



**Verified Carbon
Standard**

HEBEI YUXIAN SECOND PHASE 49.5MW WIND POWER PROJECT

Document Prepared by Demeter Venture Uk Limited

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Hebei Yuxian Second Phase 49.5 MW Wind Power Project (hereinafter referred to as the project) is developed by Hebei Construction Investment Yuzhou Wind Energy Co., Ltd. It is located at the southwest of Yuxian County, Hebei Province, P.R.China. The project installs 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 112,170 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 proposed 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 proposed 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 (from 01/09/2009 to 31/08/2019) are 111,243 tCO₂e/yr, and the 94,273 tCO₂e/yr during the second crediting period (from 01/09/2019 to 31/08/2029).

The construction of the project began on 20/08/2008, and the first turbine was put into operation on 01/09/2009. And the project was put into full commercial operation on 31/10/2009.

The first crediting period is from 01/09/2009 to 31/08/2019 while the second crediting period is from 01/09/2019 to 31/08/2029. This monitoring period is from 01/11/2018 to 30/11/2021 (1126 days), in which the period from 01/11/2018 to 31/08/2019(304 days, hereinafter referred as “P1”) belongs to the first crediting period, and the period from 01/09/2019 to 30/11/2021(822 days, hereinafter referred as “P2”) belongs to the second crediting period. The emission reductions in P1 is 101,586 tCO₂, the emission reductions in P2 is 224,505 tCO₂. Hence, the emission reductions in this monitoring period is 326,091 tCO₂.

1.2 Sectoral Scope and Project Type

This category would fall within sectoral scope 1: energy industries (Renewable sources).

Project type: wind power project.

This project is not grouped project.

1.3 Project Proponent

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1.4 Other Entities Involved in the Project

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Role in the Project	Project participant
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1.5 Project Start Date

01/09/2009 (operation date, which means the date that started to generate GHG emission reductions)

1.6 Project Crediting Period

As per the renewed VCS PD, the first crediting period is from 01/09/2009 to 31/08/2019 while the second crediting period is from 01/09/2019 to 31/08/2029.

This monitoring period is from 01/11/2018 to 30/11/2021 (1126 days), in which the period from 01/11/2018 to 31/08/2019 (304 days, hereinafter referred as “P1”) belongs to the first crediting period, and the period from 01/09/2019 to 30/11/2021(822 days, hereinafter referred as “P2”) belongs to the second crediting period.

1.7 Project Location

The project site is located in the southwest of Yuxian County, Zhangjiakou City of Hebei Province. The site is in Xiushuipeng Village approximately 18 km from Xiangongcun Town. The geographical coordinates of the project are 114°32'2.12"E, 39°35'0.71"N which are sourced from the approved FSR. Figure 1 shows the location of the project.



Figure 1. The location of the project

1.8 Title and Reference of Methodology

For P1, the project applies the approved consolidated baseline and monitoring methodology ACM0002 during the first crediting period.

- “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (Version 12.1.0).

The methodology also refers to the following tools:

- Tool to calculate the emission factor for an electricity system (Version 02);
- Tool for the demonstration and assessment of additionality (Version 05.2);
- Guideline on Assessment of Investment Analysis (Version 03.1).

For P2, the project applies the approved consolidated baseline and monitoring methodology ACM0002 during the second crediting period.

- Consolidated methodology for grid-connected electricity generation from renewable sources” (version 20.0)¹.

The methodology also refers to the following tools:

- -Tool to calculate the emission factor for an electricity system (version 07.0)
- -Tool for the demonstration and assessment of additionality (version 07.0.0)
- -Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period (version 03.0.1)

1.9 Participation under other GHG Programs

The Project has been registered as a CDM project on 01/06/2011 with registration number of 4789. It has been issued three times under CDM mechanism, covering monitoring period from 01/06/2011 to 31/12/2012.

The credits in this monitoring period (01/11/2018 to 30/11/2021) has not been counted and will not be counted under other kind of GHG programs.

1.10 Other Forms of Credit

The project has been registered as a CDM project on 01/06/2011. It has been issued three times under CDM mechanism, covering monitoring period from 01/06/2011 to 31/12/2012.

The Project has not created another form of environmental credit, and the Project will not create other environmental credit in the future.

¹ <https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG>

1.11 Sustainable Development

The project makes contribution to the sustainable development as follows:

1. GHG emission reduction

The project will help reduce the greenhouse gas GHG emissions versus the high-growth, coal-dominated business-as-usual scenario in the NCPG by reducing the electricity generation from the fossil-fuel fired power plants.

Thus, the project achieved **SDG 13 Climate Action**².

- Reduction of fossil fuel use and provide clean energy

The Project Activity will reduce reliance on imported fossil fuels, which will contribute to increasing China's energy security, and will also improve local air quality as it reduces the emissions of SO₂, and NO_x associated with fossil fuel use.

Thus, the project achieved **SDG 7 Affordable and Clean Energy**³.

3. Employment opportunities

The conducting of the project will create employment opportunities during the construction phase and operational period.

4. Economic Improvement

The construction of the wind farm will promote local economy by contributing to local government with more tax revenues through selling power generation.

Thus, the project achieved **SDG 8 Decent Work and Economic Growth**⁴.

2 SAFEGUARDS

2.1 No Net Harm

The Environmental Impact Assessment of the proposed project was completed by the Institute of Hydrogeology and Environmental Geology, CAGS and approved by the Environment Protection Bureau of Hebei Province on 27/09/2007. Main contents of the Environmental Impact Assessment are summarized as follows:

Ecological impact

Construction Phase

1) Impact on Foliage

² <https://sdgs.un.org/goals/goal13>

³ <https://sdgs.un.org/goals/goal7>

⁴ <https://sdgs.un.org/goals/goal8>

The area of the buildings stated above will be all the shrub-grassland. There will be some impacts on the local vegetation during the construction period. The main impact will be eradication of local sward and the stack of earth on the lawn. But after the construction period, new trees and grass will be planted again on the site. The vegetation condition of the earth surface will recover very soon. The original ecological system will be recovery from the third year after the construction period.

2) Impact on other animals

No big mammal has been found in the local area. There are only small mammals just like hare and mice.

The small animals disturbed by the construction (like the snail, the angleworm, the ant) will migrate the similar habitat conditions nearby due to their strong ability of migration. So, the species diversity and population size in the area will not be obviously influenced by the proposed project during the construction phase.

3) Impact on the residents

The main air pollution sources during the construction period include dust from excavation, blasting and transportation. Since the local residential area is 500m away from the temporary construction site and local atmosphere environment capacity is very large, the impact of construction dust on the local region is light. Some measures will be taken to reduce impact of dust on the construction staff, such as sprinkling, covering and so on.

Noise will be generated by machine equipment during construction. Measures will be taken to reduce the environmental impacts of noise: choosing low-noise machines and technologies, arranging reasonable construction time, and enhancing construction management. In addition, the nearest residential area is 1000m away from the wind farm, the neighbor residents will not be influenced by the noise. So, the dust and the noise generated by construction activities will have less impact on local residents.

Operation Phase

1) Impact on the local biogeocenose

There is no waste gas, waste water and solid waste in the process of wind energy. Thus, the project will not obviously affect the local biogeocenose.

2) Visual Impact

The wind turbines installed in the grassland will enhance the visual value of the grassland and demonstrate the harmonious relation between human and nature. So, the proposed project has little impact on the local scene.

3) Impact on the animals

No big mammal has been found in the local area. There are only small mammals just like hare and mice.

They may migrate back to the former sites after the completion of the project. Therefore, the project will have less impact on other propagation during the operation phase.

Environmental Impact

Construction phase

The max impact range of dust generated by construction activities is about in the downwind 150 m and the noise pollution generated by construction machine will occur in the range of 300 m. The

shortest distance between the project site and the village is 1000 m. So the dust and the noise generated by construction activities will have less impact on local residents.

The main solid waste generated from the site will be construction waste as well as the household waste from the personnel at the site. The solid waste will be carried to the landfill. And both domestic sewage and the sewage from the worksite will be treated up to the standards before being discharged. So, the waste and waste water generated by construction activities will have less impact on local residents.

Operation Phase

1) Sewage

The waste water from the proposed project during operation phase will only be sewage. The sewage processed by the biological septic tank will in compliance with the second level standards <Integrated Wastewater discharge Standard > and will be discharged into the collecting pond. The processed sewage will be utilized to irrigate plant in the project site without discharge. Therefore, the sewage from the project during the operation phase will have less impact on the environment.

2) Noise

The operating noise level of the 1500 kW turbine is 103 dB at the height of 10m from the ground.

However, at a distance of 400 m no serious noise impacts are caused, and noise levels at this distance drop down to the national standard 43 dB (A). Furthermore, the resident regions are 1000 m away from the wind farm, and with the background noise in the area being high, so the noise does not influence the residential districts nearest to the site.

3) Solid waste

The solid waste will be mainly composed of the household garbage generated from the workers in the 110kV booster station. The solid waste will be carried termly to the landfill nearby. Therefore, impact of solid waste on the environment is considered to be insignificant.

Conclusion

The project does not have any major adverse impacts on the environment during its construction and operation phase. Therefore, this project does not do harm to local environment.

2.2 Local Stakeholder Consultation

The project owner invited the comments of local stakeholders by issuing questionnaires. Hebei Construction Investment Yuzhou Wind Energy Co., Ltd carried out the surveys on the local villagers and residents, the representative of governmental officials, etc. during November 2007.

In order to invite comments from local stakeholders, a bulletin was published by the project owner on the bulletin boards in Guoshipen Village, Choushuipen Village and Chadao Village around the project, providing a detailed introduction of the project and the stakeholder meeting.

Investigations on public opinion have been carried out through site surveys, distribution of questionnaires and meetings. Questionnaire were designed to be easily filled in the following sections:

1) Project introduction

- 2) Respondent's basic information and education level
- 3) Questions
- 4) Space for the respondents' signature and date.

The questions include:

What level do you know about the project?

Do you know about the Clean Development Mechanism?

Impacts of the project to local environment?

Do you think which impact on the environment may be caused by the project?

Impacts of the project to local economic development?

Whether to support the construction of the project?

Questionnaires have been distributed according to the principle of both representation and randomness in order to reflect the public opinions and comments in a fair and real manner.

The investigated stakeholders include the individuals from the construction site and the nearby Yuxian County. The stakeholders also include the group from the government and association. The investigation has taken full account into the public advice of different ages, education levels and occupations.

80 valid responses from 80 questionnaires were collected and the following is a summary of the key findings:

100% of the investigated stakeholders know something about the project; 95% of them know about CDM; 57.50% of them don't think it will take positive effects of their livelihoods environment while 42.50% of them think it takes no little impact of the local environment; The fields of environmental protection the public concerned mainly include noise of the construction (32.50%) , noise of the operation (11.25%), construction waste water (11.25%), impact of dust on air quality (21.25%), use of land (48.75%), soil and water conservation (21.25%), construction waste (23.75%), impact on traffic (2.50%), impact on the ecological environment (8.75%),the interference on television and other receivers (5.00%); 98.75% of them think it will promote the local economy. And the stakeholders are all supportive of this project.

Comments from the questionnaires show that 100% of the investigated stakeholders agree with the project construction, and none of them objects.

The fields of environmental protection which the public concerned mainly include noise, impact of dust on air quality, use of land as mentioned above. The EIA approved by the Environment Protection Bureau of Hebei Province shows that the noise levels would be within China national

standards and no interference is expected. The developer will take some measures to reduce the dust during the construction such as watering and covering. Construction waste and waste water will be disposed of properly according to the EIA. Impact on the ecological environment and the traffic impact are very little and will be disposed of properly according to the EIA. Most of the lands for the wind farm are for temporary use, and the developer will carry out the compensation for land requisition according to state regulations. The interference on television and other receivers would be reduced the national standard.

The soil and water conservation program has got the approval by the Water Resources Department of Hebei Province. The project owner will put the measures listed in the EIA into effect during construction and operation, so as to achieve environmental benefits, social benefits and economic benefits.

In conclusion, the stakeholders are supportive of this project.

In addition to the physical stakeholder consultations, for continuous communication with local stakeholders, the project owner public its office telephone to local people and put a grievance book in the office of the company. Anyone who have comments on the project could write on the book or leave message by phone. And after these years' operation, no negative comments were received from local people.

2.3 AFOLU-Specific Safeguards

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

3 IMPLEMENTATION STATUS

3.1 Implementation Status 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. 10 sets of FD70B type wind turbines and 23 sets of FD77B type wind turbines are all supplied by Dongfang Steam Turbine Co., Ltd. The main technical parameters are shown in the table 1.

Table 1. Main technical parameters of key equipment in the Project

Items	Value	
Turbine type	FD70B	FD77B
Rated Power (kW)	1500	1500
Cut-in Wind Speed (m/s)	3.5	3.0
Rotor Diameter (m)	70	77

Rated Wind Speed (m/s)	13	12
Tower Height (m)	65	61.5
Rated Voltage (V)	690	690
Generator Type	double-fed asynchronous motor	double-fed asynchronous motor
Lifetime (years)	20	20

The simplified flow diagram and the meters that will be installed within the project activity are shown in the following figure 2:

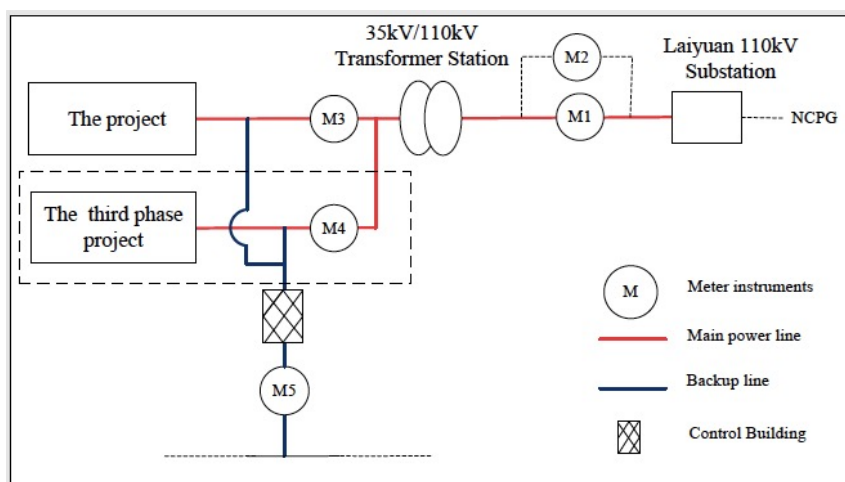


Figure 2 The simplified flow diagram of the project

The electricity generated by the project and the electricity generated by the third phase project were transmitted through 35 kV transmission lines to 35 kV/110 kV Transformer Station which is on site, and then to NCPG via Laiyuan 110kV Substation by 110 kV transmission line.

The Project started construction on 20/08/2008 and the first turbine was put into operation on 01/09/2009 and the project was put into commercial operation on 31/10/2009.

During this monitoring period, the monitoring system of the Project was implemented in line with the monitoring plan. The wind farm operated normally. No equipment is overhauled or replaced in this monitoring period. No emergencies which may impact the methodology application and monitoring occurred during the monitoring period.

3.2 Deviations

2.3.1 Methodology Deviations

There is no methodology deviation in this monitoring period.

2.3.2 Project Description Deviations

The project was registered under VCS version 3. In the Verification Report of initial VCS monitoring period, it was mentioned that the project started operation since 01/09/2009. As per UNFCCC website, it was confirmed that the project activity was registered as CDM project activity on 01/06/2011. Therefore, the VCS crediting period was determined as 01/09/2009 to 01/06/2011. As per VCS scheme under which the project was registered, the project crediting period is allowable for 10 years and could be renewed twice. Therefore, the total VCS crediting period was determined from 01/09/2009 to 31/05/2032 (considering 3*7 years CDM crediting period), of which the first crediting period is from 01/09/2009 to 31/08/2019, while the second crediting period is from 01/09/2019 to 31/08/2029. The same has been described in the renewed VCS PD.

3.3 Grouped Projects

Not applicable because this is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

For monitoring period belongs to the first crediting period:

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO ₂ e/MWh
Description	Baseline emission factor: the combined emission factor of the project grid system in year y.
Source of data	registered VCS PD
Value applied	0.99174
Justification of choice of data or description of measurement methods and procedures applied	$EF_{grid,CM,y}$ was not directly available at validation but calculated based on other parameters in the VCS PD available at validation, therefore in the MR, only $EF_{grid,CM,y}$ is included and the rest of the parameters used to calculate $EF_{grid,CM,y}$ are used in the MR.
Purpose of Data	Calculation of baseline emissions
Comments	The emission factor of the Project was ex-ante determined and is fixed during the first crediting period. All data and parameters had been determined at registration.

For monitoring period belongs to the second crediting period:

Data / Parameter	$EF_{grid,OM,y}$
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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	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 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	%
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

⁵ <http://www.mee.gov.cn/ywgz/ydqhbh/wsqtz/201812/P020181220579925103092.pdf>

⁶ <http://www.mee.gov.cn/ywgz/ydqhbh/wsqtz/201812/P020181220579925103092.pdf>

Comments	/
Data / Parameter	WBM
Data unit	%
Description	Weighting of operating margin emissions factor
Source of data	"Tool to calculate the emission factor for an electricity system" (Version 07.0)
Value 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	/

4.2 Data and Parameters Monitored

Data / Parameter	EG _{facility,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	Measured by electricity meter
Description of measurement methods and procedures to be applied	This value is calculated as the difference of exported electricity and imported electricity. $EG_{facility,y} = EG_{export,y} - EG_{import,y} - EG_{backupline,y}$ EG_{export,y}: Annual electricity exported to the grid EG_{import,y}: Annual electricity imported from the grid. EG_{backupline,y}: Electricity delivered to the project through the backup line. It is continuously measured by the bi-directional meters (M1, M2, M3 and M4) and monthly recorded by the project owner. The accuracy of the meters is 0.2S. M1 is installed at the higher voltage side of 35kV/110kV Transformer Station. M2 is installed at the same point of M1. M3 is installed at the outlet of the project and M4 is installed at the outlet of the third phase project. In case of emergencies and when the wind farm does not produce enough power for auxiliary power use, the project will use the power

	through the backup line. Power delivered to the projects through a backup power line ($EG_{\text{backupline},y}$) is metered by meter M5. The cut-off time of recording of all meters is at 24:00 on the end of each month.
Frequency of monitoring/recording	Continuously measurement and monthly recording
Value monitored	369559.464
Monitoring equipment	The information of the electricity meter is in the following table.
QA/QC procedures to be applied	The electricity meters are calibrated by qualified entity according to national standards. The electricity records are crosschecked with electricity receipts. The main information of the meters are shown in following table.
Purpose of the data	Calculation of baseline emissions
Calculation method	$EG_{\text{facility},y} = EG_{\text{export},y} - EG_{\text{import},y} - EG_{\text{backupline},y}$
Comments	/

Data / Parameter	$EG_{\text{export},y}$
Data unit	MWh
Description	Annual electricity exported to the grid.
Source of data	Mesured by meters and calculated by parameters of $EG_{\text{export},y,1}$, $EG_{\text{export},y,3}$ and $EG_{\text{export},y,4}$.
Description of measurement methods and procedures to be applied	It is continuously measured by the bi-directional meters (M1, M2, M3 and M4) and monthly recorded by the project owner. M1 is installed at the higher voltage side of 35kV/110kV Transformer Station. M2 as the backup meter is installed at the same point of M1. M3 is installed at the outlet of the project and M4 is installed at the outlet of the third phase project. The cut-off time of recording of all meters is at 24:00 on the end of each month. The accuracy of the meters is 0.2S. $EG_{\text{export},y} = EG_{\text{export},y,1} \times EG_{\text{export},y,3} / (EG_{\text{export},y,3} + EG_{\text{export},y,4})$ Where, $EG_{\text{export},y,1}$: Annual electricity exported to the grid by the project and the third phase project which will be measured by M1;

	$EG_{\text{export},y,3}$: Annual electricity exported to the grid by the project which will be measured by M3; $EG_{\text{export},y,4}$: Annual electricity exported to the grid by the third phase project which will be measured by M4;
Frequency of monitoring/recording	Measured continuously and recorded monthly.
Value applied	369968.013 MWh
Monitoring equipment	The electricity is monitored by electricity meters with national standards.
QA/QC procedures to be applied	The meters will be annually calibrated according to the relevant national electric industry standards and regulations.
Purpose of data	Calculation of baseline emissions
Calculation method	$EG_{\text{export},y} = EG_{\text{export},y,1} \times EG_{\text{export},y,3} / (EG_{\text{export},y,3} + EG_{\text{export},y,4})$
Comments	/

Data / Parameter	EG _{export,y,1}				
Data unit	MWh				
Description	Annual electricity exported to the grid by the project and the third phase project which will be measured by M1				
Source of data	Directly measured.				
Description of measurement methods and procedures to be applied	EG _{export,y,1} will be measured by meter M1 (bi-directional). The parameter will be continuously measured and monthly recorded. The relevant data will be kept during the crediting period and two years after.				
Frequency of monitoring/recording	Measured continuously and recorded monthly.				
Value applied	715,594.680				
Monitoring equipment	Main meter M1 and its backup meter M2 (bidirectional meters) are installed 35/110kV transformer higher side. Both of them are operated by the grid company. The accuracy of the metering equipments (M1, M2) is 0.2S.				
QA/QC procedures to be applied	The meters will be annually calibrated according to the relevant national electric industry standards and regulations.				
	Name	Type	Serial No.	Accuracy	Calibration Date and valid date
	M1	ZMD402C	94827520	0.2S	11/04/2018-10/04/2019
					11/04/2019-10/04/2020

					11/04/2020-10/04/2021													
					11/04/2021-10/04/2022													
	M2	ZMD402C	94827519	0.2S	11/04/2018-10/04/2019													
					11/04/2019-10/04/2020													
					11/04/2020-10/04/2021													
					11/04/2021-10/04/2022													
Purpose of data	Calculation of baseline emissions																	
Calculation method	/																	
Comments	/																	
Data / Parameter	EG _{export,y,3}																	
Data unit	MWh																	
Description	Annual electricity exported to the grid by the project which will be measured by M3.																	
Source of data	Directly measured.																	
Description of measurement methods and procedures to be applied	EG _{export,y,3} will be measured by meter M3(bi-directional). The parameter will be continuously measured and monthly recorded. The relevant data will be kept during the crediting period and two years after.																	
Frequency of monitoring/recording	Measured continuously and recorded monthly.																	
Value applied	377,600.458 MWh																	
Monitoring equipment	The meter M3 for the project exists before the 35/110kV transformer on the project site. The accuracy of the metering equipment M3 is 0.2S. <table><tr><td>Name</td><td>Type</td><td>Serial No.</td><td>Accuracy</td><td>Calibration Date and valid date</td></tr><tr><td rowspan="4">M3</td><td rowspan="4">ZFD402C</td><td rowspan="4">94316768</td><td rowspan="4">0.2S</td><td>22/12/2017-21/12/2018</td></tr><tr><td>22/12/2018-21/12/2019</td></tr><tr><td>22/12/2019-21/12/2020</td></tr><tr><td>22/12/2020-21/12/2021</td></tr></table>					Name	Type	Serial No.	Accuracy	Calibration Date and valid date	M3	ZFD402C	94316768	0.2S	22/12/2017-21/12/2018	22/12/2018-21/12/2019	22/12/2019-21/12/2020	22/12/2020-21/12/2021
Name	Type	Serial No.	Accuracy	Calibration Date and valid date														
M3	ZFD402C	94316768	0.2S	22/12/2017-21/12/2018														
				22/12/2018-21/12/2019														
				22/12/2019-21/12/2020														
				22/12/2020-21/12/2021														
QA/QC procedures to be applied	The meters will be annually calibrated according to the relevant national electric industry standards and regulations.																	
Purpose of data	Calculation of baseline emissions																	
Calculation method	/																	
Comments	/																	
Data / Parameter	EG _{export,y,4}																	

Data unit	MWh													
Description	Annual electricity exported to the grid by the third phase project which will be measured by M4.													
Source of data	Directly measured.													
Description of measurement methods and procedures to be applied	EG _{export,y,4} will be measured by M4 (bi-directional). The parameter will be continuously measured and monthly recorded. The relevant data will be kept during the crediting period and two years after.													
Frequency of monitoring/recording	Measured continuously and recorded monthly.													
Value applied	353,632.714 MWh													
Monitoring equipment	The meter M4 for the third phase project exists before the 35/110kV transformer on the project site. The accuracy of the metering equipment M4 is 0.2S. <table><tr><td>Name</td><td>Type</td><td>Serial No.</td><td>Accuracy</td><td>Calibration Date and valid date</td></tr><tr><td rowspan="4">M4</td><td rowspan="4">ZFD402C</td><td rowspan="4">94316769</td><td rowspan="4">0.2S</td><td>22/12/2017-21/12/2018</td></tr><tr><td>22/12/2018-21/12/2019</td></tr><tr><td>22/12/2019-21/12/2020</td></tr><tr><td>22/12/2020-21/12/2021</td></tr></table>	Name	Type	Serial No.	Accuracy	Calibration Date and valid date	M4	ZFD402C	94316769	0.2S	22/12/2017-21/12/2018	22/12/2018-21/12/2019	22/12/2019-21/12/2020	22/12/2020-21/12/2021
Name	Type	Serial No.	Accuracy	Calibration Date and valid date										
M4	ZFD402C	94316769	0.2S	22/12/2017-21/12/2018										
				22/12/2018-21/12/2019										
				22/12/2019-21/12/2020										
				22/12/2020-21/12/2021										
QA/QC procedures to be applied	The meters will be annually calibrated according to the relevant national electric industry standards and regulations.													
Purpose of data	Calculation of baseline emissions													
Calculation method	/													
Comments	/													

Data / Parameter	EG _{import,y}
Data unit	MWh
Description	Annual electricity imported from the grid.
Source of data	Mesured by meters and calculated by parameters of EG _{import,y,1} , EG _{import,y,3} and EG _{import,y,4} .
Description of measurement methods and procedures to be applied	It is continuously measured by the bi-directional meters (M1, M2, M3 and M4) and monthly recorded by the project owner. M1 is installed at the higher voltage side of 35kV/110kV Transformer Station. M2 as the backup meter is installed at the same point of M1. M3 is installed at the outlet of the project and M4 is installed at the outlet of the third phase project.

	The cut-off time of recording of all meters is at 24:00 on the end of each month. The accuracy of the meters is 0.2S. $EG_{import,y}=EG_{import,y,1}\times EG_{import,y,3} / (EG_{import,y,3}+EG_{import,y,4})$ Where, $EG_{import,y,1}$: Annual electricity imported from the grid by the project and the third phase project which will be measured by M1; $EG_{import,y,3}$: Annual electricity imported from the grid by the project which will be measured by M3; $EG_{import,y,4}$: Annual electricity imported from the grid by the third phase project which will be measured by M4;																																					
Frequency of monitoring/recording	Measured continuously and recorded monthly.																																					
Value applied	408.549 MWh																																					
Monitoring equipment	The electricity is monitored by electricity meters with national standards.																																					
QA/QC procedures to be applied	The meters will be annually calibrated according to the relevant national electric industry standards and regulations. <table><tr><th>Name</th><th>Type</th><th>Serial No.</th><th>Accuracy</th><th>Calibration Date and valid date</th></tr><tr><td rowspan="4">M1</td><td rowspan="4">ZMD402C</td><td rowspan="4">94827520</td><td rowspan="4">0.2S</td><td>11/04/2018-10/04/2019</td></tr><tr><td>11/04/2019-10/04/2020</td></tr><tr><td>11/04/2020-10/04/2021</td></tr><tr><td>11/04/2021-10/04/2022</td></tr><tr><td rowspan="4">M2</td><td rowspan="4">ZMD402C</td><td rowspan="4">94827519</td><td rowspan="4">0.2S</td><td>11/04/2018-10/04/2019</td></tr><tr><td>11/04/2019-10/04/2020</td></tr><tr><td>11/04/2020-10/04/2021</td></tr><tr><td>11/04/2021-10/04/2022</td></tr><tr><td rowspan="4">M3</td><td rowspan="4">ZFD402C</td><td rowspan="4">94316768</td><td rowspan="4">0.2S</td><td>22/12/2017-21/12/2018</td></tr><tr><td>22/12/2018-21/12/2019</td></tr><tr><td>22/12/2019-21/12/2020</td></tr><tr><td>22/12/2020-21/12/2021</td></tr><tr><td rowspan="4">M4</td><td rowspan="4">ZFD402C</td><td rowspan="4">94316769</td><td rowspan="4">0.2S</td><td>22/12/2017-21/12/2018</td></tr><tr><td>22/12/2018-21/12/2019</td></tr><tr><td>22/12/2019-21/12/2020</td></tr><tr><td>22/12/2020-21/12/2021</td></tr></table>	Name	Type	Serial No.	Accuracy	Calibration Date and valid date	M1	ZMD402C	94827520	0.2S	11/04/2018-10/04/2019	11/04/2019-10/04/2020	11/04/2020-10/04/2021	11/04/2021-10/04/2022	M2	ZMD402C	94827519	0.2S	11/04/2018-10/04/2019	11/04/2019-10/04/2020	11/04/2020-10/04/2021	11/04/2021-10/04/2022	M3	ZFD402C	94316768	0.2S	22/12/2017-21/12/2018	22/12/2018-21/12/2019	22/12/2019-21/12/2020	22/12/2020-21/12/2021	M4	ZFD402C	94316769	0.2S	22/12/2017-21/12/2018	22/12/2018-21/12/2019	22/12/2019-21/12/2020	22/12/2020-21/12/2021
Name	Type	Serial No.	Accuracy	Calibration Date and valid date																																		
M1	ZMD402C	94827520	0.2S	11/04/2018-10/04/2019																																		
				11/04/2019-10/04/2020																																		
				11/04/2020-10/04/2021																																		
				11/04/2021-10/04/2022																																		
M2	ZMD402C	94827519	0.2S	11/04/2018-10/04/2019																																		
				11/04/2019-10/04/2020																																		
				11/04/2020-10/04/2021																																		
				11/04/2021-10/04/2022																																		
M3	ZFD402C	94316768	0.2S	22/12/2017-21/12/2018																																		
				22/12/2018-21/12/2019																																		
				22/12/2019-21/12/2020																																		
				22/12/2020-21/12/2021																																		
M4	ZFD402C	94316769	0.2S	22/12/2017-21/12/2018																																		
				22/12/2018-21/12/2019																																		
				22/12/2019-21/12/2020																																		
				22/12/2020-21/12/2021																																		
Purpose of data	Calculation of baseline emissions																																					
Calculation method	$EG_{import,y}=EG_{import,y,1}\times EG_{import,y,3} / (EG_{import,y,3}+EG_{import,y,4})$ Where, $EG_{import,y,1}$: Annual electricity imported from the grid by the project and the third phase project which will be measured by M1; $EG_{import,y,3}$: Annual electricity imported from the grid by the project which will be measured by M3; $EG_{import,y,4}$: Annual electricity imported from the grid by the third phase project which will be measured by M4																																					

Comments	/				
Data / Parameter	EG _{import,y,1}				
Data unit	MWh				
Description	Annual electricity imported from the grid by the project and the third phase project which will be measured by M1.				
Source of data	Directly measured.				
Description of measurement methods and procedures to be applied	EG _{import,y,1} will be measured by meter M1 (bi-directional). The parameter will be continuously measured and monthly recorded. The relevant data will be kept during the crediting period and two years after.				
Frequency of monitoring/recording	Measured continuously and recorded monthly.				
Value applied	919.972 MWh				
Monitoring equipment	Main meter M1 and its backup meter M2 (bidirectional meters) are installed 35/110kV transformer higher side. Both of them are operated by the grid company. The accuracy of the metering equipments (M1, M2) is 0.2S.				
QA/QC procedures to be applied	The meters will be annually calibrated according to the relevant national electric industry standards and regulations.				
	Name	Type	Serial No.	Accuracy	Calibration Date and valid date
	M1	ZMD402C	94827520	0.2S	11/04/2018-10/04/2019
					11/04/2019-10/04/2020
					11/04/2020-10/04/2021
					11/04/2021-10/04/2022
	M2	ZMD402C	94827519	0.2S	11/04/2018-10/04/2019
					11/04/2019-10/04/2020
11/04/2020-10/04/2021					
11/04/2021-10/04/2022					
Purpose of data	Calculation of baseline emissions				
Calculation method	/				
Comments	/				

Data / Parameter	EG_{import,y,3}
Data unit	MWh
Description	Annual electricity imported from the grid by the project which will be measured by M3.
Source of data	Directly measured.

Description of measurement methods and procedures to be applied	EG _{import,y,3} will be measured by meter M3 (bi-directional). The parameter will be continuously measured and monthly recorded. The relevant data will be kept during the crediting period and two years after.																	
Frequency of monitoring/recording	Measured continuously and recorded monthly.																	
Value applied	378.180 MWh																	
Monitoring equipment	The meter M3 for the project exists before the 35/110kV transformer on the project site. The accuracy of the metering equipment M3 is 0.2S.																	
QA/QC procedures to be applied	The meters will be annually calibrated according to the relevant national electric industry standards and regulations. <table><tr><th>Name</th><th>Type</th><th>Serial No.</th><th>Accuracy</th><th>Calibration Date and valid date</th></tr><tr><td rowspan="4">M3</td><td rowspan="4">ZFD402C</td><td rowspan="4">94316768</td><td rowspan="4">0.2S</td><td>22/12/2017-21/12/2018</td></tr><tr><td>22/12/2018-21/12/2019</td></tr><tr><td>22/12/2019-21/12/2020</td></tr><tr><td>22/12/2020-21/12/2021</td></tr></table>					Name	Type	Serial No.	Accuracy	Calibration Date and valid date	M3	ZFD402C	94316768	0.2S	22/12/2017-21/12/2018	22/12/2018-21/12/2019	22/12/2019-21/12/2020	22/12/2020-21/12/2021
Name	Type	Serial No.	Accuracy	Calibration Date and valid date														
M3	ZFD402C	94316768	0.2S	22/12/2017-21/12/2018														
				22/12/2018-21/12/2019														
				22/12/2019-21/12/2020														
				22/12/2020-21/12/2021														
Purpose of data	Calculation of baseline emissions																	
Calculation method	/																	
Comments	/																	

Data / Parameter	EG _{import,y,4}
Data unit	MWh
Description	Annual electricity imported from the grid by the third phase project which will be measured by M4.
Source of data	Directly measured.
Description of measurement methods and procedures to be applied	EG _{import,y,4} will be measured by M4(bi-directional). The parameter will be continuously measured and monthly recorded. The relevant data will be kept during the crediting period and two years after.
Frequency of monitoring/recording	Measured continuously and recorded monthly.
Value applied	476.080 MWh
Monitoring equipment	The meter M4 for the third phase project exists before the 35/110kV transformer on the project site. The accuracy of the metering equipment M4 is 0.2S.

QA/QC procedures to be applied	The meters will be annually calibrated according to the relevant national electric industry standards and regulations. <table><tr><th>Name</th><th>Type</th><th>Serial No.</th><th>Accuracy</th><th>Calibration Date and valid date</th></tr><tr><td rowspan="4">M4</td><td rowspan="4">ZFD402C</td><td rowspan="4">94316769</td><td rowspan="4">0.2S</td><td>22/12/2017-21/12/2018</td></tr><tr><td>22/12/2018-21/12/2019</td></tr><tr><td>22/12/2019-21/12/2020</td></tr><tr><td>22/12/2020-21/12/2021</td></tr></table>	Name	Type	Serial No.	Accuracy	Calibration Date and valid date	M4	ZFD402C	94316769	0.2S	22/12/2017-21/12/2018	22/12/2018-21/12/2019	22/12/2019-21/12/2020	22/12/2020-21/12/2021
Name	Type	Serial No.	Accuracy	Calibration Date and valid date										
M4	ZFD402C	94316769	0.2S	22/12/2017-21/12/2018										
				22/12/2018-21/12/2019										
				22/12/2019-21/12/2020										
				22/12/2020-21/12/2021										
Purpose of data	Calculation of baseline emissions													
Calculation method	/													
Comments	/													

Data / Parameter	EG _{backupline,y}												
Data unit	MWh												
Description	Electricity delivered to the project through the backup line, which will be measured by M5 (single-directional). M5 is installed on the backup line. In case of emergencies and when the wind farm does not produce enough power for auxiliary power use, the project will use the power through the backup line. Power delivered to the projects through a backup power line (EG_{backupline,y}) is metered by meter M5. The cut-off time of recording of all meters is at 24:00 on the end of each month.												
Source of data	Measured by electricity meter												
Description of measurement methods and procedures to be applied	It is continuously measured by the bi-directional meter and monthly recorded by the project owner.												
Frequency of monitoring/recording	Continuously measured and monthly recorded												
Value monitored	0												
Monitoring equipment	The information of the electricity meter is in the following table.												
QA/QC procedures to be applied	The electricity meters are calibrated by qualified entity according to national standards. The electricity records are crosschecked with electricity receipts. The main information is shown below: <table><tr><td>Name</td><td>Type</td><td>Serial No.</td><td>Accuracy</td><td>Calibration Date and valid date</td></tr><tr><td rowspan="3">M5</td><td rowspan="3">DSSD331</td><td rowspan="3">20070130 030114</td><td rowspan="3">0.5S</td><td>11/04/2018-10/04/2019</td></tr><tr><td>11/04/2019-10/04/2020</td></tr><tr><td>11/04/2020-10/04/2021</td></tr></table>	Name	Type	Serial No.	Accuracy	Calibration Date and valid date	M5	DSSD331	20070130 030114	0.5S	11/04/2018-10/04/2019	11/04/2019-10/04/2020	11/04/2020-10/04/2021
Name	Type	Serial No.	Accuracy	Calibration Date and valid date									
M5	DSSD331	20070130 030114	0.5S	11/04/2018-10/04/2019									
				11/04/2019-10/04/2020									
				11/04/2020-10/04/2021									

				11/04/2021-10/04/2022
Purpose of the data	Calculation of baseline emissions			
Calculation method	/			
Comments	/			

4.3 Monitoring Plan

1. Monitoring data

The following parameters were measured directly by the onsite meters while the net electricity ($EG_{\text{facility},y}$) supplied to the grid by the project will be calculated from the following parameters.

$EG_{\text{export},y,1}, EG_{\text{export},y,3}, EG_{\text{export},y,4}$ is the electricity exported to the grid;

$EG_{\text{import},y,1}, EG_{\text{import},y,3}, EG_{\text{import},y,4}$ is the electricity imported from the grid;

$EG_{\text{backuptline},y}$ the electricity consumed by the project and the third phase project through the backup line.

2. Organization Chart

This monitoring plan was implemented by Hebei Construction Investment Yuzhou Wind Energy Co., Ltd, the project owner, and consultants appointed by the project owner. The monitoring activity involves one project manager, who is responsible for the implementation and monitoring of the monitoring activity.

There are 2 departments organized for data report and quality control. There is 1 manager responsible for data report and quality control department by 1 of each. The manager will take charge of the employment administration, as well as the operation implementation and monitoring; staffs will carry on the concrete assignment based on the guide of their manager. The monitoring system flowchart of this project is shown in following figure 3.

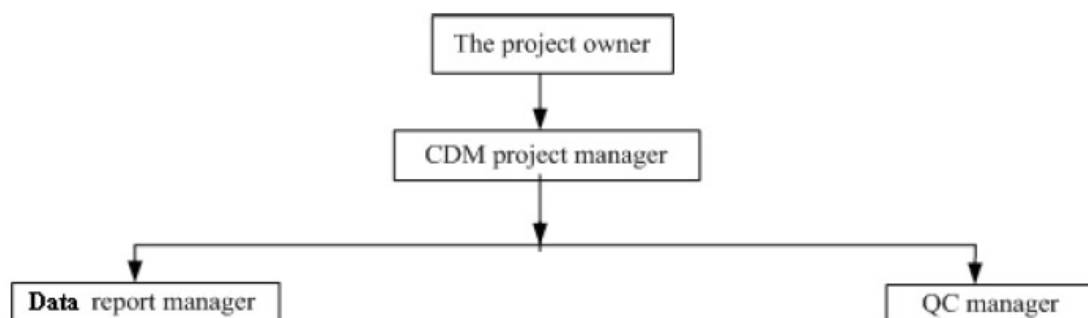


Figure 3. Monitoring structure

3. Metering System

The electricity generated by the project and the third phase project will be transmitted to an on-site 35kV/110kV transformer station that increase the voltage to 110kV, and then be delivered to Laiyuan Substation by main transmission line. The simplified electrical grid connection diagram is shown in the following figure 4:

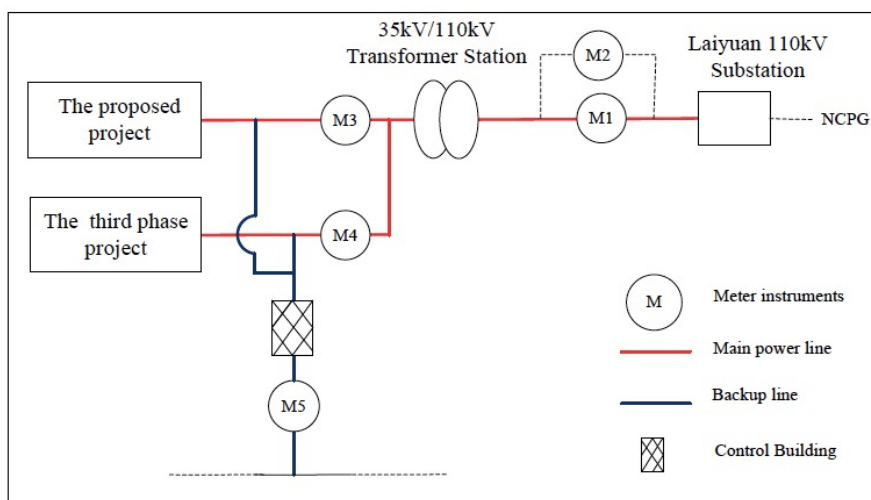


Figure 4. Simplified electrical grid connection diagram

The power line supplying electric power to the grid can also deliver power from the grid to the wind farm. The metering equipment run in two directions and will record two readings, i.e. electricity exported to the grid ($EG_{\text{export}, y}$) and electricity imported from the grid ($EG_{\text{import}, y}$). Net electricity supplied to the grid is calculated as exports minus imports.

The metering system indicated by the meter instruments at M1 in Figure 2 is the main meter, while M2 is the backup meter. M1 is installed at 35kV/110kV transformer higher side. M2 is installed at the same point of M1.

Both of them are operated by the grid company. The grid company and the project owner together will read all the meters monthly and record the readings respectively. Cut-off time of all meters is at 24:00 on last day of each month. After the meter readings of all the meters were correspondingly crosschecked through respective meter reading records saved by the grid and the project owner and both sides confirmed the meter readings, and then the sale receipts have been issued. The readings of the meters on 24:00 of the end of every year are also confirmed in separate sales receipts issued by the grid company.

Separate meters for the two projects (the meter M3 for the project and the meter M4 for the third phase project) exist at the low voltage side of the 35 kV/110 kV transformer on the project site. This means that any transmission and transformer losses and any consumption by the onsite offices are accounted for and are shared between the two projects on the basis of electricity generation. The third phase project was connected to the low voltage side of the shared 35 kV/110 kV transformer.

In case of emergencies and when the wind farm does not produce enough power for auxiliary power use, the project will use the power through the backup line. Power delivered to the projects through a backup power line ($EG_{\text{backup line, y}}$) is metered by instruments at M5.

Net electricity supplied to the grid by the project is calculated on a monthly basis as:

$$EG_{\text{facility, y}} = EG_{\text{export, y}} - EG_{\text{import, y}} - EG_{\text{backupline, y}}$$

Where:

$$EG_{\text{export, y}} = EG_{\text{export, y, 1}} \times EG_{\text{export, y, 3}} / (EG_{\text{export, y, 3}} + EG_{\text{export, y, 4}});$$

$$EG_{\text{import, y}} = EG_{\text{import, y, 1}} \times EG_{\text{import, y, 3}} / (EG_{\text{import, y, 3}} + EG_{\text{import, y, 4}});$$

$EG_{\text{export, y, 1}}$: Annual electricity exported to the grid by the project and the third phase project which will be measured by M1;

$EG_{\text{export, y, 3}}$: Annual electricity exported to the grid by the project which will be measured by M3;

$EG_{\text{export, y, 4}}$: Annual electricity exported to the grid by the third phase project which will be measured by M4;

$EG_{\text{import, y, 1}}$: Annual electricity imported from the grid by the project and the third phase project which will be measured by M1;

$EG_{\text{import, y, 3}}$: Annual electricity imported from the grid by the project which will be measured by M3;

$EG_{\text{import, y, 4}}$: Annual electricity imported from the grid by the third phase project which will be measured by M4;

$EG_{\text{backupline, y}}$: are the electricity consumed by the project and the third phase project through the backup (10kV) line measured by the meter M5;

4. Quality Assurance and Quality Control Procedure

Particular QC staff will be appointed by the Project Owner to take the overall responsibility of calibrating monitoring equipment, managing and processing the monitored data.

The meter of the Project will be calibrated by qualified entity according to national standard. The accuracy of the metering equipments (M1, M2, M3, and M4) shall not be less than 0.5S and the accuracy of backup line meter (M5) shall not be less than 1.0.

5. Information collection and management

All physical documents including the readings in electronic and manual form of the Meters, billing receipts will be stored by the project owner and kept one copy in order to facilitate the verification of DOE.

The monthly records of power supplied to the grid and received from the grid, relevant accounting documents and billing receipts and the results of calibration shall be collected in a central place by the project owner. All data collected as part of monitoring will be kept at least for 2 years after the end of the last crediting period by the project owner.

6. Procedure of emergency handling

In case metering equipment is damaged and no reliable readings can be recorded, the project owner will estimate net supply by the project activity according to the following procedure:

a. In case the main meter is damaged only:

By reading the backup meter.

b. In case both the main meter and the backup one are damaged:

The project owner and the grid company will jointly calculate a conservative estimate of power supplied to the grid. A statement will be prepared indicating

- The background to the damage to metering equipment
- The assumptions used to estimate net supply to the grid for the days for which no record could be recorded the estimation of power supplied to the grid. The statement will be signed by both a representative of the project entity as well as a representative of the grid company.
- The project entity will furthermore document all efforts taken to restore normal monitoring procedures.

7. Monitoring Report

The Project owner will annually prepare a monitoring report which will include among others a summary of metering values of power supplied to and received from the grid, copies of sales/billing receipts, a report on calibration and a calculation of emission reductions.

All the data shall be kept until two years after the end of the first crediting period.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

According to ACM0002, the baseline emission during this verification period is calculated as

$$BE_y = EG_{\text{facility},y} \times EF_{\text{grid,CM},y}$$

Where:

BE_y is the baseline emissions (tCO₂e)

$EG_{facility,y}$ is the net electricity supplied to the grid by the project in year y (MWh);

$EF_{grid, CM,y}$ is the CO₂ emission factor of the NCPG, which is fixed in the first crediting period (tCO₂e/MWh)

The combined margin emission factor is calculated, and are fixed ex-ante for the duration of the **first crediting period** as 0.99174 tCO₂/MWh.

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
Simple operating Margin Emissions Factor ($EF_{grid,OM\ simple,y}$)	0.9680	0.75
Build Margin Emissions Factor ($EF_{grid, BM,y}$)	0.4578	0.25
Baseline Emissions Factor ($EF_{grid,CM,y}$)	0.84045	

The yearly electricity volume and baseline emissions are listed in following table 2.

Table 2. Baseline emissions

Period	$EG_{export,y}$ (MWh)	$EG_{import,y}$ (MWh)	$EG_{backupline,y}$ (MWh) ⁷	$EG_{facility,y}$ (MWh)	$EF_{grid,CM,y}$ (tCO ₂ /yr)	Baseline Emissions (tCO ₂ e)
01/11/2018- 31/12/2018 (P1)	21950.167	19.249	0.00	21930.918	0.99174	21,749
01/01/2019- 31/08/2019 (P1)	80602.008	99.480	0.00	80502.529	0.99174	79,837
01/09/2019- 31/12/2019 (P2)	30513.033	54.272	0.00	30458.761	0.84045	25,599
01/01/2020- 31/12/2020 (P2)	118754.993	122.560	0.00	118632.432	0.84045	99,704
01/01/2021- 30/11/2021 (P2)	118147.811	112.989	0.00	118034.823	0.84045	99,202
Total in this monitoring period	369968.013	408.549	0.00	369559.464	/	326,091

The monthly data are shown in appendix 1.

⁷ There is no electricity imported from the grid through the 10kV line during 01/11/2018 to 30/11/2021 based on Monthly Meter Reading records and Electricity receipts. These data have been confirmed by the grid company.

5.2 Project Emissions

According to the ACM0002, the emission of wind power project activity is zero, i.e. $PE_y=0$.

5.3 Leakage

According to ACM0002, the leakage of wind power project is not needed to be considered.

5.4 Net GHG Emission Reductions and Removals

In according with the registered PD

$$ER_y = BE_y - PE_y$$

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
01/11/2018-31/12/2018 (P1)	21,749	0	0	21,749
01/01/2019-31/08/2019 (P1)	79,837	0	0	79,837
01/09/2019-31/12/2019 (P2)	25,599	0	0	25,599
01/01/2020-31/12/2020 (P2)	99,704	0	0	99,704
01/01/2021-30/11/2021 (P2)	99,202	0	0	99,202
Total	326,091	0	0	326,091

Crediting Period	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
01/11/2018-31/12/2018	21,749	0	0	21,749
01/01/2019-31/12/2019	105,436	0	0	105,436

01/01/2020-31/12/2020	99,704	0	0	99,704
01/01/2021-30/11/2021	99,202	0	0	99,202
Total	326,091	0	0	326,091

The estimated annual GHG emission reductions in the first crediting period are 111,243 tCO₂e/yr, and the 94,273 tCO₂e/yr during the second crediting period. This monitoring period is from 01/11/2018 to 30/11/2021 (1126 days, 304 days in the first crediting period and 822 days in the second crediting period), covers the first crediting period and the second crediting period.

The emission reductions claimed are 326,091 tCO₂e in this monitoring period (i.e. 1126 days). Compared with expected emission reductions 304,960 tCO₂e (calculated as 111,243/365*304+94,273/365*822) in the registered VCS PD and renewed VCS PD, the reported emission reductions in this monitoring period are 6.93% larger than the expected, which is considered to be in the reasonable variation range.

This will not impact the additionally of the project activity as the sensitivity analysis of the project activity shows that the IRR will not exceeds benchmark until an 14.3% increase in Grid-connected electricity. The main reason for the electricity generation increase is that the wind flow in this monitoring period are larger than the designing value in the FSR, the management skills of the plant improves gradually and the wind power accommodation capacity of the grid is increasing.

APPENDIX: < MONTHLY AND YEARLY ELECTRICITY SUPPLY>

Period	EGexport,y, 3 (MWh)	EGexport,y, 4 (MWh)	EGexport,y,1		Conserva tive value of EGexport,y, 1	EGexport,y (MWh)	EGimport ,y,3 (MWh)	EGimport ,y,4 (MWh)	EGimport,y,1 (MWh)		Conserva tive value of EGimport,y, 1	EGimport,y (MWh)	EGbackupli ne,y (MWh)	EGfacility,y (MWh)
	Monthly Meter reading Records	Monthly Meter reading Records	Monthly Meter reading Records (MWh)	Electricity Receipts (MWh)			Meter reading s	Meter reading s	Month ly Meter readin g Recor ds (MWh)	Electri city Recep ts (MWh)				
	A	B	C	D			G	H	I	J				
01/11/2018- 30/11/2018	13904.9 40	11,902.7 30	24526.8 40	24526.8 40	24526.8 40	13214.8 40	4.870	25.160	30.65 2	30.65 2	30.652	4.971	0.000	13209.8 69
01/12/2018- 31/12/2018	9680.58 0	11,238.2 65	18876.2 40	18876.2 40	18876.2 40	8735.32 7	13.660	16.840	31.88 0	31.88 0	31.880	14.278	0.000	8721.04 9
Total in 2018 (P1)	23585.5 20	23140.9 95	43403.0 80	43403.0 80	43403.0 80	21950.1 67	18.530	42.000	62.53 2	62.53 2	62.532	19.249	0.000	21930.9 18
01/01/2019- 31/01/2019	13805.6 40	10,288.7 60	23874.9 50	23874.9 50	23874.9 50	13679.8 99	8.650	10.290	22.62 0	22.62 0	22.620	10.331	0.000	13669.5 69
01/02/2019- 28/02/2019	13632.4 70	9,965.37 0	23468.5 30	23468.5 30	23468.5 30	13557.7 68	19.040	15.620	38.20 0	38.20 0	38.200	20.985	0.000	13536.7 83
01/03/2019- 31/03/2019	10832.6 60	9,980.64 2	20514.8 70	20514.8 70	20514.8 70	10677.3 36	9.040	11.830	23.96 0	23.96 0	23.960	10.378	0.000	10666.9 57
01/04/2019- 30/04/2019	10534.2 70	8,650.83 0	19076.2 60	19076.2 60	19076.2 60	10474.5 07	10.210	9.840	24.06 0	24.06 0	24.060	12.252	0.000	10462.2 55
01/05/2019- 31/05/2019	6808.18 0	7,745.29 0	14028.0 90	14028.0 90	14028.0 90	6562.40 5	12.080	16.790	30.21 0	30.21 0	30.210	12.641	0.000	6549.76 4
01/06/2019- 30/06/2019	6019.24 0	8,890.16 5	14209.7 60	14209.7 60	14209.7 60	5736.77 9	5.870	18.210	25.26 0	25.26 0	25.260	6.158	0.000	5730.62 1
01/07/2019- 31/07/2019	11403.2 28	7,137.19 2	18534.9 00	18534.9 00	18534.9 00	11399.8 33	9.920	7.860	19.47 0	19.47 0	19.470	10.863	0.000	11388.9 70
01/08/2019- 31/08/2019	8903.67 0	8,943.76 3	17065.3 00	17065.3 00	17065.3 00	8513.48 2	15.630	10.150	26.18 0	26.18 0	26.180	15.873	0.000	8497.60 9
Total in 2019 (P1)	81939.3 58	71602.0 12	150772. 660	150772. 660	150772. 660	80602.0 08	90.440	100.59 0	209.9 60	209.9 60	209.960	99.480	0.000	80502.5 29
01/09/2019- 30/09/2019	4509.43 0	9,903.12 7	13635.8 20	13635.8 20	13635.8 20	4266.40 3	13.990	13.210	28.19 0	28.19 0	28.190	14.499	0.000	4251.90 4
01/10/2019- 31/10/2019	5735.69 0	10,327.8 80	15168.0 20	15168.0 20	15168.0 20	5415.92 3	20.180	16.990	40.04 0	40.04 0	40.040	21.738	0.000	5394.18 5
01/11/2019- 30/11/2019	10097.5 50	11,903.7 64	21887.4 30	21887.4 30	21887.4 30	10045.2 83	6.940	17.840	26.30 0	26.30 0	26.300	7.366	0.000	10037.9 17

01/12/2019-31/12/2019	11032.640	12,382.724	22890.680	22890.680	22890.680	10785.424	9.930	10.370	21.810	21.810	21.810	10.669	0.000	10774.755
Total in 2019 (P2)	31375.310	44517.495	73581.950	73581.950	73581.950	30513.033	51.040	58.410	116.340	116.340	116.340	54.272	0.000	30458.761
01/01/2020-31/01/2020	11320.640	11,027.923	22093.170	22093.170	22093.170	11191.271	12.930	16.330	30.170	30.170	30.170	13.332	0.000	11177.939
01/02/2020-29/02/2020	11923.140	10,283.675	21987.260	21987.260	21987.260	11805.258	9.050	13.260	23.810	23.810	23.810	9.658	0.000	11795.599
01/03/2020-31/03/2020	11790.370	9,023.870	20118.050	20118.050	20118.050	11396.008	4.830	8.740	13.600	13.600	13.600	4.841	0.000	11391.168
01/04/2020-30/04/2020	9703.240	8,893.160	18397.040	18397.040	18397.040	9599.218	6.680	9.950	18.040	18.040	18.040	7.246	0.000	9591.971
01/05/2020-31/05/2020	8387.160	8,043.190	16108.730	16108.730	16108.730	8222.983	10.050	10.230	21.360	21.360	21.360	10.585	0.000	8212.398
01/06/2020-30/06/2020	8340.400	8,675.180	16703.700	16703.700	16703.700	8187.528	11.320	20.710	33.030	33.030	33.030	11.673	0.000	8175.855
01/07/2020-31/07/2020	7530.240	7,693.720	14803.660	14803.660	14803.660	7322.347	10.920	18.040	29.700	29.700	29.700	11.199	0.000	7311.148
01/08/2020-31/08/2020	7021.530	9,908.790	16109.300	16109.300	16109.300	6681.027	13.930	8.750	24.620	24.620	24.620	15.122	0.000	6665.906
01/09/2020-30/09/2020	9310.520	9,823.463	18973.780	18973.780	18973.780	9232.566	9.400	9.380	19.230	19.230	19.230	9.625	0.000	9222.941
01/10/2020-31/10/2020	9404.350	8,593.240	17760.260	17760.260	17760.260	9280.337	6.380	10.330	17.810	17.810	17.810	6.800	0.000	9273.537
01/11/2020-30/11/2020	12905.290	10,320.460	22830.820	22830.820	22830.820	12685.849	9.210	10.210	22.830	22.830	22.830	10.827	0.000	12675.022
01/12/2020-31/12/2020	13223.800	10013.278	23108.450	23108.450	23108.450	13150.600	10.480	5.720	18.010	18.010	18.010	11.651	0.000	13138.949
Total in 2020 (P2)	120860.680	112299.949	228994.220	228994.220	228994.220	118754.993	115.180	141.650	272.210	272.210	272.210	122.560	0.000	118632.432
01/01/2021-31/01/2021	11083.160	11,924.278	22730.270	22730.270	22730.270	10949.642	8.840	8.940	22.310	22.310	22.310	11.092	0.000	10938.550
01/02/2021-28/02/2021	12092.820	10,437.884	22189.540	22189.540	22189.540	11909.708	10.370	10.250	23.100	23.100	23.100	11.617	0.000	11898.091
01/03/2021-31/03/2021	12208.110	8,213.163	20316.620	20316.620	20316.620	12145.547	12.940	13.830	27.160	27.160	27.160	13.129	0.000	12132.419
01/04/2021-30/04/2021	11903.790	7,058.740	18672.930	18672.930	18672.930	11721.993	7.920	18.640	28.960	28.960	28.960	8.636	0.000	11713.357
01/05/2021-31/05/2021	11206.250	7,790.160	18306.050	18306.050	18306.050	10798.997	10.850	8.870	22.720	22.720	22.720	12.501	0.000	10786.496
01/06/2021-30/06/2021	9903.210	8,034.650	17782.940	17782.940	17782.940	9817.681	8.530	12.350	21.190	21.190	21.190	8.657	0.000	9809.024
01/07/2021-31/07/2021	9355.060	8,043.190	17451.880	17451.880	17451.880	9383.897	10.120	10.920	23.260	23.260	23.260	11.188	0.000	9372.709
01/08/2021-31/08/2021	8832.740	9,247.185	17459.030	17459.030	17459.030	8529.409	9.360	18.220	29.480	29.480	29.480	10.005	0.000	8519.404
01/09/2021-30/09/2021	12321.700	9,036.250	21094.870	21094.870	21094.870	12169.925	10.370	9.040	20.170	20.170	20.170	10.776	0.000	12159.149
01/10/2021-31/10/2021	11583.280	10,392.175	21468.380	21468.380	21468.380	11316.000	5.480	10.530	18.270	18.270	18.270	6.254	0.000	11309.747

01/11/2021-30/11/2021	9349.47 0	11,894.5 88	21370.2 60	21370.2 60	21370.2 60	9405.01 1	8.210	11.840	22.31 0	22.31 0	22.310	9.135	0.000	9395.87 6
Total in 2021 (P2)	119839.590	102072.263	218842.770	218842.770	218842.770	118147.811	102.990	133.430	258.930	258.930	258.930	112.989	0.000	118034.823
Total	377600.458	353632.714	715594.680	715594.680	715594.680	369968.013	378.180	476.080	919.972	919.972	919.972	408.549	0.000	369559.464