Project design document form
(Version 11.0)

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION	
Title of the project activity	Guoshuitou Diaobingshan Quanyangou Wind Power Project
Scale of the project activity	☒ Large-scale ☐ Small-scale
Version number of the PDD	05
Completion date of the PDD	29/08/2019
Project participants	CTGNE Diaobingshan Wind Power Co., Ltd. (P.R.China) Gunvor International B.V., Amsterdam, Geneva Branch (Switzerland)
Host Party	P.R. China
Applied methodologies and standardized baselines	ACM0002: "Grid-connected electricity generation from renewable sources" (Version 19.0). Standardized baselines: N/A
Sectoral scopes	Sectoral scope 1: Energy industries (renewable sources)
Estimated amount of annual average GHG emission reductions	94,940 tCO_2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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Guoshuitou Diaobingshan Quanyangou Wind Power Project (hereafter referred as the project) is located at the 15km southwestern of Diaobingshan City, Tieling City, Liaoning Province, People's Republic of China.The project entity is CTGNE Diaobingshan Wind Power Co.,Ltd.

The project will install 33 sets of wind turbine generators, each of which is 1500kW capacity and the total capacity is 49.5MW. The only purpose of the project is to generate electricity. The estimated annual operating hour is 2,099 hours. The annual electricity supplied to Northeast China Power Grid (NEPG) will be 103,885 MWh, and it will alleviate the power supply pressure in NEPG.

The electricity generated by the project are dispatched to the NEPG. Prior to the start of the project, the same amount of electricity generated is supplied by the NEPG, which is also the baseline scenario. After the project implementation, electricity effectively displaces part of the electricity generated from NEPG which is dominated by fossil fuel power plants. The Project commenced construction on 20/05/2010 and has been in operation since December 2010. The second crediting period for the project is from 01/04/2019 to 31/03/2026. The estimated annual emission reductions in the second crediting period are 94,940tCO_2e, the total estimated emission reductions in the second crediting period are 664,580tCO_2e.

The project not only supplies renewable electricity to the grid, but also contributes to sustainable development of the local community and the host country by means of:

- The project follows the policy of sustainable development and clean energy in China and has a positive impact on technical development and improvement of wind power industry and technology;
- Reducing emissions of CO_2 SO_2, NO_x and in general reducing dust and air pollution compared with a business-as-usual scenario of coal fired power generation;
- Mitigating the demand of local electricity supply and promoting local economic development during both construction and operation periods of the project;
- Creating 15 new employment opportunities.

A.2. Location of project activity

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The project is located at Diaobingshan City, Tieling City, Liaoning Province, People's Republic of China.The north is to Yushudi, the south is to Quanyangou, the west is to Shanglama and the east is to Gaoligou.The geographical coordinates of the Wind Farm centre are longitude 123°28‘46” East (123.4794°E) and latitude 42°24‘18” North (42.4050°N). Figure A.1 shows the exact location of the project.

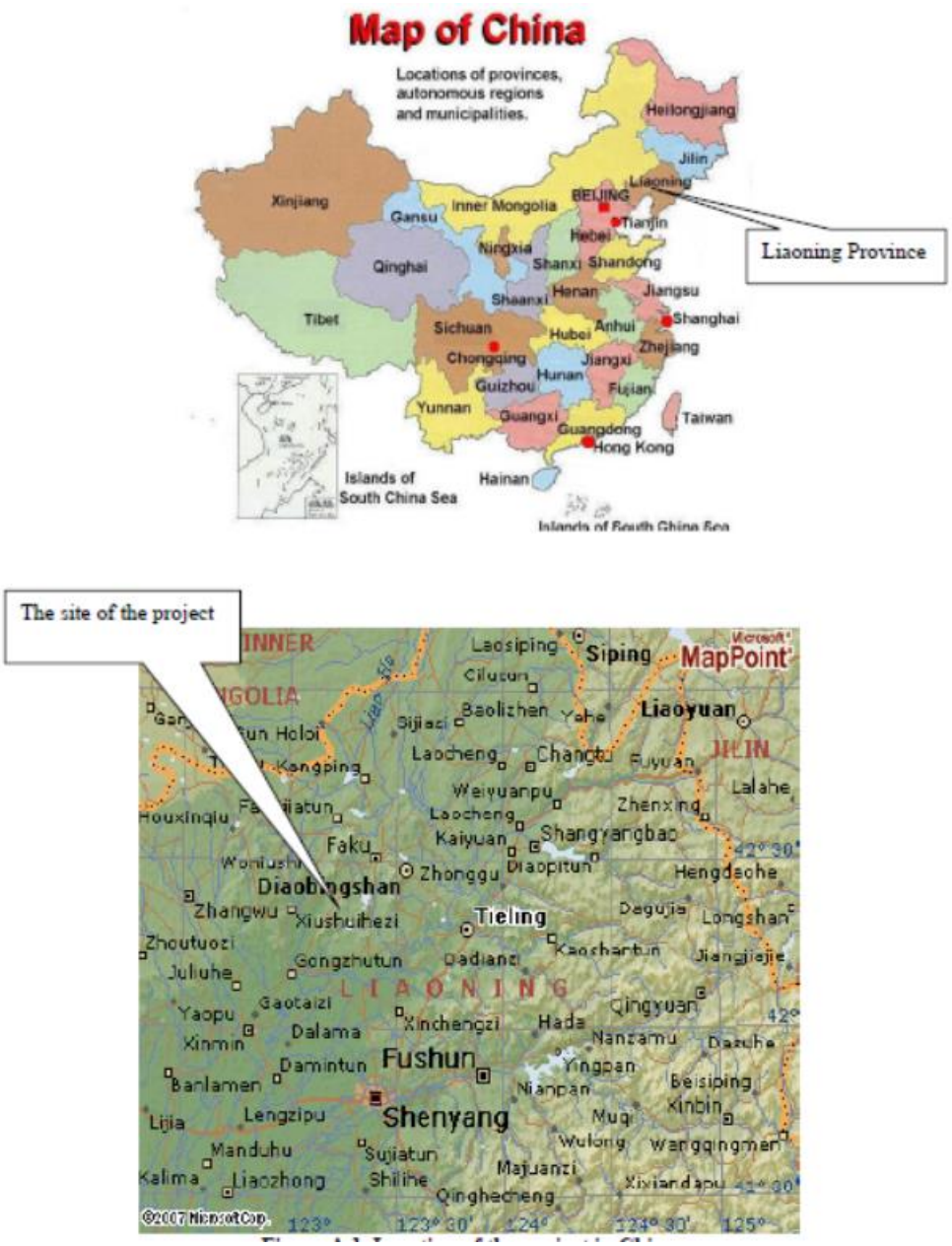

Figure A.1 Location of the project in China

A.3. Technologies/measures

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The project is to utilize wind resources for electricity generation in Diaobingshan City, Liaoning Province, P. R. China. The project is a grid-connected renewable energy project. Prior to the start of implementation of the project activity, there is no power generation unit at the site of the project, and the electricity was supplied by the Northeast China Power Grid. The baseline scenario of the project is the electricity supply of equal amount as the project from the Northeast China Power Grid. The baseline scenario of the project is the same as the scenario prior to the start of the implementation of the project activity.

The project involves the installation of 33 wind turbines with capacity of 1500 kW each, which amount to a total installed capacity of 49.5 MW. The estimated annual net electricity supplied to the grid by the project is 103,885 MWh. The annual operation hours of the project are 2,099 hours, thus the plant load factor of the project is 0.2396 (=2,099h/ (24h/d*365d)). The expected operational lifetime of the project activity is 20 years. The main technical specifications of the wind turbines are listed in the following table.

Table A.1 The main technical parameters of the wind turbine generators

Vane		Generator	
Type	GW82/1500	Type	Direct Drive Permanent Magnet Synchronous Generator
Diameter of rotor	82m	Rated capacity	1,580kW
Cut in wind speed	3m/s	Rated voltage	690V
Cut out wind speed	22m/s	Rated speed	17.3rmp
Speed	9.0-17.3rmp	Load factor	0.2396
Rated wind speed	10.3m/s	Rated frequency	50Hz
Vane number	3	Annual operation hour	2099h
Lifetime	20 years	Life time	20 years
Manufacturer	Xinjiang Goldwind Science Ltd.	Manufacturer	Xinjiang Goldwind Science Ltd.

The project entity has built a 66kV booster station for the electricity generation conducting into the grid. The electricity generated is delivered to the 220kV Diaobingshan Yici substation, and then supplied into Tieling Power Grid, which is part of NEPG. The project employs domestically manufactured equipment and no technology transfer is involved.

The main electricity meter with 0.2S accuracy is installed at the entrance to the 220kV Diaobingshan Yici substation and a back-up electricity meter with the 0.2S accuracy is installed at the exit of the plant booster. The two electricity meters are calibrated by the qualified third party annually. The location of the meters and transmission lines is displayed as following diagram:

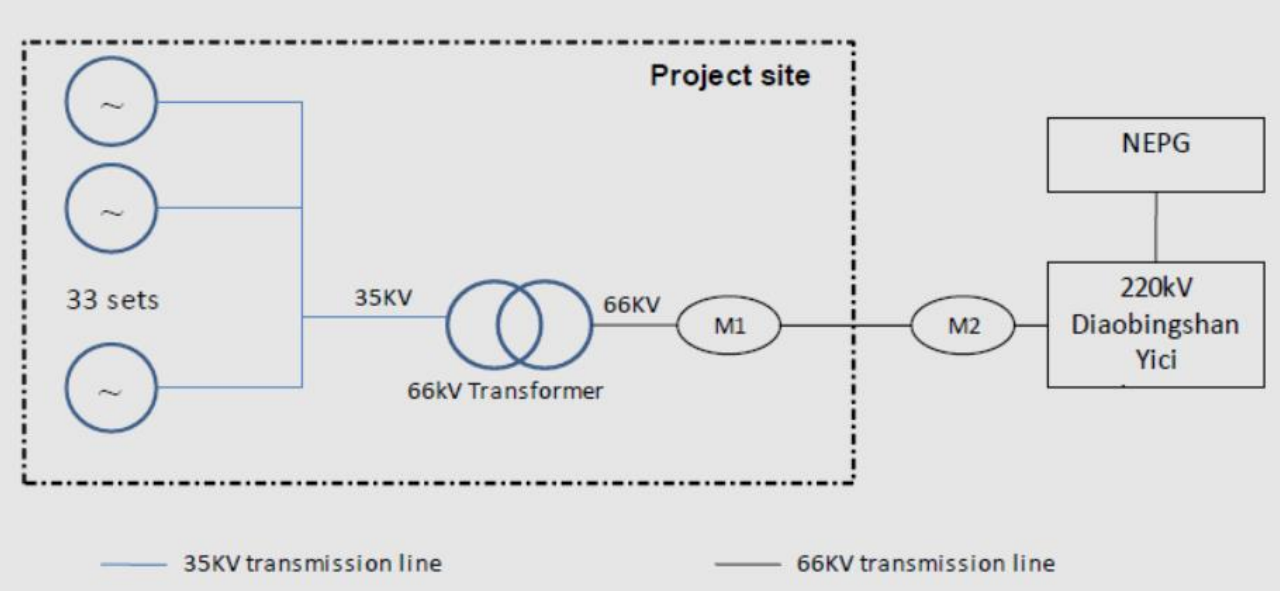

Figure A.2 The location of meters and transmission lines

A.4. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
P. R.China (host)	CTGNE Diaobingshan Wind Power Co., Ltd. (P.R.China)	No
Switzerland	Gunvor International B.V., Amsterdam, Geneva Branch	No

A.5. Public funding of project activity

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There is no public funding from Annex I Party available for the project.

A.6. History of project activity

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The project was registered as a CDM project activity by EB on 15/03/2012, which has not been deregistered.

The project was not a component project activity (CPA) that has been excluded from a registered CDM PoA, and there is no other registered CDM project activity whose crediting period has or has not expired exists in the same geographical location as the CDM project activity.

A.7. Debundling

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Not applicable.

SECTION B. Application of methodologies and standardized baselines

B.1. References to methodologies and standardized baselines

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The approved methodology applied in the project activity is ACM0002 (version 19.0) –"Grid-connected electricity generation from renewable sources".

Reference:

https://cdm.unfccc.int/filestorage/I/G/F/IGF610X25ALSK4PZ3W7MTUVCYDJ9OQ/eb100_repan06.pdf?t=d0h8cGVranZqfDBhexE2RbOUg80cNCfu-tcE

This methodology also refers to the latest approved version of the following tools:

"Tool to calculate the emission factor for an electricity system (version 07.0)" is applied in the project.

Reference:

https://cdm.unfccc.int/filestorage/T/J/U/TJUNP2WBS15MZGYXRD07HEOQ83ILF6/eb100_repan04.pdf?t=Qkh8cGVrZHVyfDAFWKsP8lPaJXHM600GKgTI

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).

Reference: http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf

Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (Version 03.0).

Reference: http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v3.0.pdf

B.2. Applicability of methodologies and standardized baselines

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The approved methodology ACM0002 (version 19.0) is applicable to the project activity and the project meets the applicability of the applied methodology as follows:

Clauses	Requirements of the ACM0002	Scenario of the project	Conclusion
1	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	The project is a greenfield NEPG-connected renewable power generation project.	Applicable

	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).		
2	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;	The project activity involves the installation of the wind power plant.	Applicable
3	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.	Not applicable, the project is a newly built wind power project.	n.a
4	In case of hydro power plants, one of the following conditions must 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 (3), 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 (3), 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	Not applicable, the Project is not a hydro power plant, so this applicability condition does not need to be considered.	n.a

	the reservoirs, calculated using equation (3), 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 (4), 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.		
5	In the case of integrated hydro power projects, project proponent shall: 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 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 five years prior to implementation of CDM project activity.	Not applicable, the Project is not a hydro power plant, so this applicability condition does not need to be considered.	n.a
6	The methodology is not applicable to:	The project does not involve switching from fossil-fuels to	Applicable

	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.	renewable energy sources at the site of the project activity and also the project is not a biomass-fired power project.	
7	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 a newly built wind power project.	n.a

In addition, the project meets the applicability conditions of the applied tools applied in the PDD as follows:

Tool/Criteria	Applicability	Conclusion
Tool to calculate the emission factor for an electricity system/ 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).	The Project is the installation of a wind power plant supplying electricity to the Grid.	Applicable
Tool to calculate the emission factor for an electricity system/ 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.	The project electricity system is located in a non-Annex I country.	Applicable
Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation./ If emissions are calculated for electricity consumption, the tool is only applicable if one out of the following three scenarios applies to the sources of electricity consumption:(a) Scenario A: Electricity consumption from the grid. (b) Scenario B: Electricity consumption from (an) off-grid fossil fuel fired captive power plant(s). or (c) Scenario C: Electricity consumption from the grid and (a) fossil fuel fired captive power plant(s).	The electricity consumption of the project is purchased from the grid.	Applicable
Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation./This tool can be referred to in methodologies to provide procedures to monitor amount of electricity generated in the	The electricity generated by the project is supplied to the grid.	Applicable

project scenario, only if one out of the following three project scenarios applies to the recipient of the electricity generated: (a) Scenario I: Electricity is supplied to the grid; (b) Scenario II: Electricity is supplied to consumers/electricity consuming facilities; or (c) Scenario III: Electricity is supplied to the grid and consumers/electricity consuming facilities.		
Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation./This tool is not applicable in cases where captive renewable power generation technologies are installed to provide electricity in the project activity, in the baseline scenario or to sources of leakage. The tool only accounts for CO_2 emissions.	There are no captive renewable power generation technologies installed to provide electricity in the project activity, in the baseline scenario or to sources of leakage.	Applicable

B.3. Project boundary, sources and greenhouse gases (GHGs)

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The spatial extent of the project boundary includes the project site and all power plants connected to Northeast China Power Grid (NEPG). The project site includes the wind farm and auxiliary installations that are used to support the project operation. NEPG is the project electricity system, which is defined by the spatial extent of the power plants that can be dispatched without significant transmission constrains. As per the boundary definitions of the Chinese DNA[1], NEPG consists of Liaoning, Jilin and Heilongjiang power grids.

The flow diagram of the project boundary is illustrated as follow:

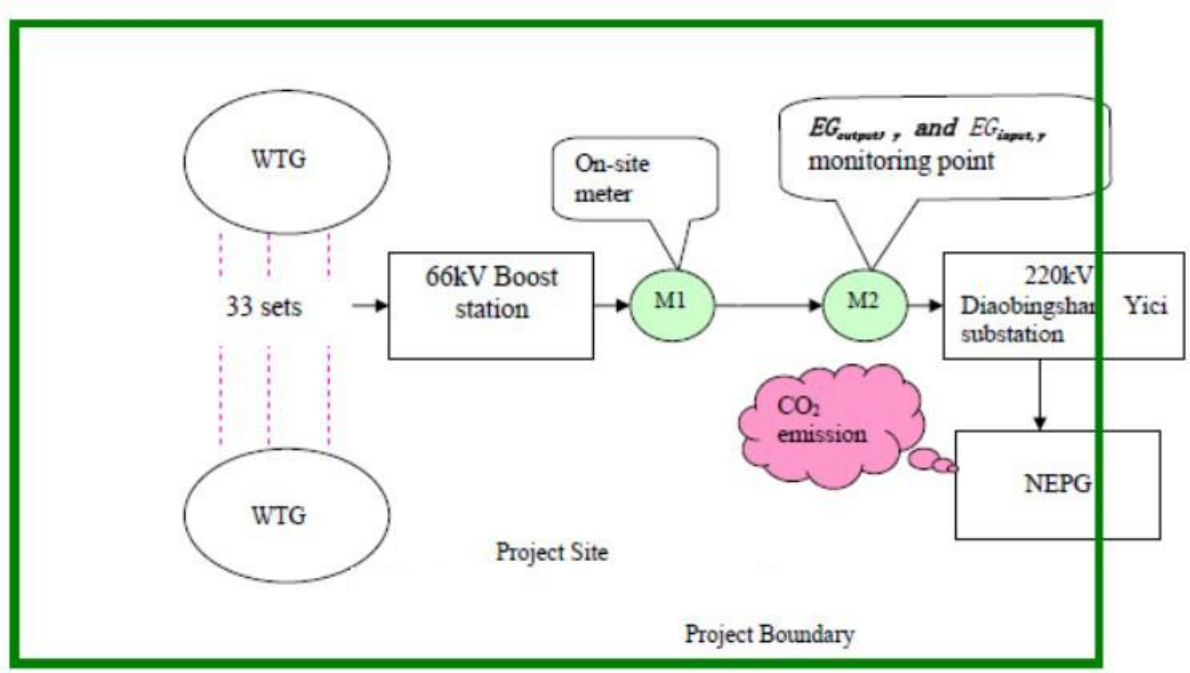

Figure B.1 The flow diagram of the project boundary

[1] http://39.137.36.61:6310/qhs.mee.gov.cn/kzwsqtpf/201812/P020181220579925103092.pdf

Source		GHG	Included?	Justification/Explanation
Baseline	Fossil fuel-fired power plants in the Northeast China Power Grid	CO_2	Yes	Major emission source
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
Project Activity	The wind power project	CO_2	No	According to methodology, the project is a wind power project, so it does not involve project emission.
		CH_4	No	According to methodology, the project is a wind power project, so it does not involve project emission.
		N_2O	No	According to methodology, the project is a wind power project, so it does not involve project emission.

B.4. Establishment and description of baseline scenario

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The current baseline is "Electricity delivered to the NEPG by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources" in the approved PDD.

In accordance with "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), the validity of the current baseline is assessed using the following sub-steps:

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 favor the development of renewable energy sources, NEPG is still dominated by the thermal power plants. The total electricity generation produced by fossil fuel power plants accounts for more than 80% of total electricity generation in NEPG and this percentage has not been changed significantly in recent 5 years[2]. Hence in the absence of the project activity, electricity would still have been generated in the existing grid-connected power plants or by the addition of new generation sources from NEPG. The current baseline still complies with all relevant mandatory national and sectoral policies which have come into effect after the submission of the project activity for validation and are applicable at the time of requesting renewal of the crediting period. Go to step 1.2.

Step 1.2: Assess the impact of circumstances

The baseline scenario identified at the validation of the project activity was the provision of an equivalent amount of annual electricity generation by NEPG. The investment environment or market characteristics especially the feed-in tariff, the policy in terms of market access permit, these circumstances continue during the second crediting period and therefore, do not have an impact on the current baseline emissions. Hence the current baseline does not need to be updated. Go to step 1.3.

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

The project is a Greenfield project with a lifetime of 20 operation years, with no baseline equipment(s) or an investment for the crediting period for which renewal is requested, this step is not applicable. Go to step 1.4.

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

[2] China Electric Power Yearbook

Assess whether data and parameters that were only determined at the start of the crediting period and not monitored during the crediting period are still valid or whether they should be updated. Updates should be undertaken in the following cases:

- Where IPCC default values are used, the values should be updated if any new default values have been adopted and published by the IPCC, for example, in guidelines for national GHG inventories, IPCC assessment report or special reports by the IPCC;
- Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the CDM project activity.

If any of the data and parameters that were only determined at the start of the crediting period and not monitored during the crediting period are not valid anymore, the current baseline needs to be updated for the subsequent crediting period.

In accordance with the methodology, the grid emission factor and all the values in its calculation are updated in section B.6.

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

Step 2.1: Update the current baseline

As per the analysis in step 1 above, the current baseline does not need to be updated.

Step 2.2: Update the data and parameters

The updated baseline emission factor for the project ($EF_{grid,CM,y}$) is calculated in line with the "Tool to calculate the emission factor for an electricity system (version 07.0)", the data is calculated as 0.9139 tCO_2e/MWh, refer to section B.6 for details.

B.5. Demonstration of additionality

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The project has demonstrated its additionality in the first crediting period and no changes affect the additionality of the project since its registration. As per the CDM Project Standard for project activities Version 02.0 para 280, the project participants are not required to reassess the additionality of the project activity and update the section relating to additionality.

B.6. Estimation of emission reductions

B.6.1. Explanation of methodological choices

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Emission reductions from the project can be calculated based on the ACM0002 consolidated methodology. According to the ACM0002, it is required to estimate the Operating Margin (OM) and Build Margin (BM) emission factor ex-ante, and through weighted average of OM and BM, the Combined Margin baseline emission factor of NEPG can be obtained and then the emission reductions from CDM project activity can be estimated. The details are shown below:

1. Baseline emissions

1.1To calculate the baseline emissions (BE_y)

According to the ACM0002 (Version 19.0), 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:

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

Where:

BE_y = Baseline emission 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"

The project activity is a Greenfield wind power plant, then:

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

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)

1.2 To calculate the emission factor for an electricity system

$EF_{grid,CM,y}$ is calculated as per the latest version of "Tool to calculate the emission factor for an electricity system" (version 07.0). The baseline emission factor $EF_{grid,CM,y}$ is calculated ex ante and fixed for the second crediting period. Detailed as follows:

Step 1. Identify the relevant electricity system

For determining the electricity emission factors, identify the relevant project electricity system. Similarly, identify any connected electricity system. If a connected electricity system is located partially or totally in Annex-I countries, then the emission factor of that connected electricity system should be considered zero. If the DNA of the host country has published a delineation of the project electricity system and connected electricity systems, these delineations should be used.

The Chinese DNA has published a delineation of the project electricity system and connected electricity systems, this delineation is used. Following the DNA delineation, the project electricity system is the Northeast China Power Grid, which consists of Liaoning, Jilin, and Heilongjiang Province Power Grids. The project is located in Liaoning province and covered by the Northeast China Power Grid. Therefore, Northeast China Power Grid is chosen as the relevant electric power system.

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.

Based on China's real situation, only grid power plants are included in the calculation.

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

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on the following methods:
(a) Simple OM, or
(b) Simple adjusted OM, or
(c) Dispatch Data Analysis OM, or
(d) Average OM.

Detailed information to carry out a dispatch data analysis is not publicly available; therefore, method (b) and method (c) is not suitable for the project.

According to ACM0002, the Simple OM method is applicable to the project if the low-cost resources constitute less than 50% of total grid generation on average in the five most recent years or based on long-term normals for hydroelectric production.

For the most recent 5 years (2012-2016), the share of low-cost/must-run generation in Northeast China Power Grid is 11.04% in 2012, 16.46% in 2013, 14.90% in 2014, 15.38% in 2015 and 19.29% in 2016[3]. The Simple OM method, therefore, is selected to calculate the Operating Margin emission factor of the project.

The Simple OM can be calculated using either of the two following data vintages for years(s) y:

• (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.
• (Ex-post option): If the ex post option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emission factor to be updated annually during monitoring.

Here ex-ante vintage is chosen, and the $EF_{grid,OM}$ is fixed during the second crediting period.

Step 4. Calculate the operating margin emission factor according to the selected method
The Simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost / must-run power plants / units. The simple OM may be calculated:

- 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.

For the project activity, the required data for the exercise of Option A is not available and those of Option B can be obtained from official sources, and off-grid power plants are not included in the calculation, therefore, Option B is chosen to calculate 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:

$$EF_{grid,OMsimple,y} = \frac{\sum_{i,m} FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{\sum_{m} EG_{y}} \quad (3)$$

Where:

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

[3] China Electric Power Yearbook 2012~2016

= The relevant year as per the data vintage chosen in Step 3

y

Regarding parameter selection, local values of $NCV_{i,y}$ and $EF_{CO2,i,y}$ should be used where available. If no such values are available, IPCC world-wide default values are preferable. In this PDD, the Net Calorific Value ($NCV_{i,y}$) of each type of fossil fuel used in the calculation comes from China Energy Statistic Yearbook 2014~2016. Emission factors ($EF_{CO2,i,y}$) of each type of fossil fuel come from IPCC 2006 default values.

The Simple OM Emission Factor ($EF_{grid,OMsimple,y}$) of the project is calculated on the basis of the fuel consumption data for electricity generation of the Northeast China Grid, not including those of low-operating cost and must-run power plants, such as wind power, hydropower and nuclear etc. These data are obtained from the China Electric Power Yearbook (2014~2016, published annually) and China Energy Statistical Yearbook (2014~2016). Based on these data, the Simple OM Emission Factor ($EF_{grid,OMsimple,y}$) of the Northeast China Grid is calculated as 1.1082 tCO_2e/MWh.

For the project, the renewable crediting period, i.e. 7*3 years, is adopted.

Step 5. Calculate the combined margin emission factor

In terms of vintages of data, project participants can choose between one of the following two options:

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 second crediting period should be used. 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.

Option 2 For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of the project activity or, if information up to year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex ante, as described in option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

The PDD chooses **Option 1**, which requires the project participant to calculate the Build Margin Emission Factor $EF_{grid,BM,y}$, *ex-ante* based on the most recent information available on units already built for sample group *m* at the time of PDD submission.

The sample group of power units *m* used to calculate the build margin should be determined as per the following procedure, consistent with the data vintage selected above:

(a) Identify the set of five power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently ($SET_{5\text{-units}}$) and determine their annual electricity generation ($AEG_{SET\text{-}5\text{-}units}$, in MWh);

(b) Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEG_{total}, in MWh). Identify the set of power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20 per cent of AEG_{total} (if 20 per cent falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) ($SET_{\geq 20 \text{ per cent}}$) and determine their annual electricity generation ($AEG_{SET\text{-}\geq 20 \text{ per cent}}$, in MWh);

(c) From $SET_{5\text{-units}}$ and $SET_{\geq 20 \text{ per cent}}$ select the set of power units that comprises the larger annual electricity generation (SET_{sample});

Otherwise:

(d) Exclude from SET_{sample} the power units which started to supply electricity to the grid more than10 years ago. Include in that set the power units registered as CDM project activity, starting with power units that started to supply electricity to the grid most recently, until the electricity

generation of the new set comprises 20 per cent of the annual electricity generation of the project electricity system (if 20 per cent falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) to the extent is possible. Determine for the resulting set ($SET_{sample-CDM}$) the annual electricity generation ($AEG_{SET-sample-CDM}$, in MWh);

If the annual electricity generation of that set is comprises at least 20 per cent of the annual electricity generation of the project electricity system (i.e. $AEG_{SET-sample-CDM} \geq 0.2 \times AEG_{total}$), then use the sample group $SET_{sample-CDM}$ to calculate the build margin. Ignore steps (e) and (f).

(e) Include in the sample group $SET_{sample-CDM}$ the power units that started to supply electricity to the grid more than 10 years ago until the electricity generation of the new set comprises 20 per cent of the annual electricity generation of the project electricity system (if 20 per cent falls on part of the generation of a unit, the generation of that unit is fully included in the calculation);

(f) The sample group of power units m used to calculate the build margin is the resulting set ($SET_{sample-CDM->10yrs}$).

However, in China, it is very difficult to obtain the data of the five existing power plants built most recently or the power plants capacity additions in the electricity system that comprise 20 per cent of the system generation (in MWh) and that were built most recently, since no data of plant specific generation and fossil fuel consumption is currently available in China. As none of the above options can be selected, the following deviations are adopted to calculate the BM:

First, to calculate the newly added installed capacity and the contribution component of other various power generation technologies, then calculate of the weight of newly added installed capacity of each power generation technology, and finally, to calculate BM emission factor using the commercially optimal efficiency level of each power generation technology.

According to the "Tool to calculate the emission factor for an electricity system", the build margin emissions factor ($EF_{grid,BM,y}$) is calculated as the generation-weighted average emission factor (tCO_2e/MWh) of all power units *m* during the most recent year *y* for which power generation data is available. The calculation equation is 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 (tCO_2e /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_2e /MWh)
m	= Power units included in the build margin
y	= Most recent historical year for which power generation data is available

Since the generating capacity of coal-fired, oil-fired and gas-fired technologies can't be separated from the existing statistical data, the following measures are taken for the calculation:

First, based on the available data of the latest year, determine the ratio of CO_2 emissions from coal, oil, and gas consumption for power generation to the total CO_2 emission; Second, to calculate the emission factor of the thermal power based on the weight of CO_2 emission from coal, oil, and gas, and the emissions factors using commercial technologies with optimal efficiency. And finally, to multiply the thermal emission factor with the portion of the thermal power comprising 20 per cent of the newly added capacity.

Sub-step 5.1. Calculation of weights of CO_2 emissions of solid, liquid and gaseous fossil fuels in total emissions for power generation.

$$\lambda_{Coal,y} = \frac{\sum_{i \in COAL,j} F_{i,j,y} \times NCV_{i,y} \times EF_{co_2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{co_2,i,j,y}} \quad (5)$$

$$\lambda_{Oil,y} = \frac{\sum_{i \in OIL,j} F_{i,j,y} \times NCV_{i,y} \times EF_{co_2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{co_2,i,j,y}} \quad (6)$$

$$\lambda_{Gas,y} = \frac{\sum_{i \in GAS,j} F_{i,j,y} \times NCV_{i,y} \times EF_{co_2,i,j,y}}{\sum_{i,j} F_{i,j,y} \times NCV_{i,y} \times EF_{co_2,i,j,y}} \quad (7)$$

Where:

$FC_{i,j,y}$	=	Amount of fossil fuel type i consumed in province *j* in year *y* (mass or volume unit)
$NCV_{i,y}$	=	Net calorific value (energy content) of fossil fuel type *i* in year *y* (GJ/t or GJ/m^3)
$EF_{CO2,i,j,y}$	=	CO_2 emission factor of fossil fuel type i in year *y* (tCO_2e/GJ)

Coal, Oil and Gas refer to the group of solid, liquid, and gaseous fossil fuels, respectively.

Sub-step 5.2: Calculation of Emission Factor of Relevant Thermal Power

$$EF_{Thermal,y} = \lambda_{Coal,y} \times EF_{Coal,Adv,y} + \lambda_{Oil,y} \times EF_{Oil,Adv,y} + \lambda_{Gas,y} \times EF_{Gas,Adv,y} \quad (8)$$

Where:

$EF_{Coal,Adv}$, $EF_{Oil,Adv}$ and $EF_{Gas,Adv}$ refer to the emission factors representing best technologies commercially available for coal, oil and gas fired power plants, respectively.

Sub-step 5.3: Calculate of BM of the grid

Using the share of different type of capacity in total capacity addition as weight, the weighted average of emission factors of different type capacity is calculated as the Build Margin emission factor $EF_{grid,BM,y}$ of Northeast China Power Grid.

$$EF_{grid,BM,y} = \frac{CAP_{Thermal,y}}{CAP_{Total,y}} \times EF_{Thermal,y} \quad (9)$$

Where:

$CAP_{Total,y}$	=	*The total newly added electricity generation capacity (MW);*
$CAP_{Thermal,y}$	=	The newly added electricity generation capacity of thermal power (MW)

Key parameters used to calculate BM emission factor include the low calorific value of each fossil fuel, the oxidation rate, the potential emission factors, and the efficiency of various power generation technologies. The data of low calorific value of each fossil fuel and their oxidation rate comes from China Energy Statistical Yearbook 2014~2016. The potential emission factors are sourced from *"2006 IPCC Guidelines for National Greenhouse Gas Inventories*" Table 1.3 and Table 1.4 of Page 1.21-1.24 in Chapter one, Volume 2 Energy.

According to the latest and available data at the time of this PDD submission, $EF_{grid,BM,y}$ *i*s calculated to be 0.3310 tCO_2e/MWh.

Step 6. Calculate 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:

(a) The project activity is located in: (i) a Least Developed Country (LDC); or in (ii) a country with less than 10 registered CDM projects at the starting date of validation; or (iii) a Small Island Developing States (SIDS); and

(b) The data requirements for the application of step 5 above cannot be met.

The PDD choose option A.

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

$$EF_{grid,CM,y} = \omega_{OM} \times EF_{grid,OM,y} + \omega_{BM} \times EF_{grid,BM,y} \quad (10)$$

Where:

$EF_{grid,BM,y}$	=	Build margin CO_2 emission for the project electricity system factor in year *y* (tCO_2e /MWh)
$EF_{grid,OM,y}$	=	Operating margin CO_2 emission factor for the project electricity system in year *y* (tCO_2e /MWh)
ω_{OM}	=	Weighting of operating margin emissions factor (%)
ω_{BM}	=	Weighting of build margin emissions factor (%)

The combined margin emissions factor $EF_{grid,CM,y}$ should be calculated as the weighted average of the Operating Margin emission factor ($EF_{grid,OM,y}$) and the Build Margin emission factor ($EF_{grid,BM,y}$), where ω_{OM}= 0.75 and ω_{BM} = 0.25 for wind project (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods. The ($EF_{grid,OM}$,y) and ($EF_{grid,BM,y}$) are calculated as described in Step 4 and 5.

$EF_{grid,CM,y}$ = 1.1082 tCO_2e/MWh *0.75+0.3310 tCO_2e/MWh *0.25 = 0.9139 (tCO_2e/MWh)

2. Project Emissions (*PE_y*)

According to ACM0002 (version 19.0), for most renewable power generation project activities, PE_y= 0.

3. Leakage (*LE_y*)

According to ACM0002 (version 19.0), no leakage is considered. The main emissions potentially giving rise to leakage are neglected.

4 Calculating the Emission Reduction (*ER_y*)

The annual emission reductions ERy for the project activity are calculated as the baseline emissions minus the project emissions and minus the leakage emissions. Being the project of a zero-emission activity the final GHG emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y \quad (11)$$

Where:

ER_y	=	Emission reductions in year *y* (tCO_2e/yr)
BE_y	=	Baseline emissions in year *y* (tCO_2e /yr)

PE_y = Project emissions in year *y* (tCO_2e yr)

B.6.2. Data and parameters fixed ex ante

(Copy this table for each piece of data or parameter.)

Data / Parameter	$EF_{grid,OM,y}$
Date unit	tCO_2e/MWh
Description	Operating margin emission factor for Northeast China Power Grid
Source of data	"2017 Baseline Emission Factors for Regional Power Grids in China" published by China DNA
Value(s) applied	1.1082
Choice of data or Measurement methods and procedures	Calculated as per the latest version of "Tool to calculate the emission factor for an electricity system" (version 07.0) by China DNA
Purpose of data	Calculation of $EF_{grid,CM,y}$
Additional comment	Calculated ex ante and fixed for the second crediting period

Data / Parameter	$EF_{grid,BM,y}$
Date unit	tCO_2e/MWh
Description	Build margin emission factor for Northeast China Power Grid
Source of data	"2017 Baseline Emission Factors for Regional Power Grids in China" published by China DNA
Value(s) applied	0.3310
Choice of data or Measurement methods and procedures	Calculated as per the latest version of "Tool to calculate the emission factor for an electricity system" (version 07.0) by China DNA
Purpose of data	Calculation of $EF_{grid,CM,y}$
Additional comment	Calculated ex ante and fixed for the second crediting period

Data / Parameter	ω_{OM}
Date unit	-
Description	Weighting of operating margin emissions factor
Source of data	"Tool to calculate the emission factor for an electricity system" (version 07.0)
Value(s) applied	0.75
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of $EF_{grid,CM,y}$
Additional comment	Calculated ex ante and fixed for the second crediting period

Data / Parameter	ω_{BM}
Date 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(s) applied	0.25
Choice of data or Measurement methods and procedures	-

Purpose of data	Calculation of $EF_{grid,CM,y}$
Additional comment	Calculated ex ante and fixed for the second crediting period

Data / Parameter	$EF_{grid,CM,y}$
Date unit	tCO_2e/MWh
Description	Baseline emission factor for Northeast China Power Grid
Source of data	"2017 Baseline Emission Factors for Regional Power Grids in China" published by China DNA
Value(s) applied	0.9139
Choice of data or Measurement methods and procedures	Calculated as per the latest version of "Tool to calculate the emission factor for an electricity system" (version 07.0) by China DNA
Purpose of data	Baseline emission calculation
Additional comment	Calculated ex ante and fixed for the second crediting period

B.6.3. Ex ante calculation of emission reductions

>>

As described in B.3., the emission reductions of the project are calculated as follows:

Baseline emissions

Base on the Feasibility Study Report (FSR), the annual generation (net of auxiliary power i.e. the on-site electricity usage for the operation of the wind farm) of the project is estimated as 103,885MWh.

$EF_{grid,OM,y}$=1.1082 tCO_2/ MWh

$EF_{grid,BM,y}$ =0.3310 tCO_2/ MWh

$EF_{grid,CM,y}$＝1.1082× 0.75 + 0.3310 × 0.25 = 0.9139 tCO_2/MWh

BE_y = 103,885× 0.9139=94,940 tCO_2e

The ex-ante baseline emission factor: **0.9139 tCO_2/ MWh**

Annual baseline emissions: **94,940 tCO_2e**

Project emissions

According to ACM0002 (version 19.0), for most renewable power generation project activities, PE_y= 0.

Leakage

According to ACM0002 (version 19.0), no leakage is considered. The main emissions potentially giving rise to leakage are neglected.

Project Emission Reductions

$ER_y = BE_y - PE_y$

The total annual baseline emissions are 94,940 tCO_2e.

The total annual project emissions are 0 tCO_2e.

The total annual leakage emissions are 0 tCO_2e.

$ER_y = BE_y - PE_y$ = 94,940– 0 = 94,940 tCO_2e
The annual emission reductions are estimated to be: 94,940 tCO_2e. The project activity is expected to achieve 664,580 tCO_2e of net emission reductions during the second 7-year crediting period.

B.6.4. Summary of ex ante estimates of emission reductions

Year	Baseline emissions (t CO_2e)	Project emissions (t CO_2e)	Leakage (t CO_2e)	Emission reductions (t CO_2e)
01/04/2019~31/03/2020	94,940	0	0	94,940
01/04/2020-31/03/2021	94,940	0	0	94,940
01/04/2021-31/03/2022	94,940	0	0	94,940
01/04/2022-31/03/2023	94,940	0	0	94,940
01/04/2023-31/03/2024	94,940	0	0	94,940
01/04/2024-31/03/2025	94,940	0	0	94,940
01/04/2025-31/03/2026	94,940	0	0	94,940
Total	664,580	0	0	664,580
Total number of crediting years	7			
Annual average over the crediting period	94,940	0	0	94,940

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Data/Parameter	$EG_{facility, y}$
Data unit	MWh/yr
Description	Quantity of net electricity generation supplied by the project to the Grid in year y.
Source of data	Calculated by the difference of $EG_{output,y}$ *and* $EG_{input,y}$
Value(s) applied	103,885 (ex ante)
Measurement methods and procedures	Calculated
Monitoring frequency	Continuous measurement and monthly recording
QA/QC procedures	Cross check measurement results with records for electricity
Purpose of data	Baseline emission calculation
Additional comment:	$EG_{facility,y}$ is determined according to the tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation'' (version 03.0). The parameter should be monitored using bi-directional energy meter or calculated as difference between (a) the quantity of electricity supplied by the project plant/unit to the grid and (b) electricity supplied by the grid to the project activity.

Data/Parameter	$EG_{output,y}$
Data unit	MWh
Description	The electricity delivered to the grid by the project in year y
Source of data	Measured by power meter M2 as main meter or M1 as back-up
Value(s) applied	103,885 (ex ante)
Measurement methods and procedures	Continuously measured and monthly recorded. The readings of the electricity meter will be continuously measured and monthly recorded. Data will be archived for 2 years following the end of the last crediting period by means of electronic and paper backup.
Monitoring frequency	Continuously measured and monthly recorded.
QA/QC procedures to be applied:	Metering equipment will be calibrated according to the relevant industry standards. Data measured will be cross checked by sales receipts or Electricity Transaction Notes (ETNs). Other QA/QC procedures in section B.7.3
Purpose of data	Baseline emission calculation
Additional comment:	-

Data/Parameter	$EG_{input,y}$
Data unit	MWh
Description	Electricity purchased from the grid by the project during year y
Source of data	Measured by power meter M2 as main meter or M1 as back-up
Value(s) applied	0 (ex ante)
Measurement methods and procedures	The readings of the electricity meter will be continuously measured and monthly recorded. Data will be archived for 2 years following the end of the crediting period by means of electronic and paper backup.
Monitoring frequency	Continuously measured and monthly recorded.
QA/QC procedures to be applied:	Metering equipment will be calibrated according to the relevant industry standards. Data measured will be cross checked by sales receipts or Electricity Transaction Notes (ETNs). Other QA/QC procedures in section B.7.3
Purpose of data	Baseline emission calculation
Additional comment:	-

B.7.2. Sampling plan

>>
Not applicable.

B.7.3. Other elements of monitoring plan

>>
The monitoring plan is to ensure the project monitoring data are complete, continuous, clear and exact for calculating the emission reduction.

1. The requirement of monitoring plan

- The monitoring plan provides the requirements and instructions for establishing and maintaining the appropriate monitoring systems for electricity generated by the project.
- Quality control of the measurements.
- Procedures for the periodic calculation of GHG emission reductions.
- Data storage and filing system.
- Preparing for the requirements of an independent, third party auditor/verifier.

This plan should be perfected according to actual conditions and requirements of DOE in order to ensure that the monitoring is credible, transparent and conservative.

2. Operational and organizational structure for monitoring

The monitoring of the emission reductions will be carried out according to the scheme shown in the figure B.2.

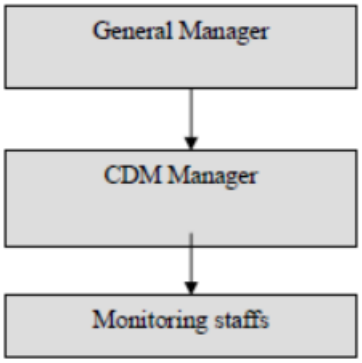

Figure B.2 The structure of CDM team

(1) Responsibility of the General Manager:

The general manager holds the overall responsibility for the monitoring process. All the affairs related to CDM project monitoring is managed by general manager. The general manager has the overall responsibility of checking data for its completeness and correctness.

(2) Responsibility of the CDM Manager:
The responsibilities of CDM manager include regular production management, internal audit, checking the operation reports, according to practical situation to ensure the accuracy of the data.

(3) Responsibility of the Monitoring staffs:
The monitoring personnel records and archive monitoring data, calculate the emission reduction and make the daily operation and maintenance.

3. Monitoring plan

The monitored data includes annual electricity delivered to NEPG by the project ($EG_{output,y}$) and electricity input from grid by the project ($EG_{input,y}$). All the monitored data will be measured by electricity meters and continuously recorded by online computer measurement system. See the location of each electricity meter in Figure B.3.
Both $EG_{output,y}$ and $EG_{input,y}$ are measured by a bi-direction electricity meter M2 (gateway meter), which precision is 0.2S. It is installed at Diaobingshan Yici Substation. The backup bi-direction electricity meter M1 with 0.2S precision is installed at the plant, which is owned by the project entity. These two electricity meters will be calibrated according to the relevant industry standards. For the $EG_{output,y}$ and $EG_{input,y}$, they will be cross check by the records of purchase electricity made by power grid company, and the conservative value will be used.

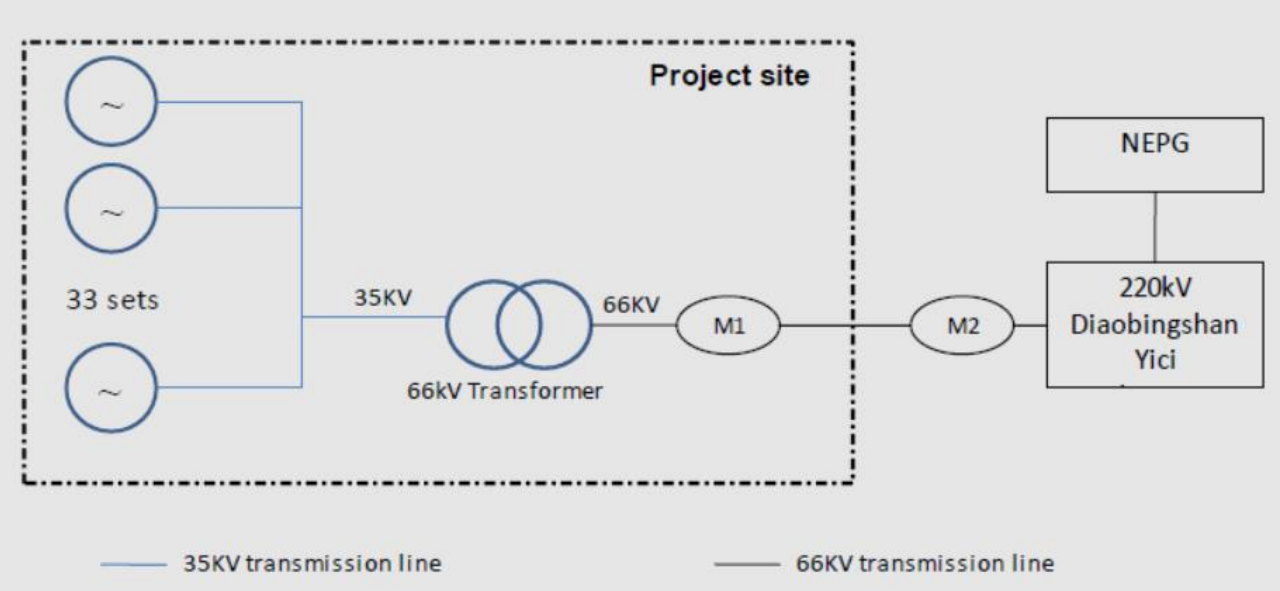

Figure B.3 Sketch for the location of the meters

4. Quality Assurance and Quality Control

(1) Calibration of meters
The main meter M2 is installed by local power-grid company and the on-site meter M1 is installed by the project owner together with the technicians of local power-grid company. An agreement should be signed between the project owner and the power grid company that defines the metering arrangements and the required quality control procedures to ensure accuracy. The project owner should prepare backup procedures to deal with any errors occurred on the power meters. The accuracy of electricity meter should meet the national requirement and calibration will be implemented by an independent accredit qualified third party at least once per year in order to ensure accuracy. Besides, the calibration record should be provided to the project owner.

(2) For emergency situation

When main meter M2 is calibrated or in malfunction, or some previous data monitored by the main meter is so inaccurate that beyond the allowable error range, the electricity generated by the project shall be determined by a corresponding backup meter unless a test reveals it is inaccurate. If the backup meter operates beyond the acceptable accuracy limit or functions improperly, a new calibrated meter should replace it. The starting time should be recorded carefully. The project owner will prepare an estimate of the correct reading acceptable by DOE.

5. Data management system

All data of the electricity meter, relevant documentation and the results of calibration, in electronic and written form, will be filed and stored in a central place by the project owner. The net quantity of electricity supplied to the facility by the project will be used in the calculation of emission reduction. Data records will be archived two years after end of crediting period or after last issuance of CERs.

6. Monitoring report

The CDM manager is responsible for the annual monitoring report, including the monthly upload power generation, download power generation and the emission reduction calculation result. The maintenance and calibration record will upload to the general manager for inner verification. Meanwhile, it will be recorded for the verification by the DOE.

The project owner will authorize special staff for the communication with the DOE for the verification process.

SECTION C. Start date, crediting period type and duration

C.1. Start date of project activity

>>

01/04/2010 (the date of WTG Purchasing Contract signed)

C.2. Expected operational lifetime of project activity

>>

20 years 0 month

C.3. Crediting period of project activity

C.3.1. Type of crediting period

>>

Renewable (7years×3)

C.3.2. Start date of crediting period

>>

01/04/2019 (the start date of second crediting period)

C.3.3. Duration of crediting period

>>

7 years,0 month

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

>>

An Environmental Impact Assessment (EIA) for the project was completed by Environment Science Institute of Shenyang, China and subsequently approved by the Liaoning Environmental Protection Bureau on March 1st, 2010 (Liaohuanshenbiao[2010]No.6).

For the project, the impact on the environment on construction and operation period will be contained the following aspects and the relative treatments are also shown.

Ecological aspect
On construction period, the land digging will cause some damage to the plant, earth and ecological environment and make the ecological protection function be weaken. Meanwhile, the installation and transportion of the devices will destroy the occupied land and plant. The on-site installation also has the same question and the waste solid will bring little influence to natural sight.

There is no endangered species in the project region and the wind farm is not in the route of migratory birds.In addition, the flight height of migratory birds is much higher than the sweeping wind height of the turbines.Therefore, the project has no negative influence on birds and endangered species.

For mitigating the influence on land plant, the project owner will take the following measures:
a. Make sure the implementation of the project will be confined to the land acquisition area and the construction staffs are asked to campaign in the area.
b. Avoid to building the cement road and the waste solid should be disposed on swale. The trucks should follow the routine for protecting the land.
c. The waste solid from the basing dig will be backfilled to the foundation of wind power generator. The redundant will be backfilled to the swale and be planted. When laying the electric cable, the waste soild will be backfilled.
d. After the construction, sprinkle water immediately to the land and landscape the road for the special examine.

On operation period, as there is no migratory birds flying over the project, so the project will have no impact on birds. Meanwhile, there are no school, hospital, industry and resident dwelt, the project will not have impact on the life to the local.

Air aspect
On construction period the main air pollution sources are dust generated from constructing building foundations, exhausted gas from vehicles and other equipments. The project owner will sprinkle water regularly. The soil dug from groundwork should be transported without delay. No overloading of the vehicles should be permitted to avoid any material falling down along the way.

On operation period, there are no air pollution sources.

Water aspect
On construction period, the waste water of the project is mainly the construction waste water and living sewage. The living sewage is tiny during the construcion period and will be treated with Sediment basin. The construction waste water is mainly the washing water from cars and equipments and the element of the waste water is suspended matter. As there is no poisonous and damage element in the waste water, it wll be no damage to environment.

On operation period, the main waste water is the living sewage. As there are few operation staff on site and the most activities are taking outside, so the waste water to the environment on operation period is very small. The waste water will be treated with septic tank and then reused as the farm water.

Noise
On construction period, the noise is mainly caused by vehicles and equipment operation. The construction site is 300m away from the villages and there are no school, hospital, industry and resident dwelling near to it. The main influenced people are the constructors. Some measures will be taken to reduce environmental impacts of noise to the maximum extent: choosing low-noise machines, enhancing construction management and job rotation to alleviate the influence.

On operation period, the noise of the project is mainly caused by the turbines. There are not any objectives sensitive to noise within 300m of the project site. So there is no negative impact on the

site. For the operation members on the wind farm, some noise partition measures will be taken to reduce the noise impacts.

Solid waste

On construction period, the main solid waste generated in the project is the excavated soil. The excavated soil will be backfilled and the other solids will be transported to a designated place.

On operation period, the main solid waste generated from the project is the domestic waste produced by the workers. It will be collected and transported to the designated waste disposal sites for centralized disposal. So there will be little environment impact caused by the solid waste.

Conclusion

Being a typical type of clean renewable energy, the project has no significant impacts on local environment and will greatly contribute to the sustainable development of the region.

D.2. Environmental impact assessment

>>

The project has no negative impacts on the environment. An Environmental Impact Assessment (EIA) for the project was approved on March 1st, 2010 by the Liaoning Province Environmental Protection Bureau.

SECTION E. Local stakeholder consultation

E.1. Modalities for local stakeholder consultation

>>

The project entity challenged the opinions of the 50 stakeholders by allocating a dedicated questionnaire of the project in Feb, 2010. The stakeholders include relevant government personnel, and local residents.

Contents of the questionnaire are as follows:

Basic information of the project:

Project title: Guoshuitou Diaobingshan Quanyangou Wind Power Project

Project owner: CTGNE Diaobingshan Wind Power Co.,Ltd.

Location: Xiaonan Town, Diaobingshan City, Tieling City, Liaoning Province, People's Republic of China

The project involves the installation and operation of 33 sets of wind turbine generators, each of which has a rated capacity of 1500kW, providing a total installed capacity of 49.5MW. The estimated annual on-grid electricity output of the project is 103,885 MWh. The generated electricity will be supplied to the Northeast China Power Grid (NEPG). The implementation of the project could reduce the emission of GHG and air pollutants like SO_2 and soot; mitigate the pressure of local power supply and promote local economic development during both construction and operation periods of the project.

E.2. Summary of comments received

>>

Total 50 pieces of questionnaire were sent out and all returned.

Vocation	Officer	Worker	Farmer	Teacher	Student	Other
Number	7	18	12	2	2	9
Potion	14%	36%	24%	4%	4%	18%
Gender	Male			Female		
Numer	40			10		
Portion	80%			20%		
Age	Below 25		Between 25 to 45		Above 46	
Number	5		32		13	
Portion	10%		64%		26%	

Academy Degree	Junior	Senior	Technical secondary school	High school
Number	12	21	15	2
Potion	24%	42%	30%	4%

According to the statistics,

- 100% of the responders are familiar with the wind farm and the wind power project;
- 100% of the responders are supportive to the project implementation and have no opinion;
- 35% of the responders consider the power supplying is inadequate and 55% consider not too much and 10% consider enough;
- 100% of the responders consider the wind power should be used.
- 90% of the responders consider the project construction can improve their life quality and 10%consider the project construction has no effect to their life;
- 92% of the responders consider the project construction has no impact on current environment and
- 8% consider the project construction has some impact on current environment.
- 98% of the responders consider the project construction will develop the economy and 2% consider the project construction has no impact on economy.

Most of parties concerned are convinced that the project is environment-friendly and agree with the project's implementation. Few respondent thought that the project implementation would cause some environment impact to them, but it would be tiny.

E.3. Consideration of comments received

>>

The stakeholders have no negative comments on the project. The project is also supported by local government. During the construction and operation period, PO will take the measures to avoid the negative impact by the project.

SECTION F. Approval and authorization

>>

The Letter of Approval from parties for the project participants is available at the following website: https://cdm.unfccc.int/Projects/DB/BVQI1330624301.93/view

Appendix 1. Contact information of project participants

Organization name	CTGNE Diaobingshan Wind Power Co.,Ltd.
Country	P.R.China
Address	Gaoligou Village, Diaobingshan City, Liaoning Province
Telephone	+86 10-58689542
Fax	
E-mail	aviva_ma@126.com
Website	
Contact person	Ma Jing

Organization name	Gunvor International B.V., Amsterdam, Geneva Branch
Country	Switzerland
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Telephone	
Fax	
E-mail	
Website	
Contact person	Timothy Legge

Appendix 2. Affirmation regarding public funding

Not applicable.

Appendix 3. Applicability of methodologies and standardized baselines

For further information, please refer to section B.2.

Appendix 4. Further background information on ex ante calculation of emission reductions

The baseline information for calculation of OM, BM and CM emission factors of Northeast China Power Grid is shown in the 2017 Baseline Emission Factors for Regional Power Grid in China issued by China's DNA on 20/12/2018.
Refer to http://qhs.mee.gov.cn/kzwsqtpf/201812/P020181220579925103092.pdf

Appendix 5. Further background information on monitoring plan

Not applicable.

Appendix 6. Summary report of comments received from local stakeholders

Not applicable.

Appendix 7. Summary of post-registration changes

Not applicable.

Document information

Version	*Date*	*Description*
11.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Make editorial improvements.
10.1	28 June 2017	Revision to make editorial improvement.
10.0	7 June 2017	Revision to: • Improve consistency with the "CDM project standard for project activities" and with the PoA-DD and CPA-DD forms; • Make editorial improvement.
09.0	24 May 2017	Revision to: • Ensure consistency with the "CDM project standard for project activities" (CDM-EB93-A04-STAN) (version 01.0); • Incorporate the "Project design document form for small-scale CDM project activities" (CDM-SSC-PDD-FORM); • Make editorial improvement.
08.0	22 July 2016	EB 90, Annex 1 Revision to include provisions related to automatically additional project activities.
07.0	15 April 2016	Revision to ensure consistency with the "Standard: Applicability of sectoral scopes" (CDM-EB88-A04-STAN) (version 01.0).
06.0	9 March 2015	Revision to: • Include provisions related to statement on erroneous inclusion of a CPA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Provisions related to the Host Party; • Make editorial improvement.

Version	*Date*	*Description*
05.0	25 June 2014	Revision to: • Include the Attachment: Instructions for filling out the project design document form for CDM project activities (these instructions supersede the "Guidelines for completing the project design document form" (Version 01.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the project activity in B.7.4 and Appendix 1; • Change the reference number from F-CDM-PDD to CDM-PDD-FORM; • Make editorial improvement.
04.1	11 April 2012	Editorial revision to change version 02 line in history box from Annex 06 to Annex 06b.
04.0	13 March 2012	Revision required to ensure consistency with the “Guidelines for completing the project design document form for CDM project activities” (EB 66, Annex 8).
03.0	26 July 2006	EB 25, Annex 15
02.0	14 June 2004	EB 14, Annex 06b
01.0	03 August 2002	EB 05, Paragraph 12 Initial adoption.

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