO₂ emissions from thermal power plants of the Northwest China Power Grid (2006)

Fuel Type	Unit	Shaanxi A	Gansu B	Qinghai C	Ningxia D	Xinjiang E	Subtotal F=A+... +E	EF (tc/TJ) G	NCV (MJ/t, kJ/m ³) H	CO2 emission (tCO ₂ e) I=G*H*F*44/12 /100 (mass unit) I=G*H*F *44/12 /10 (volume unit)
Raw Coal	10000t	2,834.44	1,660.92	421.86	1,833.72	1,547.69	8,298.63	25.8	20,908	164,138,337
Clean Coal	10000t						0	25.8	26,344	0
Other washed coal	10000t				112.7	8.45	121.15	25.8	8,363	958,466
Coke	10000t				0.01		0.01	29.2	28,435	304
Coke Oven Gas	10 ⁸ m ³	0.2				0.08	0.28	12.1	16,726	20,778
Other Coal Gas	10 ⁸ m ³	0.1					0.1	12.1	5,227	2,319
Crude oil	10000t					0.02	0.02	20	41,816	613
Gasoline	10000t	0.01					0.01	18.9	43,070	298
Diesel	10000t	1.14	0.24	0.61	0	1.25	3.24	20.2	42,652	102,355
Fuel Oil	10000t		0.6			0.11	0.71	21.1	41,816	22,970
LPG	10000t						0	17.2	50,179	0
Refinery Gas	10000t						0	18.2	46,055	0
Natural Gas	10 ⁸ m ³	1.59	0.56	1.06		7.49	10.7	15.3	38,931	2,336,911
Other petroleum products	10000t						0	20	38,369	0
other coking products	10000t	1.86					1.86	25.8	28,435	50,033
Other energy	10000tce	33.57	8.81			2.2	44.58	0	0	0
									Subtotal	167,633,385

Data source: China Energy Statistics Yearbook 2007



Table A6 Electricity Generation of the Northwest China Power Grid (2006)

Province	Electricity generation (MWh)	Used by the power station (%)	Power output (MWh)
Shaanxi	54,482,000	6.97	50,684,605
Gansu	35,738,000	4.29	34,204,840
Qinghai	7,204,000	2.57	7,018,857
Ningxia	36,731,000		36,731,000
Xinjiang	29,901,000	8.02	27,502,940
Total			156,142,241

Data source: China Electric Power Yearbook 2007

Table A7. Operating Margin Emission Factor of the Northwest China Power Grid

	CO2 Emission (tCO2e)	Electricity delivered to the grid (MWh)	OM (tCO2/MWh)
Year 2004	138,705,098	122,605,243	1.13131
Year 2005	147,425,979	125,496,682	1.17474
Year 2006	167,633,385	156,142,241	1.07359
Average EF _{OM} (tCO2/MWh)	1.1225		

**Calculation of the Build Margin Emission Factor of Northwest China Power Grid**

Table A8 Emission factor of coal-fired plants, gas-fired plants and oil-fired plants in the Northwest China Power Grid

	Efficiency A	Carbon content (tC/TJ) B	Oxidation factor (%) C	Emission factor (tCO ₂ /MWh) D=3.6/A/1000*B*C*44/12
EF coal,Adv	37.28%	25.8	100%	0.9135
EF gas,Adv	48.81%	15.3	100%	0.4138
EF oil,Adv	48.81%	21.1	100%	0.5706
Source	Data from the NDRC http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1875.pdf	2006 IPCC Guidelines for National Greenhouse Gas Inventories	2006 IPCC Guidelines for National Greenhouse Gas Inventories	

Table A9. Share of different fossil fuels in the total CO₂ emissions from thermal power plants of the Northwest China Power Grid

Item	Value
Λcoal	98.49%
Λoil	0.11%
Λgas	1.41%

Therefore $EF_{thermal} = 98.49\% \times 0.9135 + 0.11\% \times 0.4138 + 1.41\% \times 0.5706 = 0.9062 \text{ tCO}_2\text{e/MWh}$

**Table A10. Installed Capacity of Northwest Power Grid in 2006**

Installed Capacity	Unit	Shaanxi	Gansu	Qinghai	Ningxia	Xinjiang	Total
Thermal Power	MW	9723	6448	1517	6002	5937	29627
Hydro Power	MW	2165	4291	5423	429	1766	14074
Nuclear Power	MW	0	0	0	0	0	0
Wind Power and Others	MW	0	199	0	11	189	399
Total	MW	11888	10938	6940	6442	7892	44100

Data Source: China Electric Power Yearbook 2007, <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1875.pdf>

Table A11. Installed Capacity of Northwest Power Grid in 2005

Installed Capacity	Unit	Shaanxi	Gansu	Qinghai	Ningxia	Xinjiang	Total
Thermal Power	MW	9132.1	5715	886.8	4577	5051.7	25362.6
Hydro Power	MW	1578	4036.2	4825	428.5	1352.1	12219.8
Nuclear Power	MW	0	0	0	0	0	0
Wind Power and Others	MW	46	109.1	0	112.2	132.2	399.5
Total	MW	10756.1	9860.3	5711.8	5117.7	6536	37981.9

Data Source: China Electric Power Yearbook 2006, <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1875.pdf>

Table A12. Installed Capacity of Northwest Power Grid in 2004

Installed Capacity	Unit	Shaanxi	Gansu	Qinghai	Ningxia	Xinjiang	Total
Thermal Power	MW	7640.4	4975.6	889.8	3782	4959.7	22247.5
Hydro Power	MW	1876.5	3566.1	4053.4	366.2	973	10835.2
Nuclear Power	MW	0	0	0	0	0	0
Wind Power and Others	MW	0	138.2	0	42.5	95.3	276
Total	MW	9516.9	8679.9	4943.2	4190.7	6028	33358.7

Data Source: China Electric Power Yearbook 2005, <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1875.pdf>

**Table A13. Calculation of BM of Northwest Power Grid**

	Installed capacity in 2004	Installed capacity in 2005	Installed capacity in 2006	New Additions from 2004 to 2006	Ratio in New Additions
	A	B	C	D=C-A	E
Thermal Power (MW)	22247.5	25362.6	29627	7379.5	68.41%
Hydro Power (MW)	10835.2	12219.8	14074	3238.8	30.02%
Nuclear Power (MW)	0	0	0	0	0.00%
Wind Power (MW)	276	399	445	169	1.57%
Total (MW)	33358.7	37981.4	44146	10787.3	100.00%
Share in the installed capacity of 2006	75.56%	86.04%	100%		

$$EF_{BM,y} = EF_{Thermal} \times 68.41\% = 0.9062 \times 68.41\% = \mathbf{0.6199 tCO_2e/MWh}$$

Table A14. Baseline Emission Factor of Northwest Power Grid

	Parameter	Unit	Value
A	Operating Margin Emission Factor	tCO ₂ e/MWh	1.1225
B	Build Margin Emission Factor	tCO ₂ e/MWh	0.6199
C	Combined Emission Factor (C=0.75×A+0.25×B)	tCO ₂ e/MWh	0.99685

**Annex 4****FURTHER DETAILS OF THE MONITORING PLAN****Table 4.1.** CDM Monitoring System Procedures

Procedure name	Description
CDM Staff training	This procedure outlines the steps to ensure that relevant staff receive adequate training to collect and archive complete and accurate data necessary for CDM monitoring.
CDM data and record keeping arrangements	This procedure provides details of the site's data and record keeping arrangements. The arrangements ensure that complete and accurate records are retained within the quality control system.
Data collection	This procedure will outline the steps to collect the data from the meters.
CDM data quality control and quality assurance	Data and records will be checked prior to being stored and archived. Data from the project will be checked to identify possible errors or omissions. The data checks will include cross checks of the electricity meters, with the electricity figures on the receipts. All records will be checked for completeness.
Electricity meter check	This procedure outlines the steps to provide regular and preventative checks to the meters.
Equipment failure	This procedure details the process of data collection in the case that a problem with any meter occurs.
Equipment calibration	This procedure details the process of organising and managing the calibration process. The procedure includes details of how a suitable company or organisation is commissioned to undertake the calibration to the relevant standards.

The above procedures will be available during the verification and will be documented as part of the monitoring support material. The procedures may be contained in a single document (e.g. a monitoring manual) for CDM monitoring rather than separate procedures. Some of these procedures may exist in the form of existing on-site practises.



Table 4.2.. Operational procedures and responsibilities for monitoring and quality assurance of emissions reductions from the project activity

Task	On-site technician	Operations manager	Project developer's head office	Head of Maintenance / External company	EcoSecurities
Collect Data	E	R	N/A	N/A	N/A
Enter data into Spreadsheet	N/A	E	R	N/A	N/A
Make monitoring reports	N/A	E	R	N/A	I
Archive data & reports	N/A	E	R	N/A	N/A
Calibration/ Maintenance	I	I	I	E	I

Legend: *E* = responsible for executing data collection, *R* = responsible for overseeing and assuring quality, *I* = to be informed

Annex 5 VCS requirement

According to Policy Announcement from the VCS Association, a further validation shall be completed of clauses 1.5, 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS Project Description template. Therefore, the description of clauses 1.12, 1.13, 1.14, 8.1 and 8.2 is shown as follows:

1.5 Project location including geographic and physical information allowing the unique identification and delineation of the specific extent of the project:

The project is located near Guazhou County, Jiuquan City, Gansu Province, People's Republic of China (P. R. China)

The exact location of the project is defined using geographic coordinates obtained with a Global Positioning System (GPS) receiver: E 95°36'37'' Longitude, N 40°42'55'' Latitude. These geographic coordinates are for the centre of the wind farm.

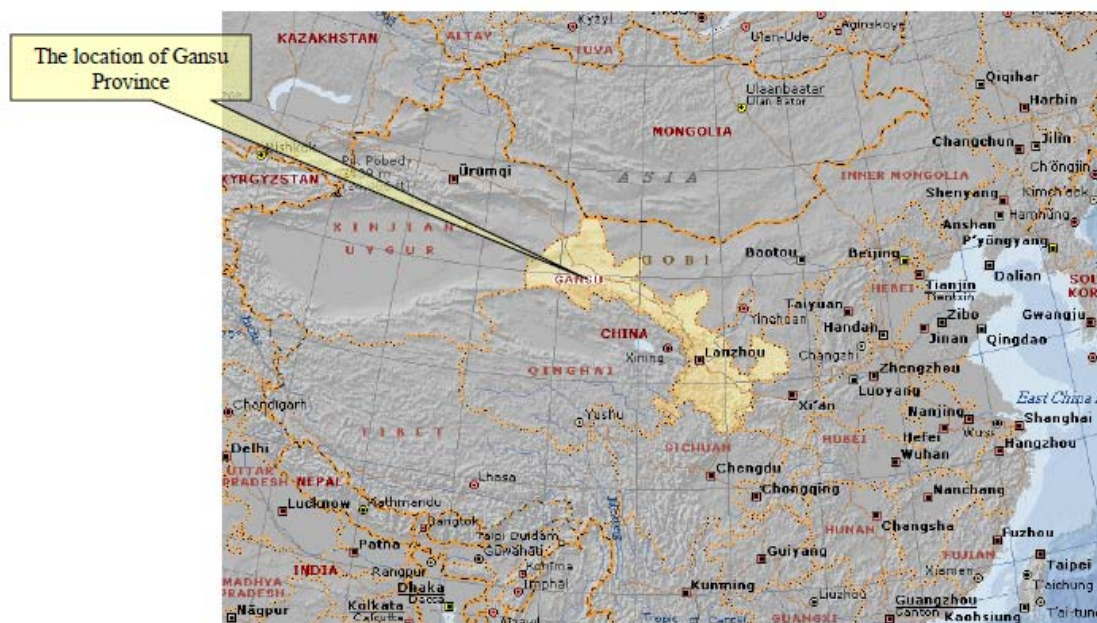


Figure A.4.1 The Location of Gansu Province in China

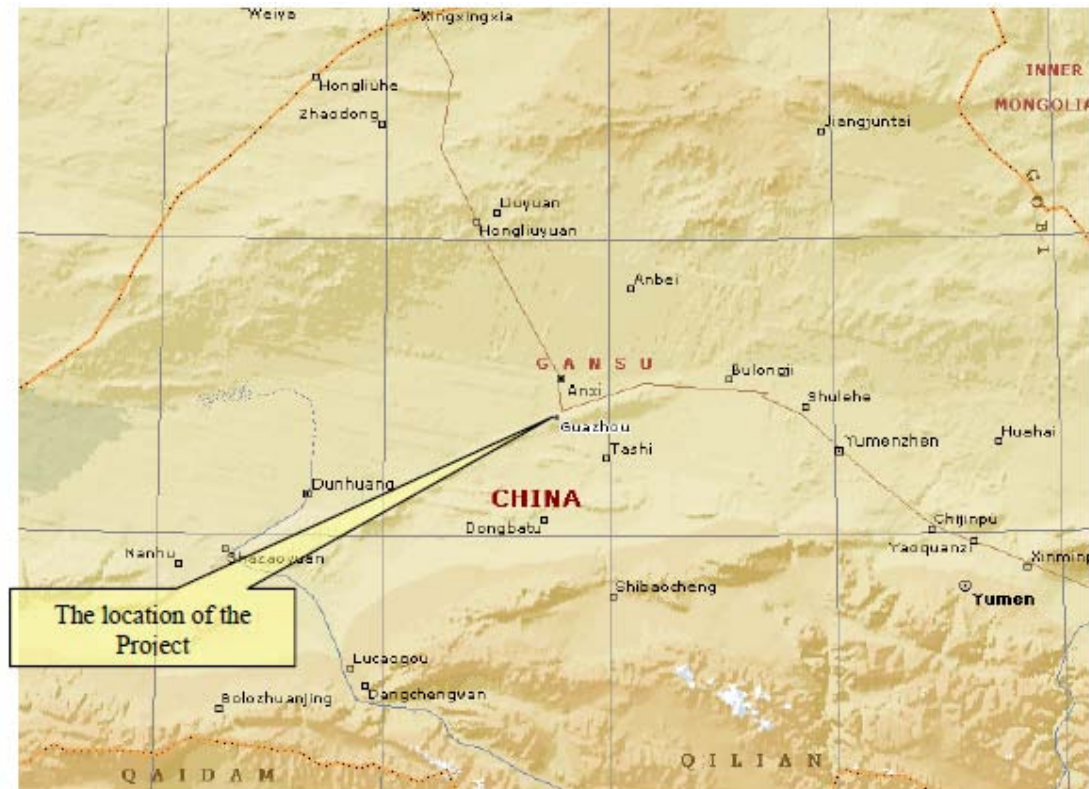


Figure A.4.2 The Location of the Project

1.12 Demonstration to confirm that the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

The Project is a new-built wind power project with the project emission is zero. Furthermore, the purpose of the Project is to utilize the local wind resources to generate electricity, which will be delivered to Northeast China Power Grid (hereafter referred to as “NECPG” or the “Grid”) without CO₂ emissions. The Project will achieve GHG emission reductions by displacing equivalent electricity supplied by NECPG, which is predominated by fossil fuel-fired power plants, that would otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources. So, the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

1.13 Demonstration that the project has not created another form of environmental credit (for example renewable energy certificates)

The Project has been registered as a CDM project in UNFCCC on May 04th, 2010. So the Credit which be issued after May 04th, 2010 would be used as a CDM credit. But the project proponent chose a clear VCS crediting period from Jan 1st, 2009 to May 03rd, 2010 which has not created another form of environmental credit.

1.14 Project rejected under other GHG programs (if applicable):

Not applicable.

8.1 Proof of Title:

The approval of EIA and FSR are evidences for legislative right. Besides, the purchasing contract of wind turbine and the purchasing power agreement are the evidences for the ownership of the plant, equipment and process generating.

8.2 Projects that reduce GHG emissions from activities that participate in an emissions trading program (if applicable):

The Project has been registered as a CDM project in UNFCCC on May 04th, 2010. So the Credit which be issued after May 04th, 2010 would be used as a CDM credit. But the project proponent chose a clear VCS crediting period from Jan 1st, 2009 to May 03rd, 2010 which has not created another form of environmental credit.