CECIC HKE ZHANGBEI LVNAOBAO WIND POWER PROJECT

Document Prepared by Demeter Venture UK Limited

Project Title	**CECIC HKE Zhangbei Lvnaobao Wind Power Project**
Version	2.0
Date of Issue	21/07/2020
Prepared By	Demeter Venture UK Limited
Contact	Address: Haidian District, Beijing, 100082, P.R.China Email: asd9818@163.com

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1 PROJECT DETAILS

1.1 Summary Description of the Project

CECIC HKE Zhangbei Lvnaobao Wind Power Project (hereafter referred to as the Project or the project) is located at Zhangbei County, northwest region of Hebei Province, China, which is a new-built project and operated by CECIC HKE Wind Power CO.,LTD.

The total installed capacity of the Project is 100.5 MW equipped with 67 sets of wind turbine generators (briefly WTG henceforth) with a unit capacity of 1500 kW. And the estimated electricity delivered to the project electricity system, i.e. North China Power Grid (briefly NCPG henceforth) by the Project is 241.70 GWh annually, equivalent to 2405 operating hours with full capacity.

The scenario existing prior to the start of the implementation of the project is: The same electricity output by the project activity would have otherwise been generated by the operation of NCPG connected power plants and by the addition of new generation sources. That is the same as the baseline scenario.

When the project is operated, the electricity generated will displace part of the electricity from fossil fuel-fired plants connected to the NCPG, and thus greenhouse gas (GHG) generated by coal-fired power plants could be reduced. The estimated annual GHG emission reductions in the first crediting period are 254,960 tCO_2e/yr and are 203,136 tCO_2e/yr during the second crediting period.

The construction of the project began in 20/08/2008, and the first turbine was put into operation on 26/07/2010. And the project was put into full commercial operation on 24/09/2010. The first crediting period is from 01/08/2010 to 31/07/2020 (10 years). The project operated normally in the first crediting period. The project is applying for the crediting period renewal and the second crediting period is expected from 01/08/2020 to 31/07/2030 (10 years).

1.2 Sectoral Scope and Project Type

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

Project type: Renewable (wind) power project

The Project is not a grouped project.

1.3 Project Eligibility

The project is a wind power project, which reduces CO_2 by replacing electricity from fossil fuel power plants. This complies with the scope of VCS program.

1.4 Project Design

This project is a single project. It is not designed to include multiple project activity instances, or as a grouped project.

The project involves the installation of 67 turbines, each of which have a capacity of 1.5 MW, with a total capacity of 100.5 MW.

Eligibility Criteria

N/A as this is not a grouped project.

1.5 Project Proponent

Organization name	CECIC HKE Wind Power CO.,LTD.
Contact person	Dongjuan Chen
Title	Manager
Address	Jieneng Mansion, No.42 Xizhimen North Street, Haidian District, Beijing City, P.R.China
Telephone	+86-10-83052209
Email	cdm@cecwpc.cn

1.6 Other Entities Involved in the Project

Organization name	Demeter Venture UK Limited
Role in the project	PD Developer
Contact person	Susan Lu
Title	Manager
Address	Haidian District, Beijing, P.R.China
Telephone	+86-10-64828259
Email	asd9818@163.com

1.7 Ownership

The approval of Environmental Impact Assessment (EIA), Feasibility Study Report (FSR), and Letter of Approval for the project as a CDM Project issued by China National Development and

Reform Commission, established the project ownership of CECIC HKE Wind Power Co., Ltd. The purchasing contract of turbines, and the purchasing power agreement are the evidences for the property and contractual right in the plant, equipment and electricity.

1.8 Project Start Date

26/07/2010 (the date when the first turbine was put into operation, which means that the project started to generate GHG emission reductions)

1.9 Project Crediting Period

The first crediting period under VCS is from 01/08/2010 to 31/07/2020 (10 years), renewable. The total VCS crediting period would have been from 01/08/2010-31/07/2040 (30 years). However, this project has been registered in CDM, and the total crediting period is from 28/10/2010-27/10/2031 (21 years). According to VCS regulations, the total crediting period of VCS is from 01/08/2010-27/10/2031.

The project is applying for the second crediting period, which is from 01/08/2020 to 31/07/2030.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	√
Large project	

Year	Estimated GHG emission reductions or removals (tCO_2e)
01/08/2020-31/12/2020 (153days)	85,150
01/01/2021-31/12/2021	203,136
01/01/2022-31/12/2022	203,136
01/01/2023-31/12/2023	203,136
01/01/2024-31/12/2024	203,136
01/01/2025-31/12/2025	203,136
01/01/2026-31/12/2026	203,136

01/01/2027-31/12/2027	203,136
01/01/2028-31/12/2028	203,136
01/01/2029-31/12/2029	203,136
01/01/2030-31/07/2030 (212days)	117,986
Total estimated ERs	2,031,360
Total number of crediting years	10
Average annual ERs	203,136

1.11 Description of the Project Activity

The Project adopts the domestically-made WTGs, and does not involve international technology transfer. Within the project electricity system NCPG, 67 units of WTG with 1.5MW unit capacity (Model type: FD77B) will be installed, forming 100.5MW of total capacity. These WTGs were manufactured and assembled by Dongfang Steam Turbine Co. Limited. The main technology parameter of this type of wind power turbine can be found at Table 1.

Table 1. Technical parameters of WTGs for the Project

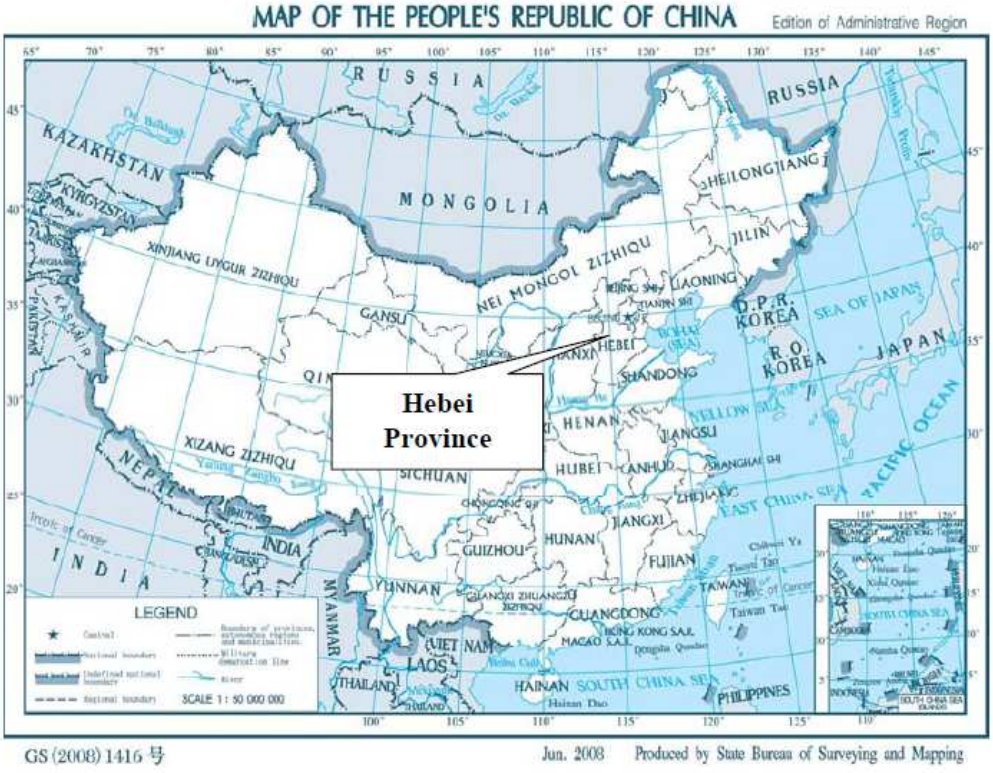
Item	Technical parameters
Type of Turbine	FD77B
Rated power (kW)	1500
Number of Blades	3
Rotor diameter (m)	77
Swept area (m^2)	4657
Rated Rotational speed (rpm)	9.6-17.3
Cut-in wind speed (m/s)	3
Rated wind speed (m/s)	12.5
Cut-out wind speed (m/s)	20
Hub height of the wind turbines (m)	70
Capacity (kW)	1500
Rated Voltage (V)	690

Each wind turbine will have a transformer from 690V to 35kV. And the wind farm will be connected with one 35kV/220kV substation located within the wind farm, and then to NCPG via a series of substations. There will be electric meters in the onsite substation to measure the electricity import/export.

According to the Feasibility Study Report (FSR) issued by China Power Construction Engineering Consulting Corporation on March, 2008, the Project can deliver 241,700 MWh to the grid annually, about 2405 operation hours with full capacity and the calculated load factor is about 0.27. 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.

1.12 Project Location

The Project is located at Zhangbei County, Zhangjiakou City, Hebei Province, P.R.China. The Project has geographical coordinates with North Latitude of 41˚03'50", East Longitude 114˚32'30". The location of the project in Hebei Province and the location of Hebei Province in China are shown in Figure 1.



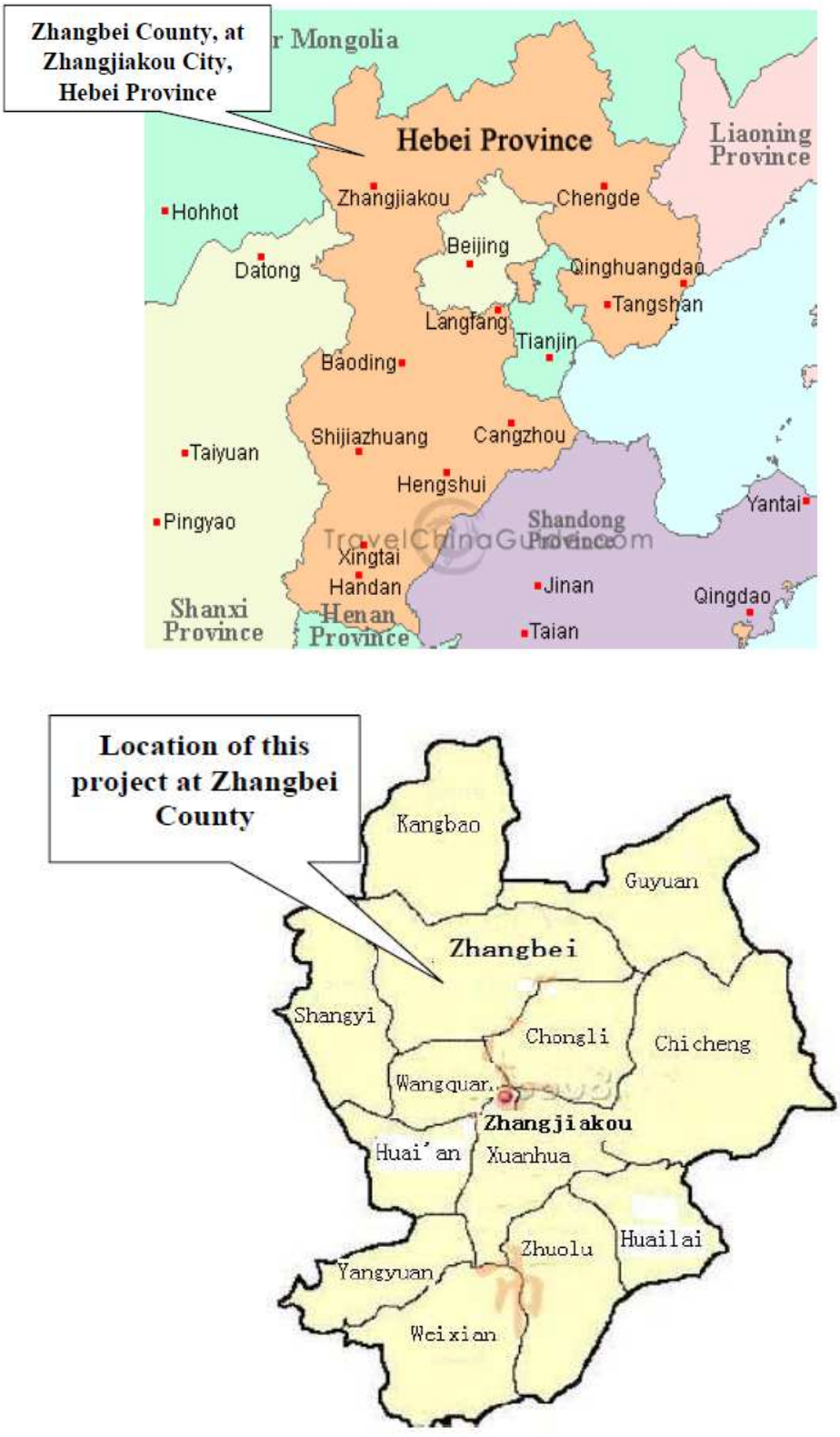


Figure 1. Map showing the location of the Project

1.13 Conditions Prior to Project Initiation

Electricity delivered to the grid (NCPG) by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources. It is the same as the baseline scenario.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

The project is in the field of renewable energy. The Environment Impact Assessment of the project was approved by the Environmental Protection Bureau of Hebei Province on 19/11/2007, and the Feasibility Study Report of the project was approved by National Development and Reform Committee on 17/07/2008. The project has got LOA from China DNA on 30/04/2009. These approvals demonstrate that the project meets the requirement of national laws and regulations, including Renewable Energy Law of the People's Republic of China and Environmental Protection Regulation for Wind Power Project, etc.

This project is also in line with current laws and regulations.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The Project has been registered as a CDM project in UNFCCC on 28/10/2010 (UNFCCC Ref. 3399). The first 7-year renewable crediting period under CDM is from 28/10/2010 to 27/10/2017.

1.15.2 Projects Rejected by Other GHG Programs

The project has not been rejected by any other GHG programs.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

The Project has been registered as a CDM project in UNFCCC on 28/10/2010 (UNFCCC Ref. 3399). The first 7-year renewable crediting period under CDM is from 28/10/2010 to 27/10/2017.

The credits from 28/10/2010 to 31/08/2015 have been issued under CDM mechanism.

The project has not been counted or used under GS project or under any other voluntary carbon crediting scheme. In the future, the emission reductions that apply for issuance under VCS will not be issued under CDM or GS project or under any other voluntary carbon crediting scheme.

1.16.2 Other Forms of Environmental Credit

The Project has been registered as a CDM project in UNFCCC on 28/10/2010 (UNFCCC Ref. 3399). The first 7-year renewable crediting period under CDM is from 28/10/2010 to 27/10/2017.

The credits from 28/10/2010 to 31/08/2015 have been issued under CDM mechanism.

The project does not apply for other forms of environmental credit.

1.17 Additional Information Relevant to the Project

Leakage Management

N/A.

Commercially Sensitive Information

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

Sustainable Development

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;

• 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

There's not any further information.

2 SAFEGUARDS

2.1 No Net Harm

The project does not bring negative environmental and socio-economic impacts.

2.2 Local Stakeholder Consultation

2.2.1 Brief description how comments by local stakeholders have been invited and compiled

On 10/03/2008, consultations were carried out in the Zhangbei County by the project owner. The consultations included two parts. One is the discussions among local people with the developer, and the 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.

1) Project brief introduction

2) Respondent’s information on name, gender, education level etc.

3) Questions on:

- Is the environment quiet where you are living, working and studying?

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

- 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.)

- Whether the completion of the project will bring about positive impacts to you?

- 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)

- Do you agree with the development & construction of the project?

- Do you think which environmental protection measures should be undertaken during the construction

and operation period of the project?

- Do you have any further comment and suggestion about the project?

2.2.2 Summary of the comments received

The questionnaires were sent to 35 respondents and the survey had a 100% response rate. The statistical results of the questionnaire survey to the stakeholders are summarized as following:

Indicator	Total	Male	Female	Young (10-35)	Middle (35-55)	Elder (55-70)

Number of Respondents	35	26	9	11	18	6

Indicator	Below junior high school	Junior high school	Above junior high school	Student	Farmer	Worker	Officials
Number of Respondents	12	20	3	1	30	3	1

Questionnaire			Yes (Num.)	No (Num.)	Not clear (Num.)
1. Is the environment quiet where you are living, working and studying?			33	1	1
2. Do you feel any impact on surrounding environment (air, noise & water) by the project construction?			7	23	5
3. Are there any adverse impacts on your whole family's life, work and study by the project construction?			1	29	5
4.Whether the completion of the project will bring about positive impacts to you?			24	1	10
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	Elec-magnetic wave disturb	Sight damage
16	7	18	0	4	16
6. Do you agree with the development & construction of the project?			31	0	4

Most respondents (31/35) 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 land occupation, grass and road destroy, noise of truck at night 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 Hebei Province. 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 Hebei 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 Zhangbei County, 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 consumption 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.

For continuous communication with local stakeholders, the project owner public its office telephone to local people and put a guest's book in the office of the company. Anyone who have comments on the project could write on the book or leave messages by phone. And after these years' operation, no negative comments were received from local people.

2.3 Environmental Impact

The EIA Form of the project was approved by Hebei Province Environmental Protection Bureau on 19/11/2007 (Document No. Ji Huan Biao [2007] 338). According to the EIA Form, environmental impacts possibly caused by the project and treatment measures adopted by the Project Owner are analyzed as follows:

2.3.1 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 Zhangbei 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.

2.3.2 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. There are no effects on the local residential life from the operational noise.

• 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.

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.

2.4 Public Comments

No public comments were received during the public comment period.

2.5 AFOLU-Specific Safeguards

This is not an AFOLU project. Therefore, this section is not applicable.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

The approved methodology applied in the project activity is ACM0002 – "Grid-connected electricity generation from renewable sources (version 20.0)[1].

[1] https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG

Related tools are:

-Tool to calculate the emission factor for an electricity system (version 07.0)

-Tool for the demonstration and assessment of additionality (version 07.0.0)

-Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period (version 03.0.1)

3.2 Applicability of Methodology

The criteria and assessment of ACM0002 (version 20.0) are in the following table.

Criteria	Assessment
This methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Install a Greenfield power plant; (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plants/units; (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s).	The project is the installation of a wind power project. Therefore, a) is applicable.
The methodology is applicable under the following conditions: a) The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit; b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects) the existing plant/unit 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, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	The project activity includes a wind power plant. Therefore, a) is applicable.
In case of hydro power plants, one of the following conditions shall apply: (a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or (b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density, calculated using equation (7), is greater than 4 W/m^2; or (c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (7), is greater than 4 W/m^2; or (d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using	Not applicable. The project is a wind power project, not hydro power plant.

equation (7), is lower than or equal to 4 W/m^2, all of the following conditions shall apply: (i) The power density calculated using the total installed capacity of the integrated project, as per equation (8), is greater than 4 W/m^2; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m^2 shall be: a. Lower than or equal to 15 MW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project.	
In the case of integrated hydro power projects, project proponent shall: (a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or (b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum of five years prior to the implementation of the CDM project activity.	Not applicable. The project is a wind power project, not an integrated hydro power project.
The methodology is not applicable to: a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; b) Biomass fired power plants/units	The project activity does not involve switching from fossil fuel to renewable energy sources at the site of the project activity. The project is not a biomass fired power plant/unit.
In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	Not applicable. The project is not retrofit, rehabilitation, replacement, or capacity addition project.

The criteria and assessment of "Tool to calculate the emission factor for an electricity system (version 07.0)" are in the following table.

Criteria	Assessment

This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	Applicable. The project generates electricity to national grid. This tool is used to calculate the OM, BM and CM.
Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in "Appendix 1: Procedures related to off-grid power generation" should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	Since the project activity is grid connected, this condition is applicable and the emission factor has been calculated accordingly.
In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	Not applicable. The project is not located in annex I country.
Under this tool, the value applied to the CO_2 emission factor of biofuels is zero.	Not applicable. The project is a wind power project and does not involve emissions from biofuels.

Applicability conditions of "Tool for the demonstration and assessment of additionality" (version 07.0.0) are in the following table.

Criteria	Assessment
Once the additionally tool is included in an approved methodology, its application by project participants using this methodology is mandatory.	Applicable. The additionally tool is included in the approved methodology ACM0002 (version 20.0) which is adopted by this renewal PD.

Applicability conditions of "Assessment of the validity of the original/current baseline and update the baseline at the renewal of the crediting period" (version 03.0.1) are in the following table.

Criteria	Assessment
This tool provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period	Applicable. The baseline in this PD is at the renewal of the crediting period. The baseline is assessed by the procedure of this tool.

The applicability criteria stated in methodology ACM0002 (Version 20.0) and the tools are met on the basis of the reasons above.

For standardized baseline, it's not applicable.

3.3 Project Boundary

According to the methodology ACM0002, the spatial extent of the project boundary includes the project power plant/unit and all power plants/units connected physically to the electricity system that the CDM project power plant is connected to.

According to 2017 Baseline Emission Factors for Regional Power Grids in China issued by the National Development and Reform Commission of China (China NDRC), NCPG consists of Beijing, Tianjin, Hebei, Shanxi, Shandong and Inner Mongolia power grids.

The GHG emission sources included in or excluded from the project boundary are as follows:

Table 2. GHG emission sources of the project

Source		Gas	Included?	Justification/Explanation
Baseline	Emissions from fossil fuels fired power plants supplying to the Northeast China Power Grid	CO_2	Included	Main emission source.
		CH_4	Excluded	Excluded for simplification. This is conservative
		N_2O	Excluded	Excluded for simplification. This is conservative
Project	Emissions caused by the proposed project activity	CO_2	Excluded	According to ACM0002 (Version 20.0), project emission is excluded as a wind power project.
		CH_4	Excluded	
		N_2O	Excluded	

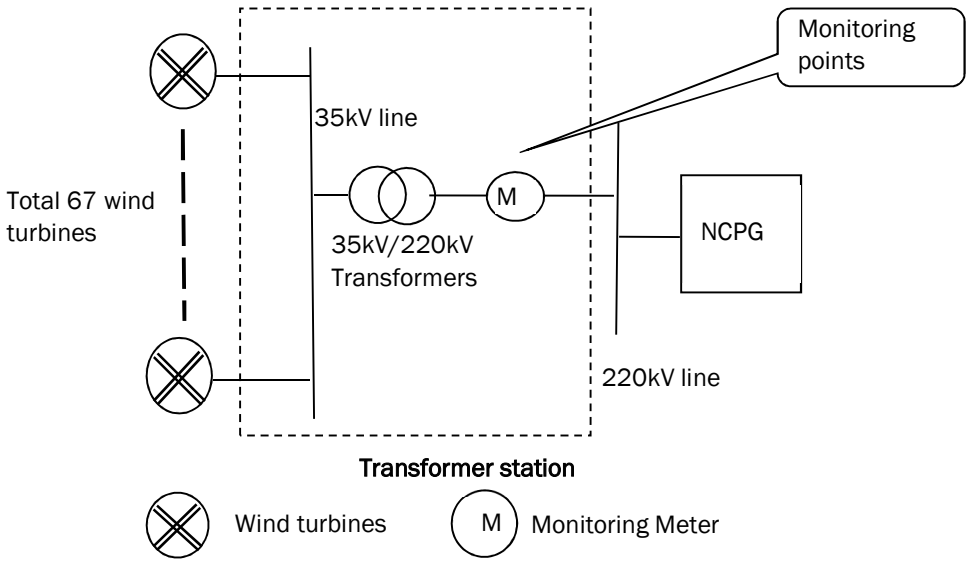


Figure 2. Flow diagram of the project boundary

3.4 Baseline Scenario

The baseline scenario of the project is electricity delivered to NCPG by the project that would otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid. According to the methodology ACM0002 (version 20.0), the baseline emissions are the electricity produced by the project multiplied by the emission factor of NCPG.

For the second crediting period, the continued validity of the original baseline should be assessed.

According to the Methodological Tool "Assessment of the validity of the original/current baseline and update the baseline at the renewal of the crediting period" (version03.0.1), the stepwise procedure as follows should be adopted to assess the continued validity of the baseline and to update the baseline:

Step 1: Assess the validity of the current baseline for the next crediting period

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies

There are no new national and/or sectoral policies that could affect the baseline scenario during the renewal of the crediting period. Although national policies favour the development of renewable energy sources, total renewable resources based power generation accounts for less than 50% of total generation of the NCPG in the latest 5 years respectively. Hence in the

absence of the project activity electricity would still have been generated in the existing fossil fuel power plants or by the addition of new fossil fuel power plants connected to the NCPG.

Step 1.2: Assess the impact of circumstances

Firstly, the baseline scenario identified at the validation of the project activity was the continuation of the current practice without any investment;

Secondly, the mainly investment environment or market characteristics especially the feed-in tariff, the policy in terms of market access permit have no significant change which would impacts the current baseline. The current practice for the baseline emissions is still the GHG emitted by NCPG: the equivalent electricity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources within the NCPG;

Step 1.3: Assess whether the continuation of the use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which the renewal is requested

The current baseline scenario is the continuation of the current practice. In the absence of the project, the electricity would have been supplied by NCPG, and it will not request an investment by the project proponent or third party. So, this step is not applicable.

Step 1.4: Assessment of the validity of the data and parameters

Since there are some parameters, which were determined at the start of the first crediting period and not monitored during the first crediting period, are not valid anymore, therefore, the current baseline emissions needs to be updated for the second crediting period according to this tool.

Before the time of requesting renewal of the crediting period, the china DNA has issued the latest Notice "2017 Baseline Emission Factors for Regional Power Grids in China" on 20/12/2018[2], so the emission factor of NCPG is updated for the second crediting period according to this Notice.

In summary, the emission factor of NCPG and all values have been updated to the latest data for the second crediting period according to this Notice.

Application of Steps 1.1, 1.2, 1.3 and 1.4 confirmed that the current baseline is valid for the second crediting period, but data and parameters need to be updated. Therefore step 2 is used.

Step 2: Update the current baseline and the data and parameters

[2] http://www.mee.gov.cn/ywgz/ydqhbh/wsqtkz/index_1.shtml

Step 2.1: Update the current baseline

The baseline emissions for the second crediting period have been updated, without reassessing the baseline scenario, based on the latest approved version of the methodology ACM0002. More details for the updated baseline emissions for the second crediting period can be seen in section 4.

Step 2.2: Update the data and parameters

As mentioned in step 1.4 above, all parameters regarding the grid emission factor calculation have been updated for this second crediting period. More details can be seen in section 4.

3.5 Additionality

According to VCS standard 4.0, a full reassessment of additionality is not required.

The validity of the original baseline scenario is demonstrated in Section 3.4, and it was concluded that the current baseline is still valid for the next crediting period. Only EF related parameters should be updated for the second crediting period.

Project has no change compared with the original status. Therefore, the project description is the same as in the first crediting period.

3.6 Methodology Deviations

There are no methodology deviations for this project.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

According to the methodology, 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. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are calculated as follows:

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

where

BEy	Baseline emissions in year y (t CO_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 "Tool to calculate the emission factor for an electricity system" (t CO_2/MWh)

Calculation of $EG_{PJ,y}$

As 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, the following applies:

$EG_{PJ,y} = EG_{facility,y}$ (2)

Where:

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

Calculation of $EF_{grid,CM,y}$

The baseline emission factor (EF_y) 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 seven steps defined in the "Tool to calculate the emission factor for an electricity system".

Data for the calculations are based on official public data on 2017 China Regional Power Grid Baseline Emission Factors[3].

Step 1. Identify the relevant electricity systems

For determining the electricity emission factors, identify the relevant project electricity system.

China DNA has published a delineation of the project electricity system and connected electricity systems, therefore these delineations are used in accordance with the Tool:

- The project electricity system is the Northeast China Power Grid (NCPG), consisting of three provincial grids: Liaoning, Jilin and Heilongjiang.

For the purpose of this tool, the reference system is the project electricity system. Hence electricity transfers from a connected electricity system to the project electricity system are

[3] http://www.mee.gov.cn/ywgz/ydqhbh/wsqtkz/index_1.shtml

defined as electricity imports, and electricity transfers from the project electricity system to connected electricity systems are defined as electricity exports.

For the purpose of determining the build margin emission factor, the spatial extent is limited to the project electricity system, except where recent or likely future additions to the transmission capacity enable significant increases in imported electricity. In such cases, the transmission capacity may be considered a build margin source.

There are no recent or likely future additions to transmission capacity that would enable significant increases in imported electricity; the data that imports are relatively small and have not changed significantly in the period covered. Therefore, the transmission capacity is not considered a build margin source.

For the purpose of determining the operating margin emission factor, use one of the following options to determine the CO_2 emission factor(s) for net electricity imports from a connected electricity system:

(a) 0 tCO_2/MWh; or

(b) The weighted average operating margin (OM) emission rate of the exporting grid, determined as described in Step 4 (d) below; or

(c) The simple operating margin emission rate of the exporting grid, determined as described in Step 4 (a), if the conditions for this method, as described in Step 3 below, apply to the exporting grid; or

(d) The simple adjusted operating margin emission rate of the exporting grid, determined as described in Step 4 (b) below.

Following the calculations of China DNA, the simple operating margin option (b) is used to calculate the CO_2 emission factors for net electricity imports ($EF_{grid,import,y}$).

For imports from connected electricity systems located in Annex-I country(ies), the emission factor is 0 tonnes CO_2 per MWh.

There are no imports from Annex-I country (ies).

Electricity exports should not be subtracted from electricity generation data used for calculating and monitoring the electricity emission factors.

Electricity exports from the project electricity system to the connected electricity system are not subtracted from electricity generation data used for calculating and monitoring the electricity emission factors.

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

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.

Following the calculations of the DNA and the availability of statistical data availability, Option I is chosen.

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

According to the tool, the calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the 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 (option a) can only be used if low-cost / must-run 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.

This criterion is met and therefore the project participants chose to use the simple OM method (option a).

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

Ex ante option: If the ex-ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. For grid power plants, use 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.

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

(a) Simple OM

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.

Option B can only be used if:

(a) The necessary data for Option A is not available; and

(b) Only nuclear and renewable power generation are considered as low-cost / must-run power sources and the quantity of electricity supplied to the grid by these sources is known; and

(c) Off-grid power plants are not included in the calculation (i.e. if Option I has been chosen in Step 2).

The criteria for Option B are met, as (a) the necessary data for Option A is not available as indicated in the calculations of the DNA, (b) only nuclear and renewable power generation are considered as low-cost / must-run power sources and the quantity of electricity supplied to the grid by these sources is known, and (c) Option I is chosen in Step 2.

Option B – Calculation based on total fuel consumption and electricity generation of the system

According to the Tool, where Option B is used, 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 total fuel consumption of the project electricity system, as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO_2,i,y}}{EG_y} \quad (3)$$

Where:

$EF_{grid,OMsimple,y}$	Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)
$FC_{i,y}$	The 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 generated and delivered to the grid by all power sources serving the system, not including low-cost / must-run power plants / units, in year y (MWh)
i	All fossil fuel types combusted in power sources in the project electricity system in year y
y	The relevant year as per the data vintage chosen in Step 3

On the basis of the data available, the three-year average operating margin emission factor is calculated by the DNA as a full-generation-weighted average of the emission factors.

$EF_{grid,OMsimIpe,y}$ =0.9680tCO_2/MWh

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

In terms of vintage of data, the project participants chose Option 1, the ex-ante option (as for the OM calculation), and $EF_{grid,BM,y}$ is fixed for the duration of the second crediting period:

Option 1: ex-ante. 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.

Following the approach accepted by UNFCCC, the latest statistical data available (from the China Power Yearbook) is used by the DNA to determine the most recent year from which the added generation capacity is equal to or just exceeds 20% of the latest statistic. The added generation capacity is the sample group of power units m used to calculate the build margin.

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.

The build margin emissions factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units m during the most recent year y for which power generation data

is available, calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \quad (4)$$

Where:

$EF_{grid,BM,y}$	Build margin CO_2 emission factor in year y(t CO_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	The most recent historical year for which power generation data is available

The CO_2 emission factor of each power unit m ($EF_{EL,m,y}$) should be determined as per the guidance in step 4 (a) for the simple OM, using options A1, A2 or A3, using for y the most recent historical year for which power generation data is available, and using for m the power units included in the build margin.

Due to the limited availability of data on individual power units, the DNA uses the deviation above to calculate the build margin emission factor and the CO_2 emission factor of thermal power units as follows.

The added generation capacity is taken instead of generation in formula (4) above, as with the determination of the group of plant included in the build margin. Therefore, the calculation following the deviation is as follows:

$$EF_{grid,BM,y} = \frac{\sum_m (CAP_{m,y} \times EF_{EL,m,y})}{\sum_m CAP_{m,y}} = \sum_m Share_{CAP,m,y} \times EF_{EL,m,y} \quad \text{(4-dev)}$$

Where:

$EF_{grid,BM,y}$	Build margin CO_2 emission factor in year y(t CO_2/MWh)
$CAP_{m,y}$	Added generation capacity by plant type m in year y (MW)
$EF_{EL,m,y}$	CO_2 emission factor of plant type m in year y (tCO_2/MWh)
$Share_{CAP,m,y}$	Share of added generation capacity by plant type m in year y (%)
m	Plant type included in the build margin (thermal, hydro, nuclear, other)
y	The most recent historical year for which electricity generation data is available

The CO_2 emission factor of plant types other than thermal power plants is taken as zero.

The CO_2 emission factor of thermal power plants is the weighted average emission factor of the best thermal power plant technologies commercially available in China, as required by the approved deviation, using option A2.

Using the equation of option A2, the CO_2 emission factor of advanced (best commercially available) power plants using fuel type i can be calculated as follows:

$$EF_{m,Adv,y} = \frac{EF_{CO_2,m,y} \times 3.6}{\eta_{m,y}} \quad (5)$$

Where:

$EF_{m,Adv,y}$	CO_2 emission factor of advanced power plants using fuel m in year y(tCO_2/MWh)
$EF_{CO2,m,y}$	Average CO_2 emission factor of fuel type m in year y (tCO_2/GJ)
$\eta_{m,y}$	Average net energy conversion efficiency of advanced power plants using fuel type m in year y (%)

m	Fuel type of thermal plant (coal/solid, oil/liquid, gas)
y	The relevant year as per the data vintage chosen

The weighted average CO_2 emission factor of thermal power plants is weighted on the basis of the emissions from each of these fuel types in the latest year for which data is available, and using the average net energy conversion efficiency for each fuel type of the best technologies commercially available in China.

$$EF_{thermal,y} = \sum_m (EF_{m,Adv,y} \times \lambda_{m,y}) \quad (6)$$

Where:

$EF_{thermal,y}$	Weighted average CO_2 emission factor of thermal power plants in year y (tCO_2/MWh)
$EF_{m,Adv,y}$	CO_2 emission factor of advanced power plants using fuel type m in year y (tCO_2/MWh)
$\lambda_{m,y}$	Share of emissions of fuel type m in year y (%)
m	Fuel type of thermal plant (coal/solid, oil/liquid, gas)
y	The relevant year as per the data vintage chosen

The build margin emission factor is calculated by the DNA using this methodology:

$EF_{grid,BM,y}$ = 0.4578 tCO_2/MWh.

Step 6. Calculation of the combined margin emission factor

The calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) is based on one of the following methods:

(a) Weighted average CM; or

(b) Simplified CM.

The weighted average CM method (option a) should be used as the preferred option.

The simplified CM method (option b) can only be used if:

- The project activity is located in a Least Developed Country (LDC) or in a country with less than 10 registered projects at the starting date of validation; and
- The data requirements for the application of step 5 above cannot be met.

Option a is the preferred option. Option b cannot be used as the project activity does not take place in an LDC or in a country with less than 10 registered CDM projects. Therefore, option a is chosen.

Weighted average CM

The combined margin emissions factor is calculated as follows:

$EF_{grid,CM,y} = w_{OM} \times EF_{grid,OM,y} + w_{BM} \times EF_{grid,BM,y}$

$$EF_{grid,CM,y} = \omega_{OM} \times EF_{grid,OM,y} + \omega_{BM} \times EF_{grid,BM,y} \quad (7)$$

Where:

$EF_{grid,BM,y}$	Build margin CO_2 emission factor in year y (tCO_2/MWh)
$EF_{grid,OM,y}$	Operating margin CO_2 emission factor in year y (tCO_2/MWh)
w_{OM}	Weighting of operating margin emissions factor (%)
w_{BM}	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 periods, w_{OM} = 0.75 and w_{BM} = 0.25.

On the basis of these weights for the second crediting period, the combined margin emission factor is calculated, and are fixed ex-ante for the duration of the second crediting period as follows:

	CO_2 emission factor (tCO_2/MWh)	Weighting
Operating Margin Emissions Factor ($EF_{grid,OM,y}$)	0.9680	0.75
Build Margin Emissions Factor ($EF_{grid,BM,y}$)	0.4578	0.25
Baseline Emissions Factor ($EF_{grid,CM,y}$)	0.8405	

Thus,

$BE_y = EG_{facility,y} \times EF_{grid,CM,y}$ = 241,700 MWh × 0.8405 tCO_2/MWh =203,136 tCO_2

4.2 Project Emissions

According to the methodology, for most renewable energy project activities, PE_y = 0. However, the methodology prescribes project emission calculations for geothermal, solar thermal and hydro power plant. The project is a wind power project, therefore, there are no project emissions according to the methodology:

$PE_y = 0$

4.3 Leakage

According to the methodology, no leakage is considered for the project activity.

4.4 Net GHG Emission Reductions and Removals

Emission reductions are calculated as follows:

$ER_y = BE_y - PE_y$ (8)

Where:

ER_y	Emission reductions in year y (t CO_2e/yr)
BE_y	Baseline emissions in year y (t CO_2/yr)
PE_y	Project emissions in year y (t CO_2e/yr)

Thus,

$ER_y = BE_y - PE_y = 203{,}136\ tCO_2e - 0\ tCO_2e = 203{,}136\ tCO_2e$

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
01/08/2020-31/12/2020 (153days)	85,150	0	0	85,150
01/01/2021-31/12/2021	203,136	0	0	203,136
01/01/2022-31/12/2022	203,136	0	0	203,136
01/01/2023-31/12/2023	203,136	0	0	203,136
01/01/2024-31/12/2024	203,136	0	0	203,136
01/01/2025-31/12/2025	203,136	0	0	203,136
01/01/2026-31/12/2026	203,136	0	0	203,136
01/01/2027-31/12/2027	203,136	0	0	203,136
01/01/2028-31/12/2028	203,136	0	0	203,136
01/01/2029-31/12/2029	203,136	0	0	203,136
01/01/2030-31/07/2030 (212days)	117,986	0	0	117,986
Total	2,031,360	0	0	2,031,360

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,OM,y}$
Data unit	tCO_2/MWh
Description	Simple operating margin CO_2 emission factor in year y
Source of data	"2017 Baseline Emission Factors for Regional Power Grids in China" issued by China DNA [4]
Value applied	0.9680
Justification of choice of data or description of measurement methods and procedures applied	Official public data from NDRC
Purpose of Data	Calculation of baseline emissions
Comments	/

Data / Parameter	$EF_{grid,BM,y}$
Data unit	tCO_2/MWh
Description	Build margin CO_2 emission factor in year y
Source of data	"2017 Baseline Emission Factors for Regional Power Grids in China" issued by China DNA [5]
Value applied	0.4578
Justification of choice of data or description of measurement methods and procedures applied	Official public data from NDRC
Purpose of Data	Calculation of baseline emissions
Comments	/

Data / Parameter	w_{OM}
Data unit	%

[4] http://www.mee.gov.cn/ywgz/ydqhbh/wsqtkz/201812/P020181220579925103092.pdf

[5] http://www.mee.gov.cn/ywgz/ydqhbh/wsqtkz/201812/P020181220579925103092.pdf

Description	Weighting of operating margin emissions factor
Source of data	"Tool to calculate the emission factor for an electricity system" (Version 07.0)
Value applied	75
Justification of choice of data or description of measurement methods and procedures applied	Based on the requirements of "Tool to calculate the emission factor for an electricity system" (Version 07.0)
Purpose of Data	Calculation of baseline emissions
Comments	/

Data / Parameter	w_{BM}
Data unit	%
Description	Weighting of build margin emissions factor
Source of data	"Tool to calculate the emission factor for an electricity system" (Version 07.0)
Value applied	25
Justification of choice of data or description of measurement methods and procedures applied	Based on the requirements of"Tool to calculate the emission factor for an electricity system" (Version 07.0)
Purpose of Data	Calculation of baseline emissions
Comments	/

5.2 Data and Parameters Monitored

Data / Parameter	$EG_{faility,y}$
Data unit	MWh/yr
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y.
Source of data	Monitored from electricity meters within the wind farm and calculated.
Description of measurement methods	Result of $EG_{togrid,y}$ minus $EG_{fromgrid,y}$

and procedures to be applied	
Frequency of monitoring/recording	Measured continuously and recorded monthly.
Value applied	241,700 MWh
Monitoring equipment	The electricity is monitored by electricity meters with national standards.
QA/QC procedures to be applied	Monthly power exported to and imported from NCPG are cross-checked against sales receipts. The metering equipments are calibrated and checked for accuracy according to the industry standards so that the metering equipment shall have sufficient accuracy.
Purpose of data	Calculation of baseline emissions
Calculation method	$EG_{facility,y}=EG_{togrid,y}-EG_{fromgrid,y}$
Comments	/

Data / Parameter	$EG_{togrid,y}$
Data unit	MWh
Description	Quantity of annual electricity exported to the grid by the Project
Source of data	Monitored from electricity meters within the wind farm.
Description of measurement methods and procedures to be applied	Two bi-direction meters are installed at the 220kV substation by the Project, one is for main meter and the other is for backup. The electricity delivered to the grid will be monitored through the bi-direction metering equipments. Monthly power exported to NCPG will be approved and signed off by monitoring and auditing staff before it is accepted and stored.
Frequency of monitoring/recording	Measured continuously and recorded monthly.
Value applied	*241,700* MWh
Monitoring equipment	The electricity is monitored by electricity meters with national standards.
QA/QC procedures to be applied	Monthly power exported to the NCPG is cross-checked against invoices. The metering equipments are calibrated and checked for accuracy according to the industry standards so that the metering equipment shall have sufficient accuracy.
Purpose of data	Calculation of baseline emissions.

Calculation method	/
Comments	/

Data / Parameter	$EG_{fromgrid,y}$
Data unit	MWh
Description	Quantity of annual electricity imported from the grid by the Project.
Source of data	Monitored from electricity meters within the wind farm.
Description of measurement methods and procedures to be applied	Two bi-direction meters are employed at the 220kV substation by the Project, one is main meter and the other is for backup. The electricity imported from the grid will be monitored through the bi-direction metering equipments. Monthly power imported from NCPG will be approved and signed off by monitoring and auditing staff before it is accepted and stored.
Frequency of monitoring/recording	Measured continuously and recorded monthly.
Value applied	0 MWh
Monitoring equipment	The electricity is monitored by electricity meters with national standards.
QA/QC procedures to be applied	Monthly power imported from NCPG is cross-checked against invoices. The metering equipments are calibrated and checked for accuracy according to the industry standards so that the metering equipment shall have sufficient accuracy.
Purpose of data	Calculation of baseline emissions
Calculation method	/
Comments	/

5.3 Monitoring Plan

5.3.1 Monitoring system organization

Overall responsibility for monitoring and carrying out the monitoring following this monitoring plan lies with CECIC HKE WIND POWER 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:

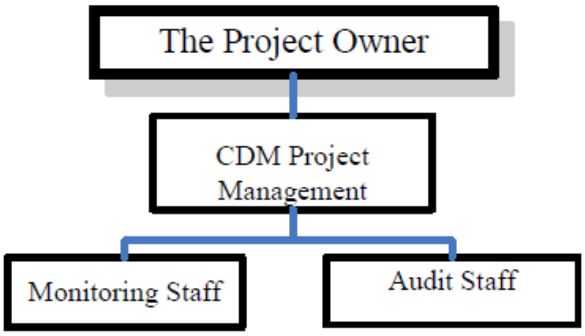


Figure 3. Monitoring system organization

5.3.2 Installation of meters

Two sets of bi-direction ammeters in the 220KV substation within the wind farm are employed by the project, one of which is for backup. Every month the 220kV substation in the wind farm will report the electricity exchanged between the project and NCPG. The connection diagram of the monitoring points shows below:

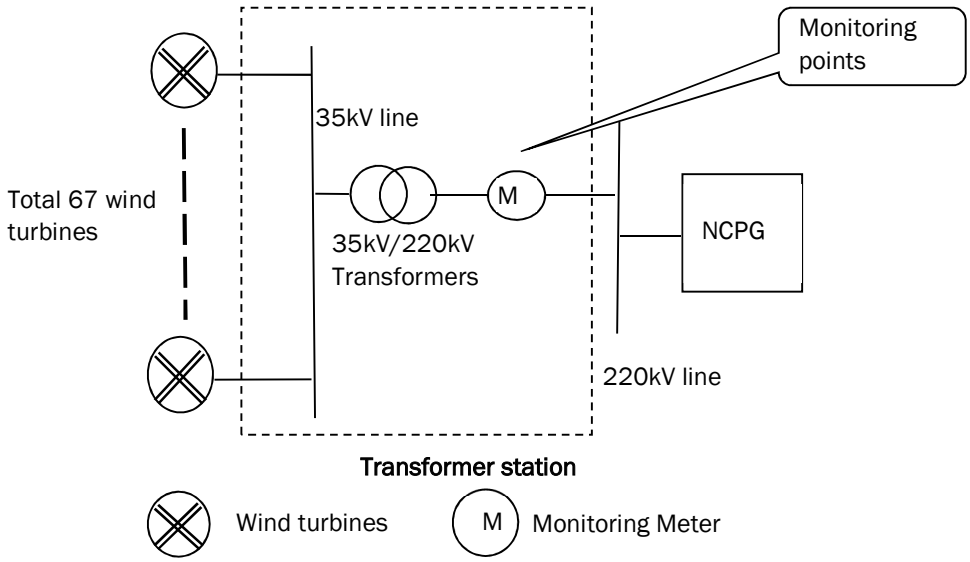


Figure 4. Connection diagram of the monitoring points

5.3.3 Calibration of meters & metering

The metering equipment will be calibrated and checked by qualified third party for accuracy according to local industry standards so that the metering equipment shall have sufficient accuracy of 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 NCPG 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.

5.3.4 Data collection and management system

• The proposed wind farm records readings monthly from the meter equipment within the farm, and other relevant separated meters if needed.

•The proposed wind farm supplies reading to Zhangjiakou Electric Power Company monthly.

• Zhangjiakou Electric Power Company records readings of meters within the wind farm via remote data transfer equipment.

• The Zhangjiakou Electric Power Company reports the confirmed readings result to NCPG Company monthly and to the wind farm in some forms, e.g. Electricity Transaction Notes or 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.

All data including calibration records was kept until 2 years after the end of the total crediting period of the project.

5.3.5 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.

5.3.6 Reporting

CECIC HKE WIND POWER CO., LTD will complete the monitoring report and provide it to a DOE for verification.