GUYUAN WUHUAPING 49.5 MW WIND POWER PROJECT

Document Prepared by Demeter Venture UK Limited

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1 PROJECT DETAILS

1.1 Summary Description of the Project

Guyuan Wuhuaping 49.5 MW Wind Power Project (hereinafter referred to as the project) is developed by Construction Investment Yanshan (Guyuan) Wind Energy Co., Ltd. It is located within Pingdingbu Town, Guyuan County, Zhangjiakou City, Hebei Province, P.R. China. The project involves the installation of 33 sets of wind turbine, each of which has a rated installed capacity of 1,500 kW, providing a total installed capacity of 49.5 MW. The annual output of the project is estimated to be 117,322.7152 MWh and the electricity will be exported to the North China Power Grid (NCPG).

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

When the project is operated, the electricity generated will displace part of the electricity from fossil fuel-fired plants connected to the NCPG, and thus greenhouse gas (GHG) generated by coal-fired power plants could be reduced. The estimated annual GHG emission reductions in the first crediting period are 123,757 tCO_2e/yr, and are 98,603 tCO_2e/yr during the second crediting period.

The construction of the project began on 10/05/2009, and the project was commissioned on 30/10/2009. The first crediting period is from 30/10/2009 to 29/10/2019 (10years). The project operated normally in the first crediting period. The project is applying for the crediting period renewal and the second crediting period is expected from 30/10/2019 to 29/10/2029 (10years).

1.2 Sectoral Scope and Project Type

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

Project type: Renewable (wind) power project

The Project is not a grouped project.

1.3 Project Eligibility

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

1.4 Project Design

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

The project involves the installation of 33 turbines, each of which have a capacity of 1.5 MW, with a total capacity of 49.5 MW.

Eligibility Criteria

N/A as this is not a grouped project.

1.5 Project Proponent

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1.6 Other Entities Involved in the Project

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Role in the project	Project participant
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1.7 Ownership

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

Reform Commission, established the project ownership of Construction Investment Yanshan (Guyuan) Wind Energy Co., Ltd. The purchasing contract of turbines, and the purchasing power agreement are the evidences for the property and contractual right in the plant, equipment and electricity.

1.8 Project Start Date

30/10/2009 (the date when the project was commissioned, which means that the project started to generate GHG emission reductions)

1.9 Project Crediting Period

The first crediting period under VCS is from 30/10/2009 to 29/10/2019 (10 years), renewable. The total VCS crediting period would have been from 30/10/2009-29/10/2039 (30 years). However, this project has been registered in CDM, and the total crediting period is from 03/07/2010-02/07/2031 (21 years). According to VCS regulations, the total crediting period of VCS is from 30/10/2009-02/07/2031.

The project is applying for the second crediting period, which is from 30/10/2019 to 29/10/2029.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	√
Large project	

Year	Estimated GHG emission reductions or removals (tCO_2e)
30/10/2019-31/12/2019 (63days)	17,019
01/01/2020-31/12/2020	98,603
01/01/2021-31/12/2021	98,603
01/01/2022-31/12/2022	98,603
01/01/2023-31/12/2023	98,603

01/01/2024-31/12/2024	98,603
01/01/2025-31/12/2025	98,603
01/01/2026-31/12/2026	98,603
01/01/2027-31/12/2027	98,603
01/01/2028-31/12/2028	98,603
01/01/2029-29/10/2029 (302days)	81,584
Total estimated ERs	986,030
Total number of crediting years	10
Average annual ERs	98,603

1.11 Description of the Project Activity

The project installed 33 sets of wind turbine, each of which has a rated installed capacity of 1,500 kW, providing a total installed capacity of 49.5 MW. The estimated electricity delivered to NCPG by the project is 117,322.7152 MWh per year and the average annual operating hours is 2,368 h with a power load factor of 0.2702. Electricity generated by the project will be delivered to NCPG via a 110 kV transmission line. Key technical parameters of main equipments in the project are shown in the following table 1.

Table 1. Key technical parameters of main equipments in the Project

	Equipment	Quantity	Type	Technical parameters
Main mechanical and electrical equipments	Turbine	33 sets	GE1.5sle	Rated power: 1,500 kW Quantity of blades: 3 Height of the hub: 80 m Power factor of generator: ±0.95 Lifetime: 20 yrs Annual operating hours: 2,368 h
Step-up substation	Main transformer	1 set	SZ11-50000/110	Capacity: 50 MVA Rated voltage: 110/35 kV

The project employs turbines manufactured by GE, which involves no technology transfer from abroad.

Electricity delivered to NCPG by the project will be monitored with the bi-directional meter installed on the main transmission line of the Project and cross-checked with receipt(s). The measurement precision of the bi-directional meter installed on the main transmission line employed by the project will be at least 0.5s.

There was a 10 kV backup line at the project Site. The 10 kV backup line was kept connected with the grid and the electricity imported by the Project from the grid via the 10 kV backup line was continuously measured by the electricity meter installed on the 10 kV backup line. And the measurement precision of the meter installed on the 10 kV backup line employed by the Project should be at least 1.0.

1.12 Project Location

The project is located within Pingdingbu Town, Guyuan County, Zhangjiakou City, Hebei Province, P.R.China. The center of the Project has geographical coordinates with east longitude of 115°45′08″ and north latitude of 41°36′36″. The area of the wind farm is about 55 km^2. Figure 1 shows the location of Hebei Province, Figure 2 shows the location of Zhangjiakou City. Figure 3 shows the location of the project.

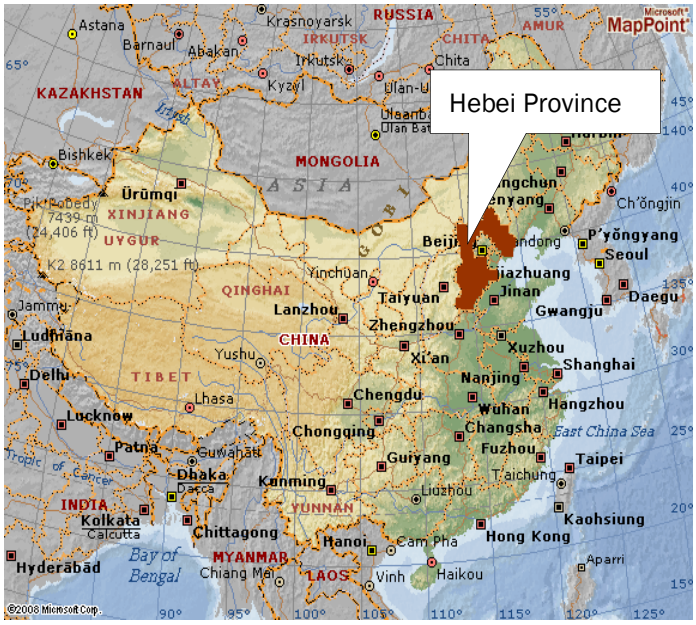

Figure 1. Location of Hebei Province

Figure 2. Location of Zhangjiakou City

Figure 3. Location of the project

1.13 Conditions Prior to Project Initiation

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

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

The project is in the field of renewable energy. The Environmental Impact Statement Form was approved by Environmental Protection Bureau of Hebei Province on 15/05/2008, and the Feasibility Study Report of the project was approved by Hebei Development and Reform Commission in December, 2008. The project has got LOA from China DNA in July, 2009. These approvals demonstrate that the project meets the requirement of national laws and regulations, including Renewable Energy Law of the People's Republic of China and Environmental Protection Regulation for Wind Power Project, etc.

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

1.15 Participation under Other GHG Programs

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

The Project has been registered as a CDM project in UNFCCC on 03/07/2010 (UNFCCC Ref. 3356). The first 7-year renewable crediting period is from 03/07/2010 to 02/07/2017.

1.15.2 Projects Rejected by Other GHG Programs

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

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

The Project has been registered as a CDM project in UNFCCC on 03/07/2010 (UNFCCC Ref. 3356). The first 7-year renewable crediting period is from 03/07/2010 to 02/07/2017.

The credits from 03/07/2010 to 30/09/2015 have been issued under CDM mechanism.

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

1.16.2 Other Forms of Environmental Credit

The Project has been registered as a CDM project in UNFCCC on 03/07/2010 (UNFCCC Ref. 3356). The first 7-year renewable crediting period is from 03/07/2010 to 02/07/2017.

The credits from 03/07/2010 to 30/09/2015 have been issued under CDM mechanism.

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

1.17 Additional Information Relevant to the Project

Leakage Management

N/A.

Commercially Sensitive Information

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

Sustainable Development

The project will not only supply renewable electricity to the grid, but also contribute to sustainable development of the local community, the host country and the world by means of:

- reducing greenhouse gas emissions compared to a business-as-usual scenario;
- diversifying power sources and mitigating the demand and supply contradiction;
- helping to stimulate the growth of the wind power industry and encourage and promote the technology progress and commercial popularization of grid-connected renewable power generation projects in China;
- reducing the emission of other pollutants resulting from the power generation industry in China, compared to a business-as-usual scenario;
- creating 10 employment opportunities for local community during the operation period of the project and creating several employment opportunities for local community during the construction period of the project.

Further Information

There's not any further information.

2 SAFEGUARDS

2.1 No Net Harm

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

2.2 Local Stakeholder Consultation

Stakeholders of the project are identified as local residents possibly affected by the project. In December 2008, a survey was conducted on the stakeholders of the project, through distributing and collecting responses to a questionnaire.

The questionnaire is distributed to the local residents near the project site. They are of different ages and occupations, coming from different towns and villages. For the total 60 questionnaires distributed to the stakeholders, 60 returned with a response rate of 100%. According to the 60 questionnaires returned, the basic structure of the respondents is illustrated in the following table:

Structure of gender		
Gender	**No.**	**Percentage**
Male	31	52
Female	29	48
Structure of educational level		
Educational level	**No.**	**Percentage**
Primary school	8	13
Junior middle school	9	15
Senior middle school	14	23
Technical college or university	29	49
Structure of age		
Age	**No.**	**Percentage**
Below 30	21	35
31~40	23	38
41~50	12	20
51 and above	4	7

The questionnaires mainly focus on the following issues:

·What's the extent of the stakeholders' knowledge about the project?

·What's the attitude of the stakeholders on the construction of the project?

·What positive impacts will be introduced by the implementation of the project from the view of stakeholders?

·What negative impacts will be introduced by the implementation of the project from the view of stakeholders?

Summary of the comments received

According to the 60 questionnaires received:

·58 respondents (97%) have a certain or very good understanding of the project and 2 respondents (3%) haven't heard of the project.

·58 respondents (97%) support the implementation of the project and 2 respondents (3%) keep a neutral attitude.

·40 respondents (67%) think that the implementation of the project could possibly enhance the electricity consumption of local residents. 18 respondents (30%) think that the implementation of the project could possibly improve the income of local residents. 33 respondents (55%) think that the implementation of the project could possibly increase employment opportunities for local residents. None of the respondents put forward any other positive impact possibly caused by the implementation of the project.

·22 respondents (37%) think that the implementation of the project could possibly result in noise. 16 respondents (27%) think that the implementation of the project could possibly cause land occupation.

None of the respondents put forward any other negative impact possibly caused by the implementation of the project.

Conclusion

We know from the results of questionnaire statistics that all the stakeholders understand and support the construction of the project.

The issue of noise considered by the respondents and corresponding prevention and control measures have been analyzed in Section 2.3 of the PD. The project owner will take measures to ensure that there will be no noise pollution to the local environment. For the issue of land occupation considered by the respondents, the project has no relation to the issue of land occupation since the land required by the project is mainly grassland and the project owner has paid for compensation on land occupation, as described in the FSR.

Thus, there is no necessity to modify the project in the aspect of design, construction and operation. The project owner will think much of the public comments and strictly implement the pollution prevention measures stated in the Environmental Impact Statement Form.

In order for on-going communicate with local stakeholders, the project owner put a grievance notebook in the company office. Anyone can put their comments on the book. Since this project has been operated for several years, all local stakeholders know the telephone of the office. When people has comments on the project, he or she can call the project owner directly and leave message.

2.3 Environmental Impact

The Environmental Impact Statement Form was completed by Hebei Provincial Institute of Geographic Sciences and approved by Environmental Protection Bureau of Hebei Province on 15/05/2008 (Document No. JHB [2008] 320). According to the Environmental Impact Statement Form, environmental impacts possibly caused by the Project and treatment measures adopted by the project owner are analyzed as follows:

Waste water

Waste water produced during construction period and operation period of the project is mainly domestic waste water of workers. A little of the waste water produced during the construction period will be absorbed by the earth or evaporated, without contaminating the surface ground. The domestic waste water produced during operation period will be treated in waste water treatment facilities. Then, the overflow water in the upper layer of the facilities will be introduced into reservoir for the greening of the wind farm area, without being discharged outside. Thus the domestic waste water has little impact on the surroundings.

Dust and exhaust gas

There is no discharge of exhaust gas during the operation period of the project. During the construction period of the Project, the generation of dust reentrainment is mainly due to excavation, piling, back filling and transportation of earth, land flatting, road expansion and transportation, loading and unloading and piling of construction materials. Exhaust gas could also be generated from the operation of oil fuelled machines and vehicle running. However, by means of watering and covering the material piling areas and limiting the speed of vehicles, the air pollutant emission of the project will meet the requirement of Integrated Emission Standard of Air Pollutants (GB16297-1996), so the project will not have any impact on the surroundings.

Noise

Noises generated during the construction period of the project stem from activities such as excavation and back filling of earth for the foundation of wind turbines, piling, casting of the foundation platform, installation of the power generation equipments and construction of the multipurpose building and the substation. After attenuation, the noises meet the requirement of Noise Limits for Construction Site (GB12523-90). The noises under abnormal working conditions during the operation period will be reduced through regular maintenance and timely conservation on equipments such as turbines and transformers. As a result, the noises in the plant area and the noises at sensitive sites meet the requirement of Category I of Standard of Noise at Boundary of Industrial Enterprises (GB12348-90) and Category I of Standard of Environmental Noise of Urban Area (GB3096-93).

Solid waste

The solid waste produced during the construction period is mainly the discarded earth, the construction waste, the domestic waste and etc. The discarded earth will be immediately

transported to dump sites. The construction waste and the domestic waste will be transported to the waste disposal site of Guyuan County by the environmental sanitation administrative department for sanitary landfill. During the operation period of the project, domestic waste (about 3.65 t/a) will be collected and periodically transported to the waste disposal site of Guyuan County by the environmental sanitation administrative department for sanitary landfill. By taking the measures above, the solid waste produced in the project will not have negative impacts on the surroundings.

Ecological impact

Damage to the vegetation caused by permanent land occupation of the project will be compensated accordingly, in other words, vegetation with equal area and quality to the damaged will be recovered in another place. By taking measures of vegetation recovery and compensation, the project will have no impact on local ecological environment. The migration route of birds does not go through the region of the project, so the wind power generation facilities will not impact the migrating birds.

Conclusion

In summary, by means of measures of pollution avoidance and control as well as ecological recovery, the project will not impact the environment.

2.4 Public Comments

No public comments were received during the public comment period.

2.5 AFOLU-Specific Safeguards

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

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

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

Related tools are:

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

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

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

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

3.2 Applicability of Methodology

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

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

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

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

Criteria	Assessment
This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is	Applicable. The project generates

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

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

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

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

Criteria	Assessment

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

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

For standardized baseline, it's not applicable.

3.3 Project Boundary

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

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

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

Table 2. GHG emission sources of the project

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

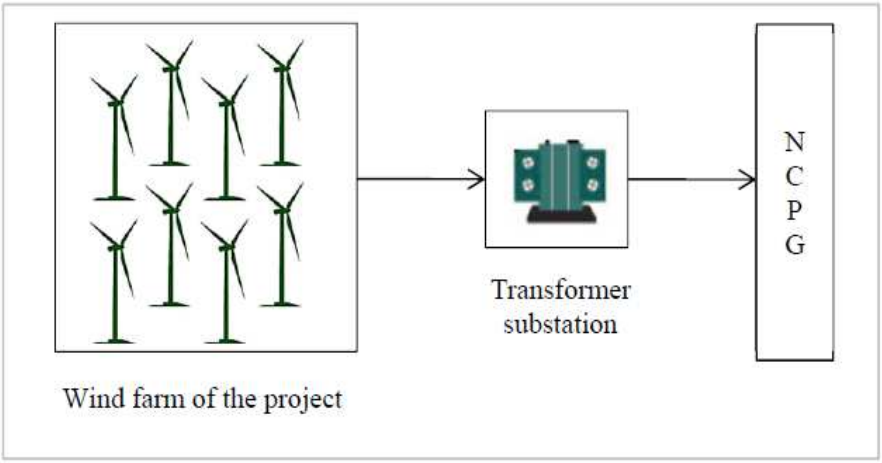

Figure 4. Flow diagram of the project boundary

3.4 Baseline Scenario

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

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

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

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

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

There are no new national and/or sectoral policies that could affect the baseline scenario during the renewal of the crediting period. Although national policies favour the development of renewable energy sources, total renewable resources based power generation accounts for less than 50% of total generation of the NCPG in the latest 5 years respectively. Hence in the absence of the project activity electricity would still have been generated in the existing fossil fuel power plants or by the addition of new fossil fuel power plants connected to the NCPG.

Step 1.2: Assess the impact of circumstances

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

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

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

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

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

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

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

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

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

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

Step 2.1: Update the current baseline

The baseline emissions for the second crediting period have been updated, without reassessing the baseline scenario, based on the latest approved version of the methodology

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

ACM0002. More details for the updated baseline emissions for the second crediting period can be seen in section 4.

Step 2.2: Update the data and parameters

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

3.5 Additionality

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

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

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

3.6 Methodology Deviations

There are no methodology deviations for this project.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

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

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

where

BEy	Baseline emissions in year y (t CO_2/yr)
$EG_{PJ,y}$	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$EF_{grid,CM,y}$	Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of "Tool to calculate the emission factor for an electricity system" (t CO_2/MWh)

Calculation of $EG_{PJ,y}$

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

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

Where:

$EG_{PJ,y}$	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)
$EG_{facility,y}$	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)

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

The baseline emission factor (EF_y) is calculated as a combined margin ($EF_{grid,CM,y}$), consisting of the combination of operating margin ($EF_{grid,OM,y}$) and build margin ($EF_{grid,BM,y}$) factors according to the following seven steps defined in the "Tool to calculate the emission factor for an electricity system".

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

Step 1. Identify the relevant electricity systems

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

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

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

For the purpose of this tool, the reference system is the project electricity system. Hence electricity transfers from a connected electricity system to the project electricity system are defined as electricity imports, and electricity transfers from the project electricity system to connected electricity systems are defined as electricity exports.

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

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

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

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

(a) 0 tCO_2/MWh; or

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

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

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

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

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

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

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

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

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

Project participants may choose between the following two options to calculate the operating margin and build margin emission factor:

Option I: Only grid power plants are included in the calculation.

Option II: Both grid power plants and off-grid power plants are included in the calculation.

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

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

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

(a) Simple OM; or

(b) Simple Adjusted OM; or

(c) Dispatch data analysis OM; or

(d) Average OM

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

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

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

Ex ante option: If the ex-ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. For grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation.

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

(a) Simple OM

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

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

Option B: Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

Option B can only be used if:

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

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

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

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

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

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

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

Where:

$EF_{grid,OMsimple,y}$	Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)
$FC_{i,y}$	The amount of fossil fuel type i consumed in the project electricity system in year y (mass or volume unit)
$NCV_{i,y}$	Net calorific value (energy content) of fossil fuel type i in year y (GJ/mass or volume unit)
$EF_{CO2,i,y}$	CO_2 emission factor of fossil fuel type i in year y (tCO_2/GJ)
EG_y	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost / must-run power plants / units, in year y (MWh)
i	All fossil fuel types combusted in power sources in the project electricity system in year y
y	The relevant year as per the data vintage chosen in Step 3

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

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

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

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

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

Following the deviation[4], the latest statistical data available (from the China Power Yearbook) is used by the DNA to determine the most recent year from which the added generation capacity is equal to or just exceeds 20% of the latest statistic. The added generation capacity is the sample group of power units m used to calculate the build margin.

The sample group of power units m used to calculate the build margin consists of the set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently. This option is chosen as it comprises larger annual generation than the five units built most recently.

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

is available, calculated as follows:

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

Where:

$EF_{grid,BM,y}$	Build margin CO_2 emission factor in year y(t CO_2/MWh)
$EG_{m,y}$	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{EL,m,y}$	CO_2 emission factor of power unit m in year y (tCO_2/MWh)
m	Power units included in the build margin
y	The most recent historical year for which power generation data is available

The CO_2 emission factor of each power unit m ($EF_{EL,m,y}$) should be determined as per the guidance in step 4 (a) for the simple OM, using options A1, A2 or A3, using for y the most

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

recent historical year for which power generation data is available, and using for m the power units included in the build margin.

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

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

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

Where:

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

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

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

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

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

Where:

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

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

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

Where:

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

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

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

Step 6. Calculation of the combined margin emission factor

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

(a) Weighted average CM; or

(b) Simplified CM.

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

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

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

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

Weighted average CM

The combined margin emissions factor is calculated as follows:

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

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

Where:

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

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

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

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

Thus,

$BE_y = EG_{facility,y} \times EF_{grid,CM,y}$ = 117,322.7152 MWh × 0.8405 tCO_2/MWh =98,603 tCO_2

4.2 Project Emissions

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

$PE_y = 0$

4.3 Leakage

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

4.4 Net GHG Emission Reductions and Removals

Emission reductions are calculated as follows:

$ER_y = BE_y - PE_y$ (8)

Where:

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

Thus,

$ER_y = BE_y - PE_y = 98,603\ tCO_2e - 0\ tCO_2e = 98,603\ tCO_2e$

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
30/10/2019-31/12/2019 (63days)	17,019	0	0	17,019
01/01/2020-31/12/2020	98,603	0	0	98,603
01/01/2021-31/12/2021	98,603	0	0	98,603
01/01/2022-31/12/2022	98,603	0	0	98,603
01/01/2023-31/12/2023	98,603	0	0	98,603
01/01/2024-31/12/2024	98,603	0	0	98,603
01/01/2025-31/12/2025	98,603	0	0	98,603
01/01/2026-31/12/2026	98,603	0	0	98,603
01/01/2027-31/12/2027	98,603	0	0	98,603
01/01/2028-31/12/2028	98,603	0	0	98,603
01/01/2029-29/10/2029 (302days)	81,584	0	0	81,584
Total	986,030	0	0	986,030

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,OM,y}$
Data unit	tCO_2/MWh
Description	Simple operating margin CO_2 emission factor in year y
Source of data	"2017 Baseline Emission Factors for Regional Power Grids in China" issued by China DNA [5]
Value applied	0.9680
Justification of choice of data or description of measurement methods and procedures applied	Official public data from NDRC
Purpose of Data	Calculation of baseline emissions
Comments	/

Data / Parameter	$EF_{grid,BM,y}$
Data unit	tCO_2/MWh
Description	Build margin CO_2 emission factor in year y
Source of data	"2017 Baseline Emission Factors for Regional Power Grids in China" issued by China DNA [6]
Value applied	0.4578
Justification of choice of data or description of measurement methods and procedures applied	Official public data from NDRC
Purpose of Data	Calculation of baseline emissions
Comments	/

Data / Parameter	w_{OM}
Data unit	%

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

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

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

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

5.2 Data and Parameters Monitored

Data / Parameter	$EG_{faility,y}$
Data unit	MWh/yr
Description	Quantity of net electricity generation supplied by the project plant to the grid in year y.
Source of data	The data used in the PD are obtained from the FSR of the project. Actual data will be determined through on-site measurement.
Description of measurement methods	This value is calculated monthly with on-site monitored data of $EG_{PJtoGRID,y}$, $EG_{GRIDtoPJ,y}$ and $EG_{10kVtoPJ,y}$.

and procedures to be applied	
Frequency of monitoring/recording	Measured continuously and recorded monthly.
Value applied	117,322.7152 MWh
Monitoring equipment	The electricity is monitored by electricity meters with national standards.
QA/QC procedures to be applied	Receipt(s) of $EG_{PJtoGRID,y}$, $EG_{GRIDtoPJ,y}$ and $EG_{10kVtoPJ,y}$ are used for cross-check.
Purpose of data	Calculation of baseline emissions
Calculation method	$EG_{facility,y}=EG_{PJtoGRID,y}-EG_{GRIDtoPJ,y}-EG_{10kVtoPJ,y}$ $EG_{PJtoGRID,y}$: The electricity delivered by the project to the grid in year y. $EG_{GRIDtoPJ,y}$: The electricity imported by the project from the grid via the main transmission line in year y. $EG_{10kVtoPJ,y}$: The electricity imported by the project from the grid via the 10 kV backup line in year y.
Comments	/

Data / Parameter	$EG_{PJtoGRID,y}$
Data unit	MWh
Description	The electricity delivered by the project to the grid in year y.
Source of data	The data used in the PD are obtained from the FSR of the project. Actual data will be obtained through on-site measurement.
Description of measurement methods and procedures to be applied	Continuously measured by the bi-directional meter installed on the main transmission line of the project and monthly recorded.
Frequency of monitoring/recording	Measured continuously and recorded monthly.
Value applied	117,322.7152 MWh
Monitoring equipment	The electricity is monitored by electricity meter with national standards.
QA/QC procedures to be applied	Receipt(s) is used for cross-check.
Purpose of data	Calculation of baseline emissions

Calculation method	/
Comments	/

Data / Parameter	$EG_{GRIDtoPJ,y}$
Data unit	MWh
Description	The electricity imported by the project from the grid via the main transmission line in year y.
Source of data	Assumed as zero in the PD. Actual data will be obtained through on-site measurement.
Description of measurement methods and procedures to be applied	Continuously measured by the bi-directional meter installed on the main transmission line of the Project and monthly recorded.
Frequency of monitoring/recording	Measured continuously and recorded monthly.
Value applied	0 MWh
Monitoring equipment	The electricity is monitored by electricity meter with national standards.
QA/QC procedures to be applied	Receipt(s) is used for cross-check.
Purpose of data	Calculation of baseline emissions
Calculation method	/
Comments	/

Data / Parameter	$EG_{10kVtoPJ,y}$
Data unit	MWh
Description	The electricity imported by the project from the grid via the 10 kV backup line in year y.
Source of data	Assumed as zero in the PD. Actual data will be obtained through on-site measurement.
Description of measurement methods and procedures to be applied	Continuously measured by the meter installed on the 10 kV backup line and monthly recorded.

Frequency of monitoring/recording	Measured continuously and recorded monthly.
Value applied	0 MWh
Monitoring equipment	The electricity is monitored by electricity meter with national standards.
QA/QC procedures to be applied	Receipt(s) is used for cross-check.
Purpose of data	Calculation of baseline emissions
Calculation method	/
Comments	/

5.3 Monitoring Plan

The monitoring plan is established according to the request of approved baseline and monitoring methodology ACM0002 (Version 20.0).

1. Monitored Data

The ex-ante determined baseline emission factor will be adopted. The electricity delivered by the project to the grid ($EG_{PJtoGRID,y}$) and the electricity imported by the project from the grid via the main transmission line ($EG_{GRIDtoPJ,y}$) and the electricity imported by the project from the grid via the 10 kV backup line ($EG_{10kVtoPJ,y}$) will be monitored.

2. Monitoring System Organization Chart

The monitoring system is shown in Figure 5 and implemented by the project owner.

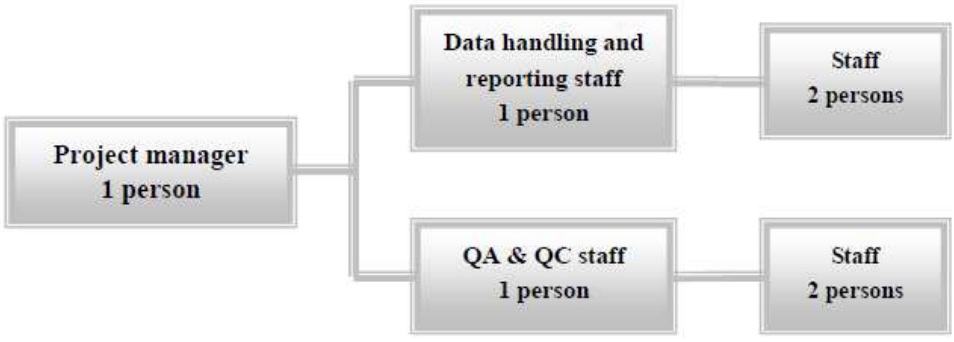

Figure 5. The monitoring system

The project manager is responsible for implementation and supervision of the monitoring activity and liaison of this project. The data handling and reporting staff are responsible for managing,

processing and submitting data. The QA & QC staff are responsible for calibration of meters and supervision of the whole process quality.

3. Installation of Meter(s)

The electricity delivered by the project to the grid ($EG_{PJtoGRID,y}$) will be measured continuously by the bi-directional meter installed on the main transmission line of the project and recorded monthly. The electricity imported by the Project from the grid via the main transmission line ($EG_{GRIDtoPJ,y}$) will be measured continuously by the bi-directional meter installed on the main transmission line of the Project and recorded monthly. The electricity imported by the project from the grid via the 10 kV backup line ($EG_{10kVtoPJ,y}$) will be measured continuously by the meter installed on the 10 kV backup line of the project and recorded monthly.

Receipt(s) is used for cross-check $EG_{PJtoGRID,y}$, $EG_{GRIDtoPJ,y}$ and $EG_{10kVtoPJ,y}$. If there exists difference between the monitored data and the data on receipt(s), the conservative values will be used to estimate emission reductions.

4. Precision of Meter(s)

The measurement precision of the bi-directional meter installed on the main transmission line employed by the project will be at least 0.5s and the measurement precision of the meter installed on the 10 kV backup line employed by the Project will be at least 1.0.

5. Calibration of Meter(s)

The meter(s) of the project will be calibrated and checked periodically for accuracy. The calibration frequency is once a year.

6. Data Management System

Particular staff will be appointed by the project owner to take the overall responsibility for monitoring emission reductions and keeping all the data collected as part of monitoring archived electronically and kept at least for two years after the end of the last crediting period.

Electronic data and documents, including readings from meter(s) connected into the computer central control system, will be regularly copied and archived via optical discs and storage tapes, and kept at least for two years after the end of the last crediting period or two years after the last issuance of VERs.

Written data and documents, including receipts for cross-checking of data, will be copied and archived with an explanation of the department or company where the original copy is kept, and kept for at least two years after the end of the last crediting period or two years after the last issuance of VERs.

7. Quality Assurance and Quality Control Procedure

Particular QC staff will be appointed by the project owner to take the overall responsibility of calibrating monitoring equipments, managing and processing the monitored data according to QA/QC procedure. If something unusual, the project manager should be immediately reported.

8. Preparation for Verification

Besides the recorded data and the documents for cross-check required in Section 5.2, other documents will be prepared by the project owner for verification by the DOE including, but not limited to:

- PDD (registration version), including the electronic spreadsheets and supporting documents (assumptions, estimations, measurement, etc);
- Documents relevant to quality control and quality assurance;
- Report on necessary maintenance and calibration of meter(s).