CECEP Gansu Yumen Changma Daba South Wind Farm Project

Document Prepared By Beijing Ruifang Technology Co., Ltd.

Project Title	CECEP Gansu Yumen Changma Daba South Wind Farm Project
Version	3.0
Date of Issue	23/07/2019
Prepared By	Beijing Ruifang Technology Co., Ltd.
Contact	Tel: 86-10-6761 8208, Email: Yaobaojie@126.com

Table of Contents

1 Project Details 3
1.1 Summary Description of the Project 3
1.2 Sectoral Scope and Project Type 4
1.3 Project Proponent 4
1.4 Other Entities Involved in the Project 4
1.5 Project Start Date 4
1.6 Project Crediting Period 4
1.7 Project Scale and Estimated GHG Emission Reductions or Removals 4
1.8 Description of the Project Activity 5
1.9 Project Location 5
1.10 Conditions Prior to Project Initiation 5
1.11 Compliance with Laws, Statutes and Other Regulatory Frameworks 5
1.12 Ownership and Other Programs 6
1.12.1 Project Ownership 6
1.12.2 Emissions Trading Programs and Other Binding Limits 6
1.12.3 Other Forms of Environmental Credit 6
1.12.4 Participation under Other GHG Programs 6
1.12.5 Projects Rejected by Other GHG Programs 6
1.13 Additional Information Relevant to the Project 6
2 Application of Methodology 7
2.1 Title and Reference of Methodology 7
2.2 Applicability of Methodology 7
2.3 Project Boundary 7
2.4 Baseline Scenario 7
2.5 Additionality 8
2.6 Methodology Deviations 8
3 Quantification of GHG Emission Reductions and Removals 8
3.1 Baseline Emissions 8
3.2 Project Emissions 8
3.3 Leakage 8
3.4 Net GHG Emission Reductions and Removals 8
4 Monitoring 8
4.1 Data and Parameters Available at Validation 8
4.2 Data and Parameters Monitored 8
4.3 Monitoring Plan 8
5 Safeguards 8
5.1 No Net Harm 8
5.2 Environmental Impact 8
5.3 Local Stakeholder Consultation 9
5.4 Public Comments 9
ANNEX CDM PDD 10

1 PROJECT DETAILS

1.1 Summary Description of the Project

CECEP Gansu Yumen Changma Daba South Wind Farm Project (hereafter referred to as the Project) is located at Changma, Yumen Town, Gansu Province, China, which is a new-built project and operated by CECEP Wind Power (Gansu) Co.,LTD.

The total installed capacity of the Project is 48 MW equipped with 16 sets of wind turbine generators (briefly WTG henceforth) with a unit capacity of 3 MW. And the estimated electricity delivered to the project electricity system, i.e. Northwest Power Grid (briefly NWPG henceforth) by the Project, via 110kV substation within the project site, is 102.01 GWh annually, equivalent to 2125 operating hours with full capacity.

Provision of an equivalent amount of annual power output by NWPG is the baseline for the Project, i.e. the scenario in the absence of the Project. Basically, NWPG is predominated by connected fossil fuel fired power plants, especially coal fired plants, so by replacing equal amount of electricity which is originally generated by the fossil fuel fired power plants within the grid system, the Project with almost zero emission would reduce GHG emission (only CO_2 is considered) accrued from the saved fossil fuel combustion. It is estimated that the resulting CO_2 emission reductions would be about 91,400 tCO_2 annually.

The Project promotes sustainable development through the following aspects:

- Reduce greenhouse gas emissions compared to the business-as-usual scenario;
- Help to stimulate the growth of the wind power industry in China and promotion of advanced wind turbine manufacturing industry;
- Reduce the emission of other pollutants resulting from the power generation industry in China, compared to a business-as-usual scenario;
- Create local employment opportunities during the construction and operation of the Project;
- Stimulate the development of local tourism industry.

The Project started construction on 10/11/2011.

The Project started commissioning on 01/01/2013.

1.2 Sectoral Scope and Project Type

The Project falls in the sectoral scope 1: energy industries (renewable-/non-renewable sources).

The Project is not a grouped project.

1.3 Project Proponent

Organization name	CECEP Wind Power (Gansu) Co.,LTD.
Contact person	Yao Baojie
Title	-
Address	12th Floor, Building A, Jieneng Mansion, NO.42, Xizhimen North St., Haidian District, Beijing, 100082, PRC China
Telephone	+86-10-761 8208
Email	Yaobaojie@126.com

1.4 Other Entities Involved in the Project

Organization name	Beijing Ruifang Technology Co., Ltd.
Contact person	Teng Haipeng
Title	-
Address	Haidian District, Beijing, PRC China
Telephone	+86-10-86291231
Email	Teng_hp@126.com

1.5 Project Start Date

01/01/2013 (project started commissioning)

1.6 Project Crediting Period

The first 7-year renewable crediting period under CDM started on 01/01/2013 and expired on 31/12/2019.

The VCS crediting period of the Project is from 01/01/2013 to 31/12/2022, totally 10 years.

1.7 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	✓
Large project	

Year	Estimated GHG emission reductions or removals (tCO_2e)

Year 1	91,400
Year 2	91,400
Year 3	91,400
Year 4	91,400
Year 5	91,400
Year 6	91,400
Year 7	91,400
Year 8	91,400
Year 9	91,400
Year 10	91,400
Total estimated ERs	914,000
Total number of crediting years	10
Average annual ERs	91,400

1.8 Description of the Project Activity

NA

1.9 Project Location

The Project is sited at Changma, southwest of Yumen Town, Gansu Province, P.R. China. The Project has central geographical coordinates with east longitude of 96.7164° and north latitude of 40.0143°, in a region with the approximate scope of (E96.7389°, N40.0409°), (E96.7404°, N40.0011°), and (E96.6700°, N40.0009°), shown from the official approval document. The altitude of the site ranges from 1790m to 1843m above mean sea level.

1.10 Conditions Prior to Project Initiation

The scenario existing prior to the start of the implementation of the project activity is same as the baseline scenario as described below.

Electricity delivered to the NWPG by the project would have otherwise been generated by the operation of grid-connected fossil fuel power plants and by the addition of new generation sources.

The proposed project will therefore help reduce GHG emissions versus the high-growth, coal-dominated business-as-usual scenario.

1.11 Compliance with Laws, Statutes and Other Regulatory Frameworks

The project is a state-supported project in the field of renewable energy and meets the relevant

provisions of the Renewable Energy Law of the People's Republic of China. The generation of power from NWPG will meet the requirement of national laws and regulations, also financially viable.

1.12 Ownership and Other Programs

1.12.1 Project Ownership

The approval of Environmental Impact Assessment (EIA), Feasibility Study Report (FSR), and Letter of Approval for "CECEP Gansu Yumen Changma Daba South Wind Farm Project" as a CDM Project issued by China National Development and Reform Commission, and the business license of the project owner are evidences for legislative right. Besides, the purchasing contract of turbines, and the purchasing power agreement are the evidences for the ownership of the plant, equipment and power generating.

1.12.2 Emissions Trading Programs and Other Binding Limits

The Project has been registered as a CDM project in UNFCCC on 17/07/2012 (UNFCCC Ref. 6540). The first 7-year renewable crediting period started on 01/01/2013 and expired on 31/12/2019. So, the credits issued after 01/01/2013 would be used as CDM credit or VCS credit. But the project proponent chooses a clear VCS crediting period from 01/01/2013 to 31/12/2022 which has not claimed other forms of environmental credit other than CERs.

1.12.3 Other Forms of Environmental Credit

The Project has been registered as a CDM project in UNFCCC on 17/07/2012(UNFCCC Ref. 6540). So, the credits that will be issued after 01/01/2013 would be used as a VCS credit or CDM credit.

1.12.4 Participation under Other GHG Programs

The Project has been registered as a CDM project in UNFCCC on 17/07/2012 (UNFCCC Ref. 6540). The first 7-year renewable crediting period started on 01/01/2013. So, the credits which be issued after 01/01/2013 would be used as a CDM or VCS credit. But the project proponent chooses a clear VCS crediting period from 01/01/2013 to 31/12/2022 which has not claimed other forms of environmental credit.

1.12.5 Projects Rejected by Other GHG Programs

The project was not rejected by other GHG programs.

1.13 Additional Information Relevant to the Project

Eligibility Criteria

The project is not a grouped project.

Leakage Management

NA

Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the project description.

Sustainable Development

The proposed project promotes local sustainable development through the following aspects:

- Reduce greenhouse gas emissions compared to the business-as-usual scenario;
- Help to stimulate the growth of the wind power industry in China and promotion of advanced wind turbine manufacturing industry;
- Reduce the emission of other pollutants resulting from the power generation industry in China, compared to a business-as-usual scenario;
- Create local employment opportunities during the construction and operation of the Project;
- Stimulate the development of local tourism industry.

Further Information

NA

2 APPLICATION OF METHODOLOGY

2.1 Title and Reference of Methodology

NA

2.2 Applicability of Methodology

NA

2.3 Project Boundary

NA

2.4 Baseline Scenario

NA

2.5 Additionality

NA

2.6 Methodology Deviations

There is no methodology deviation.

3 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

3.1 Baseline Emissions

NA

3.2 Project Emissions

NA

3.3 Leakage

NA

3.4 Net GHG Emission Reductions and Removals

4 MONITORING

4.1 Data and Parameters Available at Validation

NA

4.2 Data and Parameters Monitored

NA

4.3 Monitoring Plan

NA

5 SAFEGUARDS

5.1 No Net Harm

N/A

5.2 Environmental Impact

Wind power is green power and this project has no negative influence on the environment. Besides, the EIA (environment influence assessment) of this project has been conducted by

qualified third party and was approved by the Environmental Protection Bureau of Gansu Province on Feb 17 of 2011. The influence on environment could be referenced in section D.1 of the registered CDM PDD.

5.3 Local Stakeholder Consultation

On Aug 4, 2011, consultations were carried out in the Changma County by CECEP Wind Power (Gansu) CO., LTD. The consultations, which included two parts, one is the discussions among local people with the developer and another is a questionnaire survey.

The developer introduced the background of the Project firstly according to the meeting schedule and respondents filled in a questionnaire, and then a discussion meeting is raised to get the comments and suggestions from local people.

• Project brief introduction
• Respondents' information on name, gender, education level etc.

• Questions on:

1. Do you think whether the Project will benefit to the mitigation of Greenhouse Gas?

2. Do you feel any negative impact on surrounding environment (air, noise & water) by the project construction?

3. Are there any adverse impacts on your and your family's life, work and study by the project construction? (if yes, please explain in the attached pages.)

4. Whether the completion of the Project will bring about positive impacts to local economic development?

5. What is the issue that you are most concerned with during the construction and operation period of the Project? (Options: Noise, air pollution, equipment safety, waste water, electromagnetic interference, or landscape destroy)

6. Do you agree with the development & construction of the Project?

7. Do you think which environmental protection measures should be undertaken during the construction and operation period of the Project?

8. Do you have any further comment and suggestion about the Project and to the project owner?

The questionnaires were sent to 49 respondents and the survey had a 100% response rate. All of the respondents supported the construction of the Project.

5.4 Public Comments

The project description is public to local people and the plant staff. No public negative comments were received.

ANNEX CDM PDD

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

CONTENTS

A. General description of project activity

B. Application of a baseline and monitoring methodology

C. Duration of the project activity / Crediting period

D. Environmental impacts

E. Stakeholders' comments

Annexes

Annex 1: Contact information on participants in the project activity

Annex 2: Information regarding public funding

Annex 3: Baseline information

Annex 4: Monitoring plan

SECTION A. General description of project activity

A.1. Title of the project activity:

>>
CECEP Gansu Yumen Changma Daba South Wind Farm Project

Version Number	Date	Description
01	28/10/2011	Version submitted to the DOE for GSP
02	08/03/2012	Version after GSP
03	04/06/2012	Version after TR review of DOE

A.2. Description of the project activity:

>>
CECEP Gansu Yumen Changma Daba South Wind Farm Project (hereafter referred to as the Project) is located at Changma, Yumen Town, Gansu Province, China, which is a new-built project and operated by CECEP Wind Power (Gansu) Co., LTD.

The Project falls within sector scope 1: energy industries (Renewable electricity) from the perspective of proposed CDM activity. The total installed capacity of the Project is 48 MW equipped with 16 sets of wind turbine generators (briefly WTG henceforth) with a unit capacity of 3 MW. And the estimated electricity delivered to the project electricity system, i.e. Northwest Power Grid (briefly NWPG henceforth) by the Project, via 110kV substation within the project site, is 102.01 GWh annually, equivalent to 2125 operating hours with full capacity.

Provision of an equivalent amount of annual power output by NWPG is the baseline for the Project, i.e. the scenario in the absence of the Project. Basically, NWPG is predominated by connected fossil fuel fired power plants, especially coal fired plants, so by replacing equal amount of electricity which is originally generated by the fossil fuel fired power plants within the grid system, the Project with almost zero emission would reduce GHG emission (only CO_2 is considered) accrued from the saved fossil fuel combustion. It is estimated that the resulting CO_2 emission reductions would be about 91,400 tCO_2 annually.

The Project promotes sustainable development through the following aspects:

- Reduce greenhouse gas emissions compared to the business-as-usual scenario;
- Help to stimulate the growth of the wind power industry in China and promotion of advanced wind turbine manufacturing industry;
- Reduce the emission of other pollutants resulting from the power generation industry in China, compared to a business-as-usual scenario;
- Create local employment opportunities during the construction and operation of the Project;
- Stimulate the development of local tourism industry.

A.3. Project participants:

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*)	Kindly indicate if the Party involved wishes to be

	(as applicable)	considered as project participant (Yes/No)
P.R.China (Host)	CECEP Wind Power (Gansu) Co.,LTD	No
United Kingdom of Great Britain and Northern Ireland	Shell Trading International Limited	No

The complete contact information on participants in the project activity is listed in Annex 1 of the PDD.

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

>>

A.4.1.1. Host Party (ies):

>> People's Republic of China

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

>> Gansu Province

A.4.1.3. City/Town/Community etc:

>> Changma, Yumen Town

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

>>

The Project is sited at Changma, southwest of Yumen Town, Gansu Province, P.R. China. The Project has central geographical coordinates with east longitude of 96.7164° and north latitude of 40.0143°, in a region with the approximate scope of (E96.7389°, N40.0409°), (E96.7404°, N40.0011°), and (E96.6700°, N40.0009°), shown from the official approval document. The altitude of the site ranges from 1790m to 1843m above mean sea level. Figure 1 shows the location of the Project in Gansu Province, China.

Figure 1 Map showing the location of the Project

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

>> The project activity category falls within sector scope 1: energy industries- renewable sources

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

>>

Prior to the Project implementation, the region's electricity demand was met by existing power plants in the NWPG, mostly conventional fossil fuel based thermal power plants, resulting in high levels of CO_2 emissions.

The Project adopts the domestically-made WTGs, and does not involve international technology transfer. Within the project electricity system NWPG, 16 units of WTG with 3 MW unit capacity (Model type: SL3000/113) will be installed, forming 48MW of total capacity. These WTGs will be manufactured and assembled by Sinovel Wind Group Co., LTD.

The main technology parameter of this type of wind power turbine can be found at Table 1.

Table 1 Technology parameter of WTGs for the Project

Key Technology Parameter	Type: SL3000/113
Rated power (kW)	3000
Rotor diameter (m)	113.3
Cut-in wind speed (m/s)	3
Rated wind speed (m/s)	11
Cut-out wind speed (m/s) (average in 10 mins.)	25
Extreme(survival) wind speed (maximum in 3 seconds) (m/s)	52.5
Rated life time (year)	>20
Number of blades	3
Swept area(m^2)	10039.7
Length of the blade (m)	55
Generator capacity (kW)	3100
Rated generator voltage (V)	690

According to the provisions specified in the equipment purchase contracts, the vendor of the wind turbine equipment will provide technical training for the operation technicians and manager staffs of the Project. The engineers responsible for production and O & M work has received the training on wind turbine installation, operation and safe production, and troubleshooting at the turbine production factory and construction site, and gotten the certificate of qualification.

The electricity delivered by the Project to the NWPG will be monitored through metering equipment at the substations (interconnection facility connecting the Project to the grid). Detailed, each wind turbine will have a transformer from 690V to 35KV. And the wind farm will be connected with one new-built 35kV/110kV substation located within the wind farm, and then to NWPG via local Yumen town grid. There will be electric meters (accuracy level: no less than 0.5S) in the onsite substation to measure the electricity import/export.

Provision of an equivalent amount of annual power output by the NWPG is the reasonable baseline for the Project, details shown at Section B.4. The Project is expected to operate fully for 20 years from Nov. of 2012. According to the Feasibility Study Report (FSR) issued by Xinjiang Research Institute of Investigation & Design of Water Conservancy & Hydropower on April, 2011, the Project can deliver 102, 010 MWh to the grid annually, about 2125 operation hours with full capacity and the calculated load factor is about 0.24. With this wind power electricity output, CO_2 emission reduction can be achieved

compared to the baseline, where the thermal power plant dominated grid will provide the same electricity service.

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

>>
Renewable crediting period (7yrs×3) is adopted by the Project. It is expected that the project activity will generate emission reductions of about 639,800 tCO_2e over the first 7-year crediting period from 2012 to 2019.

Table 2 GHG Emission reduction estimation over the chosen crediting period

The chosen crediting period : The First Crediting Period: Year 2012-2019	
Years	Estimated Annual Emission Reductions in tCO_2e
01/11/2012-31/10/2013	91,400
01/11/2013-31/10/2014	91,400
01/11/2014-31/10/2015	91,400
01/11/2015-31/10/2016	91,400
01/11/2016-31/10/2017	91,400
01/11/2017-31/10/2018	91,400
01/11/2018-31/10/2019	91,400
Total estimated reductions (t CO_2e)	639,800
Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tonnes of CO_2e)	91,400

The baseline emissions factor (CM) has been fixed in the first 7-year crediting period. The amount of CERs actually generated by the Project will vary based on the metered net power supply of the Project to NWPG in the monitoring period.

A.4.5. Public funding of the project activity:

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

SECTION B. Application of a baseline and monitoring methodology:

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

>>
Approved consolidated baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (Version 12.2.0)

In line with the requirements of application of ACM0002 agreed by the CDM Executive Board, the latest version of the “Tool for the demonstration and assessment of additionality” (Version 5.2.1), and “Tool to calculate the emission factor for an electricity system” (Version 02.2.1) are used also.

“Combined tool to identify the baseline scenario and demonstrate additionality”, and “Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion” will be not applied because the Project is a

new-built wind power project, and one or more alternatives (see Section B.5 for these options) are not available options to project participants.

For more information please refer to
http://www.unfccc.int/methodologies/PAmethodologies/approved.html.

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

>>

The approved methodology ACM0002 is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).

Further, the approved methodology ACM0002 is applicable under the following conditions:

- The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;;
- In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use Option 2 in the methodology to calculate the parameter $EG_{PJ,y}$): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;;
- In case of hydro power plants, one of the following conditions must apply:
  - The project activity is implemented in an existing reservoir, with no change in the volume of reservoir; or
  - The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m^2; or
  - The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m^2.

In addition, the applicability conditions included in the tools referred to above apply.

The Project is satisfied with the above conditions because:

• The Project involves electricity capacity installation from wind sources, not biomass and hydro, and without fuel switching; and
• The Project is connected to the grid and substitutes grid electricity, i.e. where the project activity supplies electricity to a grid; and
• The Project does not involve switching from fossil fuels to renewable energy at the site of the project activity.

The “Tool for the demonstration and assessment of additionality” is applicable to the Project, because its

application is indicated and mandatory in the approved methodology ACM0002.

The "Tool to calculate the emission factor for an electricity system" is applicable to the Project and used to estimate the OM, BM and CM for the purpose of calculating baseline emissions of the Project, also mentioned in the approved methodology ACM0002.

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

>>
For the baseline determination only CO_2 emissions from electricity generation by fossil fuel fired power plant that is displaced due to the project activity are taken into account.

According to the approved methodology ACM0002, the emission sources and GHGs in the project boundary are listed in Table 3.

Table 3 Emission sources of the Project

Source		GHG	Included?	Justification / Explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.	CO_2	Yes	Main source of emissions
		CH_4	NO	Small source, excluded and is conservative
		N_2O	NO	Small source, excluded and is conservative
Project Activity	Not applicable	CO_2	NO	By ACM0002, emission from the project activity is ZERO
		CH_4	NO	Same as above
		N_2O	NO	Same as above

As per "Tool to calculate the emission factor for an electricity system" (Version 02.2.1), the delineation of grid boundaries as provided by the DNA (Contained in the file entitled "Notification on Determining Baseline Emission Factor of China's Grid" [1], Briefly Notification of NDRC hereafter) of the host country is used. NWPG, including Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang that can be dispatched without significant transmission constraints, is the project electricity system, which is defined by the spatial extent of the power plants that can be dispatched without significant transmission constraints. The connected electricity system is Central China Power Grid (CCPG). Since NWPG is located in resource rich area and has no electricity import from CCPG, the spatial extent is limited to the project electricity system.

The spatial extent of the project boundary includes the project site and all power plants connected physically to the NWPG that the CDM project power plant is connected to. The project boundary, emission sources and monitoring variables and the energy flows are illustrated in Figure 2.

[1] It can be obtained from the official website of China' DNA at http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File2720.pdf

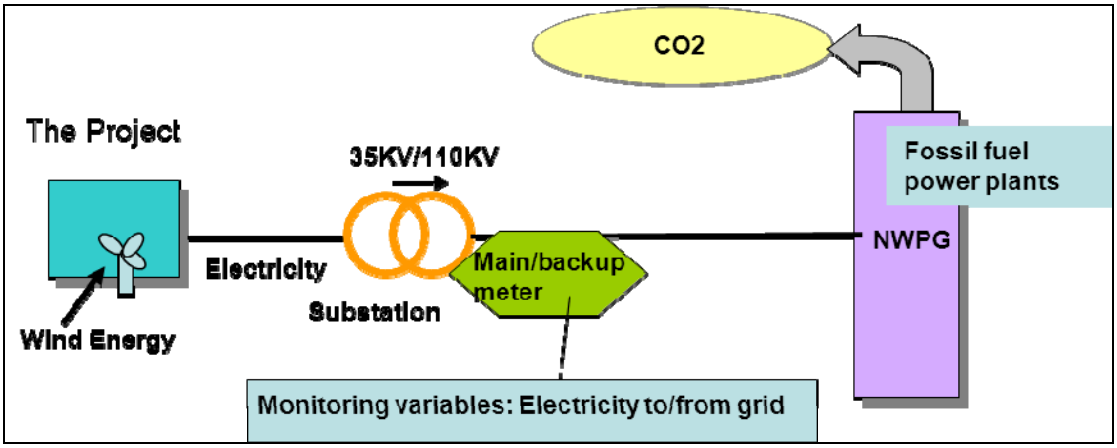

Figure 2 Illustration of the boundary of the Project

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

>>

Because the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario, according to latest methodology ACM0002, is the following:

"Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of NWPG 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".

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):

>>

According to the analysis in the FSR, the Project is not financially attractive because the IRR of this project was lower than the benchmark[2,3] (8%, project IRR and after tax), so the CERs revenue was suggested in the FSR to improve the IRR above benchmark. The developer decided to develop the Project as a CDM project on July15, 2011. The incentive from the CDM, therefore, had been fully taken into account prior to the starting date of the project activity, aiming to obtain the additional funding to secure the Project smoothly. Table 4 illustrated the key time schedule about the Project.

Table 4 Timeline of the implementation of the Project

Time	Milestone
Aug 10, 2010	Approve letter issued by Gansu DRC on the starting of feasibility study of the Project
Jan., 2011	EIA completed and submission for approval

[2] Interim Measures for Economic Evaluation on Electric Power Technical Reconstruction Project, issued by State Power Corporation, issued on Sept.10th, 2002, Document No. GuoDianFa [2002]623.

[3] "Measures for Feasibility Study Preparation of Wind Farm", issued by NDRC, China, Fagaibannengyuan [2005]899. http://www.cepee.com/news/text.php?NewsId=17479

Feb. 17, 2011	EIA of the proposed project was approved by the Environmental Protection Administration of Gansu Province.
April, 2011	FSR finished, and the Project not economically feasible, and CDM already considered to make it feasible (the IRR benchmark, 8% can be achieved for the project with the CDM CERs revenue)
July 15, 2011	Board Meeting – launch of CDM development
July 22,2011	ERPA LOI signed
Aug 04, 2011	The stakeholder meeting and questionnaire survey given
August 05, 2011	The CDM development contract signed with the consultancy company
Sep 02, 2011	ERPA signed
Oct 15, 2011	FSR approval by DRC and approval of the Project
Oct 20, 2011	WTGs purchase contract signed (**selected as project starting date**)
Oct 25, 2011	Wind farm civil construction contract signed
Oct 27, 2011	Prior Consideration of the CDM form submitted to EB
Nov.3, 2011	Prior Consideration of the CDM form submitted to NDRC
Nov.10, 2011	civil construction started
Dec, 2011	Installation contract of wind turbine units signed
Dec 28, 2011	Tower Purchase Contract
Jan 13, 2012	Main Transformer Purchase Contract
Feb 3, 2012	Installation contract of 35 kV transmission line
Feb 15, 2012	Box Transformer Purchase Contract
Feb 21, 2012	Construction contract of substation
Feb 27, 2012	Cable purchase contract

Approved methodology ACM0002 asks to use the latest version of the "Tool for the demonstration and assessment of additionality (Version 5.2.1)" agreed by the Executive Board to demonstrate and assess the additionality of the Project. The Tool consists of 4 steps as described below.

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

Sub-step1a. Define alternatives to the project activity:
According to the VVM para.105, the PDD shall identify credible alternatives to the project activity in order to determine the most realistic baseline scenario, unless the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario and no further analysis is required.

The Project is the installation of a new grid-connected renewable power plant, and is not a capacity addition, retrofit or replacement of existing grid-connected renewable power plant/unit. Therefore, the

baseline scenario according to the methodology is the following:

"Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of NWPG 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".

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

The alternative, i.e. the prescribed baseline scenario, is realistic and feasible and complies with applicable laws and regulations.

Step 2. Investment Analysis

The purpose of this step is to determine whether the project activity is economically or financially less attractive than (d) without an additional revenue/funding, possibly from the sales of certified emission reductions (CERs). The investment analysis is 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 potential alternative (d) of the Project is the NWPG 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 the benchmark IRR of the power sector is available.

Sub-step 2b. Benchmark Analysis Method (Option III)

According to the *Interim Measures for Economic Evaluation on Electric Power Technical Reconstruction Project,* the financial benchmark IRR (after tax) for power industry is 8% for the IRR of total investment. If the IRR of a project is higher or equal to the benchmark, this project is financially feasible and reasonable."

Since the Project is a power generation project, 8% for the IRR of total investment is adopted by the Project as the financial benchmark. This benchmark IRR 8% is an industrial standard benchmark IRR recognized in the electric power industries and widely adopted for economic and financial evaluation for both electric power new construction projects and reconstruction projects in China[7,8]. On the basis of the above benchmark, calculation and comparison of financial indicators are carried out in sub-step 2c.

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

---

[7] Interim Measures for Economic Evaluation on Electric Power Technical Reconstruction Project, issued by State Power Corporation, issued on Sept.10th, 2002, Document No. GuoDianFa [2002]623.

[8] "Measures for Feasibility Study Preparation of Wind Farm", issued by NDRC, China, Fagaibannengyuan [2005]899. http://www.cepee.com/news/text.php?NewsId=17479

(1) Basic parameters for calculation of financial indicators

According to the FSR, with reference to the approval letter of the Project about electricity purchase price, the basic parameters for calculation of financial indicators of the Project are summarized in Table 5.

Table 5 Financial parameters for calculation of the IRR of the Project

Key parameters	Unit	Value	Sources of data
Electricity delivered to power grid	MWh	102, 010	FSR14-1 (Section 1, Chapter 14)
Construction period	Year	1	FSR14-1
Designed project life time	Year	20	FSR14-1
Total capital investment (static)	million Yuan	404.64	FSR14-1
Annual operation & maintenance cost (including salary & awards, materials, maintenance, and insurance fee etc.)	million Yuan	14.21*	FSR Appendix Form
Depreciable life of fixed assets	year	15	FSR14-1
Rate of residual value of fixed assets	million Yuan	3%	FSR 14-1
Income tax rate	%	25	FSR14-2
VAT rate	%	17	FSR14-2
VAT drawback rate	%	50%	FSR 14-3
VAT paid on initial investment cost	Million Yuan	47.92	FSR 14-3
Grid bus-bar tariff of the electricity (With VAT)	Yuan/kWh	0.54	Official document Fa Gai Jia Ge [2009]1906
City Construction Tax Rate	%	5	FSR14-2
Education tax	%	5	FSR14-2
Expected CERs price	€/tCO_2	10	
Exchange rate	Yuan/€	8.7	

* These costs are average values calculated from the total life cost divided by the life time according to the FSR, given that the corresponding cost is slightly different across years because of the minor change of material and maintenance cost in different years.

(2) Comparison of the financial benchmark of the IRR of total investment for the 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 6.72%, which is lower than the benchmark (8%). The Project is not financially attractive. With revenue from CDM at the assumed price level, the Project would be more financially attractive and the IRR is 9.52% assuming the CERS price is 10€/tCO_2.

Sub-step 2d. Sensitivity analysis

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

(1) Static total investments
(2) Annual operational costs

(3) Annual electricity delivered to the grid
(4) Grid bus-bar tariff (W/T VAT)

Firstly, the effects of changes in the static total investments, annual operational costs and electricity delivered to the grid on the IRR are examined, assuming these parameters have reasonable variations within (-10%~10%). This optional variation range [-10%, 10%] is common practice in sensitivity assessment, especially often used for industrial projects, which is also adopted by Measures for Feasibility Study Preparation of Wind Farm issued by NDRC. All of the CDM projects registered in the EB website in the scope of China as we know also adopted this variation range. This approach is consistent with the Guidance on the Assessment of Investment Analysis issued by EB 41 meeting.

And the outcomes of IRR are presented in the Table 6 and Fig.3.

Table 6 IRR Sensitivity test (total investment)

Variation / Factor	-10%	-5%	0%	5%	10%
Static total investments	8.26%	7.47%	6.72%	6.02%	5.38%
Annual operational costs	7.22%	6.97%	6.72%	6.47%	6.21%
Annual electricity delivered to the grid	5.12%	5.93%	6.72%	7.47%	8.20%
Grid Bus-Bar Tariff (W/T VAT)	5.12%	5.93%	6.72%	7.47%	8.20%

It showed that within the range of change by -10% ~ +10% of those uncertain parameters the IRRs (for the total investment and after tax) of the Project could not reach or overcome 8%.

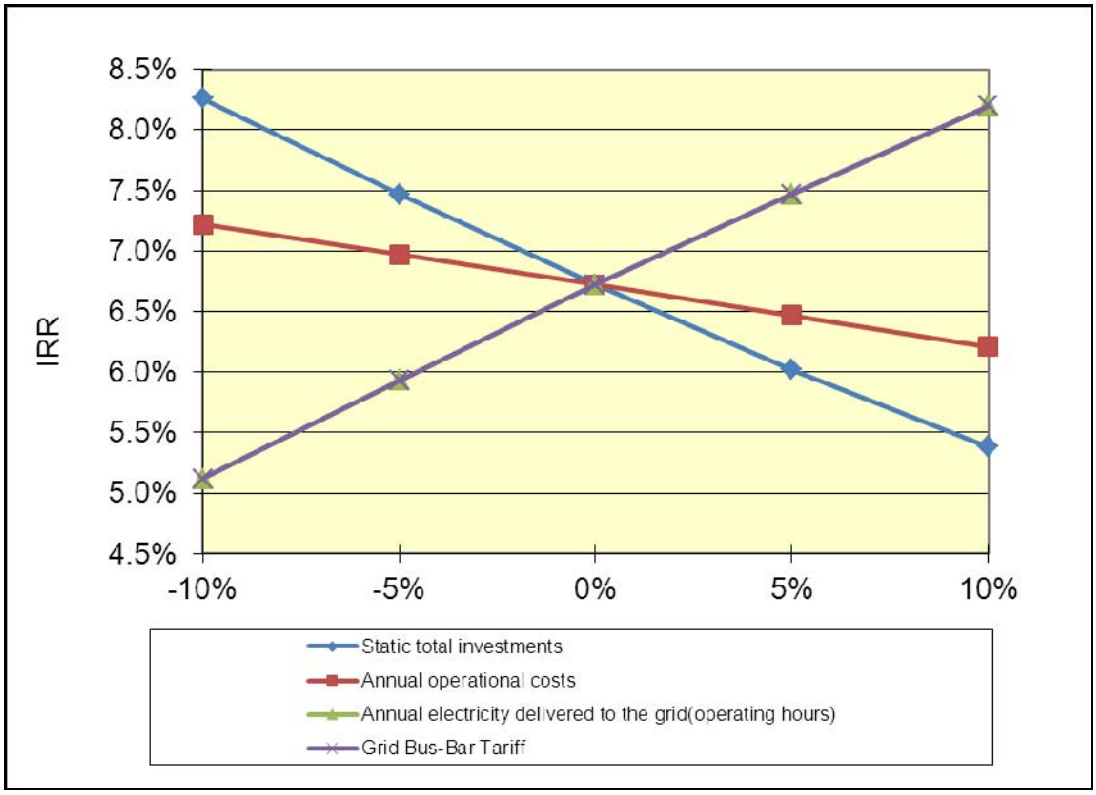

Figure 3 Sensitivity Analysis regarding the impact of three key elements' variation on IRR

Further sensitivity analysis was given and it showed that without CER revenue, the IRR of the Project reaches the benchmark 8% only if the investment decreases by at least 8.40%, or either the power delivered to the grid increases by at least 8.65%, or the Grid Bus-Bar Tariff increases by 8.65% based on 0.54 Yuan/kWh for the whole project life, or the annual O&M cost decreases by at least 26.00%. However, none of these conditions can be achieved due to the following reasons:

Regarding the electricity bus-bar tariff

The tariff of wind power project is mainly decided upon the provincial base including similar wind resource, grid structure, geological and economic developing conditions. According to the Tariff Approval for Wind Power Project [Fa Gai Jia Ge (2009) No.1906] issued by NDRC in 2009, Yumen Region belongs to Resource Zone Class II and the guiding tariff is 0.54Yuan/kWh (Inc. VAT), which will be fixed in the whole life time. Therefore, with the determined tariff, the IRR of the proposed project is always under 8% and the proposed project is still lack of financial attractiveness.

Regarding the electricity delivered to the grid

The electricity delivered to the grid by the project activity would fluctuate annually along with the seasonal changes in wind power resource availability. The estimated power supplied to grid in the FSR is 102,010MWh. This is based on an annual operation time of 2125 hours, resulting in a load factor of 24%, which was derived from the Feasibility Study Report (FSR) prepared by a third party design institute "Xinjiang Research Institute of Investigation & Design of Water Conservancy & Hydropower" on April, 2011, and officially approved by Gansu Development and Reform Committee in Oct. 2011. So the plant load factor (PLF) for the Project is in line with EB guidelines (EB 48, Annex 11 option b).This estimation

was based on long term data measured at the site, and long term wind energy estimates derived from data records at the local weather station in Gansu Province. A detailed wind power generation estimate was made using the exact specifications of the wind turbines being used and calculated using the professional wind energy resource analysis and electricity calculation software[9]. And the chosen wind turbine is the one that could best fit local wind resource. While in addition, along with the age increase in project operation, the time needed for regular maintenance of wind equipment would also increase, which would tend to decrease the annual electricity generation. So it is unlikely to have giant increase in the annual electricity delivered by the Project by 8.65%.

Regarding total investment

For the wind farm project, the cost of turbine, engineering construction and related accessories consist main budget of the investment. In order to save capital, 3 options in terms of per kWh equipment investment have been compared at length in the FSR (Chapter 5) and the project option is finally determined. The total investment cost of the proposed project is 404.64 Million RMB. These values for these calculations were derived from the Feasibility Study Report (FSR) prepared by a third party design institute "Xinjiang Research Institute of Investigation & Design of Water Conservancy & Hydropower" on April, 2011, and officially approved by Gansu Development and Reform Committee in Oct. 2011. Physical equipment investment is the main part of the total investment. It is impossible to largely decrease the total investment by 8.4%, given that the purchase contracts of WTGs and most key equipments and items had been signed. With the validation of DOE, the amount of signed contracts, i.e. the investment cost already occurred by now is already over 93% of the total investment in FSR.

Regarding the O&M cost

Annual O&M cost comprises maintenance cost, salary & awards, materials, and other costs. All of these costs are determined by long term operation experience. Values for the O&M cost calculation have come from the FSR, which was prepared by an independent third party. The annual O&M costs are estimated in the FSR as 14.25 Million RMB per year, corresponding to approximately 297 RMB/kW, which is normal level compared to other projects in Gansu Province. It is not realistic to reduce the salary & awards of the employees, which is related to the daily life standard. In term of maintenance cost, which are basically consigned to the professional entities and it is impossible for the contract price to change much. As O&M costs would need to drop by at least 26% in order to reach the benchmark rate of 8%, this possibility can be ruled out.

Finally, according to EB 61, Para 78, the highest applicable tariff in Gansu province is 0.5599 Yuan/kWh (with VAT), under which, the Project has a IRR of 7.07%, still below the benchmark and is financially unfeasible.

It can be demonstrated that, the sensitivity analysis always support the conclusion that the Project is not financially attractive. However, the revenues from the CERs will greatly improve the IRR to reach the benchmark of the financial feasibility for the Project. This is an effective evidence for demonstration of additionality.

Step 3 Barrier analysis

Barrier analysis is not employed by the Project which can satisfy the requirement of the *Tool for the*

[9] See Chapter 5 of FSR for the whole detailed calculation process.

Demonstration and Assessment of Additionality.

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, the common practice analysis is carried out on similar projects in the same region and taking place in a comparable environment with regards to regulatory framework, investment climate, access to technology, and access to financing, etc.

In China, the regulatory framework and investment climate for wind farm projects are only similar and comparable in the same Province/Autonomous Region. The common practice analysis of the proposed project activity, therefore, covers projects in the Gansu Province. Given the Project is power generation from wind resource, the other wind power projects will be within the category of the similar technology.

To analyze the common practice, the statistics of wind power installed capacity in China 2007-2010 is adopted as the data source[10]. Taking note of that the proposed project is a large scale project, the small scale projects, less than 15MW, and CDM projects[11] registered and in pipeline are excluded as per the EB guidance for common practice, only one projects, to our knowledge, can be the similar projects to the Project. Table 7 illustrates the detailed information.

Table 7 Wind farm projects similar to the Project

Name	Capacity(MW)	Commissioning Date	Project Owner	Notes
Gansu Wind Power Phase I	100.5	2007	Gansu China Power Jiuquan Wind Power Co., LTD	Carbon Finance (developed under VCS)

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

As discussed above, all similar wind power projects except the Gansu Wind Power Phase I have applied for CDM projects due to their financially unattractiveness and/or other implementation barriers. Moreover, Gansu Wind Power Phase I meets the standards of Voluntary Carbon Standard (VCS) and has being developed as a Verified Emission Reductions (VERs) project to obtain the related carbon finance support[12]. Therefore, the wind power projects similar with the proposed project activity are not common practice in Gansu Province.

To summarize, if the Project fails to be registered as a CDM project, without CERs sales revenues, the high cost of the Project can not be compensated and the loan payback can not be guaranteed. Under such

---

[10] Statistics of wind power installed capacity in China in 2007-2010. http://www.cwea.org.cn/upload/20080324.pdf; http://www.cwea.org.cn/upload/20090305.pdf; http://www.cwea.org.cn/upload/201006102.pdf; http://www.cwea.org.cn/upload/2010%E5%B9%B4%E9%A3%8E%E7%94%B5%E8%A3%85%E6%9C%BA%E5%AE%B9%E9%87%8F%E7%BB%9F%E8%AE%A1.pdf.

[11] See: http://cdm.unfccc.int/Projects/registered.html, and http://cdm.unfccc.int/Projects/Validation/index.html.

[12] http://finance.thestandard.com.hk/upload/comp_report_item/00735/LTN20090130107_C.pdf.

circumstances, the implementation of the Project is facing prohibitive barriers as mentioned above. Being registered as a CDM project, CERs sales revenues can alleviate the identified barriers, therefore the Project is additional.

B.6. Emission reductions:

>>

B.6.1. Explanation of methodological choices:

According to ACM0002, the baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity, calculated as follows in four steps:

·First, calculate the project GHG emissions;
·Second, calculate the baseline GHG emissions;
·Third, calculate the project leakage;
·Fourth, calculate the emission reductions.

1. Calculate the project GHG emissions

According to ACM0002, for wind energy project activities, it can be treated as ZERO.

2. Calculate the baseline GHG emissions

According to latest ACM0002 (Version 12.2.0), the baseline emissions calculated as follows:

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y} \quad (1)$$

Where:

BE_y	=	Baseline emissions in year *y* (tCO_2/yr)
$EG_{PJ,y}$	=	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year *y* (MWh/yr)
$EF_{grid,CM,y}$	=	Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO_2/MWh)

If the project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, then:

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

$EG_{facility,y}$	=	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y* (MWh/yr)

Furthermore,

$$EG_{facility,y} = EG_{togrid,y} - EG_{fromgrid,y} \quad (2)$$

So,

$$BE_y = (EG_{togrid,y} - EG_{fromgrid,y}) \times EF_{grid,CM,y} \qquad (3)$$

Where,

$EG_{togrid,y}$: The electricity delivered to the grid by the proposed project activity in y year

$EG_{fromgrid,y}$: The electricity purchased by the proposed project activity from the grid in *y* year, when wind resources not sufficient or wind turbine might shut down for regular maintenance.

The baseline emission factor (EFy) is calculated as a combined margin ($EF_{grid,CM,y}$), consisting of the combination of operating margin ($EF_{grid,OM,y}$) and build margin ($EF_{grid,BM,y}$) factors according to the following six steps defined in the "Tool to calculate the emission factor for an electricity system(Ver 02.2.1)" (Briefly the Tool hereafter). Data for the calculations are based on official national statistics books: China Energy Statistical Yearbook and China Electric Power Yearbook.

STEP 1. Identify the relevant electric power system

The power generated from the proposed project activity will be supplied to the grid. As the DNA has published a delineation of the project electricity system and connected electricity systems, these delineations are used.

Following the DNA delineation, the project electricity system is the NWPG (NWPG), consisting of five provincial grids: Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang, which is defined by the spatial extent of the power plants that can be dispatched without significant transmission constraints.

The connected electricity system is Central China Power Grid (CCPG). Since NWPG is located in resource rich area and has no electricity import from CCPG, so for the purpose of determining the build margin emission factor, the spatial extent is limited to the project electricity system according to the Tool.

STEP 2. Choose whether to include off-grid power plants in the project electricity system (optional).

As per the tool to calculate the emission factor for an electricity system, project participants may choose between the following two options to calculate the operating margin and build margin emission factor:
Option I: Only grid power plants are included in the calculation.
Option II: Both grid power plants and off-grid power plants are included in the calculation.

Here, Option I was chose given off-grid power generation is not significant in NWPG and it is impossible to be partially displaced by the project activities as an intermittent wind power generation source, also consistent with the approach in the Notification of NDRC.

STEP 3. Select a method to determine the operating margin (OM)

According to the Tool mentioned above, the calculation of the OM emission factor of the identified grid is based on one of the four following methods:

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

According to the Tool, the Simple OM method (a) is applicable to the project if the low-cost resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.

Since NWPG is thermal plants dominated grid and the generation from all the other sources (including hydro power) were 23% more or less of total generation and this percentage has not changed significantly in recent years, shown from the statistic data from China Electric Power Yearbook 2006-2010 listed in the table below, the Simple OM method is applicable to the proposed project.

Table 8 Power generation in the NWPG from 2005 to 2009

Year	Thermal Generation (10^8 kWh)	Low-cost/must-run generation (mainly hydro and wind) (10^8kWh)	Total Generation (10^8 kWh)	Share
2005	1286.8	437.2	1724.0	25.36%
2006	1639.7	490.7	2130.4	23.03%
2007	1767.1	532.3	2299.4	23.15%
2008	2131.4	615.1	2746.5	22.39%
2009	2191.4	716.8	2908.2	24.65%

Source: China Electric Power Yearbook, 2006-2010

The Simple OM emissions factor can be calculated using either ex-ante or ex-post data vintages. The project proponents have chosen to use the ex-ante option, and $EF_{grid,OM,y}$ is fixed for the duration of the first crediting period.

• 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.

STEP 4. Calculate the operating margin emission factor according to the selected method

The Simple Operating Margin emission factor $EF_{grid,OM,y}$ is defined as the generation-weighted average emissions per unit net electricity generation (tCO_2/MWh) of all generating sources serving the system, not including low-operating cost and must-run power plants. Two options can be selected to calculate the simple OM:

Option A: Based on the net electricity generation and a CO_2 emission factor of each power unit; or
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.

As data for options A are not available, the Notification of NDRC uses option B for the calculation of the operating margin emission factor.

For Option B, the Simple OM emission factor 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:

$$EF_{grid,OMsimple,y} = \frac{\sum FC_{i,y} \times NCV_{i,y} \times EF_{co2,i,y}}{\sum EG_y} \quad (4)$$

Where:

$EF_{grid,OMsimple,y}$ = Simple operating margin CO_2 emission factor in year y (tCO_2/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)

$EF_{CO2,i,}y$ = CO_2 emission factor of fossil fuel type i in year y (tCO_2/GJ)

EG_y = Net electricity delivered to the grid by all power sources serving the system, not including low-cost / must-run power plants / units, in year y (MWh) , which can be calculated from the product of net electricity generation (*GENy)* by all power sources, not including low-cost / must-run power plants / units, in year y (MWh) and (1-*AERy*), where, AERy is the average auxiliary electricity consumption rate(%) of all power sources serving the NWPG, not including low-cost/must-run power plants/units, in year y.

i = All fossil fuel types combusted in power sources in the project electricity system in year y

y = Either the three most recent years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex-ante option) or the applicable year during monitoring (ex post option), following the guidance on data vintage in step 2.

For this approach (simple OM) to calculate the operating margin (OM), the subscript m refers to the power plants / units delivering electricity to the grid, not including low-cost/must-run power plants / units, and including electricity imports to the grid (ZERO in this project case). Electricity imports should be treated as one power plant m.

Finally, the weighted average $EF_{OM,y}$ of the NWPG based on the latest 3 years data (2008-2010) is 1.0001tCO_2e/MWh[13]. For more details please refer to Annex 3 Table A3-1 to A3-6.

STEP 5. Calculate the build margin (BM) emission factor

The sample group of power units *m* used to calculate the build margin consists of 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. This option is chosen as it comprises larger annual generation than the five units built most recently. Following the deviation, the latest statistical data available is used by the DNA (NDRC of China) to determine the most recent year from which the added generation capacity is equal to or just exceeds 20% of the latest statistic year 2009.

In terms of vintage of data, project participants can choose between option 1 ex-ante, and option 2 ex-post data vintages. The project proponents have chosen to use the ex-ante option, and $EF_{grid,BM,y}$ is fixed for the duration of the first crediting period.

• *Option 1*. For the first crediting period, calculate the build margin emission factor 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. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

[13] Notification on Determining Baseline Emission Factor of China's Grid for the NWPG issued by NDRC, China's DNA on Oct. 20, 2011

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \quad (5)$$

Where,

$EF_{grid,BM,y}$ =Build margin CO_2 emission factor in year y (tCO_2/MWh)

$EG_{m,y}$ =Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)

$EF_{EL,m,y}$ =CO_2 emission factor of power unit m in year y (tCO_2/MWh)

m =Power units included in the build margin

y =Most recent historical year for which power generation data is available

The CO_2 emission factor $EF_{grid,BM,y}$, should be determined as per step 3 (a) for the simple OM in the "Tool to calculate the emission factor for an electricity system". However, due to the limited availability of publicly available data, the Notification of DNA uses the accepted deviation mentioned in Step 4 to calculate $EF_{grid,BM,y}$, as follows:

• Using the latest statistical data available from China Energy Statistical Yearbook 2010 to calculate the different CO_2 emission percentage (λ_i) of solid, liquid and gas fuel in the total emission from thermal generation in the NWPG in 2009.
• Based the emission percentage (λ_i) of different kind fossil fuels and the corresponding emission factor (EF_i) according to the best technology commercially available in the China, the weighted emission factor of thermal power ($EF_{thermal}$)is calculated.
• Using the latest statistical data available (from the China Electric Power Yearbook) determine the year from which the added generation capacity is equal to or just exceeds 20% of the capacity of the latest statistic year 2010. Regarding the added generation capacity above 20%, calculate the BM through multiply the weighted emission factor of thermal power ($EF_{thermal}$) by the capacity percentage of the thermal power among the about 20% new capacity of 2009.

The detailed steps and formulas are as follows:

Step a: calculate the proportion λ_i of the CO_2 emission of solid, liquid and gas fuel type consumed for power generation to the total CO_2 emission from the total thermal power generation.

$$\lambda_{Coal} = \frac{\sum_{i \in COAL,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,j,y}} \quad (6)$$

$$\lambda_{Oil} = \frac{\sum_{i \in OIL,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,j,y}} \quad (7)$$

$$\lambda_{Gas} = \frac{\sum_{i \in GAS, j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,j,y}} \quad (8)$$

Where:

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

$NCV_{i,y}$ is the net calorific value (energy content) per mass or volume unit of a fuel i (GJ/t for solid and liquid fuel and GJ/m^3 for gas fuel)

$EF_{CO2,i,j,y}$ is CO_2 emission factor of fuel i (tCO_2/GJ)

COAL, OIL and *GAS* is the footnote set of the solid fuel, liquid fuel and gas fuel.

Step b: calculate the emission factor of the corresponding thermal power.

$$EF_{Thermal} = \lambda_{Coal} * EF_{Coal,Adv} + \lambda_{Oil} * EF_{Oil,Adv} + \lambda_{Gas} * EF_{Gas,Adv} \quad (9)$$

Where:

$EF_{Coal,Adv}$, $EF_{Oil,Adv}$ and $EF_{Gas,Adv}$ are the emission factors in line with the efficiency level of the best technology commercially available in China's power grid for each fuel type respectively.

Step c: calculate the $EF_{grid,BM,y}$ of the grid:

$$EF_{grid,BM,y} = \frac{CAP_{Thermal}}{CAP_{Total}} * EF_{Thermal} \quad (10)$$

Where:

CAP_{Total} is the total newly capacity addition, $CAP_{Thermal}$ is the newly capacity addition of thermal power plants.

STEP 6. Calculate the combined margin (CM) emissions factor.

The baseline combined emission factor ($EF_{grid,CM,y}$) is the weighted average value of the $EF_{grid,OMsimple,y}$ and $EF_{grid,BM,y}$:

$$EF_{grid,CM,y} = w_{OM} * EF_{grid,OMsimple,y} + w_{BM} * EF_{grid,BM,y} \quad (11)$$

Where

$EF_{grid,BM,y}$ is the build margin CO_2 emission factor in year y (tCO_2/MWh)

$EF_{grid,OM,y}$ is the operating margin CO_2 emission factor in year y (tCO_2/MWh)

w_{OM} is the weighting of operating margin emissions factor (%)

w_{BM} is the weighting of build margin emissions factor (%).

The default weights are used, i.e. for the wind farm projects in the first crediting period and the subsequent crediting period, $w_{OM} = 0.75$ and $w_{BM} = 0.25$.

3. Calculate the project leakage

According to ACM0002, for wind energy project activities, it can be treated as ZERO.

4. Calculate the emission reductions

The emission reductions for a given year are calculated as baseline emissions minus the project emissions and leakage:

$$ER_y = BE_y - PE_y = BE_y \qquad (12)$$

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

Data / Parameter:	$FC_{i,y}$
Data unit:	ton or m^3
Description:	Amount of fuel *i* consumed within the project electricity system, in years *y*, not including low operating cost/must run power sources.
Source of data used:	China's Energy Statistical Yearbook, 2008-2010
Value applied:	see Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Based on official national statistics
Any comment:	

Data / Parameter:	GEN_y
Data unit:	MWh
Description:	electricity generated by all power sources serving the project grid system, not including low-cost/must-run power plants/units, in year y.
Source of data used:	China Power Electric Yearbook, 2008-2010
Value applied:	see Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	The choice of data satisfies the guidance in the methodology ACM0002 and its deviation approach. The data is used to calculate OM emission factor.
Any comment:	

Data / Parameter:	AER_y
Data unit:	%
Description:	the self-service electricity rate of all power sources serving the NWPG.
Source of data used:	China Power Electric Yearbook, 2008-2010
Value applied:	see Annex 3 for details
Justification of the choice of data or description of measurement methods and procedures actually applied :	Based on official national statistics
Any comment:	

Data / Parameter:	NCV_i
Data unit:	GJ/ton or GJ/km^3
Description:	Net calorific value (energy content) per mass or volume unit of a fuel *i*.

Source of data used:	China Energy Statistical Yearbook, 2009, p 287
Value applied:	See Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	The choice of data satisfies the guidance in the methodology ACM0002. The data is used to calculate the emission coefficient of the fuel.
Any comment:	

Data / Parameter:	$EF_{CO2,i,j,y,}$
Data unit:	tCO_2/GJ
Description:	CO_2 emission factor per unit of energy of the fuel *i*.
Source of data used:	"2006 IPCC Guidelines for National Greenhouse Gas Inventories ", Volume 2
Value applied:	See Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	The choice of data satisfies the guidance in the methodology ACM0002. The data is used to calculate the emission coefficient of the fuel
Any comment:	

Data / Parameter:	$CAP_{j,y}$
Data unit:	MW
Description:	The total installed capacity of province j in year y
Source of data used:	China Electric Power Yearbook, 2008-2010
Value applied:	see Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	The choice of data satisfies the guidance in the methodology ACM0002. The data is used to calculate the BM emission factor
Any comment:	

Data / Parameter:	$EF_{i,Adv}$
Data unit:	%
Description:	The efficiency level of the best technology commercially available in China's power grid for each fuel type.
Source of data used:	Notification of NDRC, China
Value applied:	The supply efficiency for coal is 39.45%; for oil and gas is 51.77%
Justification of the choice of data or description of measurement methods and procedures actually applied :	The choice of data satisfies the guidance in the methodology ACM0002. The data is used to calculate the BM emission factor.
Any comment:	

Data / Parameter:	$F_{i,j,y}$
Data unit:	tce
Description:	the consumption of fuel i in province j in year y.
Source of data used:	China Energy Statistical Yearbook, 2008-2010
Value applied:	see Annex 3 for details

Justification of the choice of data or description of measurement methods and procedures actually applied :	Based on official national statistics
Any comment:	

Data / Parameter:	**Import Electricity from other regional grids**
Data unit:	MWh
Description:	The net imported electricity from other regional grids, which should be considered as one power source *j, j = imports.*
Source of data used:	China Electric Power Yearbook, 2008-2010
Value applied:	Zero. See Annex 3.
Justification of the choice of data or description of measurement methods and procedures actually applied :	Based on official national statistics
Any comment:	

Data / Parameter:	**EF_{OM}**
Data unit:	tCO_2/MWh
Description:	Operating margin emission factor of the project grid system
Source of data used:	China Electric Power Yearbook, 2008-2010; China Energy Statistical Yearbook, 2008-2010
Value applied:	See Annex 3.
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on official national statistics
Any comment:	

Data / Parameter:	**EF_{BM}**
Data unit:	tCO_2/MWh
Description:	Building margin emission factor of the project grid system
Source of data used:	China Electric Power Yearbook, 2008-2010; China Energy Statistical Yearbook, 2008-2010
Value applied:	See Annex 3.
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on official national statistics
Any comment:	

B.6.3. Ex-ante calculation of emission reductions:

>>

According to the Tool, The weight of w_{OM} and w_{BM} is set: w_{OM} = 0.75, w_{BM} = 0.25. So the ex-ante calculation of CM is

$EF_{grid,CM,y}$＝1.0001*0.75＋0.5851*0.25＝0.8960 (tCO_2/MWh)

According to the ACM0002 methodology, the project emissions (PE_y) as well as the leakage (L_y) are zero for wind power projects, and therefore the emission reductions are equal to the baseline emissions:

$ER_y = BE_y = EF_{grid,\ CM,\ y} * EG_{facility,y}$＝0.8960($tCO_2$e/MWh) * 102,010 (MWh) ＝91,400 tCO_2e

The proposed power plants will sell approx. 102, 010MWh of power to the grid. Annual GHG emissions reduction based on the above methodology and data sources are estimated at 91,400 tCO_2e.

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

>>

Year	Estimation of project activity emissions (tonnes of CO_2e)	Estimation of baseline emissions (tonnes of CO_2e)	Estimation of leakage (tonnes of CO_2e)	Estimation of overall emission reductions (tonnes of CO_2e)
01/11/2012-31/10/2013	0	91,400	0	91,400
01/11/2013-31/10/2014	0	91,400	0	91,400
01/11/2014-31/10/2015	0	91,400	0	91,400
01/11/2015-31/10/2016	0	91,400	0	91,400
01/11/2016-31/10/2017	0	91,400	0	91,400
01/11/2017-31/10/2018	0	91,400	0	91,400
01/11/2018-31/10/2019	0	91,400	0	91,400
Total (tonnes of CO_2e)	0	639,800	0	639,800

B.7. Application of the monitoring methodology and description of the monitoring plan:

>>

B.7.1. Data and parameters monitored:

>>

Following approved methodology ACM0002, the data that is required to be monitored to establish the emission reductions, is the net electricity supplied by the project activity to the grid (EG_y).

Data / Parameter:	$EG_{togrid,y}$
Data unit:	MWh
Description:	Quantity of annual electricity exported to the grid by the Project
Source of data to be used:	Monitored from electricity meters within the wind farm
Value of data applied for the purpose of calculating expected emission reductions in section B.6	102,010
Description of measurement methods and procedures to be applied:	Two bi-direction meters are employed at the substations within the wind farm by the Project, one of which is for backup. Monthly power exported to NWPG will be approved and signed off by monitoring and auditing staff before it is accepted and stored.
Monitoring frequency:	Continuous measurement and monthly recording
QA/QC procedures to be applied:	Monthly power exported to the NWPG is cross-checked against sales receipts. The metering equipments (with accuracy level of no less than

	0.5S) are calibrated and checked for accuracy periodically (once a year) according to the industry standards so that the metering equipment shall have sufficient accuracy.
Any comment:	-

Data / Parameter:	$EG_{fromgrid,y}$
Data unit:	MWh
Description:	Quantity of annual electricity imported from the grid by the Project
Source of data to be used:	Monitored from electricity meters within the wind farm
Value of data applied for the purpose of calculating expected emission reductions in section B.6	Zero
Description of measurement methods and procedures to be applied:	Two bi-direction meters are employed at the substations within the wind farm by the Project, one of which is for backup. Monthly power imported from NWPG will be approved and signed off by monitoring and auditing staff before it is accepted and stored.
Monitoring frequency:	Continuous measurement and monthly recording
QA/QC procedures to be applied:	Monthly power imported from NWPG is cross-checked against receipts. The metering equipments (with accuracy level of no less than 0.5S) are calibrated and checked for accuracy periodically (once a year) according to the industry standards so that the metering equipment shall have sufficient accuracy.
Any comment:	

Data / Parameter:	$EG_{facility,y}$
Data unit:	MWh
Description:	Net electricity supplied to the grid by the Project
Source of data to be used:	Monitored from electricity meters within the wind farm and calculated
Value of data applied for the purpose of calculating expected emission reductions in section B.6	102,010
Description of measurement methods and procedures to be applied:	Result of $EG_{togrid,y}$ minus $EG_{fromgrid,y}$
Monitoring frequency:	Continuous measurement and monthly recording
QA/QC procedures to be applied:	Monthly power exported and imported to the NWPG are cross-checked against sales receipts.
Any comment:	

B.7.2. Description of the monitoring plan:

>>

The whole monitoring system scheme of this project can be referred to Figure 2 of this document. The quantity of net electricity generation supplied to the grid by the project which is used to calculate emission reductions is the monitoring data. To achieve this purpose, the monitoring organization, meter

infrastructure and calibration, data management and reporting and so on will be formulated correspondingly, detailed as below.

1. Monitoring system organization

Overall responsibility for monitoring and carrying out the monitoring following this monitoring plan lies with CECEP Wind Power (GANSU) CO.,LTD. The company will assign dedicated people responsible for the monitoring and reporting of the generation and emission reductions of the project activity. The operating and management structure is illustrated as followed:

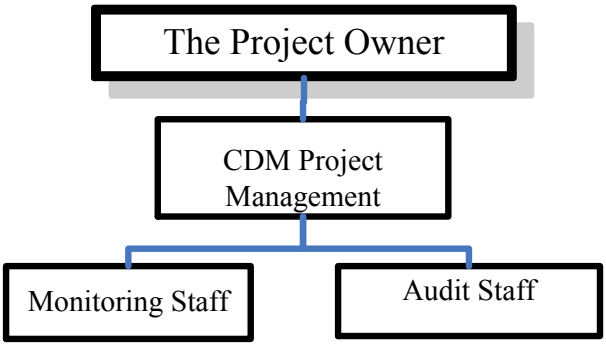

Figure 4 Monitoring system organizations

2. Installation of meters

Two bi-direction meters in the 110kV side of the substation within the wind farm are employed by the Project, one of which is for backup. Every month the 110kV substation will report the electricity exchanged between the Project and NWPG. The staffs in the operating department will be responsible for the monitoring of the electricity from and to the grid.

3. Calibration of meters & metering

The metering equipment will be calibrated and checked once a year by qualified third party for accuracy according to local industry standards so that the metering equipment shall have sufficient accuracy of no less than 0.5S. Both meters shall be jointly inspected and sealed on behalf of the parties concerned and shall not be interfered with by either party except in the presence of the other party or its accredited representatives.

All the meters installed shall be tested by the NWPG within 10 days after: the detection of a difference larger than the allowable error in the readings of both meters; the repair of all or part of meter caused by the failure of one or more parts to operate in accordance with the specifications.

If any errors are detected the party owning the meter shall repair, recalibrate or replace the meter giving the other party sufficient notice to allow a representative to attend during any corrective activity.

Should any previous month's reading of the main meter be inaccurate by more than the allowable error, or otherwise functioned improperly, the net generation output shall be determined by: (a) first, by reading backup meter, unless a test by either party reveals it is inaccurate; (b) if the backup system is not with acceptable limits of accuracy or operation is performed improperly the project owner and the grid company shall jointly prepare a reasonable and conservative estimate of the correct reading, and provide

sufficient evidence that this estimation is reasonable and conservative when DOE undertakes verification; and (c) if the two parties fail to agree then the matter will be referred for arbitration according to agreed procedures.

4. Data collection and management system

• The proposed wind farm records readings monthly from the meter equipment within the farm's substation, and other relevant separated meters if needed.
•The proposed wind farm supplies reading to the Grid Company monthly.
• The Grid Company confirms the readings result monthly in some forms, e.g. sale receipts.
• The proposed wind farm carries out an internal audit on the readings and calculations and prepare for the verification by DOE.

Relevant physical document will be collated in a central place, together with this monitoring plan. In order to facilitate auditors' reference of relevant literature relating to the proposed Wind farm project, the project material and monitoring results will be indexed. All paper-based information will be stored by the technology department of the proposed Wind farm and all the material will have a copy for backup.

And all data including calibration records is kept until 2 years after the end of the total crediting period of the CDM project.

5. Quality control

Monthly net generation data will be approved and signed off by monitoring and auditing staff before it is accepted and stored.

This audit will check compliance with operational procedures in this monitoring plan.

This internal audit will also identify potential improvements to procedures to improve monitoring and reporting in future years. If such improvements are proposed these will be reported to the DOE and only operated after approval from the DOE.

6. Reporting

CECEP Wind Power (GANSU) CO.,LTD will complete the monitoring report and provide it to a DOE for verification

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)

>> **Date of completion:** 04/06/2012.

The application of the baseline study and monitoring methodology of the Project was completed by:

Name/Origination	Project participate Yes/No
Dr. Shuwei ZHANG, Ms. Mengqing Xia Gold China Consultancy International Room 10-D, Building C, Huating Park, No.6 Middle Road of the 4th North Ring, Chaoyang District, Beijing, P.R.China (100029)	No

Tel: (8610) 8285 8669 Fax: (8610) 8284 7322 Email: zhangshuwei09@gmail.com Mr.Shen Hongshuai, Mr.Yao Xi CECEP Wind Power Co., LTD Add: 12th floor, A Building Jieneng Mansion, No.42 Xizhimen North Street, Haidian Distract Beijing China 100082. Tel: (8610) 6224 8705 Fax: (8610) 6224 8700 Email: shenhongshuai@cecwpc.cn	

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:

>> 20/10/2011 (The date when the WTGs purchase contract signed of the Project)

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

>>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:

>>01/11/2012 (or the date of registration, whichever is later)

C.2.1.2. Length of the first crediting period:

>>7 years

C.2.2. Fixed crediting period:

>> N/A

C.2.2.1. Starting date:

>> N/A

C.2.2.2. Length:

>> N/A

SECTION D. Environmental impacts

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

>>

On Feb.17, 2011, the Environmental Protection Bureau of Gansu Province approved the Environmental Impact Assessment (EIA) of the Project. Here is a summary of the EIA with analysis of the

environmental impacts of the Project, during the construction and the operation period, respectively.

1. The analysis of the environment impact during the construction period

• Dust: Since the local residential area is at least 500m away from the wind farm site, the impact of construction dust to the local region is limited. Several measures will be implemented to reduce the impact of dust on local residents and the construction staff, including watering and earthwork covering.
• Noise: Construction machines, transportation vehicles and construction work will generate noise. However, the noise levels are within acceptable levels at the nearest habitation, which is 500m away from the project site. Furthermore, using machinery and equipments with low noise levels, and arranging the construction times during day time, reduces the impact to the environment significantly.
• Solid waste: The solid wastes from the construction include waste soil and stone and construction wastes, as well as some waste from human life. All these wastes are collected and disposed properly to the landfill site of Changma County.
• Waste water: The waste water will be generated from construction work and the project office. The total volume is small and it can be treated and re-used as watering or sprinkler.
• Ecosystem: After construction, the land temporally occupied by the Project will be recovered by grass, so as to recreate the original ecosystem. So the Project has little impact to the ecosystem.

2. **The analysis of the environment impact during operation period**

• Noise: The operating noise of these turbines ranges from 101 dB to 105dB. With at least 500 meters far from the turbines, where residential areas are located, the noise has been greatly weakened to about 37 db, dropping down below the national standard (No. GB 3096-93) of 45dB in night and 55 db in daytime.
• Waste: Solid waste and waste water will be produced by operation staff during operation period. The emitted waste quantity is very small and will cause no interference with the environment after proper treatment or integrated utilization.
• Impact on birds: The site of the Project is not the main habitat of migratory bird, and also not on the main line of bird migratory. Also the often-seen birds in this region are commonly with a small size and flexible in flying. They are easy to find the huge wind blades and avoid the hitting. So the Project will not bring obvious effects on birds.

3. Conclusion

Wind power is green power and the impact caused by wind farm on the surrounding ecosystem and residents, water, and atmosphere etc. is very little. Therefore, the Project is feasible from aspect of environment protection.

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:

>>
The implementation of the Project is without obviously adverse and transboundary impacts. The Environmental Protection Bureau of Gansu Province has approved the EIA of the Project.

SECTION E. Stakeholders' comments

>>

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

>>

In Aug 4, 2011, consultations were carried out in the Changma County by CECEP Wind Power (Gansu) CO., LTD. The consultations, which included two parts, one is the discussions among local people with the developer and another, a questionnaire survey.

The developer introduced the background of the Project firstly according to the meeting schedule and respondents filled in a questionnaire, and then a discussion meeting is raised to get the comments and suggestions from local people.

• Project brief introduction
• Respondents' information on name, gender, education level etc.
• Questions on:
1. Do you think whether the Project will benefit to the mitigation of Greenhouse Gas?
2. Do you feel any negative impact on surrounding environment (air, noise & water) by the project construction?
3. Are there any adverse impacts on your and your family's life, work and study by the project construction? (if yes, please explain in the attached pages.)
4. Whether the completion of the Project will bring about positive impacts to local economic development?
5. What is the issue that you are most concerned with during the construction and operation period of the Project? (Options: Noise, air pollution, equipment safety, waste water, electromagnetic interference, or landscape destroy)
6. Do you agree with the development & construction of the Project?
7. Do you think which environmental protection measures should be undertaken during the construction and operation period of the Project?
8. Do you have any further comment and suggestion about the Project and to the project owner?

E.2. Summary of the comments received:

>>
The questionnaires were sent to 49 respondents and the survey had a 100% response rate. The statistical results of the questionnaire survey to the stakeholders are summarised as following:

Questionnaire	Yes (Num.)	No (Num.)	Not clear (Num.)
1. Do you think whether the Project will benefit to the mitigation of Greenhouse Gas?	42	0	7
2. Do you feel any negative impact on surrounding environment (air, noise & water) by the project construction?	7	40	2
3. Are there any adverse impacts on your whole family's life, work and study by the project construction?	1	47	1
4. Whether the completion of the project will bring about positive impacts to you?	47	1	1
5. Which issue you are most concerned with during the construction and operation period of the project?	(Multi options)		

Noise	Air Pollution	Equipment safety	Waste water discharge	Elecmagnetic wave disturb	Sight damage
22	9	18	6	8	19

6. Do you agree with the development & construction of the project?	45	0	4

Most respondents (45/49) agree and support the development of the Project. Some respondents provide their concern in the section of Question 5 and descriptive questions on the possible negative impacts

possible caused by the Project, including equipment safety and grass and road destroy etc., which possibly occur at the period of construction and all of these were mentioned and designed to be solved in EIA report.

Conclusions of the meeting discussions:

With respect to local economic development, this wind farm project is expected to greatly promote the development of wind power in Gansu. Hopefully this project could also help drive the local economic growth and contribute much to local fiscal revenues. Wind electricity can provide "green energy" for the Gansu power grid and boost local sustainable development.

With respect to environmental protection, the environmental impact analysis (EIA) for this project shows that noise level associated with the operation of this wind-turbine can meet the permitted range of China's national standard. As is known this project is geographically located far from the downtown of Changma, apparently without the possibility of telecommunication signal jamming. In addition, no migratory bird is flying over this region.

With respect to local people's life and employment, the project is basically without negative impact on the people's daily life, but can be possible to employ some local farmers or herdsmen nearby. During the construction and operation of this project, the related purchases and consumptions could promote local business and trade, thus increasing local farmer's income.

To sum up, the stakeholders are very supportive of this project and looking forward to the operation of the Project as early as possible. And the project owner will strengthen the communication with the stakeholders, and confirm the measurements given in the EIA report will be implemented totally to solve the issues the local people concern mostly, including land occupation, grass and road destroy, noise of truck at night etc. at the construction period.

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

>>
The project owner has given full consideration to the comments and suggestions from stakeholders, and has an overall environment-friendly plan (partially included in the EIA report) to guarantee that the Project has the minimum negative impact on the environment during the project construction and operation. Local residents and government are all supportive to the implementation of the Project. There has been no need to modify the project design according to the comments received.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	CECEP Wind Power (Gansu) CO.,LTD
Street/P.O.Box:	NO.42, Xizhimen North St., Haidian District
Building:	12th Floor, Building A, Jieneng Mansion
City:	Beijing
State/Region:	
Postfix/ZIP:	100082
Country:	The People's Republic of China
Telephone:	86-10-62248705
FAX:	86-10-62248700
E-Mail:	chendongjuan@cecwpc.cn
URL:	-
Represented by:	Chen Dongjuan
Title:	CDM Office Manager
Salutation:	Ms.
Last Name:	Chen
Middle Name:	-
First Name:	Dongjuan
Department:	-
Mobile:	-
Direct FAX:	86-10-62248700
Direct tel:	86-10-62248705
Personal E-Mail:	chendongjuan@cecwpc.cn

Organization:	Shell Trading International Limited
Street/P.O.Box:	80 Strand London WC2R OZA
Building:	
City:	London
State/Region:	
Postfix/ZIP:	WC2R OZA
Country:	United Kingdom of Great Britain and Northern Ireland
Telephone:	+44 20 75465000
FAX:	+44 20 76329813
E-Mail:	stascoeptb@shell.com
URL:	www.shell.com
Represented by:	Ziyuan Wang
Title:	CDM Portfolio Manager
Salutation:	Ms.
Last Name:	Wang
Middle Name:	
First Name:	Ziyuan
Department:	Environmental Products Trading Business (EPTB)
Mobile:	
Direct FAX:	+44 20 7632 9813
Direct tel:	+44 20 7546 5000
Personal E-Mail:	Ziyuan.wang@shell.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

>>
The Project receives no public funding from Annex 1 countries.

Annex 3

BASELINE INFORMATION

>>

To determine the simple OM emission factor ($EF_{grid,OM,y}$) and the Build Margin emission factor ($EF_{grid,BM,y}$) of the Project, data and formula recommended in the latest *Notification on Determining Baseline Emission Factor of China's Grid* for the NWPG (NWPG) issued by NDRC, China's DNA on Oct. 20, 2011, are adopted.

The following tables summarized the numerical results from the equations listed in the approved methodology ACM0002 (Version 12.2.0) and Notification of NDRC. The information provided by the tables includes data, data sources and the underlying calculations.

Table A3-1 Simplified Operation Margin Emission Factor Calculation for NWPG in 2007

Type	Unit	Shaanxi	Gansu	Ningxia	Qinghai	Xinjiang	Total	Emission factor (tc/TJ)	OXID (%)	Fuel emission factor((kgCO_2/TJ)	NCV (MJ/t,km3)	CO_2 emission(tCO_2e)
Raw coal	10^4t	3303.44	1969.03	470.85	2165.8	1762.11	**9671.23**	25.8	100	87,300	20,908	176,525,905
Clean coal	10^4t						**0**	25.8	100	87,300	26,344	0
Other washed coal	10^4t	3.73			124.31	7.73	**135.77**	25.8	100	87,300	8,363	991,243
Briquette coal		3.53					**3.53**	26.6	100	87,300	20,908	64,432
Coke	10^4t						**0**	29.2	100	95,700	28,435	0
Coke Oven Gas	10^8m^3	0.52	0.65			0.26	**1.43**	12.1	100	37,300	16,726	89,215
Other coal gas	10^8m^3	14.14	0.71				**14.85**	12.1	100	37,300	5,227	289,526
Crude oil	10^4t					0.09	**0.09**	20	100	71,100	41,816	2,676
Gasoline	10^4t	0.02					**0.02**	18.9	100	67,500	43,070	581
Diesel	10^4t	1.12	0.26	0.42		1.77	**3.57**	20.2	100	72,600	42,652	110,546
Fuel oil	10^4t	0.01	1.05	0.04		0.05	**1.15**	21.1	100	75,500	41,816	36,307
LPG	10^4t						**0**	17.2	100	61,600	50,179	0
Refinery gas	10^4t					5.99	**5.99**	15.7	100	48,200	46,055	132,969
Natural gas	10^8m^3	1.68	0.49	1.93		8.66	**12.76**	15.3	100	54,300	38,931	2,697,404
Other petro. product	10^4t						**0**	20	100	72,200	41,816	0
Other coking product	10^4t						**0**	25.8	100	95,700	28,435	0
Other energy	10^4tce	94.36	9.73				**104.09**	0	0	0	0	0
											Total	**180,940,805**

Source: China Energy Statistical Yearbook 2008

Table A3-2 Thermal Generation and OM of NWPG in 2007

Province	**Generation**	**Self-service rate**	**Electricity supply**
	(MWh)	(%)	(MWh)
Shaanxi	59,100,000	6.77	55,098,930
Gansu	42,400,000	5.89	39,902,640
Ningxia	9,700,000	7.19	9,002,570
Qinghai	43,500,000		43,500,000
Xinjiang	34,600,000	9.2	31,416,800
Total			**178,920,940**

Source: China Electric Power Yearbook 2008

Table A3-3 Simplified Operation Margin Emission Factor Calculation for NWPG in 2008

Type	Unit	Shaanxi	Gansu	Ningxia	Qinghai	Xinjiang	Total	Emission factor (tc/TJ)	OXID (%)	Fuel emission factor((kg CO_2/TJ)	NCV (MJ/t,km3)	CO_2 emission(tCO_2e)
Raw coal	10^4t	3620	2216.9	507.44	2330.72	1924.9	**10599.96**	25.8	100	87,300	20,908	193,477,720
Clean coal	10^4t						**0**	25.8	100	87,300	26,344	0
Other washed coal	10^4t	9.22			53.85	8.2	**71.27**	25.8	100	87,300	8,363	520,335
Briquette coal							**0**	26.6	100	87,300	20,908	0
Coke	10^4t						**0**	29.2	100	95,700	28,435	0
Coke Oven Gas	10^8m^3	0.35	0.74			0.13	**1.22**	12.1	100	37,300	16,726	76,113
Other coal gas	10^8m^3	18.38	0.2				**18.58**	12.1	100	37,300	5,227	362,249
Crude oil	10^4t						**0**	20	100	71,100	41,816	0
Gasoline	10^4t	0.05				0.01	**0.06**	18.9	100	67,500	43,070	1,744
Diesel	10^4t	1.03	0.44	0.26	0.05	1.64	**3.42**	20.2	100	72,600	42,652	105,902
Fuel oil	10^4t		0.86	0.04		0.02	**0.92**	21.1	100	75,500	41,816	29,045
LPG	10^4t						**0**	17.2	100	61,600	50,179	0
Refinery gas	10^4t					7.25	**7.25**	15.7	100	48,200	46,055	160,939
Natural gas	10^8m^3	0.94	0.24	2.99		7.2	**11.37**	15.3	100	54,300	38,931	2,403,565
Other petro. product	10^4t					0.01	**0.01**	20	100	72,200	41,816	302
Other coking product	10^4t						**0**	25.8	100	95,700	28,435	0
Other energy	10^4tce	93.67	10.58		21.24		**125.49**	0	0	0	0	0
											Total	**197,137,915**

Source: China Energy Statistical Yearbook 2009

Table A3-4 Thermal Generation and OM of NWPG in 2008

Province	Generation	Self-service rate	Electricity supply
	(MWh)	(%)	(MWh)
Shaanxi	71,500,000	6.95	66,530,750
Gansu	46,800,000	6.4	43,804,800
Ningxia	10,700,000	7.14	9,936,020
Qinghai	44,000,000	7.57	40,669,200
Xinjiang	39,700,000		39,700,000
Total			**200,640,770**

Source: China Electric Power Yearbook 2009

Table A3-5 Simplified Operation Margin Emission Factor Calculation for NWPG in 2009

Type	Unit	Shaanxi	Gansu	Ningxia	Qinghai	Xinjiang	Total	Emission factor (tc/TJ)	OXID (%)	Fuel emission factor((kg CO_2/TJ)	NCV (MJ/t,km^3)	CO_2 emission(tCO_2e)
Raw coal	10^4t	3620	2216.9	507.44	2330.72	1924.9	**10599.96**	25.8	100	87,300	20,908	193,477,720
Clean coal	10^4t						**0**	25.8	100	87,300	26,344	0
Other washed coal	10^4t	9.22			53.85	8.2	**71.27**	25.8	100	87,300	8,363	520,335
Briquette coal							**0**	26.6	100	87,300	20,908	0
Coke	10^4t						**0**	29.2	100	95,700	28,435	0
Coke Oven Gas	10^8m^3	0.35	0.74			0.13	**1.22**	12.1	100	37,300	16,726	76,113
Other coal gas	10^8m^3	18.38	0.2				**18.58**	12.1	100	37,300	5,227	362,249
Crude oil	10^4t						**0**	20	100	71,100	41,816	0
Gasoline	10^4t	0.05				0.01	**0.06**	18.9	100	67,500	43,070	1,744
Diesel	10^4t	1.03	0.44	0.26	0.05	1.64	**3.42**	20.2	100	72,600	42,652	105,902
Fuel oil	10^4t		0.86	0.04		0.02	**0.92**	21.1	100	75,500	41,816	29,045
LPG	10^4t						**0**	17.2	100	61,600	50,179	0
Refinery gas	10^4t					7.25	**7.25**	15.7	100	48,200	46,055	160,939
Natural gas	10^8m^3	0.94	0.24	2.99		7.2	**11.37**	15.3	100	54,300	38,931	2,403,565
Other petro. product	10^4t					0.01	**0.01**	20	100	72,200	41,816	302
Other coking product	10^4t						**0**	25.8	100	95,700	28,435	0
Other energy	10^4tce	93.67	10.58		21.24		**125.49**	0	0	0	0	0
											Total	**197,137,915**

Source: China Energy Statistical Yearbook 2010

Table A3-6 Thermal Generation and OM of NWPG in 2009

Province	**Generation**	**Self-service rate**	**Electricity supply**
	(MWh)	(%)	(MWh)
Shaanxi	77,400,000	7.24	71,796,240
Gansu	44,100,000	6.88	41,065,920
Ningxia	10,700,000	7.01	9,949,930
Qinghai	44,700,000	7.76	41,231,280
Xinjiang	45,200,000	5.16	42,867,680
Total			**206,911,050**

Source: China Electric Power Yearbook 2010

The average OM is**: 1.0001** tCO_2/ MWh

Table A3-7 Proportion of the solid, liquid, gas fuel emission out of the total emission in NWPG

		Shaanxi	Gansu	Ningxia	Qinghai	Xinjiang	Total	NCV (MJ/t,km^3)	Emission factor (tc/TJ)	OXID (%)	CO_2 emission(tCO_2e)
Raw coal	10^4t	3,949.22	2,060	467.05	2,350.13	2,380	11,206.4	20,908	87,300	100	204,546,513
Clean coal	10^4t	0	0	0	0	0	0	26,344	87,300	100	0
Other washed coal	10^4t	8.34	0	0	56.01	6.66	71.01	8,363	87,300	100	518,437
Briquette coal	10^4t	0	0	0	0	0	0	20,908	87,300	100	0
Coke	10^4t	0	0	0	0	0	0	28,435	95,700	100	0
Other coking product	10^4t	0	0	0	0	0	0	28,435	95,700	100	0
Sum											205,064,950
Crude oil	10^4t	0	0	0	0	0	0	41,816	71,100	100	0
Gasoline	10^4t	0.02	0	0	0	0	0.02	43,070	67,500	100	581
Diesel	10^4t	0.6	0.52	0.2	0.07	0.7	2.09	42,652	72,600	100	64,718
Fuel oil	10^4t	0	0.25	0.08	0	0.06	0.39	41,816	75,500	100	12,313
Other petro. product	10^4t	0	0	0	0	0	0	41,816	72,200	100	0
Sum											77,612
Natural gas	10^7m^3	9.1	0.7	39.3	0	78.3	127.4	38,931	54,300	100	2,693,177
Coke Oven Gas	10^7m^3	4.9	8	0	0	1.2	14.1	16,726	37,300	100	87,967
Other coal gas	10^7m^3	183.7	4.4	0	0	0	188.1	5,227	37,300	100	366,733
LPG	10^4t	0.02	0	0	0	0	0.02	50,179	61,600	100	618
Refinery gas	10^4t	0	0	0	0	8.56	8.56	46,055	48,200	100	190,019
Sum											3,338,514
Sum together											**208,481,076**

Source: China Energy Statistical Yearbook 2010;

From the table and the formula of λ,

$\lambda_{Coal,y}$ =98.36%，$\lambda_{Oil,y}$ =0.04%，$\lambda_{Gas,y}$ =1.60%

Table A3-8 Emission factor and the efficiency level of the best technology commercially available in China's power grid for each fuel type coal, oil and gas

	Variable	Elec. supply efficiency (%)	Emission factor (tC/TJ)	OXID	Emission factor (tCO_2e/MWh)
Coal power	$EF_{Coal,Adv}$	39.45	87,300	1	0.7967
Oil power	$EF_{Oil,Adv}$	51.77	75,500	1	0.5250
Gas power	$EF_{Gas,Adv}$	51.77	54,300	1	0.3776

Source: Baseline emission factor of China grid determined by the Notification of NDRC.

$$EF_{Thermal} = \lambda_{Coal} \times EF_{Coal,Adv} + \lambda_{Oil} \times EF_{Oil,Adv} + \lambda_{Gas} \times EF_{Gas,Adv} = 0.7899 \ \ tCO_2e/MWh.$$

Table A3-9 Installed Capacity of the NWPG in 2009

Installed Capacity	Unit	Shaanxi	Gansu	Ningxia	Qinghai	Xinjiang	Total
Thermal	MW	19,900	10,990	1,930	8,820	9,520	51,160
Hydro	MW	1,920	5,940	8,740	430	2,430	19,460
Nuclear	MW	0	0	0	0	0	0
Wind & others	MW	0	750	0	270.3	860	1,880
Total	MW	21,820	17,680	10,670	9,520	12,810	72,500

Source: China Electric Power Yearbook, 2010

Table A3-10 Installed Capacity of the NWPG in 2008

Installed Capacity	Unit	Shaanxi	Gansu	Ningxia	Qinghai	Xinjiang	Total
Thermal	MW	17,850	8,980	2,000	7,540	8,200	44,570
Hydro	MW	1,810	5,440	5,910	430	2,190	15,780
Nuclear	MW	0	0	0	0	0	0
Wind & others	MW	0	600	0	170	510	1,280
Total	MW	19,660	15,020	7,910	8,140	10,900	61,630

Source: China Electric Power Yearbook, 2009

Table A3-11 Installed Capacity of the NWPG in 2007

Installed Capacity	Unit	Shaanxi	Gansu	Ningxia	Qinghai	Xinjiang	Total
Thermal	MW	12,290	7,840	1,900	7,030	6,560	35,620
Hydro	MW	1,790	4,400	5,830	430	2,140	14,590
Nuclear	MW	0	0	0	0	0	0
Wind & others	MW	72.5	346	0	50	330	798.5
Total	MW	14,153	12,586	7,730	7,510	9,030	51,009

Source: China Electric Power Yearbook, 2008

Table A3-12 BM calculation for the NWPG

Unit (MW)	Installed Capacity in 2007	Installed Capacity in 2008	Installed Capacity in 2009	Newly added capacity from 2008-2009	Newly added capacity from 2007-2009	Share in the newly added capacity (%)
	A	B	C	D=C-A	D=C-B	
Thermal	35,620	44,570	51,160	16,998	7,389	74.07%
Hydro	14,590	15,780	19,460	4,870	3,680	21.22%
Nuclear	0	0	0	0	0	0.00%
Wind etc	798.5	1,280	1,880.3	1,081.8	600	4.71%
Total	**51,008.5**	**61,630**	**72,500.3**	**22,949.8**	**22,949.8**	**100.00%**
% of the capacity of 2009				31.65%	16.10%	
In the sample group m consisting of newly added capacity in 2007-2009, the ratio of newly built thermal capacity to the total capacity in group m = $CAP_{thermal}/CAP_{total}$				74.07%		

Data source: China Electric Power Yearbook 2008-2010

$$EF_{BM,y} = (Cap_{Thermal}/Cap_{Total}) \times EF_{Thermal} = 74.07\% \times 0.7899 = 0.5851\ tCO_2/MWh.$$

Annex 4

MONITORING PLAN

>>

- - - - -