Project design document form
(Version 10.1)

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

BASIC INFORMATION	
Title of the project activity	Xinjiang Jimunai CGN Phase I Wind Farm Project
Scale of the project activity	☒ Large-scale ☐ Small-scale
Version number of the PDD	Version 04.0(updated addressing to renewal of crediting period)
Completion date of the PDD	02/01/2019
Project participants	Xinjiang Jimunai CGN Wind Power Co., Ltd.
Host Party	People's Republic of China
Applied methodologies and standardized baselines	Methodology: ACM0002 "Grid-connected electricity generation from renewable sources" (Version 19.0)
Sectoral scopes linked to the applied methodologies	Sectoral scope 1: Energy industries (renewable / non-renewable sources)
Estimated amount of annual average GHG emission reductions	90,027 tCO_2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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The Xinjiang Jimunai CGN Phase I Wind Farm Project (hereafter refers to the proposed project) is to utilize wind resources for electricity generation through the construction of a wind farm with the installation of 33 wind turbines with capacities of 1500 kW each, which amount to a total installed capacity of 49.5 MW in Jimunai County, Xinjiang Uygur Autonomous Region, P. R. China. The electricity generated from the proposed project will be sold to Xinjiang Uygur Power Grid, an integral part of the Northwest China Power Grid (NWPG).

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

As the Grid is dominated by fossil fuel-fired power generation, the establishment of the Project Activity is leading to greenhouse gas (GHG) emission reductions. The Project Activity was registered on 28/10/2011 (Ref.3919) and the first crediting period is 28/10/2011 – 27/10/2018. Following the methodology, the emission reductions of the second crediting period (28/10/2018-27/10/2025) are estimated to be on average 90,027 tonnes of CO_2 equivalent (tCO_2e) per year, and 630,189 tCO_2e over the chosen crediting period.

The proposed project makes contribution to the local sustainable development as follows:

1. GHG emission reduction
The proposed project activity will achieve greenhouse gas (GHG) emission reductions by reducing CO2 emissions, as grid-connected fossil fuel-fired power dominates in the NWPG.

2. Pollutants emission reduction through replacing fossil fuel combustion
The proposed project is to reduce grid-connected fossil fuel-fired power plants in the NWPG, and thus reduce fossil fuel consumption and avoid pollutants emission, such as sulphur dioxide and dust, brought by fossil fuel combustion. Therefore, the proposed project has obvious environmental benefit.

3. Employment opportunities
The conducting of the proposed project will offer job opportunities for local people. The temporary work includes assembly and installation of the wind turbines and the long-term work can be the maintenance of the facilities, etc.

4. Contribution to the Development of the local Region
The construction and operation of the project will be favourable to the economic growth of the local city with expected revenues.

A.2. Location of project activity

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The proposed project is located at the southwest of Jimunai County, Xinjiang Uygur Autonomous Region, P. R. China. The geographical coordinates of the proposed project is 86.0054°- 86.8443° east longitude and 47.5454°- 47.5796° north latitude. Figures 1 and 2 below show the geographical location of the proposed project.

Figure 1 Map showing the location of the Project

A.3. Technologies/measures

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The wind turbines will be supplied by a domestic manufacturer –Goldwind Co., Ltd. The proposed project uses domestic wind turbines. Therefore, it does not involve any technology transfer.

The main technical specifications of the wind turbines are provided in Table 1.

Table 1. Key Technology to be employed at the Project Wind Farm

Wind Turbine		
Item	Unit	Index
Model		77/1500
Rated capacity	kW	1500
Number of blades		3
Rotor diameter	m	77
Swept area	m^2	4656
Rotor speed	m/s	36.28/69.75
Cut-in speed	m/s	3.0
Rated wind speed	m/s	11.5
Cut-off speed	m/s	22
Height of hub	m	65
Generator		
Rated power	kW	1580
Rated voltage	V	620
Rated current	A	660
Lifetime	year	20

A 35kV/110kV substation will be set up at the project site. The electricity supplied by the proposed project will be delivered to the 35kV/110kV on-site substation via a 35kV transmission line, and then theelectricity supplied by the proposed project will delivered to Longwan Substation through 110kV transmission line. The electricity will be transmitted to the NWPG finally. The electricity supplied to the grid by the proposed project will be monitored through metering equipment (meter monitoring both electricity input and electricity output) at the on-site substation. The data will be also monitored and recorded at the on-site control centre using a computer system.

The proposed project will use domestic wind turbines. Hence, it does not involve technology transferred to the host parties.

A.4. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
People's Republic of China (host)	Xinjiang Jimunai CGN Wind Power Co., Ltd.	No

A.5. Public funding of project activity

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The Project Activity has not received public funding from Parties included in Annex I.

A.6. History of project activity

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The project was registered as CDM project on 28/10/2011, the reference no. is 5289. The PDD is renewal of crediting period. Therefore, it can be confirmed that:

(a) The proposed CDM project activity is neither registered as a CDM project activity nor included as a component project activity (CPA) in a registered CDM programme of activities (PoA);
(b) The proposed CDM project activity is not a project activity that has been deregistered.

And confirm that:
(a) The proposed CDM project activity was not a CPA that has been excluded from a registered CDM PoA;
(b) The proposed project is not a registered CDM project activity or a CPA under a registered CDM PoA whose crediting period has or has not expired (hereinafter referred to as former project) exists in the same geographical location as the proposed CDM project activity.

A.7. Debundling

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The proposed project is a large-scale project, therefore, not applicable.

SECTION B. Application of selected methodologies and standardized baselines

B.1. Reference to methodologies and standardized baselines

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The approved large-scale consolidated methodology applied in the project is ACM0002 “Grid-connected electricity generation from renewable sources” (Version 19.0, EB100, 2018). For more information regarding the methodology please refer to
http://cdm.unfccc.int/methodologies/DB/8W400U6E7LFHHYH2C4JR1RJWWO4PVN

The project activity also refers to:
1. “Tool for the demonstration and assessment of additionality (version 07.0.0)”.
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf
2. “Tool to calculate the emission factor for an electricity system” (Version 06.0).
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v6.pdf
3. Methodological Tool: “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).
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf

More information on the methodology and tools listed above is available at the following website:
http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

B.2. Applicability of methodologies and standardized baselines

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The approved methodology ACM0002 is applicable to the proposed project activity, because:

Applicability	Conclusion
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 proposed project is the installation of a Greenfield power plant;
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.	a) The proposed project is the installation of a wind power plant. b) Not applicable. The proposed project is a Greenfield plant and does not represent a capacity addition, retrofits, rehabilitations or replacement.
In case of hydro power plants, one of the following conditions shall apply:	Not applicable. The proposed project is the

(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/m2; 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/m2; 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 equation (3), is lower than or equal to 4 W/m2, 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/m2; (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.	installation of a wind power plant.
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 five years prior to implementation of CDM project activity.	Not applicable. The proposed project is the installation of a wind power plant.
The methodology is not applicable to the following: (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.	a) Not applicable. The proposed project does not involve switching from fossil fuels to renewable energy at the site of the proposed project. b) Not applicable. The proposed project is a wind power plant.
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 proposed project is the installation of a wind power plant and not a retrofits, rehabilitations or replacement or capacity additions.
Applicability conditions of “Tool to calculate the emission factor for an electricity system”, - Version 07.0	

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).	This condition is applicable. OM, BM and CM are estimated using the tool under section B.6.3 for calculating baseline emissions.
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 2: be met. Namely, the total capacity of off-grid Procedures related to off-grid power generation" should 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 proposed project 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.	The proposed project is located in China, a non-Annex I country. Therefore, this criterion is not applicable for the project activity.
Under this tool, the value applied to the CO_2 emission factor of biofuels is zero.	The proposed project is a grid connected wind power project/ unit and does not involve emission from biofuels. Therefore, this criterion is not applicable.

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

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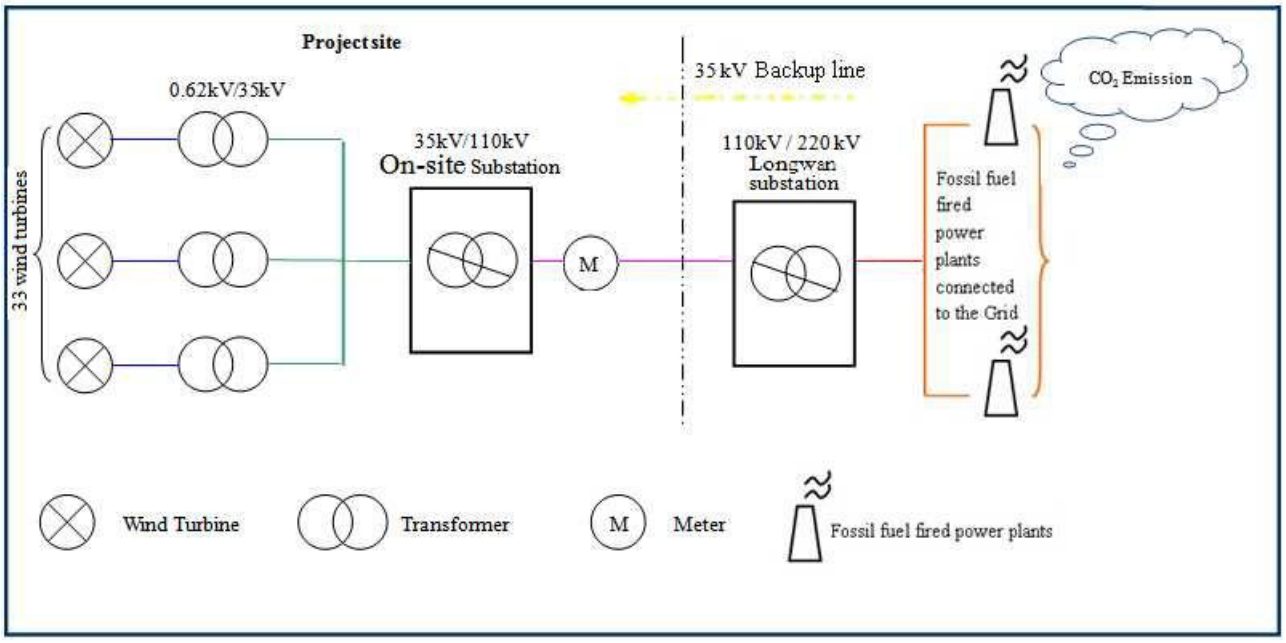
The spatial extent of the project boundary includes the project site and all power plants physically connected to NWPG. NWPG is an electricity system which is defined by the spatial extent of the power plants that can be dispatched without significant transmission constraints.

Using the boundary definitions of the Chinese DNA Bookmark not defined., NWPG consists of Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang power grids. The electricity transmission between different provinces in NWPG is very large and it is reasonable for the project to regard the project site and all power plants physically connected to NWPG as the project boundary.



The sources and types of GHG included in the project boundary are listed below.

Source		Gas	Included	Justification/explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO_2	Yes	Main emission source
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
Project activity	For dry or flash steam geothermal power plants, emissions of CH_4 and CO_2 from non-condensable gases contained in geothermal steam	CO_2	No	Not applicable to wind.
		CH_4	No	Not applicable to wind.
		N_2O	No	Not applicable to wind.
	For binary geothermal power plants, fugitive emissions of CH4 and CO2 from non-condensable gases contained in geothermal steam	CO_2	No	Not applicable to wind.
		CH_4	No	Not applicable to wind.
		N_2O	No	Not applicable to wind.
	For binary geothermal power plants, fugitive emissions of hydrocarbons such as n-butane and isopentane (working fluid) contained in the heat exchangers	Low GWP hydrocarbon/ refrigerant	No	Not applicable to wind.
	CO_2 emissions from combustion of fossil fuels	CO_2	No	Not applicable to wind.
		CH_4	No	Not applicable to wind.

Source		Gas	Included	Justification/explanation
	for electricity generation in solar thermal power plants and geothermal power plants	N_2O		Not applicable to wind.
	For hydro power plants, emissions of CH_4 from the reservoir	CO_2	No	Not applicable to wind.
		CH_4	No	Not applicable to wind.
		N_2O	No	Not applicable to wind.

A connected electricity system is defined as an electricity system that is connected by transmission lines to the project electricity system. Power plants within the connected electricity system can be dispatched without significant transmission constraints but transmission to the project electricity system has significant transmission constraint.

B.4. Establishment and description of baseline scenario

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The Project Activity is the installation of a new Greenfield power plant, and is not a capacity addition, retrofit, rehabilitation or replacement of existing grid-connected renewable power plant/unit. Therefore, the baseline scenario is prescribed in the methodology:

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

The selected methodology prescribes the baseline scenario, thus no further analysis is required. The combined margin is calculated in Section B.6 below.

According to the ACM0002(version 19.0) and Project Standard (version 02.0), the methodological tool "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" (version 3.0.1) is adopted to assess the continued validity of the baseline and to update the baseline. 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, as required by paragraph 49 (a) of the modalities and procedures of the clean development mechanism.

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

If the current baseline complies with all relevant mandatory national and/or sectoral policies which have come into effect after the submission of the project activity for validation or the submission of the previous request for renewal of the crediting period and are applicable at the time of requesting renewal of the crediting period, go to Step 1.2.

- There are no new national and/or sectoral policies that could affect the baseline scenario at the time of requesting renewal of the crediting period. The current baseline complies with all relevant mandatory national and/or sectoral policies. Hence in the absence of the project activity the electricity would still have been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

Step 1.2: Assess the impact of circumstances

Assess the impact of circumstances existing at the time of requesting renewal of the crediting period on the current baseline emissions, without reassessing the baseline scenario.

In the situation where the baseline scenario identified at the validation of the project activity was the continuation of the current practice without any investment, an assessment of the changes in market characteristics is required for the renewal of the crediting period.

- *The baseline scenario identified at the validation of the project activity was the continuation of the current practice without any investment. Baseline emissions are primarily derived from the fossil fuel power plants in the NWPG. The total generation produced by fossil fuel power plants accounts for 90% of total electricity generation in NWPG; and this percentage has not been changed significantly in recent 5 years. Therefore market characteristics do not have impact on the baseline emissions.*

Evaluate whether the conditions used to determine the baseline emissions in the previous crediting period are still valid. Assess the availability of new fuels or raw materials and the impact of electricity or fuel prices in the identification of the current practice for the baseline emissions.

- The conditions used to determine the baseline emissions in the previous crediting period are still valid. The availability of new fuels or raw materials or the level of fuel prices has no impact on the identification of the current practice for the baseline emissions. Presently the NWPG is dominated by the fossil fuel power plants. The availability of new fuels or raw materials or the level of fuel prices has no impact on the baseline emissions.

If the new circumstances make a continued validity of the current baseline not plausible, then the current baseline needs to be updated for the subsequent crediting period.

As there are no new circumstances that make a continued validity of the current baseline not plausible, the current baseline does not need to be updated for the second crediting period.

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

This sub-step should only be applied if the baseline scenario identified at the validation of the project activity was the continuation of use of the current equipment(s) without any investment and, the projects proponents or third party (or parties) would undertake an investment later due, for example, to the end of the technical lifetime of the equipment(s) before the end of the crediting period or the availability of a new technology.

Assess whether the remaining technical lifetime of the equipment that would have continued to be used in the absence of the project activity, as determined in the CDM-PDD or CDM-PDD-REN, exceeds the crediting period for which renewal is requested.

Take into consideration the market penetration of different technologies. Evaluate the penetration rate of different technologies that are available in the market and evaluate how they could affect the baseline.

- As determined in the CDM-PDD and CDM-PDD-REN, the baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources in NWPG, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”. The projects proponents or third party (or parties) would not undertake an investment later due. The combined margin calculation

automatically takes account of any issues regarding remaining technical lifetime or market penetration.

If the baseline scenario of the project activity is the continuation of use of the current equipment(s) without any investment and the projects proponents or third party(ies) will undertake an investment later, but before the end of a crediting period, then the current baseline needs to be updated for that crediting period or the crediting of emission reductions should be limited to the period before the baseline equipment would cease its operation.

Therefore, the current baseline does not need to be updated for the second crediting period.

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

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 activity 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.

If the application of Steps 1.1, 1.2, 1.3 and 1.4 confirmed that the current baseline as well as data and parameters are still valid for the subsequent crediting period, then this baseline, data and parameters can be used for the renewed crediting period. Otherwise, proceed to Step 2.

The original baseline scenario needs to be updated to incorporate the latest grid emission factor in accordance with the methodology.

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

This step is only applicable if any of the Steps 1.1, 1.2, 1.3 and/or 1.4 showed that the current baseline needs to be updated.

Step 2.1: Update the current baseline

Update the current baseline emissions for the subsequent crediting period, without reassessing the baseline scenario, based on the latest approved version of the methodology applicable to the project activity. The procedure should be applied in the context of the sectoral policies and circumstances that are applicable at the time of request for renewal of the crediting period.

As shown in step 1.1 above, in accordance with the procedures for renewal of the crediting period of a registered CDM project activity, the original baseline, as updated, remains valid taking new relevant national and/or sectoral policies and circumstances into account.

Step 2.2: Update the data and parameters

If the application of Step 1.4 showed that the data and/or parameter(s) that were only determined at the start of the crediting period and not monitored during the crediting period are not valid anymore, project participants should update all applicable data and parameters, following the guidance in Step 1.4.

As discussed above in step 1.4, the grid emission factor and all the values in its calculation are updated in section B.6.

Conclusion regarding the assessment of the validity of the original baseline scenario

In accordance with the procedures for renewal of the crediting period of a registered CDM project activity, the original baseline, as updated in accordance with step 2.2 in section B.6, remains valid taking new relevant national and/or sectoral policies and circumstances into account.

B.5. Demonstration of additionality

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Not applicable for the second crediting period.

In accordance with the procedures for renewal of the crediting period of a registered CDM project activity and the applied methodology, it does not require a reassessment of the baseline scenario or additionality, it is only required to assess whether the original project baseline is still valid or has been updated taking account of new data where applicable.

B.6. Estimation of emission reductions

B.6.1. Explanation of methodological choices

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1. 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. As a wind power plant, therefore, there are no project emissions according to the methodology:

$$PE_y = 0 \quad (1)$$

2. 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:

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y} \quad (2)$$

Where:

BE_y	=	The baseline emissions in year y (tCO_2/yr)
$EG_{PJ,y}$	=	The 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)

$EF_{grid,CM,y}$ = The combined margin CO_2 emission factor for grid connected power generation in year *y* calculated (tCO_2/MWh)

Calculation of $EG_{PJ,y}$

The calculation of $EG_{PJ,y}$ is different for: (a) Greenfield plants, (b) retrofits and replacements; and (c) capacity additions. The Project Activity is a Greenfield plant.

(a) Greenfield renewable energy power plants

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:

$$EG_{PJ,y} = EG_{facility,y} \quad (3)$$

Where:

$EG_{PJ,y}$ = The 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)

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

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

In line with the methodology, the baseline emission factor 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 steps defined in "*Tool to calculate the emission factor for an electricity system*" .

Details of the calculations and data follow the published data from the Chinese DNA[1], which uses official national statistics.

Step 1. Identify the relevant electricity systems

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 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 Northwest China Power Grid (NWCPG), consisting of the following provincial grids: Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang. There are no imports from connected systems.

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 defined as electricity imports while 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

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

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 in the enclosed EF calculation spreadsheet shows 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 simple operating margin emission rate of the exporting grid, determined as described in Step 4 section 6.4.1 of the Tool, if the conditions for this method, as described in Step 3 of the Tool, apply to the exporting grid; or
(c) The simple adjusted operating margin emission rate of the exporting grid, determined as described in Step 4 section 6.4.2 of the Tool; or
(d) The weighted average operating margin (OM) emission rate of the exporting grid, determined as described in Step 4 section 6.4.4 of the Tool.

- Following the calculations of the 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 statistical data available, Option I is chosen.

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 one of the following methods:

(a) Simple OM; or
(b) Simple Adjusted OM; or
(c) Dispatch data analysis OM; or
(d) Average OM

The simple OM method (Option a) can only be used if any one of the following requirements is satisfied:

(a) Low-cost/must-run resources[2] constitute less than 50% of total grid generation (excluding electricity generated by off-grid power plants) in: 1) average of the five most recent years, and the average of the five most recent years shall be determined by using one of the approaches described below; or 2) based on long-term averages for hydroelectricity production.

(i) Approach 1

$$Share_{LCMR} = \text{average}\left[\frac{EG_{LCMR_{y-4}}}{total_{y-4}}, \ldots, \frac{EG_{LCMR_y}}{total_y}\right]$$

(ii) Approach 2

$$Share_{LCMR} = \frac{average\left(EG_{LCMR_{y-4}}, \ldots, EG_{LCMR_y}\right)}{average\left(total_{y-4}, \ldots, total_y\right)}$$

Where:

$Share_{LCMR}$	=	The share of the low cost/must run resources (%)
EG_{LCMRy}	=	The electricity generation supplied to the project electricity system by the low cost/must run resources in year *y* (MWh)
$totall_y$	=	The total electricity generation supplied to the project electricity system in year *y* (MWh)
y	=	The most recent year for which data is available

(b) The average amount of load (MW) supplied by low-cost/must-run resources in a grid in the most recent three years is less than the average of the lowest annual system loads (LASL) in the grid of the same three years.

(iii)

- The approach 1 is chosen for calculation and low-cost/must-run resources constitute less than 50% of total grid generation in average of the five most recent years[3]. 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.

The date of the publication of the most recent official data for the calculation of the emission factor prior to the start of validation was 20/12/2018.

[2] Low-cost/must-run resources are defined as power plants with low marginal generation costs or dispatched independently of the daily or seasonal load of the grid. They include hydro, geothermal, wind, low-cost biomass, nuclear and solar generation. If a fossil fuel plant is dispatched independently of the daily or seasonal load of the grid and if this can be demonstrated based on the publicly available data, it should be considered as a low-cost/must-run.

[3] http://qhs.mee.gov.cn/kzwsqtpf/201812/P020181220579925103092.pdf

Power plants registered as CDM project activities should be included in the sample group that is used to calculate the operating margin if the criteria for including the power source in the sample group apply.

- Details of the calculations and data follow the published data from the Chinese DNA, which uses official national statistics. This data does not exclude CDM projects.

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

The Simple OM method (Option a) was chosen in Step 3 above.

(a) Simple OM

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 sources serving the system, not including low-cost/must-run power plants/units.

The simple OM may be calculated by one of the following options:

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).

Following the calculations of the DNA, Option B is chosen. The criteria for Option B are met:

(a) The necessary data for Option A is not available, as indicated in the calculations of the DNA; 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) Option I is chosen in Step 2.

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

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:

$$EF_{grid,OMsimple,y} = \sum_i (FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}) / EG_y \quad (4)$$

Where:

$EF_{grid,OMsimple,y}$ = The simple operating margin CO_2 emission factor in year *y* (tCO_2/MWh)
$FC_{i,y}$ = The amount of fuel type *i* consumed in the project electricity system in year *y* (mass or volume unit)
$NCV_{i,y}$ = The net calorific value (energy content) of fuel type *i* in year *y* (GJ/mass or volume unit)
$EF_{CO2,i,y}$ = The CO_2 emission factor of fuel type *i* in year *y* (tCO_2/GJ)
EG_y = The 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 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

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

Based on the data available, the three-year average operating margin emission factor is calculated as a full-generation-weighted average of the emission factors. Details of the calculations and data follow the published data from the Chinese DNA[4], which uses official national statistics.

$EF_{grid,OMsimple,y}$ = 0.9155 tCO_2/MWh

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

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

Option 1: 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.

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 electricity generation data is available, calculated as follows:

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

Where:

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

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

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

m = The power units included in the build margin

y = The most recent historical year for which electricity generation data is available

Due to the limited availability of data on individual power units, the published grid emission factor calculations from the Chinese DNA uses the approved deviation[5] to calculate the build margin emission factor. The deviation is applied as follows:

- Generation *capacity* is used in formula (5) above, instead of generation.
- The newly added generation capacity that has been added to the grid most recently, and that comprises 20 percent of total installed capacity in the latest year for which data is available is used as the sample group of power units m to calculate the build margin. This option comprises a larger sample than the five units built most recently.
- The efficiency level of the best technology commercially available in the provincial/regional or national grid of China is used, as a conservative proxy, to determine the CO_2 emission factor of thermal power plants using each fuel type.

Using this deviation, formula (5) can be re-written as follows:

[4] http://qhs.mee.gov.cn/kzwsqtpf/201812/P020181220579925103092.pdf

[5] M-DEV0004, DNV (07/10/2005), see http://cdm.unfccc.int/Projects/deviations/87512.

$EF_{grid,BM,y} = \sum_m (CAP_{m,y} \times EF_{EL,m,y}) / \sum_m CAP_{m,y} = \sum_m Share_{CAP,m,y} \times EF_{EL,m,y}$ (5-dev)

Where:

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

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

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

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

Where:

$EF_{thermal,y}$	=	The CO_2 emission factor of the best technologies commercially available thermal power plants in year *y* (tCO_2/MWh)
$EF_{m,Adv,y}$	=	The CO_2 emission factor of the best technologies commercially available power plants using fuel type m in year *y* (tCO_2/MWh)
$\lambda_{m,y}$	=	The share of emissions of fuel type m in year *y* (%)
m	=	The fuel type of thermal plant (coal/solid, oil/liquid, gas)
y	=	The most recent historical year for which data is available

Using the equation of option A2 from guidance in Step 4 section 6.4.1 of the Tool, the CO_2 emission factor of advanced power plants using fuel type m can be calculated as follows:

$EF_{m,Adv,y} = EF_{CO2,m,y} \times 3.6 / \eta_{m,y}$ (7)

Where:

$EF_{m,Adv,y}$	=	The CO_2 emission factor of the best technology commercially available power plants using fuel m in year *y* (tCO_2/MWh)
$EF_{CO2,m,y}$	=	The average CO_2 emission factor of fuel type m in year *y* (tCO_2/GJ)
$\eta_{m,y}$	=	The average net energy conversion efficiency of the best technologies commercially available power plants using fuel type m in year *y* (%)
m	=	The 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 using this methodology in the enclosed EF calculation spreadsheet:

$EF_{grid,BM,y}$ = 0.3232 tCO_2/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.

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

(a) Weighted average CM

The combined margin emissions factor is calculated as follows:

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

Where:

$EF_{grid,OM,y}$	=	The operating margin CO_2 emission factor in year y (tCO_2/MWh)
w_{OM}	=	The weighting of operating margin emissions factor (%)
$EF_{grid,BM,y}$	=	The build margin CO_2 emission factor in year y (tCO_2/MWh)
w_{BM}	=	The weighting of build margin emissions factor (%)

According to the Tool, the default values for w_{OM} and w_{BM} for wind projects in the first crediting period and the subsequent crediting period, which should be used, are: w_{OM} = 0.75 and w_{BM} = 0.25 (owing to their intermittent and non-dispatchable nature).

Based on these weights for the second crediting period, the combined margin emission factor is calculated, and fixed ex-ante for the duration of the second crediting period (conservatively rounded down to the fourth digit) as given below.

	CO_2 emission factor (tCO_2/MWh)	**Weighting (%)**
Operating margin (see step 4)	0.9155	75%
Build margin (see step 5)	0.3232	25%
Combined margin	0.7674	-

These parameters will be recalculated at any renewal of the crediting period.

Baseline emissions (BE_y) now can be calculated as the annual net generation of the Proposed Project Activity (EG_y) multiplied by the combined margin CO_2 emission factor ($EF_{grid,CM,y}$).

3. Leakage

No leakage emissions are considered in the methodology. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, and transport). These emissions sources are neglected.

4. Emission reductions

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y \quad (9)$$

Where:

ER_y	=	The emission reductions in year y (tCO_2e/yr)
BE_y	=	The baseline emissions in year y (tCO_2/yr)
PE_y	=	The project emissions in year y (tCO_2e/yr)

B.6.2. Data and parameters fixed ex ante

Data/Parameter	$FC_{i,y}$
Data unit	Mass or volume
Description	The amount of fossil fuel *i* consumed in the project/connected electricity system in year *y*
Source of data	China Energy Statistical Yearbook
Value(s) applied	Same as used by the DNA for the official emission factor calculations
Choice of data or measurement methods and procedures	Data accepted and used by the DNA for the official emission factor calculations.
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data/Parameter	$NCV_{i,y}$
Data unit	GJ/mass or volume unit
Description	Net caloric value of fossil fuel type *i* consumed in the project/connected electricity system in year *y*
Source of data	China Energy Statistical Yearbook
Value(s) applied	Same as used by the DNA for the official emission factor calculations
Choice of data or measurement methods and procedures	National average default values, accepted and used by the DNA for the official emission factor calculations.
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data/Parameter	$EF_{CO2,i,y}$
Data unit	tCO_2/GJ
Description	CO_2 emission factor of fossil fuel type i in year y
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value(s) applied	Same as used by the DNA for the official emission factor calculations
Choice of data or measurement methods and procedures	The IPCC default values at the lower level of 95% confidence interval are accepted and used by the DNA for the official emission factor calculations and are the default value in the tool.
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data/Parameter	EG_y
Data unit	MWh
Description	Net electricity generated and delivered in the project electricity system in year *y*
Source of data	China Electric Power Yearbook
Value(s) applied	Same as used by the DNA for the official emission factor calculations
Choice of data or measurement methods and procedures	Data accepted and used by the DNA for the official emission factor calculations.
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data/Parameter	$\eta_{fuel\text{-}type,y}$
Data unit	%
Description	Average net energy conversion efficiency of the best technologies commercially available in China using solid, liquid and gas fuels
Source of data	Chinese DNA
Value(s) applied	Same as used by the DNA for the official emission factor calculations
Choice of data or measurement methods and procedures	Data accepted and used by the DNA for the official emission factor calculations.
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data/Parameter	$Share_{CAP,m,y}$
Data unit	%
Description	Share of added generation capacity by plant type m in year *y*
Source of data	Chinese DNA
Value(s) applied	Same as used by the DNA for the official emission factor calculations
Choice of data or measurement methods and procedures	Data accepted and used by the DNA for the official emission factor calculations.
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data/Parameter	w_{OM}
Data 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	75
Choice of data or measurement methods and procedures	Follow the “Tool to calculate the emission factor for an electricity system” (Version 07.0,)
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

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(s) applied	25
Choice of data or measurement methods and procedures	Follow the “Tool to calculate the emission factor for an electricity system” (Version 07.0,)
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data/Parameter	$EF_{grid,OMsimple,y}$
Data unit	tCO_2/MWh
Description	Simple operating margin CO_2 emission factor in year *y*
Source of data	Calculated follow the "Tool to calculate the emission factor for an electricity system" (Version 07.0,)
Value(s) applied	0.9155
Choice of data or measurement methods and procedures	Calculated follow the "Tool to calculate the emission factor for an electricity system" (Version 07.0,)
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data/Parameter	$EF_{grid,BM,y}$
Data unit	tCO_2/MWh
Description	Build margin CO_2 emission factor in year *y*
Source of data	Calculated follow the "Tool to calculate the emission factor for an electricity system" (Version 07.0,)
Value(s) applied	0.3232
Choice of data or measurement methods and procedures	Calculated follow the "Tool to calculate the emission factor for an electricity system" (Version 07.0,)
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data/Parameter	$EF_{grid,CM,y}$
Data unit	tCO_2/MWh
Description	Combined margin CO_2 emission factor in year *y*
Source of data	Calculated follow the "Tool to calculate the emission factor for an electricity system" (Version 07.0,)
Value(s) applied	0.7674
Choice of data or measurement methods and procedures	Calculated follow the "Tool to calculate the emission factor for an electricity system" (Version 07.0,)
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

B.6.3. Ex ante calculation of emission reductions

>>

In accordance with the methodology, emission reductions are calculated as follows:

$ER_y = BE_y – PE_y$

Using the formulae presented in Section B.6.1., the baseline emissions are calculated from the net electricity supplied by the Project Activity to the grid and the combined margin emission factor of the grid. The annual net generation is estimated based on long-term averages in the Feasibility Study Report; the combined margin emission factor is calculated in section B.6.1. above. The ex-ante calculations of baseline emissions and emission reductions, therefore, are as follows:

$BE_y = EG_{facility,y} \times EF_{grid,CM,y} =$ 117,315 MWh/yr × 0.7674 tCO_2/MWh = 90,027 tCO_{2e}/yr

$ER_y = BE_y – PE_y =$ 90,027 tCO_{2e}/yr – 0 tCO_{2e}/yr = 90,027 tCO_{2e}/yr

The ex-ante calculations of estimated emission reductions are included in the ER calculation spreadsheet.

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)
28/10/2018-27/10/2019	90,027	0	-	90,027
28/10/2019-27/10/2020	90,027	0	-	90,027
28/10/2020-27/10/2021	90,027	0	-	90,027
28/10/2021-27/10/2022	90,027	0	-	90,027
28/10/2022-27/10/2023	90,027	0	-	90,027
28/10/2023-27/10/2024	90,027	0	-	90,027
28/10/2024-27/10/2025	90,027	0	-	90,027
Total	630,189	0	-	630,189
Total number of crediting years	7			
Annual average over the crediting period	90,027	0	-	90,027

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Data / Parameter	$EG_{facility,y}$
Unit	MWh
Description	Quantity of net electricity generation supplied to the grid by the proposed project to the Grid in year y.
Source of data	Electricity meter readings from the meters at the project site
Value(s) applied	117,315 MWh
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 last crediting period by means of electronic and paper backup. The accuracy of electricity meter will be 0.2s. The meter would be calibrated once a year according to the rules of Relative Technical Administrative Code of Electric Energy Metering (DL/T448-2000).
Monitoring frequency	Continuously measurement and monthly recording
QA/QC procedures	The net electricity supplied to the grid by the proposed project will also can be monitored and recorded at the central control room. The project operator is responsible for recording such data. Receipts for electricity sales will be kept for further verification.
Purpose of data	Calculation of baseline emissions
Additional comment	Quantity of net electricity generation supplied to the grid by the proposed project will be measured as electricity supplied to the grid by the proposed project ($EG_{export,y}$) minus imports ($EG_{import,y}$ and $EGi_{m\text{-}backup,y}$), $EG_{export,y}$, $EG_{import,y}$ and $EG_{im\text{-}backup,y}$ will measured by electricity meters as the following table shows

Data / Parameter	$EG_{export,y}$
Unit	MWh
Description	Electricity supplied to the grid by the proposed project in year y.
Source of data	Electricity meter reading (M1 as main meter, M2 as backup meter) at the on-site substation
Value(s) applied	N/A
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 last crediting period by means of electronic and paper backup. The accuracy of electricity meter will be 0.2s. The meter would be calibrated once a year according to the rules of Relative Technical Administrative Code of Electric Energy Metering (DL/T448-2000).
Monitoring frequency	Continuously measurement and monthly recording
QA/QC procedures	The electricity exported to the grid by the proposed project will be monitored and recorded at the central control room. The project operator is responsible for recording such data. Receipts for electricity sales will be kept for further verification.
Purpose of data	Calculation of baseline emissions
Additional comment	

Data / Parameter	$EG_{import,y}$
Unit	MWh
Description	Electricity purchased from the grid by the proposed project in year y.
Source of data	Electricity meter reading (M1 as main meter, M2 as backup meter) at the on-site substation.
Value(s) applied	N/A
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 last crediting period by means of electronic and paper backup. The accuracy of electricity meter will be 0.2s. The meter would be calibrated once a year according to the rules of Relative Technical Administrative Code of Electric Energy Metering (DL/T448-2000).
Monitoring frequency	Continuously measurement and monthly recording
QA/QC procedures	The electricity purchased from the grid will also can be monitored and recorded at the central control room. The project operator is responsible for recording such data. Receipts for electricity sales will be kept for further verification.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	$EG_{im\text{-}backup,y}$
Unit	MWh
Description	Electricity imported from the grid by the proposed project through the backup power line in the year y.
Source of data	Electricity meter reading (M3) at the project site.
Value(s) applied	N/A
Measurement methods and procedures	Continuously measurement and monthly recording. Data will be archived for 2 years following the end of the crediting period. The accuracy of electricity meter is 1.0. The metering equipments at the substation will be calibrated once a year according to relevant national regulatory standard.
Monitoring frequency	Continuously measurement and monthly recording
QA/QC procedures	Electricity imported from the grid through the backup line will be double checked according to electricity sales receipts.
Purpose of data	Calculation of baseline emissions
Additional comment	-

B.7.2. Sampling plan

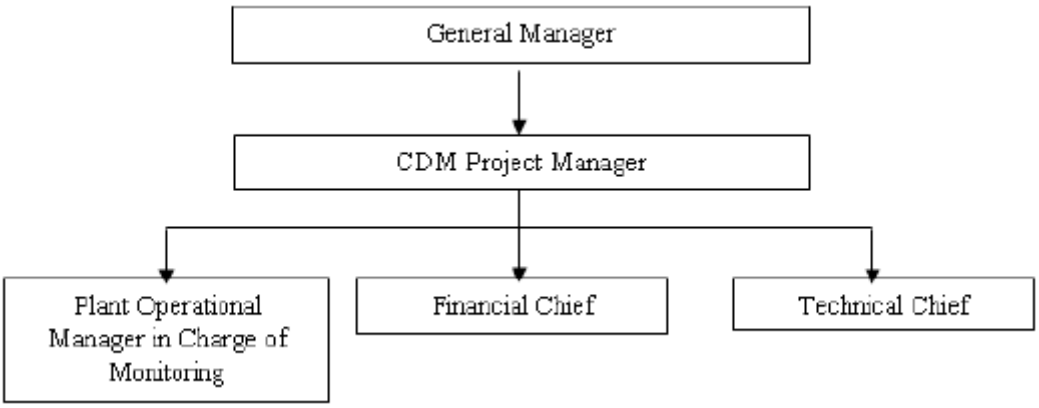
>>

Not applicable. None of the data and parameters monitored in section B.7.1 above are to be determined by a sampling approach.

B.7.3. Other elements of monitoring plan

>>

The General Manager of the project entity will appoint a CDM project manager or a chief officer. The operational and monitoring manager of the plant, the Financial Chief, and the Technical Chief are responsible for the collection of the data and information required in the monitoring plan. The collected information will be documented and sent to the CDM manager or responsible staffs of the project entity monthly. The CDM manager will in charge of the implementation of the Monitoring Plan and report to the General Manager of the company. The General Manager of the company will make the confirmations on monitoring, calculation data and reports.



1. Monitoring of the Electricity Delivered to the North China Power Grid by the Project

Grid-connected electricity generated by the proposed project will be monitored through metering equipment (a meter monitoring both electricity output generated from the proposed project and electricity input provided by the grid) at the on-site substation.

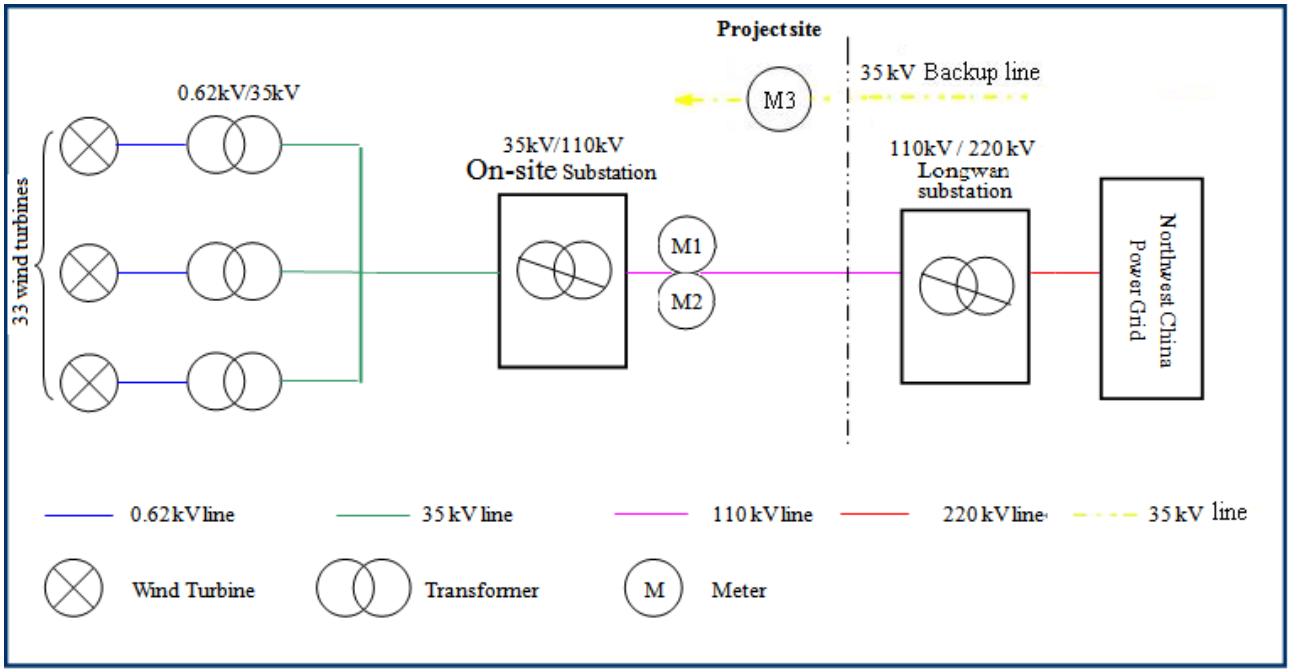
Monitoring equipments include two meters, the main meter (M1) and the backup meter (M2). All the meters are the multifunctional electricity meters (accuracy degree is 0.2s, bidirectional). M1 as the main meter will be used to monitor the electricity supplied to the grid by the proposed project and the electricity purchased from the Grid. M2 will monitor the electricity supplied to the grid and imported from the grid by the proposed project in case M1 is damaged. The main meter (M1) and backup meter (M2) are equipped at the high pressure site (110kV) of the 110kV on-site substation of the proposed project and the project owner is responsible for conducting the meters monitoring.

A backup power line will be used for supplied electricity in emergent case that the main power line fails to supply power. A meter (hereafter referred as meter M3) will be installed to measure the electricity imported via this line. This meter is owned, maintained and monitored by the local grid company. The accuracy of the meter will be 1.0.

The receipts of the electricity supplied to the power grid by the proposed project and the electricity purchased from the grid will be issued based on the power purchase agreement (PPA) signed between the project owner and the grid company and the readings from the main meter (M1).

The net electricity supplied by the proposed project is calculated as electricity supplied to the grid by the proposed project minus imports.

A diagram shows how parameters are monitored and the location of meters is presented as follows.



Having been cross-checked by the project owner and the Grid Company every month, the metered values of electricity exported and imported will confirmed by the Grid Company and then the Grid Company will give the related sales invoices.

Before the project is in operation, both the project owner and the grid company will check the equipments to ensure their work properly

2. Quality Assurance and Quality Control

The quality assurance and quality control procedures for recording, maintaining and archiving data are developed as part of this CDM project activity. This is an on-going process that will be ensured through the CDM activity in terms of the need for verification of the emissions on an annual basis according to this PDD and the CDM manual.

Monthly data of electricity supply and import will be approved and signed by the Manager before it is accepted and stored. This audit will check compliance with monitoring procedures in this monitoring plan. This internal audit will also identify potential improvements to procedures to improve monitoring and reporting in future years. The monitoring staff will also attend a training session organized by the CDM consultant. The purpose of training is to assure those staff are competent to conduct the monitoring plan, thus to make the monitored data accurate. Sales invoices will be used and kept for checking consistency of the recorded data.

The verification will use the main meter's data as long as the inaccuracy of the meter is within the permissible tolerance. The main procedures are as follows:

I According to the requirements of power purchase/sales agreement, the project owner and the gridcompany should collect the two meters' data periodically, and check them at the same time.

II The project owner supplies the electricity to the grid company, and provides an electricity sales invoice to the Grid Company. A copy of the invoice is stored by the project owner, together with a record of the payment by the grid company.

III When the electricity generated by this project cannot meet the electricity self-use requirement of the power plant, the grid company supplies the electricity to the project owner. The Grid Company provides an electricity sales invoice to the project owner and the invoice is stored by the project owner.

IV The project owner records the power supplied to and purchased from the grid, and hence calculate the net electricity supplied to the grid;

V The records of the main meter's data readings will be provided by the Grid company to the project owner monthly and for verification by the DOE.

Emergency Procedure:

If the fault of the main meter exceeds the allowable tolerance or its malfunction occurs, the grid-connected electricity generated by the proposed project will be resolved by following measures:

I Adopting the backup meter's data, unless a test by either party reveals it is inaccuracy;

II If the inaccuracy of the backup meter is not within the acceptable limits or it cannot work properly, the project owner and the grid company will discuss and calculate a conservative estimate of power supplied to the grid. A statement will be prepared indicating

► the background to the damage to metering equipment

► the assumptions used to estimate net electricity generation supplied to the grid for the days when no record was available

► the estimation of electricity supplied to the grid. The statement will be signed by representatives from the project owner and the grid company.

If any error is detected, the party owning the meter shall repair, recalibrate or replace the meter and give the other party sufficient notice to allow a representative to attend during any corrective activity.

The project entity will furthermore document all efforts taken to restore normal monitoring procedures.

2. Calibration of Meters & Metering

The metering equipment will be properly calibrated and checked annually for accuracy. The project owner will prepare backup procedures to deal with any errors occurred to the meters. The calibration records carried out by the third party designated should be provided to the proposed project owner and these records will be maintained.

Meters should be tested by a qualified organization co-agreed by the project owner and the grid company within 10 days after:

I The detection of the reading difference between the main meter and the backup meter that exceeds the allowable tolerance.

II The equipments malfunction caused by improper operation. All the calibration test records should be maintained safely for the verification.

3. Data Management System

To keep safely the record of the data collected during monitoring, this project will set up a complete data management system. The project will perfect the whole monitoring procedure by developing the CDM manual, tracking information from the primary source to the end-data calculations in paper document format. Physical documentation such as paper-based maps, diagrams and environmental assessment will be collated in a central place, together with this monitoring plan. All paper-based information will be stored by the proposed project owner and kept at least one copy.

At the end of each month, the monitoring data will be filed in a spreadsheet and stored electronically, and the paper-based printout should be also archived. Furthermore, the project owner collects the sales invoices for the electricity supplied to the grid as a cross-check, and compiled the monitoring report including the monitoring data and relevant evidence at the end of each crediting year.

All the data will be kept for two years following the end of the last crediting period.

SECTION C. Start date, crediting period type and duration

C.1. Start date of project activity

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>> 18/07/2010(the date when the first construction contract signed)

C.2. Expected operational lifetime of project activity

>>

21y-0m

C.3. Crediting period of project activity

C.3.1. Type of crediting period

>>

Renewable crediting period (second).

C.3.2. Start date of crediting period

>>

28/10/2018 (2nd crediting period)

C.3.3. Duration of crediting period

>>

7y-0m

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

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The environmental impact assessment for this project was carried out by Xinjiang Uygur Environmental Protection Technique Consulting Centre in August 2009 and approved by Xinjiang Uygur Environmental Protection Bureau on October 27th 2009 (xinhuanjianjianhan 212) and then renamed the EIA approval at May 18th 2010 (xinhuanpingjiahan 249). A summary of the report is illustrated as below:

Ambient air
The impact on ambient air quality of the proposed project is mainly from dust during the construction phase. The excavation work is the primary emission source, however, it is a ground source and the particle size is quite large so that dust will deposit quickly on the ground. Immediately replant the areas where construction has completed, and sprinkling water on the road frequently should be conducted. Therefore, the proposed project will not cause any threat on the quality of ambient air.

Impact from noise
There is some noise during the operation of wind turbines. The equipments and techniques with lower noise will be chosen to apply. Improvement on construction process and strengthening of equipment maintenance is emphasized. However, no village or resident exists near the project location within 200 meters. Consequently, the noise arising from operation and construction period has little impact to the surrounding environment.

Electromagnetic impact
The operation of the wind farm will generate electromagnetic pollution, whereas the pollution is slight. In addition, the project is very far from local residents and village. Therefore, the electromagnetic pollution to the surrounding environment is insignificant.

Impact from Solid waste
Solid wastes generated from the proposed project activity are excavated earth material and domestic solid waste. Part of the excavated earth material will be backfilled, and the rest will be used for land levelling and road construction near the project site. The domestic solid waste will be legally collected and treated together with the waste from local residents.

Impact from Wastewater
Wastewater is mainly domestic wastewater. Wastewater quantity is fairly small and treatment methods will be applied for on-site primary treatment, and then the wastewater will be treated together with the local wastewater. Small-scale septic tanks should be built on the site, through which the wastewater can meet the national second degree standard of water discharge after treatment. Therefore, the impact of wastewater is limited and mitigated.

Impact on natural environment
The lands permanently taken by wind farms are normally mountain ridges, where most of the vegetation is grass and shrub, without rare plants. No re-settlement is involved for construction of the project. The land taken by the proposed project is approximate of 20 mu (about3.29 acres) permanently and 85mu (about 14 acres) temporarily. In order to protect the landscape, vehicles are prohibited from driving on the landscape randomly and afforestation is required; hunting wild animals is strictly forbidden at the same time. Hence, the project construction has little impact on the mountain’s eco-environment.

Impact on birds
The fly height of birds is usually higher than 150m, which is about 50m higher than the height of wind turbines and birds usually can avoid obstacles as far as 100 to 200 meters away. In addition, the project site locates on mountainous area, with no lakes and marshes around, thus it is not a habitat for birds. Hence, the project construction and operation will have insignificant influence to the birds.

D.2. Environmental impact assessment

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The environmental impacts of the Xinjiang Jimunai CGN Phase I Wind Farm Project are not considered significant.

SECTION E. Local stakeholder consultation

E.1. Modalities for local stakeholder consultation

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The project developer has sent out questionnaires to the stakeholders in the local County Jimunai Community for the comments of the proposed project construction on 30/06/2010. 40 copies of questionnaire were distributed, and 38 pieces of reply were received. The recovery ratio is 95%. Among the interviewees, there were 35 farmers, 2 government official and1student. 15 of them have educational level of middle school or below middle school, 22 of high school and 1 of college.

An invitation notice for stakeholder comments was later issued by the project owner, representatives of local stakeholders, including governmental officials of the local county and local residents, etc attended the meeting in Jimunai County government meeting room on 02/07/ 2010 to discuss the questionnaires collected, introduce the project and further expressed their concerns or opinions. No negative opinion on construction of the project is heard and environmental considerations expressed by stakeholders are discussed on the meeting.

The questions regarding the proposed project were mainly as follows:
a) Is the current living and/or working environment quiet?
b) Do you currently experience electromagnetic interference when watching TV at home?
c) Are there any negative impacts of the proposed project on the everyday life of local residents?
d) Is the proposed project going to help improve the living and/or working environment?
e) Which is the environmental topic that concerns you the most during the construction and operation of the proposed project?
f) Do you support the proposed project?

E.2. Summary of comments received

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The summary of survey is listed as the following:
- 37 of them consider their current living and/or working environment quiet, only one person is unsure;
- 37 of them currently do not experience electromagnetic interference when watching TV at home nd only one person is unsure;
- 38 of them think there will not be any negative impacts on their daily life;
- 38 of them think the proposed project will help improve their living and/or working environment;
- Regarding the construction and operation of the propose project, 32 of them are most concerned ith the noise level, and 6 of them are most concerned with wastewater from the project;
- 38 of them support the implementation of the proposed project.

Conclusion:
The local community possesses basically positive comments on the effects of the proposed project. The nterviewees considered that local social, economic and environmental development would be eneficial from the proposed project. The response was overall supportive to the project mplementation.

E.3. Consideration of comments received

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As shown in the questionnaires, local residents were most concerned with noise level, and some of them ere concerned with wastewater. As discussed in the EIA report, these issues are well illuminated and nstructions were given to mitigate the potential impacts of these issues. With good implementation of the bove-mentioned measures by the project developer, the proposed project will not have significant egative impact on the local environment.

SECTION F. Approval and authorization

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The letters of approval for the Project Activity are available and had been uploaded with the registration.

Appendix 1. Contact information of project participants

Organization name	Xinjiang Jimunai CGN Wind Power Co., Ltd.
Country	China
Address	No.2 Building, area 12 of Advanced Business Park, No. 188 west of South 4th Ring Road
Telephone	+86 10 63705765
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E-mail	cgnwind@163.com
Website	
Contact person	Shi Lei

Appendix 2. Affirmation regarding public funding

Not applicable. There is no public funding from UNFCCC Annex 1 parties for the project.

Appendix 3. Applicability of methodologies and standardized baselines

The applicability of the selected methodology is described in B.2.

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

All the details on ex ante calculation of emission reductions are described in B.6.

Appendix 5. Further background information on monitoring plan

All the details on monitoring plan are described in B.7.

Appendix 6. Summary report of comments received from local stakeholders

Comments received from local stakeholders during registration validation and the corresponding response has been displayed at the project interface.

Appendix 7. Summary of post-registration changes

Not applicable.