Project design document form for CDM project activities (Version 05.0)	
Complete this form in accordance with the Attachment "Instructions for filling out the project design document form for CDM project activities" at the end of this form.	
PROJECT DESIGN DOCUMENT (PDD)	
Title of the project activity	Zhangbei Mijiagou 49.5 MW Windfarm Project
Version number of the PDD	1.13
Completion date of the PDD	26/08/2014
Project participant(s)	Zhangbei Guotou Wind Power Plant (the proposed project owner) Carbon Resource Management Ltd RWE Supply & Trading Netherlands B.V. Carbon Resource Management S.A.
Host Party	People's Republic of China
Sectoral scope and selected methodology(ies), and where applicable, selected standardized baseline(s)	Sectoral Scope 1: Energy Industries (renewable/non-renewable); ACM0002: Grid-connected electricity generation from renewable sources, Version 15.0 Standardized baseline(s): not applicable
Estimated amount of annual average GHG emission reductions	97,018 tCO_2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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The "Zhangbei Mijiagou 49.5MW Windfarm Project (UNFCCC Reference Number: 0845)" was registered as a CDM project on 22/03/2007. The first 7 year renewable crediting period is 22/03/2007-21/03/2014. The project participant, Zhangbei Guotou Wind Power Plant, is applying for a second crediting period from 22/03/2014 to 21/03/2021.

The purpose of the Zhangbei Mijiagou 49.5MW Windfarm Project (hereafter refered to as "the Project Activity", or "the project") is the generation of electricity from wind and the supply of this electricity to the North China Power Grid (the Grid, or NCPG). The Project Activity has installed and operates 33 wind turbines with a capacity of 1,500 kW each. Therefore, the project scenario is the installation of 49.5 MW of renewable energy power generation capacity, and the supply to the Grid of 105,800 MWh/y of electricity generated from renewable energy once fully operational. In accordance with the methodology there are no project emissions.

The baseline scenario, which is the same as the scenario existing prior to the implementation of the Project Activity, is, according to 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".

As the Grid is dominated by fossil fuel-fired power generation, the establishment of the proposed Project Activity will lead to greenhouse gas (GHG) emission reductions. Following the methodology, the emission reductions are estimated to be on average 97,018 tonnes of CO_2 equivalent (tCO_2e) per year, and 679,126 tCO_2e over the second renewable crediting period.

The project will assist China in stimulating and accelerating the commercialisation of grid-connected renewable energy technologies and markets which is an important objective of the Chinese government. The project will therefore help reduce GHG emissions versus the high-growth, coal-dominated business-as-usual scenario. Furthermore, the project will improve air quality and local livelihoods and promote sustainable renewable energy industry development. The specific goals of the project are to:

- generate electricity;
- reduce greenhouse gas emissions in China compared to a business-as-usual scenario;
- help to stimulate the growth of the wind power industry in China;
- create local employment opportunity during the assembly and installation of wind turbines, and for operation of the windfarm;
- reduce other pollutants resulting from the power generation industry, compared to a business-as-usual approach, such as SO_2 and soot.

A.2. Location of project activity

A.2.1. Host Party

>>

People's Republic of China (P. R. China)

A.2.2. Region/State/Province etc.

>>

Hebei Province

A.2.3. City/Town/Community etc.

>>
Zhangbei County, Zhangjiakou City

A.2.4. Physical/Geographical location

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The Zhangbei Mijiagou Windfarm project is located nearby the Mijiagou village, west of Zhangbei County, Zhangjiakou City in Hebei Province of P.R.China. Zhangbei is located in the northwest of Hebei Province, southeast of Mongolia tableland, and outside of ancient Great Wall. The altitude of the site ranges is from 1400m to 1800m above mean sea level. The geographic coordinate of the project site is longitude 114°32'E and latitude 41°08'N. The site is 220 km far away from Beijing. Figure 1 shows the location of Zhangbei county and the windfarm project.

Figure 1. Location of the Project Activity

A.3. Technologies and/or measures

>>
The purpose of the project is the generation of electricity from wind and the supply of this electricity to the NCPG.

- The project scenario is the installation of 49.5 MW of renewable energy power generation capacity, and the supply to the Grid of 105,800 MWh/y of electricity generated from renewable energy once fully operational.
- The baseline scenario, which is the same as the scenario existing prior to the implementation of the Project Activity, is, according to 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 Project Activity has installed and operated 33 wind turbines with a capacity of 1,500 kW each. The 1,500kW wind turbines by Nantong CASC Wanyuan Acciona Wind Turbine Manufacture Co., Ltd. were selected through competitive bidding. The provider of these turbines got some advanced techniques transferred from Spain to the host country.

The key technical specifications of the 1,500 kW wind turbine generator system are mentioned in table 1.

Table 1. Key technical specifications of the 1,500 kW wind turbine generator system

Parameter	Value
Operating Data	
Manufacturer	Nantong CASC Wanyuan Acciona Wind Turbine Manufacture Co., Ltd.
Type	IT-77/1500-C II
Rated power	1500 kW
Rotor diameter	76.662 m
Cut-in wind speed	3 m/s
Rated wind speed	11 m/s
Cut-out wind speed (average value for 10 min)	25 m/s
Survival wind speed (maximum value for 3 sec)	55.3 m/s
Expected lifetime	20 ys
Availability of equipments	≥95%
Blade	
Type	LM37.3P2
Blade material item	GFRP
Number of blades	3
Rotor rotate speed	11-22 rpm
Blade endline speed	73.9 m/s
Swept area	4,613 m^2
Gearbox	
Type	WINERGY TIANJING Tianjin WINERGU
Gear stages	3
Gearing ratio	1:65.72
Rated power	1,660 kW
Rated torque (put-in)	950 N.m
Generator	
Type	INDAR
Rated power	1,500 kW
Rated voltage	12,000 V
Rated current	72 A
Rated rotate speed	1,200 rpm
Insulation	H-H Class
Breaking system	
Main breaking system	Aerodynamic breaking
Second breaking system	SINGLE DISK
Yaw system	
Type/Design	LIEBHERR LAU LAGUN
Yaw controling speed	0.08 R.P.M. °/s
Type of anemograph & wind vane	NRG SONICA

Each wind turbine has a box transformer from 12kV to 35kV, and connects to the on site 110kV substation through an 50MVA transformer, and then connects to 220kV Zhangbei substation via 110kV transmission line, and then to NCPG.

The project shared one electricity meter (the main meter M) at the low-voltage side of 220kV substation with Zhangbei Manjing Windfarm Project (UNFCCC ref: 0233), so the main meter measures the total electricity exchanged between NCPG and the two wind farms. There are also one meter (meter M1) installed at the exit of 110kV Manjing project site substation and one meter (meter M2) installed at the exit of 110kV Mijiagou project site substation respectively to mesure electricity for calculating the to-grid electricity for each farm.

A.4. Parties and project participants

Party involved (host) indicates host Party	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
People's Republic of China (host)	Zhangbei Guotou Wind Power Plant	No
United Kingdom of Great Britain and Northern Ireland	Carbon Resource Management Ltd	No
Netherlands	RWE Supply & Trading Netherlands B.V.	No
Switzerland	Carbon Resource Management S.A.	No

A.5. Public funding of project activity

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The Proposed Project Activity does not receive public funding from Parties included in Annex I.

SECTION B. Application of selected approved baseline and monitoring methodology and standardized baseline

B.1. Reference of methodology and standardized baseline

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In accordance with the procedures for renewal of the crediting period of a registered CDM project activity, the latest approved version of the baseline and monitoring methodology, applied in the original CDM-PDD of the registered CDM project activity, is used.

(a) The selected methodology(ies):

- ACM0002 "Grid-connected electricity generation from renewable sources" (Version 15.0).

(b) Any tools and other methodologies to which the selected methodology(ies) refer:

- AM Tool 01 "Tool for the demonstration and assessment of additionality" (Version 07.0.0) (this tool is not applicable to the Project Activity as the additionality is not reassessed at renewal of the crediting period);
- AM Tool 07 "Tool to calculate the emission factor for an electricity system" (Version 04.0).
- AM Tool 11 "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)

B.2. Applicability of methodology and standardized baseline

>>
This methodology is applicable to grid-connected renewable 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).

Therefore, the methodology is applicable as the Project Activity is the installation of a Greenfield, grid-connected wind power plant (a).

The methodology is applicable under the following conditions:

Criteria	Applicability	Conclusion
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 is the installation of a wind power plant.	OK
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 Activity is a Greenfield plant and does not represent a capacity addition, retrofit, rehabilitation or replacement.	OK
In case of hydro power plants, one of the following conditions shall apply: (a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or (b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (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 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.	Not applicable. The Project Activity is a wind power plant.	OK
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	Not applicable. The Project Activity is a wind power plant.	OK

(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.		

The methodology is not applicable to the following:

Criteria	Applicability	Conclusion
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;	Not applicable. The Project Activity does not involve switching from fossil fuels to renewable energy at the site of the project activity.	OK
Biomass fired power plants	Not applicable. The Project Activity is a wind power plant.	OK

In addition, the applicability conditions included in the tools applied and referred to above apply as follows:

Tool / Criteria	Applicability	Conclusion
AM Tool 01 / Once the additionally tool is included in an approved methodology, its application by project participants using this methodology is mandatory.	The chosen methodology prescribes the use of this tool. There are no further applicability criteria for using the tool.	OK
AM Tool 07 / 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 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 Activity is the installation of a wind power plant supplying electricity to the Grid.	OK
AM Tool 07 / 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.	OK
AM Tool 11/ 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.	According to ACM0002, in the case of “Changes required for methodology implementation in 2nd and 3rd crediting periods”, project participants shall refer to the methodological tool “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period”.	OK

Any conditions for the application of the tools are addressed in the sections below where the tools

are used, sections B.5 and B.6, showing that the tools are applicable to the Proposed Project Activity. In addition, it is noted that:

- the Proposed Project Activity is a Greenfield project, therefore the "Combined tool to identify the baseline scenario and demonstrate additionality" is not required to identify the baseline scenario of the Proposed Project Activity; and
- the Proposed Project Activity is a wind power project, therefore there are no fossil fuels used for electricity generation, so there are no CO_2 emissions and leakage from combustion of fossil fuels, and thus the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" is not applicable to the Proposed Project Activity.

B.3. Project boundary

According to methodology ACM0002, the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the proposed project is connected to. For this project, all the electricity generated will be delivered to NCPG.

According to Chinese DNA's Notice on Baseline Emission Factor of China Regional Power Grid 2013[1], NCPG encompasses Beijing, Tianjin, Heibei, Shanxi, Shandong and Inner Mongolia Grids.

NCPG has imported electricity from Northwest Power Grid (NWPG) and Northeast Power Grid (NEPG).

The greenhouse gases and emission sources included in or excluded from the project boundary are shown in table below:

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.	CO_2	Yes	Main emissions source.
		CH_4	No	Minor emissions source.
		N_2O	No	Minor emissions source.
Project scenario	Not applicable- The proposed project is a zero-emissions renewable power source	CO_2	No	Minor emissions source.
		CH_4	No	Minor emissions source.
		N_2O	No	Minor emissions source.

[1] http://cdm.ccchina.gov.cn/archiver/cdmcn/UpFile/Files/Htmleditor/201310/20131024151336847.pdf

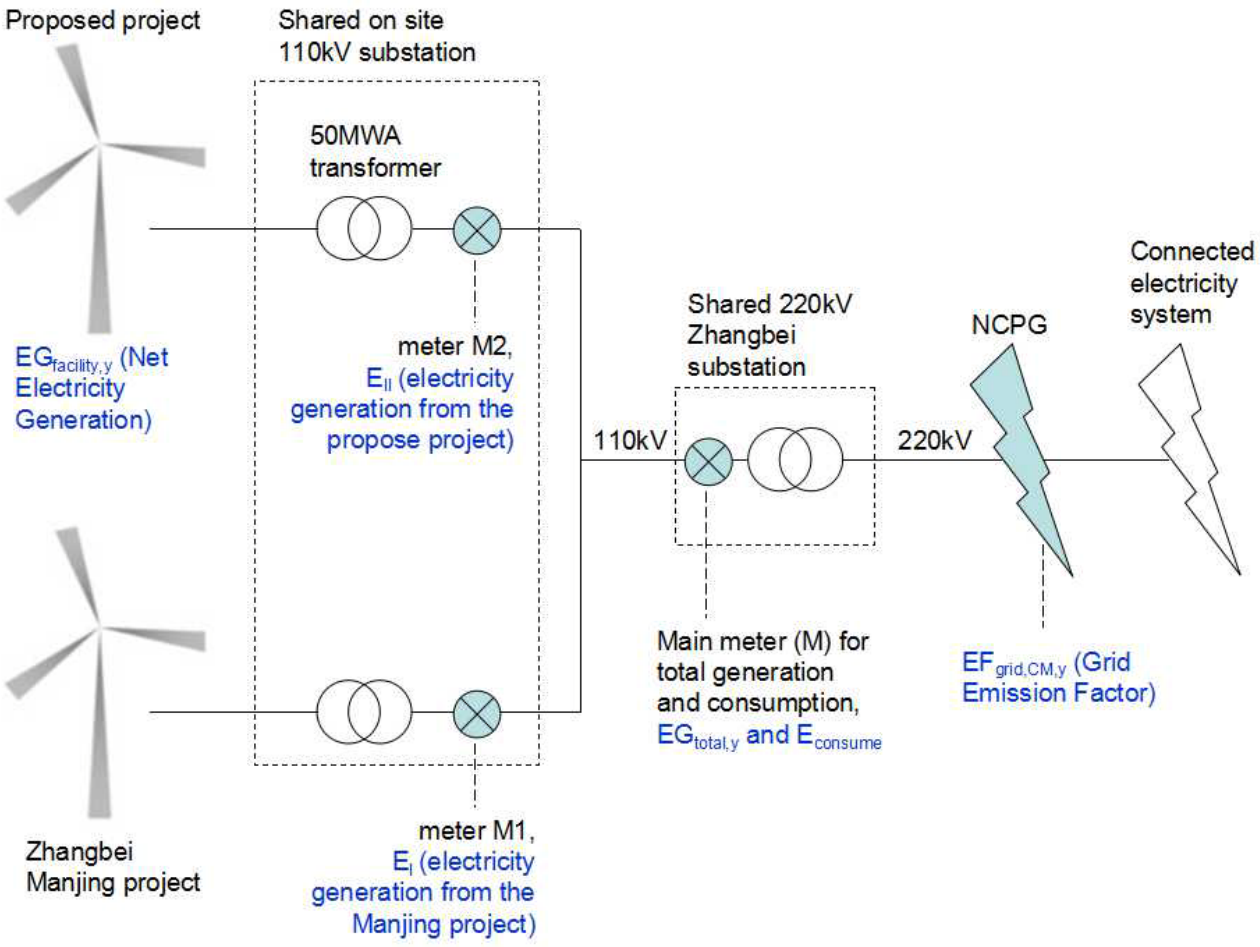

Figure 1. Diagram of Project Boundary

B.4. Establishment and description of baseline scenario

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The Project Activity is the installation of a new grid-connected renewable power plant, and is not a capacity addition, retrofit or replacement of existing grid-connected renewable power plant/unit. Therefore, the baseline scenario 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[2]. The combined margin calculated in Section B.6 below.

Update of the original baseline scenario

In accordance with the procedures for renewal of the crediting period of a registered CDM project activity[3], the continued validity of this baseline, as updated, is assessed for the impact of new relevant national and/or sectoral policies and circumstances on the baseline, using the Methodological Tool "Assessment of the validity of the original/current baseline and to update the baseline at the renewable of a crediting period"[4], using the steps below.

[2] Validation and Verification Standard (EB65 Annex 4), para 115.

[3] CDM Project Cycle Procedure, Version 07.0 (EB65, Annex 32).

[4] 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 (EB66, Annex 47).

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

The procedures for the renewal of the crediting period of a registered CDM project activity require assessing the impact of new relevant national and/or sectoral policies and circumstances on the baseline.

The validity of the current baseline is assessed using the following Sub-steps:

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. 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 NCPG. The total generation produced by fossil fuel power plants accounts for 96.23% of total electricity generation in NCPG in 2011, and this percentage has not been changed significantly in recent 5 years.[5] Therefore market characteristics do not otherwise impact 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 NCPG is dominated by the fossil fuel power plants. For example the total fossil fuel based power generation accounts for 96.23% of total grid generating output in NCPG in 2011. 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.

[5] Please see attached spreadsheet for details.

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 NCPG, 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 can not 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 has been 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 has been 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 has been 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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In accordance with the procedures for renewal of the crediting period of a registered CDM project activity, the original baseline scenario or additionality is not reassessed.

B.6. Emission reductions

B.6.1. Explanation of methodological choices

>>
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:

$PE_y = 0$ (1)

Baseline emissions

According to the methodology, *the baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are calculated as follows:*

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

Where:
BE_y is the baseline emissions in year y (tCO_2/yr).
$EG_{PJ,y}$ is 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).
$EF_{grid,CM,y}$ is the combined margin CO_2 emission factor for grid connected power generation in year y calculated using the "Tool to calculate the emission factor for an electricity system"[6] (tCO_2/MWh).

Calculation of $EG_{PJ,y}$

(a) Greenfield power plants

As the proposed 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:

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

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

Baseline emission factor

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 the "Tool to calculate the emission factor for an electricity system". Details of the calculations and data follow the published data from the Chinese DNA[7] and 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 systems. 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

[6] Version of the tool given in B.1.

[7] http://cdm.ccchina.gov.cn/zyDetail.aspx?newsId=46143&TId=161 Department of Climate Change, NDRC, 2013-9-17.

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 North China Power Grid (NCPG), consisting of six provincial grids: Beijing, Tianjin, Hebei, Shanxi, Inner Mongolia and Shandong.
- The connected electricity systems are the Northeast Power Grid (NEPG), consisting of three provincial grids: Jilin, Liaoning and Heilongjiang, and the North West Power Grid (NWPG), consisting of Shanaxi, Gansu, Qinghai, Ningxia, Xinjiang.

For the purpose of this tool, the reference system is the project electricity system. Hence electricity transfers from a connected electricity systems 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 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 (Simple OM), if the conditions for this method, as described in Step 3 below, 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 (Simple Adjusted OM) below; or
(d) The weighted average operating margin (OM) emission rate of the exporting grid, determined as described in Step 4 section 6.4.4 (Weighted Average OM) below.

- 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)

According to the tool, the calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods:

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

According to the Tool, *the simple OM method (option a) can only be used if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.*

- Low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production (see enclosed EF calculation spreadsheet). 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 first 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 data for the calculation of the emission factor was 17/09/2013.

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

(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).

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

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

According to the Tool, where Option B is used, *the simple OM emission factor is calculated based on the net electricity supplied to the grid by all power plants serving the system, not including low-cost / must-run power plants / units, and total fuel consumption of the project electricity system, as follows:*

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

Where:
$EF_{grid,OMsimple,y}$ is the simple operating margin CO_2 emission factor in year y (tCO_2/MWh);
$FC_{i,y}$ is the amount of fossil fuel type i consumed in the project electricity system in year y (mass or volume unit);
$NCV_{i,y}$ is the net calorific value (energy content) of fossil fuel type i in year y (GJ/mass or volume unit);
$EF_{CO2,i,y}$ is the CO_2 emission factor of fossil fuel type i in year y (tCO_2/GJ);
EG_y is 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 is all fossil fuel types combusted in power sources in the project electricity system in year y;
y is 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[8] to the grid. Electricity imports should be treated as one power plant m.

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

$EF_{grid,OMsimple,y} = 1.0302\ tCO_2/MWh$

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

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

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

[8] As described above, an import from a connected electricity system should be considered as one power source.

Following the deviation[9], the latest statistical data available (from the China Electric Power Yearbook) is used by the DNA to determine the most recent year from which the added generation capacity is equal to or just exceeds 20% of the latest statistical year. The added generation capacity is the sample group of power units m used to calculate the build margin. This option comprises larger annual generation than the five units built most recently.

The build margin emissions factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units m during the most recent year y for which 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:
$EF_{grid,BM,y}$ is the build margin CO_2 emission factor in year y (tCO_2/MWh);
$EG_{m,y}$ is the net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh);
$EF_{EL,m,y}$ is the CO_2 emission factor of power unit m in year y (tCO_2/MWh);
m is the power units included in the build margin;
y is the most recent historical year for which electricity generation data is available.

The CO_2 emission factor of each power unit m ($EF_{EL,m,y}$) should be determined as per the guidance in Step 4 section 6.4.1 for the simple OM, using Options A1, A2 or A3, using for y the most recent historical year for which electricity generation data is available, and using for m the power units included in the build margin.

Due to the limited availability of data on individual power units, the DNA uses the deviation above to calculate the build margin emission factor and the CO_2 emission factor of thermal power units as follows (with more detail presented in the EF calculation spreadsheet):

- The added generation capacity is taken instead of generation in formula (5) above, as with the determination of the group of plant included in the build margin. Therefore, the calculation following the deviation is as follows:

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

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

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

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

$$EF_{m,Adv,y} = EF_{CO2,m,y} \times 3.6 / \eta_{m,y} \quad (6)$$

Where:
$EF_{m,Adv,y}$ is the CO_2 emission factor of advanced power plants using fuel m in year y (tCO_2/MWh);

[9] Deviation for projects in China (DNV, 7 Oct 05), see http://cdm.unfccc.int/Projects/Deviations.

$EF_{CO2,m,y}$ is the average CO_2 emission factor of fuel type m in year y (tCO_2/GJ);
$\eta_{m,y}$ is the average net energy conversion efficiency of advanced power plants using fuel type m in year y (%);
m is the fuel type of thermal plant (coal/solid, oil/liquid, gas);
y is the relevant year as per the data vintage chosen.

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

$$EF_{thermal,y} = \sum_m (EF_{m,Adv,y} \times \lambda_{m,y}) \quad (7)$$

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

The build margin emission factor is calculated using this methodology:

$EF_{grid,BM,y} = 0.5777\ tCO_2/MWh$

Step 6. Calculate the combined margin emissions factor

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

(a) Weighted average CM; or
(b) Simplified CM.

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

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

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

Option a is the preferred option. Option b 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) <u>Weighted average CM</u>

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:
$EF_{grid,OM,y}$ is the operating margin CO_2 emission factor in year y (tCO_2/MWh);
w_{OM} is the weighting of operating margin emissions factor (%);
$EF_{grid,BM,y}$ is the build margin CO_2 emission factor in year y (tCO_2/MWh);
w_{BM} is the weighting of build margin emissions factor (%).

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

On the basis of these weights for the first crediting period, the combined margin emission factor is calculated, and fixed ex-ante for the duration of the first crediting period (conservatively rounded down to the fourth digit) as given below and presented in the enclosed EF calculation spreadsheet.

	CO2 emission factor (tCO_2/MWh)	Weighting (%)
Operating margin (see step 4)	1.0302	75%
Build margin (see step 5)	0.5777	25%
Combined margin	0.9170	

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 ($EF_{grid,CM,y}$).

Leakage

According to the methodology, no leakage emissions are considered. The emissions potentially arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport etc) are neglected.

Emission reductions

Emission reductions are calculated as follows:

$$ER_y = BE_y – PE_y \quad (9)$$

Where
ER_y is the emission reductions in year y (tCO_2e/yr);
BE_y is the baseline emissions in year y (tCO_2/yr);
PE_y is the 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 and parameter.)

Data / Parameter	**$FC_{i,y}$**
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	See enclosed EF calculation spreadsheet.
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	/

Data / Parameter	$NCV_{i,y}$
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	See enclosed EF calculation spreadsheet.
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	/

Data / Parameter	$EF_{CO2,i,y}$
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	See enclosed EF calculation spreadsheet.
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	/

Data / Parameter	EG_y
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	See enclosed EF calculation spreadsheet.
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	/

Data / Parameter	$\eta_{fuel\text{-}type,y}$
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	See enclosed EF calculation spreadsheet.
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	/

Data / Parameter	**$Share_{CAP,m,y}$**
Unit	%
Description	Share of added generation capacity by plant type m in year y
Source of data	Chinese DNA
Value(s) applied	See enclosed EF calculation spreadsheet.
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	/

Data / Parameter	**Import Electricity**
Unit	MWh
Description	Net import electricity from NEPG and NWPG to the NCPG
Source of data	Electricity Industry Statistical Document Summary
Value(s) applied	See enclosed EF calculation spreadsheet.
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	/

Following EB guidance, data that is calculated with equations provided in the methodology or default values specified in the methodology are not included in this compilation.

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 Proposed Project Activity to the grid and the combined margin emission factor of the grid. The annual net generation is estimated on the basis of 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:

$BE_y = EG_{facility,y} \times EF_{grid,CM,y} = 105{,}800\ MWh \times 0.9170\ tCO_2/MWh = 97{,}018\ tCO_2$.
$ER_y = BE_y - PE_y = 97{,}018 - 0 = 97{,}018\ tCO_2$.

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)
Year 1	97,018	0	0	97,018
Year 2	97,018	0	0	97,018
Year 3	97,018	0	0	97,018
Year 4	97,018	0	0	97,018
Year 5	97,018	0	0	97,018
Year 6	97,018	0	0	97,018
Year 7	97,018	0	0	97,018
Total	679,126	0	0	679,126
Total number of crediting years	7 years			
Annual average over the crediting period	97,018	0	0	97,018

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

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

Data / Parameter	$EG_{facility,y}$
Unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data	Calculated from meter readings E_I, E_{II}, EG_{total} and $E_{consume}$.
Value(s) applied	105,800
Measurement methods and procedures	The data are calculated as $EG_{facility,y} = EG_{total} \times E_{II} / (E_I + E_{II}) - E_{consume}$.
Monitoring frequency	N/A
QA/QC procedures	QA/QC procedures are implemented in monitoring EG_{total}, E_I, E_{II} and $E_{consume}$. Refer to the tables below for details. The data are calculated. Internal auditing reduced the risk of error caused by data transfer and calculation mistakes.
Purpose of data	Calculation of baseline emissions.
Additional comment	-

Data / Parameter	EG_{total}
Unit	MWh

Description	The total power generation to the grid of these two projects (Zhangbei Manjing Windfarm Project and Zhangbei Mijiagou Windfarm Project) at the 220kV Zhangbei substation metered by meter M with accuracy of 0.2s.
Source of data	Meter reading record of meter M at 220 kV Zhangbei substation.
Value(s) applied	N/A
Measurement methods and procedures	Bi-directional meter M measures the electricity exported and imported to the power grid by Zhangbei Manjing Windfarm Project and Zhangbei Mijiagou Windfarm Project. Meter readings are read and recorded by the Power Grid Company and reported to project owner monthly.
Monitoring frequency	Measuring continuously/Recording monthly
QA/QC procedures	The total power generation to the grid of the two projects is measured continuously by grid company at 220kV substation. The data were monthly recorded. ETNs from grid company were issued, stamped and sent to project owner. The meter was calibrated according to the national standard. The calibration is carried out annually by a qualified organization with the calibration report being supplied to the grid company and project owner.
Purpose of data	Calculation of baseline emissions.
Additional comment	/

Data / Parameter	E_I
Unit	MWh
Description	The electricity generation metered from the Zhangbei Manjing Windfarm Project
Source of data	Meter reading record of onsite zhangbei Manjing meter (M1) with accuracy of 0.5s.
Value(s) applied	N/A
Measurement methods and procedures	Separate meter M1 measures the electricity generation by Zhangbei Manjing Windfarm Project. Meter reading was read and recorded by onsite designated staff on a monthly basis.
Monitoring frequency	Measuring continuously/Recording monthly
QA/QC procedures	Electricity was measured continuously by the meter M1. Trained Staff from the Wind Farm recorded the meter readings manually on a monthly basis. Reading records were saved as both hard and electrical copy. The meter was calibrated according to the national standard. The calibration is carried out annually by a qualified organization with the calibration report being supplied to the grid company and project owner.
Purpose of data	Calculation of baseline emissions.
Additional comment	/

Data / Parameter	E_{II}
Unit	MWh
Description	The electricity generation from the Propose Project
Source of data	Meter reading record of onsite zhangbei mijiagou meter (M2) with accuracy of 0.5s.
Value(s) applied	N/A
Measurement methods and procedures	Separate meter M2 measures the electricity generation from the Proposed Project. Meter reading was read and recorded by onsite designated staff on a monthly basis.
Monitoring frequency	Measuring continuously/Recording monthly

QA/QC procedures	Electricity was measured continuously by the meter M2. Trained Staff from the Wind Farm recorded the meter readings manually on a monthly basis. Reading records were saved as both hard and electrical copy. The meter was calibrated according to the national standard. The calibration is carried out annually by a qualified organization with the calibration report being supplied to the grid company and project owner.
Purpose of data	Calculation of baseline emissions.
Additional comment	/

Data / Parameter	$E_{consume}$
Unit	MWh
Description	The total power consumption of these two projects (Zhangbei Manjing Windfarm Project and Zhangbei Mijiagou Windfarm Project) at the 220kV Zhangbei substation metered by the meter M with accuracy of 0.2s.
Source of data	Meter reading record of meterM at 220kV Zhangbei substation.
Value(s) applied	N/A
Measurement methods and procedures	Bi-directional meter M measures the electricity exported and imported to the power grid by Zhangbei Manjing Windfarm Project and Zhangbei Mijiagou Windfarm Project. Meter reading were read and recorded by the Power Grid Company and reported to project owner monthly.
Monitoring frequency	Measuring continuously/Recording monthly
QA/QC procedures	The total power consumption of the two projects was measured continuously by grid company at 220kV substation. The data were monthly recorded. ETNs from grid company were issued, stamped and sent to project owner. The meter was calibrated according to the national standard. The calibration is carried out annually by a qualified organization with the calibration report being supplied to the grid company and project owner.
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

>>

1. Introduction

The proposed Project adopts the latest version of the approved consolidated monitoring methodology ACM0002 to determine the emission reductions from the electricity supplied to NCPG from the windfarm project. This plan describes in more detail the process as set out in Section D of the PDD.

2. Responsibility

Overall responsibility for monitoring and carrying out the monitoring following this monitoring plan lies with Zhangbei Guotou Wind Power Plant.

Zhangbei Guotou Wind Power Plant had established CDM project management office and assigned dedicated people responsible for the monitoring and report the emission reduction due to the Project activity.

Zhangbei Guotou Wind Power Plant will train the staff carrying out the monitoring work.

3. Installation of meters

The project shared the main meter (M) at the low-voltage side of 220kV Zhangbei substation with Zhangbei Manjing Windfarm Project (UNFCCC ref: 0233), so the meter M measures the total electricity exchanged between NCPG and the two wind farms. There are also meter M1 installed at the exit of 110kV Manjing project site substation and meter M2 installed at the exit of 110kV Mijiagou project site substation respectively to measure electricity for calculating the to-grid electricity for each farm.

Zhangjiakou Electric Power Company takes independent responsibility to operate the 220kV sub-station and read the meter M at 0:00 every day and reports to Zhangbei Mijiagou Windfarm monthly. The data gained from the meter M is the total power supply (EG_{total}) to the grid and the total power consumption ($E_{comsume}$) from the grid by the two projects. The data gained from meter M1 is E_I. The data gained from meter M2 is E_{II}. So, the electricity delivered by Zhangbei Mijiagou Windfarm (EG_{II}) can be calculated as:

$$EG_{II} = EG_{total} \times \frac{E_{II}}{E_I + E_{II}} \quad (10)$$

Therefore, the net electricity supplied to the grid by the Project ($EG_{facility,y}$) can be calculated as:

$EG_{facility,y} = EG_{II} - E_{consume} = EG_{total} \times E_{II} / (E_I + E_{II}) - E_{consume}$ (11)

4. Calibration

The metering equipment are calibrated and checked annually for accuracy. The accuracy of meter M is 0.2s, and the accuracy of meter M1 and M2 is both 0.5s. The power supplied to NCPG registered by the meters alone will suffice for the purpose of billing and emission reduction verification as long as the error in the meters is within the agreed limits.

Calibration is carried out by a qualified organization with the calibration report being supplied to Zhangbei Mijiagou Wind Farm, and these records will be maintained by Zhangbei Mijiagou Wind Farm.

All meters shall be jointly inspected and sealed on behalf of the parties concerned and shall not be interfered with by either party except in the presence of the other party or its accredited representatives.

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

Should any previous months reading of the main meter be inaccurate by more than the allowable error, or otherwise functioned improperly, the power supplied to NCPG shall be determined by (a) first, by reading meter M2, unless a test by either party reveals it is inaccurate; (b) if the meter M2 is not with acceptable limits of accuracy or operation is performed improperly the Zhangbei Mijiagou Wind Farm and NCPG shall jointly prepare an reasonable and conservative estimate of the correct reading, and provide sufficient evidence that this estimation is reasonable and conservative when DOE undertakes verification; and (c) if NCPG and Zhangbei Mijiagou Wind Farm fail to agree then the matter will be referred for arbitration according to agreed procedures.

5. Monitored data

During the second seven operating years, EG_{total}, $EG_{consume,}$ EG_{I} and EG_{II} will be monitored and recorded following the procedures above.

6. Quality control

Monthly net generation data will be approved and signed off by appointed stuff before it is accepted.

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

7. Data management system

Physical document such as paper-based maps, diagrams and environmental assessments will be collated in a central place, together with this monitoring plan. In order to facilitate auditors' reference of relevant literature relating to Zhangbei Mijiagou Wind Farm project, the project material and monitoring results will be indexed. All paper-based information will be stored by the technology department of Zhangbei Mijiagou Wind Farm and all the material will have a copy for backup.

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

8. Verification

Zhangbei Mijiagou Windfarm will facilitate the verification through providing the DOE with all required necessary information at any stage.

B.7.4. Date of completion of application of methodology and standardized baseline and contact information of responsible persons/ entities

>>
Date of completion of application of methodology and standardized baseline: 26/08/2014
Contact information of responsible person/entity:
Ms. Lv Xin
CECEP Wind Power Corporation
F12, Building A, Jieneng Mansion, Xizhimen North Str., Haidian District, Beijing 100082
P.R.China.
Email: lvxin@cecwpc.cn

SECTION C. Duration and crediting period

C.1. Duration of project activity

C.1.1. Start date of project activity

>>
20/03/2007 (first wind turbine commission start date)

C.1.2. Expected operational lifetime of project activity

>>
21 years 0 month

C.2. Crediting period of project activity

C.2.1. Type of crediting period

>>

Renewable crediting period (second[10]).

C.2.2. Start date of crediting period

>>
22/03/2014

C.2.3. Length of crediting period

7 years 0 month

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

>>
Environmental Impact Assessment (EIA) for the Zhangbei Mijiagou Windfarm project has been completed by the Hebei Academy of Engineering Consulting assigned by the Project owner, and has been approved by the Environmental Protection Bureau of Hebei Province. Here is a summary of the EIA.

1 The analysis of the environment impact in the construction period

The main environmental impacts during the construction period are impact of flying dust on grassland, impacts on vegetation, animals, water and soil loss and atmospherical environment, noise and solid waste:

- The flying dust to be produced in construction period is not much. With the good quality of grassland ecological system within this area, flying dust can be absorbed by the ecological system, and will not impact on the normal growth of the grassland.
- The amount of land temporarily used is 50,900 m^2. The temporary equipment in the construction will be removed and the ground will be cleared up after the construction is completed, so that the land can be used again. The vegetation cover spoiled due to land temporarily used will regenerate in 3-5 years.
- Since the construction period is only 9 months, distance between the construction sites is as far as 400-500m, and the undisturbed grasslands that are connected with each other exist, the project construction will not have big impact on local animals.
- Spatial extent of water and soil loss impact is restricted within the project area. Due to the local soil and rock characteristic and series of control measurements to be adopted, this impact will disappear once the vegetation restores to some extent after the construction period.
- The diffusion condition of the surrounding atmosphere is good. Furthermore, appropriate measurements such as timely watering can effectively reduce the impact on the atmosphere by flying dust.
- All the construction work is carried out during day time. The noise level of all kinds of equipments is from 70-95dB. This is within the acceptable levels for the distance to the nearest habitation (500m).
- The waste soil 33,600 m^3 and other solid waste from the construction will be carried away in time, and sealed up with soil covering.

2 The analysis of the environment impact in operation period

The main environmental impacts in operation period are impacts on landuse, birds, natural vision, and noise, potential magnetic radiation and waste emissions:

- The land occupied by the wind farm is all non-cultivable wasteland, and the permanently occupied land is little. Therefore, the project has little impact on the production and livelihood of the local villagers.
- The wind farm is not located in the main habitat of migratory birds, and neither on the main migration way of birds. Therefore, the project will not have bad impact on birds.

[10] The first crediting period is 22/03/2007 to 21/03/2014.

- The wind farm will form a dynamic landscape and become a tourism resource with the theme of high technology and environment protection, which will be helpful for the development of local tourism.
- The operating noise level of 1500kW turbine is from 96-104dB, no essential impacts are caused in the range of 500 meters outside as noise has been greatly weakened, and it drops down to 45dB 500m away. Furthermore the resident regions are 500m away from the windfarm, so the noise does not influence the residential districts nearest to the site.
- The magnetic radiation intensity from the operation of the wind farm is low, and furthermore the wind farm is far away from the residential districts. Therefore, the health of residents and local electrical equipment will not be impacted.
- The waste water and garbage from the daily office work and life during the operation period is little, and will have little impact on the environment.

D.2. Environmental impact assessment

>>
The windfarm project will have very little impact on the local environment, therefore, the project is feasible from the aspect of environment protection.

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

>>
In April 2006, there were consultations carried out by staff from Zhangbei Guotou Wind Power Plant. with the local government, which represents the local community. The consultations resulted in a clear support letter for the Project from the local government – see E.2. below.

And also, in April 2006, staff from Zhangbei Guotou Wind Power Plant carried out a survey of the local villagers and residents in the area, the result of the survey indicated the support to the project. A summary of the survey—see E.2. below.

E.2. Summary of comments received

>>
Following is a translation of the letter received from the local government.

Comments from Local Government about the Zhangbei Mijiagou Wind Farm Project

Zhangbei Mijiagou Windfarm project is located in Mijiagou village, Zhangbei county, Hebei province. The construction and operation of the windfarm project will be helpful to fully utilize the local rich wind resources. As a green power project, it will improve the environment and reduce the carbon dioxide emission. The project not only comply with the industry policies, but also play an important role in creating employment opportunities and push forward relevant industries. The development of the wind farm will contribute to the sustainable development of this underdeveloped region.
As the local government, we will fully support the development of Zhangbei Mijiagou Windfarm project.

The People's Government of Zhangbei County
April, 2006
Stamp

Following is a summary of the Local Survey. The survey forms are available from the developer.

A 1 page questionnaire was designed to be easy to fill in and had the following sections:

Project introduction
Respondent's basic information and education level
Questions on:

Is their environment of living, studying and working quiet?
Will the project have positive benefits to their livelihood?
What are the concerns they have with respect to the project—noise, air pollution or equipment safety?
Do they think the project construction will have impact on their livelihoods?
Do they think the project will bring inconvenience to their lives?
Do they agree with the development of the Project?

The survey had a 100% response rate and the following is a summary of the key findings (The questionnaires were sent to 40 households):

Respondents' basic information and education level

Item	Content	Number	Percentage/%
Gender	Male	32	**80**
	Female	8	**20**
Age	Under 20	2	**5**
	20－45	30	**75**
	45－60	8	**20**
	60 above	0	**0**
Education	Elementary School	4	**10**
	Middle School	35	**87.5**
	College	1	**2.5**
Occupation	Worker	18	**45**
	Farmer	16	**40**
	Businessman	2	**5**
	Student	**4**	**10**

Survey Result of Stakeholders %

Do you agree with the development of the Project?	**Yes**	**No**	**Don't care**
	93	0	**7**
What are the **main** concerns you have with respect to the project	Equipment	Air pollution	**Noise**
	90	5	**5**
Is your environment of living, studying and working quiet?	Quiet	Not noisy	**Noisy**
	60	**38**	**2**
Will the project have positive benefits to your livelihood?	Yes	No	Not clear
	30	0	70
Do you think the project construction will have impact on your livelihoods?	Yes	No	Not clear
	20	80	0
Do you think the project will bring inconvenience to your lives?	Yes	No	Not clear
	12	88	0

Conclusions from the survey
The survey shows that the Project has strong local support amongst the local people, as further evidenced by the local government support letter. The main issues seem to be equipment safety and air pollution (occuring mainly during construction period). The developer will focus on the equipment safety issue not only in the construction period but also in the operation period. The developer will reduce the possibility of air pollution through appropriate environment protection

measurement that can control the flying dust. So all these concerns are maybe perceived problems rather than real ones. However the developer will enforce all measurements to keep a pleasant environment for local people and if any problem occurs, they will find a best way to solved it.

E.3. Report on consideration of comments received

>>
The villagers and local government are all supportive of the Project and to date there has been no need to modify the due to the comments received.

The project developer has a overall environment- friendly plan during the project construction and operation (see above EIA).

SECTION F. Approval and authorization

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

- - - - -

Appendix 1. Contact information of project participants and responsible persons/ entities

Project participant and/or responsible person/ entity	☒ Project participant ☐ Responsible person/ entity for application of the selected methodology (ies) and, where applicable, the selected standardized baselines to the project activity
Organization name	Zhangbei Guotou Wind Power Plant
Street/P.O. Box	/
Building	Jieneng Mansion, No.42 Xizhimen North Street, Haidian District
City	Beijiing
State/Region	/
Postcode	100082
Country	People's Republic of China
Telephone	+86-10-62248705
Fax	+86-10-62248700
E-mail	cdm@cecwpc.cn
Website	/
Contact person	Chen Dongjuan
Title	/
Salutation	Ms.
Last name	Chen
Middle name	/
First name	Dongjuan
Department	/
Mobile	/
Direct fax	+86-10-62248700
Direct tel.	+86-10-62248705
Personal e-mail	chendongjuan@cecwpc.cn

Project participant and/or responsible person/ entity	☒ Project participant ☐ Responsible person/ entity for application of the selected methodology (ies) and, where applicable, the selected standardized baselines to the project activity
Organization name	Carbon Resource Management Ltd.
Street/P.O. Box	49 St. James's Street, London SW1A 1JT, UK
Building	
City	London
State/Region	
Postcode	SW1A 1JT
Country	United Kingdom of Great Britain and Northern Ireland
Telephone	+44 207 016 1420
Fax	+44 207 016 1421
E-mail	deliveries@carbonresource.com
Website	

Contact person	John Martin
Title	/
Salutation	Mr.
Last name	John
Middle name	
First name	Martin
Department	
Mobile	
Direct fax	+44 207 016 1421
Direct tel.	+44 207 016 1420
Personal e-mail	deliveries@carbonresource.com

Project participant and/or responsible person/ entity	☒ Project participant ☐ Responsible person/ entity for application of the selected methodology (ies) and, where applicable, the selected standardized baselines to the project activity
Organization name	Carbon Resource Management S.A.
Street/P.O. Box	Boulevard du Pont d'Arve 28 / P.O. Box 384
Building	
City	Geneva 4
State/Region	
Postcode	1211
Country	Switzerland
Telephone	+41 22 328 08 51
Fax	+41 22 328 08 52
E-mail	deliveries@carbonresource.com
Website	
Contact person	John Green
Title	/
Salutation	Dr
Last name	Green
Middle name	
First name	John
Department	
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	

Project participant and/or responsible person/ entity	☒ Project participant ☐ Responsible person/ entity for application of the selected methodology (ies) and, where applicable, the selected standardized baselines to the project activity
Organization name	RWE Supply and Trading Switzerland B.V.
Street/P.O. Box	1 Rue de Jargonnant, Geneva, 1207
Building	

City	Geneva
State/Region	
Postcode	
Country	Switzerland
Telephone	+41 22 918 3065
Fax	+41 22 918 3399
E-mail	carbon@rwe.com
Website	
Contact person	Sebastian Wurster
Title	
Salutation	Mr.
Last name	Wurster
Middle name	
First name	Sebastian
Department	
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	

Appendix 2. Affirmation regarding public funding

Not applicable.

Appendix 3. Applicability of methodology and standardized baseline

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

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

The information on the ex ante calculation of emission reductions is described in B.6 and the enclosed EF and ER calculation spreadsheet.

Appendix 5. Further background information on monitoring plan

The information used in the development of the monitoring plan is described in B.7.

Appendix 6. Summary of post registration changes

Not applicable.

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Attachment. Instructions for filling out the project design document form for CDM project activities

1. General instructions

1. When designing a project activity and completing the CDM-PDD-FORM, in addition to applying the "CDM project standard" (Project standard), the selected approved baseline and monitoring methodology(ies) (hereinafter referred to as the selected methodology(ies)) and, where applicable, the selected approved standardized baseline(s) (hereinafter referred to as the selected standardized baseline(s)), consult the "Rules and Reference" section of the UNFCCC CDM website < http://cdm.unfccc.int/ >. This section contains all regulatory documents for the CDM, such as standards (including methodologies, tools and standardized baselines), procedures, guidelines, clarifications, forms and the "Glossary of CDM terms".

2. When documenting changes occurred to the project activity after its registration in accordance with applicable provisions relating to the post registration changes process, prepare two versions of the PDDs using the CDM-PDD-FORM, one in clean version and the other indicating the changes in track-change.

3. In addition to the provisions in paragraph 2 above, provide a summary of the changes, including the reasons for the changes and any additional information relating to the changes, in Appendix 6 below.

4. Where a PDD contains information that the project participants wish to be treated as confidential/proprietary, submit documentation in two versions:

   (a) One version where all parts containing confidential/proprietary information are made illegible (e.g. by covering those parts with black ink) so that the version can be made publicly available without displaying confidential/proprietary information;

   (b) A version containing all information that is to be treated as strictly confidential/proprietary by all parties handling this documentation (designated operational entities (DOEs) and applicant entities (AEs); Board members and alternate members; panel/committee and working group members; external experts requested to consider such documents in support of work for the Board; the secretariat).

5. Information used to: (a) demonstrate additionality; (b) describe the application of the selected methodology(ies) and, where applicable, the selected standardized baseline(s); and (c) support the environmental impact assessment; is not considered proprietary or confidential. Make any data, values and formulae included in electronic spreadsheets provided accessible and verifiable.

6. Complete the CDM-PDD-FORM and all attached documents in English, or contain a full translation of relevant sections in English.

7. Complete the CDM-PDD-FORM using the same format without modifying its font, headings or logo, and without any other alteration to the form.

8. Do not modify or delete tables and their columns in the CDM-PDD-FORM. Add rows of the tables as needed. Add additional appendices as needed.

9. If a section of the CDM-PDD-FORM is not applicable, explicitly state that the section is left blank intentionally.

10. Use an internationally recognized format for presentation of values in the CDM-PDD-FORM, for example use digits grouping in thousands and mark a decimal point with a dot (.), not with a comma (,).

11. Complete the CDM-PDD-FORM deleting this Attachment "Instructions for filling out the project design document form for CDM project activities".

2. Specific instructions

1. Indicate the following information on the cover page:
   (a) Title of the project activity;
   (b) Version number of the PDD;
   (c) Completion date of the PDD (DD/MM/YYYY);
   (d) Project participant(s);
   (e) Host Party;
   (f) Sectoral scope, selected methodology(ies) and, where applicable, selected standardized baseline(s);
   (g) Estimated amount of annual average GHG emission reductions.

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

1. Provide a brief description of the project activity in accordance with applicable provisions related to the description of project activity in the Project standard.
2. Also provide a brief description of (in a couple of paragraphs):
   (a) The scenario existing prior to the implementation of the project activity including, where applicable, the type of facility where the project activity will take place or replace (e.g. sugar mill, swine farm, iron smelter, etc.);
   (b) The baseline scenario, as identified in section B.4 below.
3. The full description of the technologies and measures, project boundary and baseline scenario are to be provided in sections A.3, B.3 and B.4 below.
4. If the baseline scenario is the same as the scenario existing prior to the implementation of the project activity, there is no need to repeat the description of the scenarios, but only to state that both are the same.
5. Provide the estimate of annual average and total GHG emission reductions for the chosen crediting period.
6. Include a brief description of how the project activity contributes to sustainable development (not more than one page).
7. The UNFCCC CDM website presents all methodologies linked to sectoral scopes as well as standardized baselines. The CDM Methodology Booklet also classifies methodologies by sectoral scope and type of project activities and lists standardized baselines.

A.2. Location of project activity

A.2.1. Host Party

A.2.2. Region/State/Province etc.

A.2.3. City/Town/Community etc.

A.2.4. Physical/Geographical location

1. Provide details of the physical/geographical location of the project activity, including information allowing the unique identification of this project activity and a map. Do not exceed one page for the description of location.

A.3. Technologies and measures

1. Describe the technologies and measures to be employed and/or implemented by the project activity, including a list of the facilities, systems and equipment that will be installed and/or modified by the project activity. This includes:
   (a) A list and the arrangement of the main manufacturing/production technologies, systems and equipment involved. Include in the description information about the age and average lifetime of the equipment based on manufacturer's specifications and industry standards, and existing and forecast installed capacities, load factors and efficiencies. The monitoring equipments and their location in the systems are of particular importance;
   (b) Energy and mass flows and balances of the systems and equipment included in the project activity;
   (c) The types and levels of services (normally in terms of mass or energy flows) provided by the systems and equipment that are being modified and/or installed under the project activity and their relation, if any, to other manufacturing/production equipment and systems outside the project boundary. The types and levels of services provided by those manufacturing/production systems and equipment outside the project boundary may also constitute important parameters of the description. Clearly explain how the same types and levels of services provided by the project activity would have been provided in the baseline scenario.
2. Also provide a list of:
   (a) Facilities, systems and equipment in operation under the existing scenario prior to the implementation of the project activity;
   (b) Facilities, systems and equipment in the baseline scenario, as established in section B.4 below.
3. If the baseline scenario is a continuation of current practice, thus identical to the scenario existing prior to the implementation of the project activity, there is no need to repeat the description of the scenarios, only state that both are the same.
4. Do not provide information that is not essential to understanding the purpose of the project activity and how it reduces GHG emissions. Do not include information related to equipment, systems and measures that are auxiliary to the main scope of the project activity and do not affect directly or indirectly GHG emissions and/or mass and energy balances of the processes related to the project activity.
5. Include a description of how the technologies and measures and know-how to be used are transferred to the host Party.

A.4. Party(ies) and project participant(s)

1. List in the table below Party(ies) and project participant(s) involved in the project activity and provide contact information in Appendix 1. below.
2. When the CDM-PDD-FORM is completed in support of a proposed new methodology, identify at least the host Party and any known project participant(s) (e.g. those proposing a new methodology).

Name of Party involved (host) indicates host Party	Name of private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Name A (host)	Private entity A Public entity A	
Name B	Private entity B Public entity B	
…	…	

A.5. Public funding of project activity

1. Indicate whether the project activity receives public funding from Parties included in Annex I. If so:
   (a) Provide information on Parties providing public funding;
   (b) Attach in Appendix 2. below the affirmation obtained from such Parties in accordance with applicable provisions related to official development assistance in the Project standard.
2. When the CDM-PDD-FORM is completed in support of a proposed new methodology, describe whether public funding from Parties included in Annex I is likely to be provided, indicating the Parties to the extent possible.

SECTION B. Application of selected approved baseline and monitoring methodology and standardized baseline

B.1. Reference of methodology and standardized baseline

1. Indicate exact reference (number, title, version) of:
   (a) The selected methodology(ies) (e.g. ACM0001: "Large-scale Consolidated Methodology: Flaring or use of landfill gas" (Version 15.0);
   (b) Any tools and other methodologies to which the selected methodology(ies) refer (e.g. "Methodological Tool: Tool for the demonstration and assessment of additionality" (Version 07.0.0));
   (c) The selected standardized baseline(s), where applicable (e.g. ASB0001 "Standardized baseline: Grid emission factor for the Southern African power pool" (Version 01.0)).
2. Refer to the UNFCCC CDM website for the exact reference of approved baseline and monitoring methodologies, tools and standardized baselines.

B.2. Applicability of methodology and standardized baseline

1. Justify the choice of the selected methodology(ies) and, where applicable, the selected standardized baseline(s) by showing that the project activity meets each applicability condition of the methodology(ies) and, where applicable, the selected standardized baseline(s). Explain documentation that has been used and provide the references to it or include the documentation in Appendix 3. below.

B.3. Project boundary

1. Use the table below to describe emission sources and GHGs included in the project boundary for the purpose of calculating project emissions and baseline emissions.
2. In addition to the table, present a flow diagram of the project boundary, physically delineating the project activity, based on the description provided in section A.3 above. Include in the flow diagram the equipment, systems and flows of mass and energy described in that section. In particular, indicate in the diagram the emission sources and GHGs included in the project boundary and the data and parameters to be monitored.

Source		Gas	Included	Justification/Explanation
Baseline scenario	Source 1	CO_2		
		CH_4		
		N_2O		
		…		
	Source 2	CO_2		
		CH_4		
		N_2O		
		…		
	…	CO_2		
		CH_4		
		N_2O		
		…		
Project scenario	Source 1	CO_2		
		CH_4		
		N_2O		
		…		
	Source 2	CO_2		
		CH_4		
		N_2O		
		…		

Source		Gas	Included	Justification/Explanation
	…	CO_2		
		CH_4		
		N_2O		
		…		

B.4. Establishment and description of baseline scenario

1. Explain how the baseline scenario is established in accordance with applicable provisions for establishment and description of baseline scenarios in the Project standard and the selected methodology(ies).
2. Where the procedure in the selected methodology(ies) involves several steps, describe how each step is applied and transparently document the outcome of each step. Explain and justify key assumptions and rationales. Provide and explain all data used to establish the baseline scenario (variables, parameters, data sources, etc.). Provide all relevant documentation and/or references.
3. Provide a transparent description of the baseline scenario as established above.
4. Where the selected standardized baseline standardizes the baseline scenario, describe the baseline scenario in accordance with the selected standardized baseline.
5. The full description of the technology of the baseline scenario is to be provided in section A.3 above.
6. Note that section B.4 above and section B.5 below are complementary. Some of the steps undertaken in one section may overlap with the steps undertaken in the other section depending on the procedures used to establish the baseline scenario and demonstrate additionality. If the "Combined tool to identify the baseline scenario and demonstrate additionality" is used, replicate the same information in both sections. In this case, make a reference to the other section where the description is contained.

B.5. Demonstration of additionality

1. Demonstrate that the project activity is additional in accordance with the selected methodology(ies), where applicable, the selected standardized baseline(s) and applicable provisions for demonstration of additionality in the Project standard. Where the procedure in the selected methodology(ies) and/or tool involves several steps, describe how each step is applied and transparently document the outcome of each step. Indicate clearly the method selected to demonstrate additionality (e.g. investment analysis or barrier analysis). Present in a transparent manner, in the form or in a separate appendix, with all data used (variables, parameters, data sources, etc.), how the additionality of the project activity is demonstrated.
2. Where the additionality criteria (e.g. positive lists of technologies) in the selected standardized baselines(s) are used, justify how the project activity meets the additionality criteria (e.g. how the technology to be implemented or implemented by the project activity is justified as one of the technologies listed in the positive list).
3. Where investment analysis is used, list all relevant assumptions and parameters used in the analysis. Where benchmark analysis is used, clearly indicate the benchmark. Where cost comparison is used, describe the scenarios compared.
4. Where the barriers are involved in demonstrating additionality, only select the most relevant barriers. With key facts and/or assumptions and the rationale, justify the credibility of the barriers. Provide relevant documentation or references.
5. If the start date of the project activity is prior to the date of publication of the PDD for the global stakeholder consultation, provide evidence of the prior consideration of the CDM in accordance with applicable provisions related to the demonstration of prior consideration of the CDM in the Project standard.

B.6. Emission reductions

B.6.1. Explanation of methodological choices

1. Explain how the methods or methodological steps in the selected methodology(ies) and, where applicable, the selected standardized baseline(s), for calculating baseline emissions, project emissions, leakage and emission reductions are applied. Clearly state which equations will be used in calculating emission reductions.
2. Explain and justify all relevant methodological choices, including:

(a) Where the selected methodology(ies) and, where applicable, the selected standardized baseline(s) include different scenarios or cases, indicate and justify which scenario or case applies to the project activity (e.g. which scenario in ACM0006 is applicable);

(b) Where the selected methodology(ies) and, where applicable, the selected standardized baseline(s) provide different options to choose from (e.g. which methodological approach is used to calculate the "operating margin" in ACM0002), indicate and justify which option is chosen for the project activity;

(c) Where the selected methodology(ies) and, where applicable, the selected standardized baseline(s) allow different default values, indicate and justify which of the default values have been chosen for the project activity.

B.6.2. Data and parameters fixed ex ante

1. Include a compilation of information on the data and parameters that are not monitored during the crediting period but are determined before the registration and remain fixed throughout the crediting period. Do not include data that become available only after the registration of the project activity (e.g. measurements after the implementation of the project activity) here but include them in the table in section B.7.1 below.
2. The compilation of information may include data that are measured or sampled, and data that are collected from other sources (e.g. official statistics, expert judgment, proprietary data, IPCC, commercial and scientific literature, etc.). Do not include data that are calculated with equations provided in the selected methodology(ies) or default values specified in the methodology(ies) in the compilation.
3. For each piece of data or parameter, complete the table below, following these instructions:
   (a) "Value(s) applied": Provide the value applied. Where a time series of data is used, where several measurements are undertaken or where surveys have been conducted, provide detailed information in Appendix 4. below. To report multiple values referring to the same data and parameter, use one table. If necessary, use reference(s) to electronic spreadsheets;
   (b) "Choice of data": Indicate and justify the choice of data source. Provide clear and valid references and, where applicable, additional documentation in Appendix 4. below;
   (c) "Measurement methods and procedures": Where values are based on measurement, include a description of the measurement methods and procedures applied (e.g. which standards have been used), indicate the responsible person/entity that undertook the measurement, the date of the measurement and the measurement results. More detailed information can be provided in Appendix 4. below;
   (d) "Purpose of data": Choose one of the following:
      (i) Calculation of baseline emissions;
      (ii) Calculation of project emissions;
      (iii) Calculation of leakage.

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

Data / Parameter:	
Unit:	
Description:	
Source of data:	
Value(s) applied:	
Choice of data or Measurement methods and procedures:	
Purpose of data:	
Additional comment:	

B.6.3. Ex ante calculations of emission reductions

1. Provide a transparent ex ante calculation of baseline emissions, project emissions (or, where applicable, direct calculation of emission reductions) and leakage expected during the crediting period, applying all relevant equations provided in the selected methodology(ies) and, where applicable, the selected standardized baseline(s). For data or parameters available before registration, use values contained in the table in section B.6.2 above.

2. For data/parameters not available before registration and monitored during the crediting period, use estimates contained in the table in section B.7.1 below. If any of these estimates has been determined by a sampling approach, provide a description of the sampling efforts undertaken in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities".
3. Document how each equation is applied, in a manner that enables the reader to reproduce the calculation. Where relevant, provide additional background information and/or data in Appendix 4. below, including relevant electronic spreadsheets.
4. Provide a sample calculation for each equation used, substituting the values used in the equations.

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

1. Summarize the results of the ex ante calculation of emission reductions for all years of the crediting period, using the table below.

Year	Baseline emissions (t CO_2e)	Project emissions (t CO_2e)	Leakage (t CO_2e)	Emission reductions (t CO_2e)
Year A				
Year B				
Year C				
Year …				
Total				
Total number of crediting years				
Annual average over the crediting period				

B.7. Monitoring plan

1. Through sections B.7.1, B.7.2 and B.7.3 below, provide a detailed description of the monitoring plan of the project activity developed in accordance with the applicable provisions in the Project standard and the monitoring requirements of the selected methodology(ies).

B.7.1. Data and parameters to be monitored

1. Include specific information on how the data and parameters that need to be monitored in the selected methodology(ies) and, where applicable, the selected standardized baseline(s) would actually be collected during monitoring. Include here data that are determined only once for the crediting period but that will become available only after registration of the project activity (e.g. measurements after the implementation of the project activity).
2. For each piece of data or parameter, complete the table below, following these instructions:
   (a) "Source of data": Indicate the source(s) of data that will be used for the project activity (e.g. which exact national statistics). Where several sources are used, justify which data sources should be preferred;
   (b) "Value(s) applied": The value applied is an estimate of the data/parameter that will be monitored during the crediting period, but is used for the purpose of calculating estimated emission reductions in section B.6 above. To report multiple values referring to the same data and parameter, use one table. If necessary, use reference(s) to electronic spreadsheets;
   (c) "Measurement methods and procedures": Where data or parameters are to be monitored, specify the measurement methods and procedures, standards to be applied, accuracy of the measurements, person/entity responsible for the measurements, and, in case of periodic measurements, the measurement intervals;
   (d) "QA/QC procedures": Describe the Quality Assurance (QA)/Quality Control (QC) procedures to be applied, including the calibration procedures, where applicable;

(e) "Purpose of data": Choose one of the following:
  (i) Calculation of baseline emissions;
  (ii) Calculation of project emissions;
  (iii) Calculation of leakage.

3. Provide any relevant further background documentation in Appendix 5. below.

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

Data / Parameter:	
Unit:	
Description:	
Source of data:	
Value(s) applied:	
Measurement methods and procedures:	
Monitoring frequency:	
QA/QC procedures:	
Purpose of data:	
Additional comment:	

B.7.2. Sampling plan

1. If data and parameters monitored in section B.7.1 above are to be determined by a sampling approach, provide a description of the sampling plan in accordance with the recommended outline for a sampling plan in the "Standard for sampling and surveys for CDM project activities and programme of activities".

B.7.3. Other elements of monitoring plan

1. Describe the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage generated by the project activity. Clearly indicate the responsibilities and institutional arrangements for data collection and archiving. Provide any relevant further background information in Appendix 5. below.

B.7.4. Date of completion of application of methodology and standardized baseline and contact information of responsible persons/ entities

1. Provide the date of completion of study on application of the selected methodology(ies) and, where applicable, the selected standardized baseline(s) to the project activity in the format of DD/MM/YYYY.
2. Provide contact information of the person(s)/ entity(ies) responsible for the application of the selected methodology(ies) and, where applicable, the selected standardized baseline(s) to the project activity and indicate if the person(s)/ entity(ies) is also a project participant(s) in Appendix 1. below.

SECTION C. Duration and crediting period

C.1. Duration of project activity

C.1.1. Start date of project activity

1. State the start date of the project activity, in the format of DD/MM/YYYY, describe how this date has been determined, and provide evidence to support this date.

C.1.2. Expected operational lifetime of project activity

1. State the expected operational lifetime of the project activity in years and months.

C.2. Crediting period of project activity

C.2.1. Type of crediting period

1. State the type of crediting period chosen for the project activity (renewable or fixed).
2. For a renewable crediting period, indicate whether it is the first, second or third.

C.2.2. Start date of crediting period

1.	State the start date of crediting period of the project activity in the format of DD/MM/YYYY.

C.2.3. Length of crediting period

1.	State the length of the crediting period of the project activity in years and months.

SECTION D. Environmental impacts

D.1. Analysis of the environmental impacts

1.	Provide a summary of the analysis of the environmental impacts of the project activity and references to all related documentation.

D.2. Environmental impact assessment

1.	If an environmental impact assessment is required, provide conclusions and references to all related documentation.

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

1.	Describe the process by which comments from local stakeholders have been invited for the project activity.

E.2. Summary of comments received

1.	Identify stakeholders that have made comments and provide a summary of these comments.

E.3. Report on consideration of comments received

1.	Provide information demonstrating that all comments received have been considered.

SECTION F. Approval and authorization

1.	Indicate whether the letter(s) of approval from Party(ies) for the project activity is available at the time of submitting the PDD to the validating DOE.
2.	If so, provide the letter(s) of approval along with the PDD.

Appendix 1. Contact information of project participants and responsible persons/ entities

1. For each organisation listed in sections A.4 and B.7.4 above, complete the table below, with the following mandatory fields: Project participant and/or responsible person/ entity, Organization, Street/P.O. Box, City, Postcode, Country, Telephone, Fax, e-mail and Name of contact person. Copy and paste the table as needed.

Project participant and/or responsible person/ entity	☐ Project participant ☐ Responsible person/ entity for application of the selected methodology (ies) and, where applicable, the selected standardized baselines to the project activity
Organization name	
Street/P.O. Box	
Building	
City	
State/Region	
Postcode	
Country	
Telephone	
Fax	
E-mail	
Website	
Contact person	
Title	
Salutation	
Last name	
Middle name	
First name	
Department	
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	

Appendix 2. Affirmation regarding public funding

1. If applicable, attach the affirmation obtained from Parties included in Annex 1 providing public funding to the project activity.

Appendix 3. Applicability of methodology and standardized baseline

1. Provide any further background information on the applicability of the selected methodology(ies) and, where applicable, the selected standardized baseline(s).

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

1. Provide any further background information on the ex ante calculation of emission reductions. This may include data, measurement results, data sources, etc.

Appendix 5. Further background information on monitoring plan

1.	Provide any further background information used in the development of the monitoring plan. This may include tables with time series data, additional documentation of measurement equipment, procedures, etc.

Appendix 6. Summary of post registration changes

1.	Provide a summary of the post registration changes.

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Document information

Version	*Date*	*Description*
05.0	25 June 2014	Revisions 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;* • 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.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: project activities, project design document