



**Verified Carbon
Standard**

HEBEI YUXIAN KONGZHONGCAOYUAN 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 Kongzhongcaoyuan 49.5MW Wind Farm Project (hereinafter referred to as the project) is developed by Hebei Construction Investment Yuzhou Wind Energy Co., Ltd. It is located in Xiagongcun Village of Yuxian County, Zhangjiakou City, 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 111,610 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 project is operated, the electricity generated has displaced 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 17/07/2008 to 16/07/2018) are 118,735 tCO₂e.

The construction of the project began on 20/05/2007, and the first turbine was put into operation on 17/07/2008. The project was put into full commercial operation on 27/09/2008 and has a 20-year operating life.

The first crediting period is from 17/07/2008 to 16/07/2018. This monitoring period is from 23/02/2016 to 31/12/2016 (313 days), belongs to the first crediting period. The emission reductions in this monitoring period is 108,086 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

Organization name	Hebei Construction Investment Yuzhou Wind Energy Co., Ltd
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1.4 Other Entities Involved in the Project

Organization name	Demeter Venture Uk Limited
Role in the Project	Project participant
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1.5 Project Start Date

17/07/2008 (operation date, which means the date that started to generate GHG emission reductions).

1.6 Project Crediting Period

This is the first crediting period. The start date of the crediting period is 17/07/2008 and the end date of the crediting period is 16/07/2018. The total number of years for the crediting period is 10 years.

The project is also a registered CDM project (Ref.2088) with a 7*3 renewable project crediting period, the VCS issuance is not eligible for beyond the end of those 21 years. Furthermore, given that the VCS crediting period started on 17/07/2008 and the lifetime of the project is about 20 years, thus, the VCS crediting period will end on 16/07/2028.

1.7 Project Location

The project site is located in the southwest of Yuxian County, Zhangjiakou City of Hebei Province. The site location's approximate coordinates are East Longitude of $114^{\circ}30'45'' \sim 114^{\circ}32'25''$ and North Latitude of $39^{\circ}36'32'' \sim 39^{\circ}33'58.6''$. The project site is about 30 kilometers far away from the town of Yuxian County. Figure 1 shows the location of the project.



Figure 1. The location of the project

1.8 Title and Reference of Methodology

The project applies the approved consolidated baseline and monitoring methodology ACM0002 during the first crediting period.

- Grid-connected electricity generation from renewable sources (version 6.0).

Reference:

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

The methodology also refers to the following tools:

- Tool for the demonstration and assessment of additionality (Version 5.0).

Reference:

https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-01-v7.0.0.pdf/history_view

1.9 Participation under other GHG Programs

The Project has been registered as a CDM project on 23/02/2009 with registration number of 2088. The credits from 23/02/2009 to 24/10/2012 have been issued under CDM mechanism. The credits from 25/10/2012 to 22/02/2016 are waiting for issuance under CDM.

The credits in this monitoring period (23/02/2016 to 31/12/2016) has not been counted and will not be counted under other kind of GHG programs.

1.10 Other Forms of Credit

Emission Trading Programs and Other Binding Limits

The project proponent Hebei Construction Investment Yuzhou Wind Energy Co., Ltd., as an enterprise for renewable energy investment, is not included in the compliance entity list by China national Emission Trading Scheme (ETS). Also, the project has not been registered as a CCER (Chinese Certified Emission Reductions) project in China, thus it is not eligible for emission reductions transaction under the China's ETS. Therefore, the project is not involved in an emission trading program or any other mechanism that includes GHG allowance trading. Furthermore, as a voluntary emission reduction project, the GHG emission reductions and removals generated by the project will not be enforced to be used for compliance in China.

Other Forms of Environmental Credit

The project hasn't sought or received another form of environmental credits.

1.11 Sustainable Development Contributions

The project makes contribution to the sustainable development as follows:

The project located at Xiagongcun Village of Yuxian County, Zhangjiakou City, Hebei Province, P.R.China, involves to employ 300 temporary employment during the construction phase and 35 permanent employment including 12 female during the operation phase, and operate 49.5 MW(33*1500kW) wind turbine units to generate power from clean renewable wind power in Hebei Province.

- The project generated 35 working opportunities for the poor people in the area and help

them lift out of poverty, and contributes to Chinese poverty alleviation goal¹.

- The project has supplied 100,499.089 MWh in this monitoring period that otherwise have been produced by thermal power generation projects, and contributes to Chinese renewable energy target².
- The emission reduction of the project is 108,086 t CO₂e in this monitoring period, and contributes to Chinese Climate change target³.

¹ China's rural poverty alleviation and development Outline

http://www.gov.cn/zhengce/content/2016-09/23/content_5111138.htm

² Nationally Determined Contribution Goals of renewable energy

<https://www.ccchina.org.cn/Detail.aspx?newsId=73916&TId=60>

³ Nationally Determined Contribution Goals of carbon peak in 2030 and carbon neutral in 2060

<https://www.ccchina.org.cn/Detail.aspx?newsId=73916&TId=60>

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	1.2	1.2.1 Proportion of population living below the national poverty line, by sex and age	Implemented activities to decrease	During the current monitoring period there are 35 jobs stable job opportunities provided to local people and their annual average income are about 36,000RMB/year in 2016, which are all above the Chinese poverty line of 2,952 RMB/year in 2016 ⁴ , and there is no further change of the proportion of population living below the national poverty line, by sex and age.	From the operation start date of the project to the end of this monitoring period, the project provides about 35 stable work opportunities to local people, and give local people additional income from low- and unstable-income individual under poverty to income of more than 18,000 RMB/year and 36,000RMB/year in 2008 and 2016 respectively. As per Chinese Poverty line standard, Chinese poverty line in 2008 is 1,196RMB/year, in 2016 is 2,952RMB/year ⁵ .
2)	7.2	7.2.1 Renewable energy share in the total final energy	Implemented activities to increase	The project utilizes wind energy for electricity generation, which could increase the ratio of renewable energy in total energy consumption of China. From 23/02/2016 to 31/12/2016 the electricity supplied from the project is 100,499.089	The credits from 25/10/2012 to 22/02/2016 are waiting for issuance under CDM, so from the operation start date of the project to the end of this monitoring period, the verified electricity generated by this project is 483,636.805MWh (refer to table below for

⁴ http://www.stats.gov.cn/tjsj/sjjd/201701/t20170120_1456174.html

⁵ <https://www.gpbctv.com/jrrd/202104/159842.html>

				MWh.	further details).
3)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	By utilizing wind for power generation and replaced it from thermal power generation projects from 23/02/2016 to 31/12/2016 the emission reduction from the project is around 108,086 tCO ₂ e	The credits from 25/10/2012 to 22/02/2016 are waiting for issuance under CDM, so from the operation start date of the project to the end of this monitoring period, the verified emission reduction generated by this project is 520,148 tCO ₂ e (refer to table below for further details).

The electricity and emission reduction that has been verified during the previous monitoring period and will be verified by VVB during this monitoring period are as follows:

Monitoring period	EGy(MWh)	Emission Reductions (tCO ₂ e)
17/07/2008-22/02/2009	40,445.91	43,499
23/02/2009-24/06/2009	32,559.613	35,017
25/06/2009-24/06/2010	97,373.773	104,725
25/06/2010-24/06/2011	106,738.301	114,797
25/06/2011-24/06/2012	84,135.860	90,488
25/06/2012-24/09/2012	11,678.760	12,560
25/09/2012-24/10/2012	10,205.500	10,976
23/02/2016-31/12/2016	100,499.088	108,086
Total	483,636.805	520,148

2 SAFEGUARDS

2.1 No Net Harm

The Environmental Impact Assessment of the proposed project was completed by the College of Resource and Environmental Sciences, Hebei Normal University, and approved by the Environment Protection Bureau of Hebei Province on 21th August, 2006 (decree number: [2006]133). Main contents of the Environmental Impact Assessment are summarized as follows:

Ecological impact

-Construction Phase

1) Impact on Foliage

The impact of Booster Station, Temporary Construction Field, The main Approach Road, the waste disposal area (WDA) and the road to WDA. The area of the buildings stated above will be all the shrub-grassland. The original vegetation will be uprooted for the construction. So, constructing the buildings stated above have some adverse impact on vegetation during construction phase.

2) Impact of the wind turbine's zone and the cable chutes

The area of the wind turbine's zone and the cable chutes will be all the grassland. The greensward in the area under construction will be divided into pieces (30×30cm) before construction. The pieces of greensward will be replanted in the construction field and maintained by special personnel. The surface soil from permanent occupation and part of the construction field will be piled up in the construction field. The surface soil will be backfilled and then replanted the pieces of greensward after the construction. Therefore, the wind turbine's zone and the cable chutes have little impact on vegetation during construction phase.

3) Impact of construction road

The folding-road laying system will be used as the construction road. When constructs finished, the laying device will be removed and the grassland will be recovery after a period of time. Hence, the construction road has little impact on vegetation during construction phase. In a word, there is little impact on vegetation during construction phase.

4) 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. To conclude, the ecological impact of the proposed project during construction phase is insignificant.

-Operation Phase

1) Impact on the Vegetation

The area occupied by the proposed wind farm will be 339,822m², in which there will be 26,372 m² for permanent occupation and 313,450 m² for temporary occupation. The original ecological system will be recovery from the third year after the construction period. Additionally, the project owner will plant 2 hm² Sea buck thorn and other shrub to make the afforestation rate over 15%. Hence, the impact of the proposed project on the vegetation during operation phase will be minimal.

2) Impact on the animal

No big mammal has been found in the local area. There are only small mammals just like hare and mice. They will migrate to the former address after the construction period. Moreover, there is no rare birds in the project site and the project site is not the thoroughfare of migratory birds. Therefore, the impact of the proposed project on the animal during operation phase will be minimal.

3) 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. In a word, the ecological impact of the proposed project during the operation phase will be insignificant.

Environmental Impact

-Construction phase

The distance between the temporary construction field and Xiushuipen village is 50m. The shortest distance between the wind turbine and the village is 3500m. The periodic sprinkling will be done during the construction phase and the transport truck will be covered by canvas. The construction will be prohibited from 12:00 to 14:00 and night. 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. The waste water is the sewage from the workers. The sewage will be sprinkled on the site ground. Because of the spot construction manner, the sewage can't be collected. The little sewage will be absorbed into soil or vaporized and will not form the runoff. So the waste water will not damage the water environment.

-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 in the Table 4 of 'Integrated Wastewater discharge Standard' and will be discharged into the collecting pond. The processed sewage will be utilize to irrigate plant in the project site without discharge because it will in compliance with the standards of dry land in the Standards for irrigation water quality (GB5084-1992). Therefore, the sewage from the proposed project during the operation phase will have less impact on the environment.

2) Noise

It is predicted that the noise contribution of the wind turbines is 43db (A) with a distance of 400m to the wind turbines. The project is located in the rural area which has a lower geoenvironmental background value. So the noise will have less impact on the residents if the distance is over 400m. The closest village to the proposed wind farm is Guoshitang village and the shortest distance between them is 3500m. Hence, the proposed project will have less impact on the residents during the operation phase.

3) Solid waste

The solid waste will be mainly composed of the household garbage generated from the workers in the 110 kV booster station. The yield of the solid waste will be about 3.0t/a. The solid waste will be carried termly to the landfill nearby. Therefore, impact of solid waste on the environment is considered to be insignificant.

Socio-economic impact

The project has increased local employment levels by providing 300 temporary jobs during construction and 35 permanent jobs for 35 employees, including 12 women, during operation. These 35 employees earn well above the local poverty level, as described in Section 1.11. Regular skills and CDM training is provided to employees during the project operations, which in part enhances their market competitiveness of employees and the possibility of lifelong learning.

By increasing renewable energy capacity, the project displaces electricity that may have been generated from fossil fuel fired power plants, such as coal, and consequently delivers improved air quality, both locally and globally, by reducing NOX, SOX and PM emissions. Refer to Section 1.11 for further details.

Conclusion

Wind energy is a kind of inexhaustible and inexhaustible clean and renewable energy, which has unique advantages and great development potential. Making full use of wind energy is of great significance to energy saving, emission reduction, environmental protection and local economy, and contributes to the sustainable development of global energy.

Thus, the project does not have any major adverse impacts on the environment and social economy during its construction and operation phase. This project does not do harm to local environment and social economy.

2.2 Local Stakeholder Consultation

Hebei Construction Investment Yuzhou Wind Energy Co., Ltd carried out on-site surveys on the local government agencies, local villagers and residents, the representative of investor and project owner in Yuxian County during June in 2007. The survey was conducted through distributing and collecting responses to a questionnaire which was designed by project owner. Questionnaire were designed to be easily filled in the following sections:

- 1) Project introduction
- 2) Respondent's basic information and education level
- 3) Questions on:

- Does the proposed project has positive/negative impact on your livelihoods?
- Do you agree with the construction of the proposed project?
- What is your opinion on developing wind farm projects in the local area?
- Does the proposed project has positive/negative impact on the local environment?
- Do you think that the proposed project will accelerate the developing of local economy?

4) Space for the respondents' signature and date.

In addition, a questionnaire was advertised in Yuxian County TV Station on 29/01/2008. Besides the content mentioned above, the following question was added in the advertisement.

- What other comments and suggestions do the respondents have for the company regarding the Project?

The on-site survey had 88.8% response rate (40 questionnaires returned out of 45) and the survey results are shown as follows:

Survey Result of Stakeholders			
Does the proposed project have positive/negative impact on your livelihoods?	positive	negative	Do not care
	90%	0	10%
Do you agree with the construction of the proposed project?	Yes	No	Do not care
	100%	0	0
What is your opinion on developing wind farm projects in the local area?	Good	Normal	Bad
	87.5%	7.5%	5%
Does the proposed project has positive/negative impact on the local environment?	positive	negative	Do not care
	95%	0	5%
Do you think that the proposed project will accelerate the developing of local economy?	Yes	No	Do not care
	82.5%	0	17.5%

Conclusion:

The stakeholders are all supportive of this project and no negative comments have been received.

- For continuous communication with local stakeholders, the project owner public its office telephone to local people and put a guest's book in the office of the company. Anyone who have comments on the project could write on the book or leave messages 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

Based on the public bidding, the project owner has signed a 33×1500kW wind power equipment purchase agreement with the winner of the wind generator supplier company, i.e. Dongfang Turbine Co., Ltd., which is a domestic manufacturer. The type of wind generator is determined as FD70B. Key technical specifications of FD70B turbines are listed as the table below.

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

Parameters Name	Unit	Value
Type of Turbine		FD70B
Nominal output	kW	1500
Diameter	m	70
Hub height	m	65
Rated voltage	V	690
Nominal wind speed	m/s	13

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

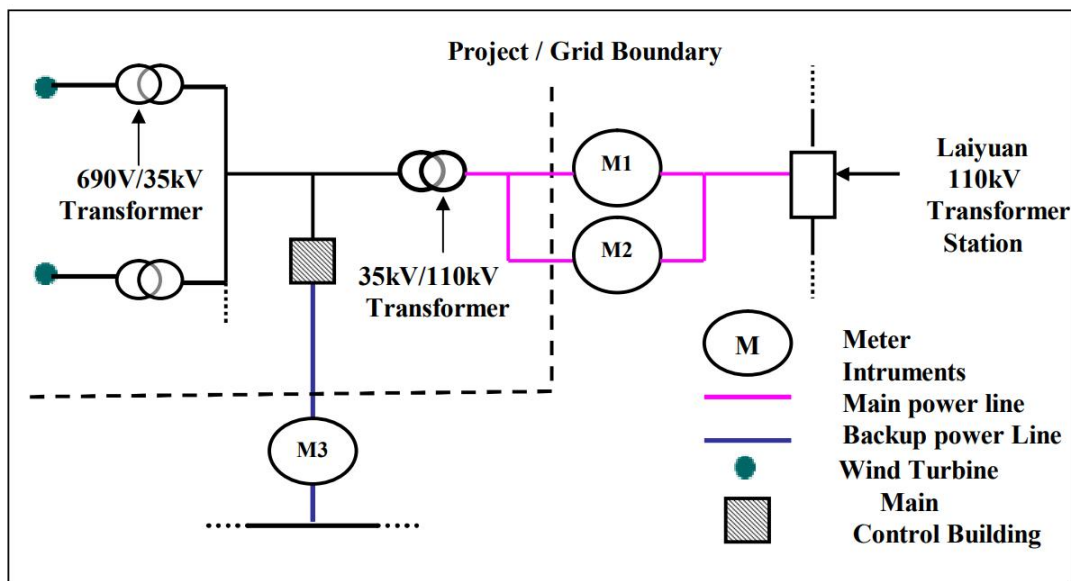


Figure 2 The simplified flow diagram of the project

The electricity generated by the project has been transmitted to an on-site transformer station that increases the voltage to 110 kV, and then been delivered to Laiyuan transformer station which connected to the Hebei Southern Power Grid.

The Project started construction on 20/05/2007 and the first turbine was put into operation on 17/07/2008 and the project was put into full operation on 27/09/2008.

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

3.2.1 Methodology Deviations

There is no methodology deviation in this monitoring period.

3.2.2 Project Description Deviations

In the registered VCS PD, the crediting period is described as from 17/07/2008 to 22/02/2009. The project is registered under VCS Standard Version 2007.1 and completed validation before 19/03/2020. Thus, it remains eligible to apply the crediting period requirements under VCS Standard Version 3, which shall be a maximum of ten years and may be renewed at most twice. Hence, the first renewable crediting period of the project has been updated from 17/07/2008 - 22/02/2009 to 17/07/2008 - 16/07/2018.

As a CDM project with a 7*3 renewable project crediting period, the VCS issuance is not eligible for beyond the end of those 21 years. Furthermore, given that the VCS crediting period started on 17/07/2008 and the lifetime of the project is about 20 years, thus, the VCS crediting period will end on the 16 July 2028.

There are no project description deviations applied during this monitoring period.

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

Data / Parameter	EF _{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	1.0755
Justification of choice of data or description of measurement methods and procedures applied	Ex-ante determined in the registered PD and fixed during the 1 st crediting period.
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.

4.2 Data and Parameters Monitored

Data / Parameter	EG _{s,y}															
Data unit	MWh															
Description	Electricity supplied to the grid by the project															
Source of data	Measured by electricity meters: M1 and M2.															
Description of measurement methods and procedures to be applied	It is continuously measured by the bi-directional meters. M1 and M2 are installed at the high voltage side of 35kV/110kV transformer. M1 is the main meter, M2 is the backup meter, which are both managed, operated and maintained by the project owner. The accuracy of the meters is 0.2S. The cut-off time of recording of all meters is at 24:00 on the end of each month.															
Frequency of monitoring/recording	Continuously measured, daily recorded and monthly aggregated															
Value monitored	100,616.536															
Monitoring equipment	The information of the electricity meters is shown below: <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>M1</td><td>ZMD402</td><td>94827518</td><td>0.2S</td><td>22/12/2015-21/12/2016 22/12/2016-21/12/2017</td></tr><tr><td>M2</td><td>ZMD402</td><td>95411208</td><td>0.2S</td><td>22/12/2015-21/12/2016 22/12/2016-21/12/2017</td></tr></table>	Name	Type	Serial No.	Accuracy	Calibration Date and valid date	M1	ZMD402	94827518	0.2S	22/12/2015-21/12/2016 22/12/2016-21/12/2017	M2	ZMD402	95411208	0.2S	22/12/2015-21/12/2016 22/12/2016-21/12/2017
Name	Type	Serial No.	Accuracy	Calibration Date and valid date												
M1	ZMD402	94827518	0.2S	22/12/2015-21/12/2016 22/12/2016-21/12/2017												
M2	ZMD402	95411208	0.2S	22/12/2015-21/12/2016 22/12/2016-21/12/2017												

QA/QC procedures to be applied	The electricity meters are annually calibrated by qualified entity according to national standards. The electricity records are crosschecked with electricity receipts. All data will be archived for at least 2 years after the end of the final crediting period.
Purpose of the data	Calculation of baseline emissions
Calculation method	/
Comments	/

Data / Parameter	EG _{c,y}															
Data unit	MWh															
Description	Electricity consumed from the grid by the project through the main power line															
Source of data	Measured by electricity meters: M1 and M2.															
Description of measurement methods and procedures to be applied	It is continuously measured by the bi-directional meters. M1 and M2 are installed at the high voltage side of 35kV/110kV transformer. M1 is the main meter, M2 is the backup meter, which are both managed, operated and maintained by the project owner. The accuracy of the meters is 0.2S. The cut-off time of recording of all meters is at 24:00 on the end of each month.															
Frequency of monitoring/recording	Continuously measured, daily recorded and monthly aggregated															
Value monitored	117.447															
Monitoring equipment	The information of the electricity meters is shown below: <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>M1</td><td>ZMD402</td><td>94827518</td><td>0.2S</td><td>22/12/2015-21/12/2016 22/12/2016-21/12/2017</td></tr><tr><td>M2</td><td>ZMD402</td><td>95411208</td><td>0.2S</td><td>22/12/2015-21/12/2016 22/12/2016-21/12/2017</td></tr></table>	Name	Type	Serial No.	Accuracy	Calibration Date and valid date	M1	ZMD402	94827518	0.2S	22/12/2015-21/12/2016 22/12/2016-21/12/2017	M2	ZMD402	95411208	0.2S	22/12/2015-21/12/2016 22/12/2016-21/12/2017
Name	Type	Serial No.	Accuracy	Calibration Date and valid date												
M1	ZMD402	94827518	0.2S	22/12/2015-21/12/2016 22/12/2016-21/12/2017												
M2	ZMD402	95411208	0.2S	22/12/2015-21/12/2016 22/12/2016-21/12/2017												
QA/QC procedures to be applied	The electricity meters are annually calibrated by qualified entity according to national standards. The electricity records are crosschecked with electricity receipts. All data will be															

	archived for at least 2 years after the end of the final crediting period.
Purpose of the data	Calculation of baseline emissions
Calculation method	/
Comments	/

Data / Parameter	EG _{backupline,y}															
Data unit	MWh															
Description	Electricity consumed from the grid by the project through the backup line.															
Source of data	Measured by electricity meter M3.															
Description of measurement methods and procedures to be applied	M3 is installed at the 10kV backup line. In case blackout in the main power line, the project will consume the electricity through the backup power line. Power delivered to the project through the backup power line (EG_{backupline,y}) is metered by instruments at M3. The cut-off time of recording of all meters is at 24:00 on the end of each month.															
Frequency of monitoring/recording	Continuously measured, daily recorded and monthly aggregated															
Value monitored	0															
Monitoring equipment	The information of the electricity meters 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>M3</td><td>DSSD331</td><td>20070130030114</td><td>0.5S</td><td>11/04/2015-10/04/2016</td></tr><tr><td></td><td></td><td></td><td></td><td>11/04/2016-10/04/2017</td></tr></table>	Name	Type	Serial No.	Accuracy	Calibration Date and valid date	M3	DSSD331	20070130030114	0.5S	11/04/2015-10/04/2016					11/04/2016-10/04/2017
Name	Type	Serial No.	Accuracy	Calibration Date and valid date												
M3	DSSD331	20070130030114	0.5S	11/04/2015-10/04/2016												
				11/04/2016-10/04/2017												
QA/QC procedures to be applied	The electricity meter is annually calibrated by qualified entity according to national standards. The electricity records are crosschecked with electricity receipts. All data will be archived for at least 2 years after the end of the final crediting period.															
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_y) supplied to the grid by the project will be calculated from the following parameters.

$$EG_y = EG_{s,y} - EG_{c,y} - EG_{backupline,y}$$

Where:

$EG_{s,y}$: Electricity supplied to the grid by the project by main meter M1 and backup meter M2.

$EG_{c,y}$: electricity consumed by the project through the main power line by main meter M1 and backup meter M2.

$EG_{backupline,y}$: electricity consumed from the grid by the project through the backup line by meter M3.

2. Organization Chart

This monitoring plan will be implemented by Hebei Construction Investment Yuzhou Wind Energy Co., Ltd, the project owner, and by consultants appointed by the project owner.

The monitoring activity involves 8 employments which include 1 project manager. The project manager is responsible for the implementation and monitoring of the monitoring activity. There are 3 departments organized for data report, quality control and training. There is 1 manager responsible for data report and quality control department by 1 of each. There are also 4 staffs work in these two departments by 2 of each. The manager takes charge of the employment administration, as well as the operation implementation and monitoring; staffs carry on the concrete assignment based on the guide of their manager. The training department has 1 manager who is responsible for the entire training process of the project. The monitoring system flowchart of this project is shown in figure 3.

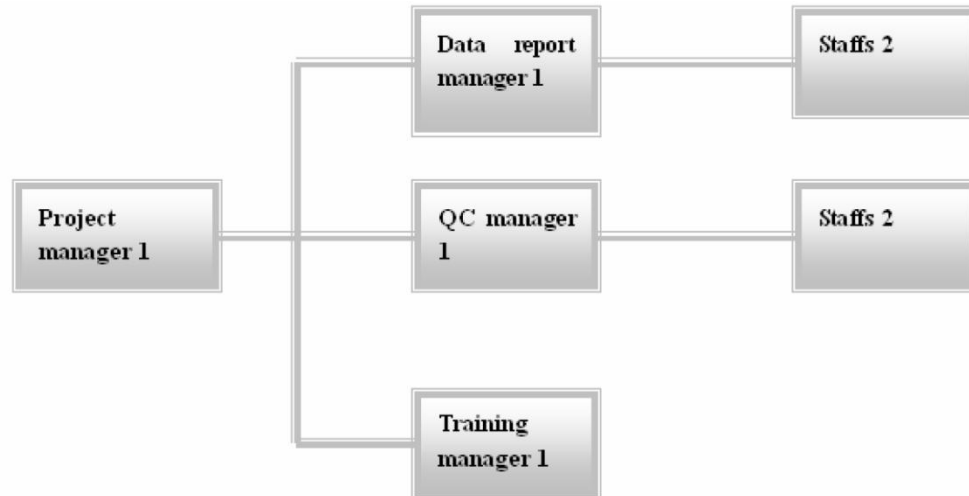


Figure 3. Monitoring structure

3. Metering System

The electricity generated by the project are transmitted to an on-site transformer station that increases the voltage to 110 kV, then be delivered to Laiyuan transformer station which connected to the Hebei Southern Power Grid. The simplified electrical grid connection diagram is shown in the following figure 4.

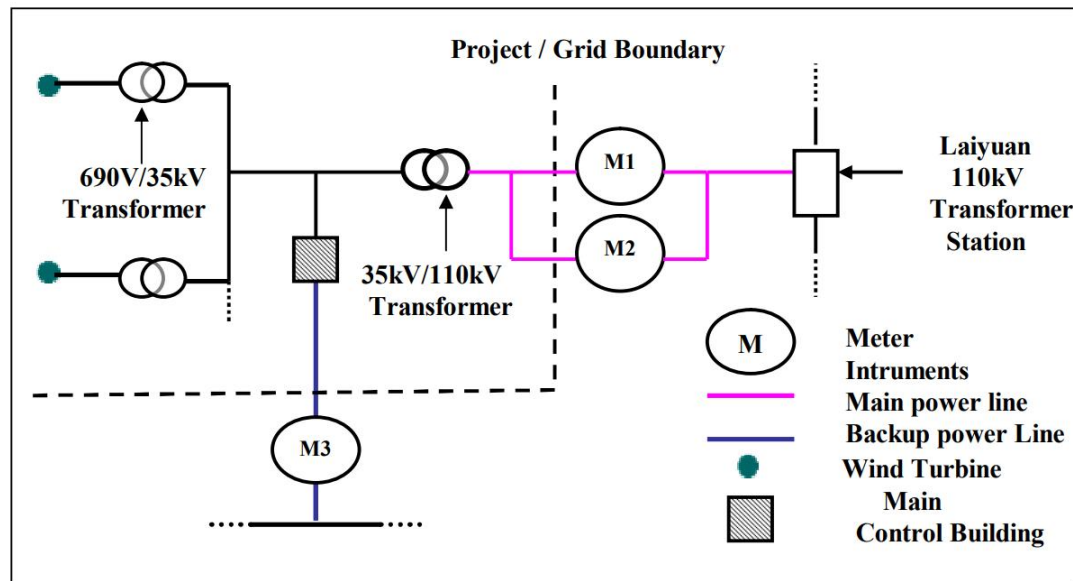


Figure 4. Simplified electrical grid connection diagram

The power line supplying electric power to the grid can also deliver power from the grid to the wind farm in case of emergencies and when the wind farm does not produce enough power for auxiliary power use. The metering equipment runs in two directions and will

record two readings, i.e. electricity supplied to the grid ($EG_{s,y}$) and electricity consumed from the grid ($EG_{c,y}$).

The metering system indicated by the meter instruments at M1 in Figure 4 is the main meter, the metering system indicated by the meter instruments at M2 in Figure 4 is the backup meter, which are both managed, operated and maintained by the project owner. The main meter and the backup one are as like as two peas.

The grid company will monitor the main meter M1. The invoice, electricity receipts and accounting vouchers for receipt of payment for power supplied to the grid will serve as a cross-check. The project owner will read and record the main (M1) and backup (M2) instruments monthly. The cut-off time of recording of all meters is at 24:00 on the end of each month.

In case blackout in the main power line, the project will consume the electricity through the backup power line. Power delivered to the project through the backup power line ($EG_{backupline,y}$) is metered by instruments at M3 in figure 4 which are operated by the grid company but can also be read by the project owner. The project owner records the readings in electronic and manual form. The project owner receives monthly billing receipts from the grid company which serve as a cross-check of the accuracy of the record of the readings of meter M3.

4. Quality Assurance and Quality Control Procedure

The metering equipments are properly calibrated and checked annually according to national standard to ensure its accuracy. The metering equipment shall have sufficient accuracy so that any error resulting from such equipment shall not exceed 0.5% of full-scale rating.

The main calibration is implemented by Hebei Northern Power Grid and relative recording files are supplied to the project owner. These recording files are preserved by the project owner and provide to VVB in Verification

The main meters must be fulfilled calibration in 10 days by both parties in such conditions:

- The error resulting from such equipments exceed allowable scale.
- The operation of one or more elements does not accord with the request of rules.

There is a maintenance schedule programmed at the start of the operation and is refreshed according to the plants performance requirement.

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:

1) In case the main meter is damaged only:

By reading the backup meter.

2) 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.

5. Information collection and management

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

The monthly records of power supplied to the grid and received from the grid, relevant accounting documents and electricity 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 of emergencies, the project entity will not claim emission reductions due to the project activity for the duration of the emergency. The project entity will follow the following procedure for declaring the emergency period to be over:

The project entity will ensure that all requirements for monitoring of emission reductions have been re-established.

The monitoring officer and the head of operations of the wind farm will both sign a statement declaring the emergency situation to have ended and normal operations to have resumed.

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 final 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

$$BE_y = EG_y \times EF_{CM,y}$$

Where:

BE_y is the baseline emissions (tCO₂e)

EG_y is the net electricity supplied to the grid by the project in year y (MWh);

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

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

$$EG_y = EG_{s,y} - EG_{c,y} - EG_{backupline,y}$$

With:

$EG_{s,y}$: electricity supplied to the project through the main power line metered by the instruments at M1.

$EG_{c,y}$: electricity consumed from the grid through the main power line metered by the instruments at M1.

$EG_{backupline,y}$: electricity consumed from the grid by the project through the backup line metered by the instruments at M3.

On the basis of these weights for the first crediting period, the combined margin emission factor ($EF_{CM,y}$) is calculated, and are fixed as 1.0755 tCO₂/MWh. The yearly electricity volume and baseline emissions during this monitoring period are listed in following table 2.

Table 2. Baseline emissions

Period	$EG_{s,y}$ (MWh)	$EG_{c,y}$ (MWh)	$EG_{backupline,y}$ (MWh) ⁶	EG_y (MWh)	$EF_{CM,y}$ (tCO ₂ /yr)	Baseline Emissions (tCO ₂ e)
23/02/2016 ⁷ -31/12/2016	100616.536	117.447	0.00	100499.089	1.0755	108,086
Total in this monitoring period	100616.536	117.447	0.00	100499.089	1.0755	108,086

The monthly data are shown in appendix 1.

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, $ER_y=BE_y - PE_y - L_y$

Year	Baseline emissions or removals	Project emissions or	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or
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⁶ There is no electricity imported from the grid through the 10kV line during 23/02/2016-31/12/2016.

⁷ The grid company issued the confirmation of Electricity exported to the grid by the Project covering the period from 23/02/2016-29/02/2016.

	(tCO ₂ e)	removals (tCO ₂ e)		removals (tCO ₂ e)
23/02/2016-31/12/2016	108,086	0	0	108,086
Total	108,086	0	0	108,086

This monitoring period is from 23/02/2016-31/12/2016 (313 days). The estimated annual GHG emission reductions during this crediting period are 101,819 tCO₂e/yr.

The emission reductions claimed are 108,086 tCO₂e in this monitoring period (i.e. 313 days). Compared with expected emission reductions 101,819 tCO₂e (calculated as 118,735/365*313) in the registered VCS PD, the reported emission reductions in this monitoring period are 6.15% 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 12.2% 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 1: < MONTHLY AND YEARLY ELECTRICITY SUPPLY >

period	EG _{s,y} (MWh)			EG _{c,y} (MWh)			EG _{backupline,y} (MWh)	EG _y (MWh)
	Monthly Meter reading records (MWh)	electricity receipts (MWh)	Conservative value (MWh)	Monthly Meter reading records (MWh)	electricity receipts (MWh)	Conservative value (MWh)	value for ER calculation (MWh)	
	A	B	C=Min(A,B)	D	E	F=Max(D,E)	G	
23/02/2016-29/02/2016	3283.766	3283.766	3283.766	3.407	3.407	3.407	0.000	3280.359
01/03/2016-31/03/2016	11024.280	11024.280	11024.280	13.720	13.720	13.720	0.000	11010.560
01/04/2016-30/04/2016	10103.620	10103.620	10103.620	10.860	10.860	10.860	0.000	10092.760
01/05/2016-31/05/2016	8239.070	8239.070	8239.070	5.730	5.730	5.730	0.000	8233.340
01/06/2016-30/06/2016	7953.770	7953.770	7953.770	15.220	15.220	15.220	0.000	7938.550
01/07/2016-31/07/2016	8954.380	8954.380	8954.380	10.140	10.140	10.140	0.000	8944.240
01/08/2016-31/08/2016	9630.250	9630.250	9630.250	13.280	13.280	13.280	0.000	9616.970
01/09/2016-30/09/2016	9362.110	9362.110	9362.110	15.630	15.630	15.630	0.000	9346.480
01/10/2016-31/10/2016	9247.890	9247.890	9247.890	10.590	10.590	10.590	0.000	9237.300
01/11/2016-30/11/2016	10893.670	10893.670	10893.670	10.350	10.350	10.350	0.000	10883.320

01/12/2016-31/12/2016	11923.730	11923.730	11923.730	8.520	8.520	8.520	0.000	11915.210
Total	100616.536	100616.536	100616.536	117.447	117.447	117.447	0.000	100499.089

Note: The electricity supplied to the grid and imported from the grid by meter M1 during the period from 23/02/2016-29/02/2016 were calculated by the meter readings on 23/02/2016-29/02/2016, which were sourced from the daily records carried out by the project owner. The relevant certificate issued by the power grid company was used to take the crosscheck.

APPENDIX 2: < DESCRIPTION OF EMPLOYMENT AND SALARY>

Evidence for SDG7.2 and 13.0

The electricity supplied during this monitoring period between 23/02/2016 to 31/12/2016 is 100,499.089MWh. The total emission reductions claimed in this monitoring period are 108,086tCO₂e. and the emission reduction generated from the project during this monitoring period is 108,086tCO₂e as mentioned in section 5.4 above, which is calculated from meter(s) readings and Sales receipts provided by the project owner, which will be verified by VVB.

The list of employees and their monthly salaries are shown below, using the monthly salaries of employees as of October 2008 and June 2016, respectively, to illustrate employee earnings, and employees' annual salaries can be obtained by multiplying their monthly salaries by 12 months.

说 明

蔚县空中草原 49.5MW 风电项目，建设阶段为当地提供了超过 300 个工作岗位，并在项目运营期间提供 35 个永久工作岗位。截至目前，员工人数共计 35 人，女员工 12 人，其中 8 名女员工为项目周边村庄居民。

本项目严格遵守国家政策规定和公司薪资管理制度，2016 年人均税后工资为 3000 元/月。下一步，项目公司还将增设更多岗位，帮助周边村民实现就近就地就业。

特此说明！

河北建投蔚州风能有限公司

2022 年 4 月 7 日

Hebei Yuxian Kongzhongcaoyuan 49.5MW Wind Farm Project has provided more than 300 local jobs during the construction phase and 35 permanent jobs during the project operation. Up to now, the total number of employees is 35, including 12 female employees, 8 of whom are residents of the villages surrounding the project.

The project company strictly complies with national policies and regulations and the company's salary management system. In 2016, the per capita after-tax salary is 3,000 Yuan RMB/month. In the next step, the project company will add more jobs to help villagers find jobs nearby.

Hebei Construction Investment Yuzhou Wind Energy Co., Ltd.

April 7, 2022

Hebei Construction Investment Yuzhou Wind Energy Co., Ltd.
employees' salaries for the month of October 2008

河北建投蔚州风能有限公司 2008 年 10 月工资单

序号 NO	姓名 NAME	性别 GENDER	当月工资 (元、税后) SALARY (After tax)
1	韩贵东	男	2200
2	孙卓然	男	2200
3	孙家波	男	2150
4	王森	男	2000
5	徐敏明	男	2300
6	于坤	男	2000
7	张胜	男	2180
8	张鑫喆	男	2000
9	李波	男	2200
10	徐莉	女	1800
11	向春华	男	1985
12	杜利明	男	1900
13	刘霞	女	2100
14	宋佳立	男	1600
15	张鑫安	男	1800
16	刘妮	女	1900
17	李翠研	女	2000
18	王洁	女	2000
19	邓莉丽	女	1500
20	李晓霞	女	1500
21	范树永	男	2200
22	徐一诺	女	2000
23	王波	男	2000
24	谢静哲	男	1700
25	徐向前	男	1800
26	李欣	女	2000
27	吕军	男	2300
28	董辉	男	2300
29	王瑞	男	2000
30	肖晓敏	女	1900
31	李岩	男	2000
32	李震勇	男	2000
33	杜宇	女	2200
34	刘世华	男	2000
35	张笑函	女	1600
合计			69315

Hebei Construction Investment Yuzhou Wind Energy Co., Ltd.
employees' salaries for the month of June 2016

河北建投蔚州风能有限公司 2016 年 6 月工资单

序号 NO	姓名 NAME	性别 GENDER	当月工资 (元、税后) SALARY (After tax)
1	韩贵东	男	3200
2	孙卓然	男	3300
3	孙家波	男	3300
4	王森	男	3600
5	徐敏明	男	3000
6	于坤	男	3100
7	张胜	男	3000
8	张鑫喆	男	3000
9	李波	男	3000
10	徐莉	女	3200
11	向春华	男	3200
12	杜利明	男	3100
13	刘霞	女	3500
14	宋佳立	男	3700
15	张鑫安	男	3300
16	刘妮	女	3000
17	李翠研	女	3000
18	王洁	女	3000
19	邓莉丽	女	3600
20	李晓霞	女	3600
21	范树永	男	3500
22	徐一诺	女	3000
23	王波	男	3300
24	谢静哲	男	3000
25	徐向前	男	3000
26	李欣	女	3000
27	吕军	男	3600
28	董辉	男	3000
29	王瑞	男	3300
30	肖晓敏	女	3200
31	李岩	男	3200
32	李震勇	男	3000
33	杜宇	女	3200
34	刘世华	男	3000
35	张笑函	女	3000
合计			112000