

Hebei Chengde Weichang Yudaokou Pasture 150MW Wind Farm Project

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Project Title	Hebei Chengde Weichang Yudaokou Pasture 150MW Wind Farm Project
Version	02
Report ID	892-02
Date of Issue	10-04-2016
Project ID	VCS 892, CDM registered number:3476
Monitoring Period	01-09-2011 to 31-12-2012
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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Hebei Chengde Weichang Yudaokou Pasture 150MW Wind Farm Project (hereafter referred to as “the project”) is located in Weichang Manchu & Mongolia Autonomous County, Chengde City, Hebei Province, P.R. China. The project is constructed and operated by Hebei Construction Investment New Energy Co., Ltd. The project has been registered as a CDM project on 17/01/2011.

The total installed capacity of the project is 150MW equipped with 100 sets of wind turbines with a unit installed capacity of 1.5MW. Electricity generated by the project is delivered to North China Power Grid (NCPG) via a 220 KV transmission line. The project as a renewable source generates emission reductions by avoiding CO₂ emissions from the same amount of electricity generation from NCPG, which is mainly composed of traditional thermal power plants.

The construction of the project started on 11/05/2009, the first wind turbine of the project has been put into operation on 27/11/2010 and the commissioning time of all wind turbines was 08/01/2011.

During the monitoring period (from 01/09/2011 to 31/12/2012), the monitoring activities were conducted strictly in accordance with the monitoring plan in the registered PDD. The project has operated without any accidental or emergency events that might impact the accuracy and/or implementation of monitoring activities. The net feed-in electricity during this period is 428,202.720MWh, and the emission reduction achieved by the project in this monitoring period is 451,689tCO₂e. The emission reductions in the monitoring period will be verified and issued under VCS rules.

1.2 Sectoral Scope and Project Type

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

Project type: wind power project.

1.3 Project Proponent

Organization name	Hebei Construction Investment New Energy Co., Ltd.
Contact person	Cao Wanpeng
Title	Project manager
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1.4 Other Entities Involved in the Project

Organization name	Goldchina Consultancy International Co., Ltd.
Role in the project	The buyer
Contact person	Dr, Zheng Zhaoning
Title	Technical director
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1.5 Project Start Date

27/11/2010. (It is the date when the first turbine was commissioned.)

1.6 Project Crediting Period

Renewable crediting period (7yrs×3) is adopted by the project, so the first 7-year renewable crediting period is from 17/01/2011 to 16/01/2018.

1.7 Project Location

The project is located within Weichang Manchu & Mongolia Autonomous County, Chengde City, Hebei Province, P.R. of China. The central geographical coordinates of the project is longitude 116°57' 05" E and latitude 42°11'21" N.

1.8 Title and Reference of Methodology

Approved consolidated baseline and monitoring methodology ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources" (Version 10)

1.9 Other Programs

Emission Trading Programs and Other Binding Limits:

The project has been registered as a CDM project on 17/01/2011, for which a renewable crediting period of 3×7 years will be used under the CDM GHG Program. The project proponent confirmed that, once emission reductions generated from 01/09/2011 to 31/12/2012 are issued under VCS rules, those credits will not be claimed as CERs and will be claimed as zero in the possible future CER monitoring report. And issued VCUs will be sold only once to one particular buyer.

Once the project proponent are included in an emissions trading program or any other mechanism that includes GHG allowance trading, the VCU issuance under VCS rules will be stop immediately since the date of included in an emissions trading program or any other mechanism that includes GHG allowance trading.

Other Forms of Environmental Credit:

The Project is a renewable energy generation project, which discharges no emission during operation period. Thus, the project doesn't fall into categories that creating GHG emissions primarily for the purpose of its subsequent removal or destruction.

The Project has not created another form of environmental credit, which will be verified by DOE. And The Project will not create other environmental credit in the future.

Participation under Other GHG Programs:

The Project has been registered as a VCS project with registration number 892.

The Project has been registered as a CDM project with registration number 3476.

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

The project is a greenfield grid-connected wind power project. The total installed capacity of the project is 150MW equipped with 100 sets of wind turbines with a unit installed capacity of 1.5MW. Electricity generated by the project is delivered to NCPG via a 220 KV transmission line.

Construction of the project was started on 11/05/2009. The date of first wind turbine started operation was 27/11/2010. And the date of all wind turbine started full operation was 08/01/2011.

Major technical parameters of the key equipments employed by the project are illustrated in the following table.

Table 1. Key technical parameters of turbines in the project

Equipment	Quantity	Type	Technical Parameters
Turbine	100 sets	SL1500/77	Rated Capacity: 1.5MW Number of blades: 3 Fan Diameter: 77.4m Swept Area: 4,657m ² Cut in Wind Speed: 3m/s

			Rated Wind Speed: 12m/s Cut out Wind Speed: 20m/s
Generator	100	Asynchronous bidirectional	Rated Capacity: 1.5MW Rated Voltage: 690V Rated Frequency: 50Hz
Main Transformer	2	SFZ10- 100000/220	Rated Frequency: 50Hz Rated Voltage High Side: 242kV Rated Voltage Low Side: 38.5kV

During this monitoring period from 01/09/2011 to 31/12/2012, the project has a normal operation, smooth data transfer and grid connection as per the registered CDM-PDD without any emergencies or special events, which might impact the applicability of the chosen methodology.

2.2 Deviations

2.2.1 Methodology Deviations

There is no deviation applied to this monitoring period.

2.2.2 Project Description Deviations

There is no deviation applied to this monitoring period.

2.3 Grouped Project

The Project is not a grouped project.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO ₂ e/MWh
Description	Baseline emission factor of NCPG in the monitoring

	period.
Source of data	The registered PDD
Value applied:	1.05485
Justification of choice of data or description of measurement methods and procedures applied	<i>Notification on 2008 baseline emission factors for regional power grids in China</i> and the registered PDD.
Purpose of the data	Calculation of baseline emissions
Comments	Determined ex-ante and fixed for the first crediting period

3.2 Data and Parameters Monitored

According to the registered PDD, there is a power plant B near the project. The descriptions of the parameters monitored were referred to the different situation: situation A (during power plant B connecting with the project) and situation B (Before power plant B connecting to the project and after it completely disconnected with the project).

Before the plant B's transformer substation put into use, the power plant B is temporarily connected with the NCPG via the main transformer (2#) of the project from 1st December 2011 to the date when the power plant B completely disconnected with project.

In fact, although the power plant B was connected with the project via the main transformer (2#), the plant B put into operation until December 2014. Therefore, during this monitoring period (from 01/09/2011 to 31/12/2012), the descriptions of the parameters monitored were listed on the basis of the situation B.

Data / Parameter	$EG_{facility,y}$
Data unit	MWh
Description	Net power supplied to the grid in year y
Source of data	Calculated
Description of measurement methods and procedures to be applied	Net power supplied to the grid in year y ($EG_{facility,y}$) is calculated monthly with on-site monitored data of $EG_{s,y}$ and $PR_{g,y}$
Frequency of monitoring/recording	-
Value monitored:	428,202.720
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	Calculation of baseline emissions
Calculation method	Calculated as $EG_{s,y} - PR_{g,y}$
Comments	-

Data / Parameter	$EG_{s,y}$
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Data unit	MWh
Description	Power supplied to the grid in year y
Source of data	Measured by M1 located at the output of the on-site 220kV transformer substation
Description of measurement methods and procedures to be applied	Measured
Frequency of monitoring/recording	Power supplied to the grid in year y ($EG_{s,y}$) is continuously measured by the bi-directional electricity meter installed at the output of the on-site 220kV transformer substation of the Project and monthly recorded.
Value monitored:	429,201.960
Monitoring equipment	Meter: M1 Type: SL7000 Accuracy Class; 0.2S Serial Number: 36013942 Calibration date: 15/03/2011; 06/03/2012; Validity: Yes Meter: M2 (Backup meter of M1) Type: SL7000 Accuracy Class; 0.2S Serial Number: 36014056 Calibration date: 15/03/2011; 06/03/2012; Validity: Yes
QA/QC procedures to be applied	The meter was annually calibrated according to the relevant national electric industry standards and regulations of (DL/T 448-2000); power supplied to the grid was double checked according to sales receipts
Purpose of the data	Calculation of baseline emissions
Calculation method	-
Comments	-

Data / Parameter	$PR_{g,y}$
Data unit	MWh
Description	The electricity use of power plant supplied by the grid via the 220kV line in year y

Source of data	Measured by M1 located at the output of the on-site 220kV transformer substation
Description of measurement methods and procedures to be applied	Measured
Frequency of monitoring/recording	The electricity use of power plant supplied by the grid in year y ($PR_{g,y}$) is continuously measured by the bi-directional electricity meter installed at the output of the on-site 220kV transformer substation of the project and monthly recorded
Value monitored:	999.240
Monitoring equipment	Meter: M1 Type: SL7000 Accuracy Class; 0.2S Serial Number: 36013942 Calibration date: 15/03/2011; 06/03/2012; Validity: Yes Meter: M2 (Backup meter of M1) Type: SL7000 Accuracy Class; 0.2S Serial Number: 36014056 Calibration date: 15/03/2011; 06/03/2012; Validity: Yes
QA/QC procedures to be applied	The meter was annually calibrated according to the relevant national electric industry standards and regulations of (DL/T 448-2000); electricity use of power plant supplied by the grid was double checked according to sales records.
Purpose of the data	Calculation of baseline emissions
Calculation method	-
Comments	-

Data / Parameter	$PR_{10kV,y}$
Data unit	MWh
Description	The electricity imported by the project from the grid via the 10kV line
Source of data	Measured by M_3
Description of measurement	Measured

methods and procedures to be applied	
Frequency of monitoring/recording	Measured continuously and recorded on a monthly basis
Value monitored:	0
Monitoring equipment	Meter: M3 Type: DTS Accuracy Class; 1.0 Serial Number: 2103348 Calibration date: 15/03/2011; 06/03/2012; Validity: Yes
QA/QC procedures to be applied	The meter was annually calibrated according to the relevant national electric industry standards and regulations; electricity use of power plant supplied by the grid was double checked according to sales receipts issued by the grid.
Purpose of the data	Calculation of baseline emissions
Calculation method	-
Comments	-

3.3 Monitoring Plan

In line with the methodology ACM0002 (Version 10) and the registered CDM-PDD (version 0.3), it is required to monitor the following parameters:

Parameter	Description
$EG_{s,y}$	Power supplied to the grid in year y
$PR_{g,y}$	The electricity use of power plant supplied by the grid in year y
$PR_{10kV,y}$	The electricity imported by the project from the grid via the 10kV line
$EG_{facility,y}$	Net power supplied to the grid in year y

Monitoring point of the project

The monitoring point of the project is shown in figure 2.

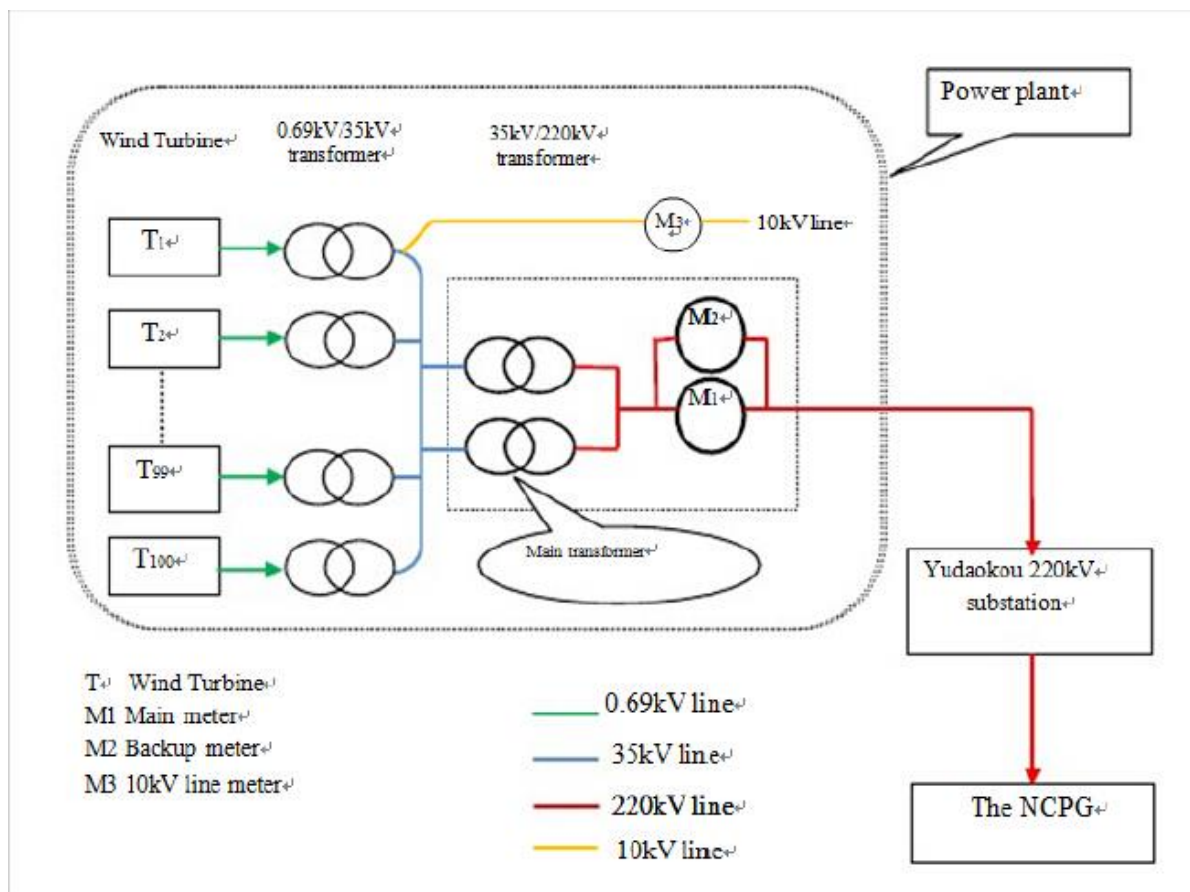


Figure 2. Monitoring point of the project

The main meter (M1) and backup meter (M2) were installed at the output of the on-site 220kV transformer substation and the M3 was installed on the 10kV line of the project site.

Data generation, recording and calculation

Power supplied to the grid in year y

Power supplied to the grid in year y ($EG_{s,y}$) was continuously measured by M1 the bi-directional electricity meter located at the output of the on-site 220kV transformer substation.

Readings of the electricity meter at 24:00 were recorded every day in the Daily Reading Records by designated personnel at the wind farm of the Project. Readings of the meter at 24:00 in the last day of every month were recorded, and designated personnel of the Project Owner summarized and recorded readings of the electricity meter in Monthly Production Report of the Project to verify the data. After the grid company confirmed the data, the sales records would be issued based on the data by the grid company.

For the electricity use of power plant supplied by the grid in year y ($PR_{g,y}$), sales receipts are used for double check.

The electricity imported by the project from the grid via the 10kV line

Before the construction of this project, this 10 kV line owned by the NCPG was there. The 10 kV backup line was kept connected with the project just for the case of emergency.

The electricity imported by the project from the grid via the 10 kV line ($PR_{10\text{ kV},y}$) was continuously measured by the electricity meter M3 installed on the 10 kV line of the project site. Designated personnel of the project owner monthly records readings of the electricity meter M3. Readings of the meter M3 at 24:00 in the last day of every month were recorded. During this monitoring period, there is no electricity imported by the project from the grid via the 10 kV line ($PR_{10\text{ kV},y}$).

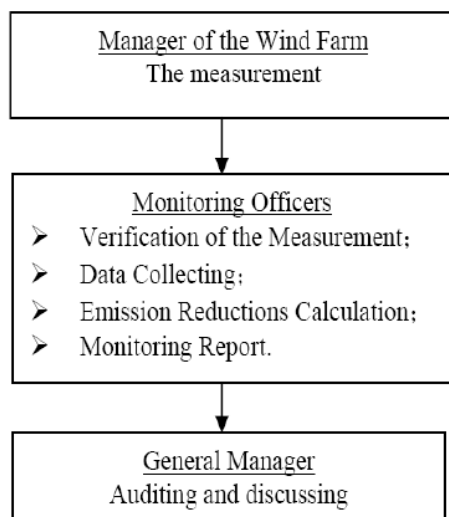
The calibration frequency of the meter is once a year. During the monitoring period, the electricity meter M3 was calibrated on 15/03/2011 and 06/03/2012, and it was valid until 05/03/2013.

Net power supplied to the grid in year y

Net power supplied to the grid in year y ($EG_{\text{facility},y}$) was calculated monthly with on-site monitored data of $EG_{s,y}$ and $PR_{g,y}$ using the formula $EG_{\text{facility},y} = EG_{s,y} - PR_{g,y} - PR_{10\text{ kV},y}$

Organizational structure, roles and responsibilities of the personnel

The operation and management structure and the responsibilities of the principal are as follows. A chief monitoring officer is appointed by the project owner, who is in charge of supervising and verifying metering and recording, collecting data, calculating emission reductions and preparing monitoring reports. And second monitoring officers help the chief officer to do all things mentioned above. Responsibilities for the monitoring activities are listed in following table.



The relevant training was implemented by the project owner and the equipment manufacturer before operation of the project.

Emergency procedures

In this monitoring period, the Project was operated smoothly and no emergency happened.

If abnormal operation happens, on-site operators should immediately report to Emergency Office. Emergency Office takes the responsibility to handle the erroneous measurement as follows:

- If the reason for erroneous measurement is the malfunction of the meter(s), the project owner and the NCPG use the data automatically obtained and saved by the computer system as backup.

- If the erroneous measurement is caused by employees in charge of recording, the project owner and the NCPG use the data automatically obtained and saved by the computer system as backup. At the same time, training courses shall be re-arranged for relevant employees to ensure the correct implementation of the monitoring plan, so as to prevent error.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Baseline emissions in the monitoring period are calculated by multiplying the fixed baseline emission factor determined in the registered PDD of the project ex ante by net electricity supplied by the Project to the NCPG in the monitoring period.

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

Where

BE_y is the baseline emissions in year y (tCO₂e);

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

$EF_{grid,CM,y}$ is combined margin CO₂ emission factor for grid connected power generation in year y calculated using *Tool to calculate the emission factor for an electricity system* (tCO₂/MWh)

Net electricity generation supplied by the Project ($EG_{facility,y}$)

As per the registered CDM-PDD (version 0.3), the project is the installation of a new grid-connected renewable power plant at a site where no renewable power plant was operated prior to the implementation of the project, so:

$$EG_{facility,y} = EG_{s,y} - PR_{g,y} - PR_{10kV,y}$$

Where:

$EG_{facility,y}$ is net power supplied to the grid in year y;

$EG_{s,y}$ is power supplied to the grid in year y;

$PR_{g,y}$ is the electricity use of power plant supplied by the grid in year y;

$PR_{10kV,y}$ is the electricity imported by the project from the grid via the 10kV line;

So, the $EG_{facility,y}$ are listed as follow:

Date	Power supplied to the grid in year y EG _{s,y} (MWh)	The electricity use of power plant supplied by the grid in year y PR _{g,y} (MWh)
01/09/2011 - 30/09/2011	11,679.360	72.600
01/10/2011 - 31/10/2011	14,688.960	92.400
01/11/2011 - 30/11/2011	17,603.520	108.240
01/12/2011 - 31/12/2011	23,625.360	91.080
Total from 01/09/2011 -31/12/2011	67,597.200	364.320
01/01/2012 - 31/01/2012	20,178.840	137.280
01/02/2012 - 29/02/2012	32,243.640	34.320
01/03/2012 - 30/03/2012	37,878.720	36.960
01/04/2012 - 30/04/2012	46,019.160	36.960
01/05/2012 - 31/05/2012	38,751.240	27.720
01/06/2012 - 30/06/2012	24,752.640	23.760
01/07/2012 - 31/07/2012	20,151.120	72.600
01/08/2012 - 31/08/2012	12,893.760	50.160
01/09/2012 - 30/09/2012	17,846.400	64.680
01/10/2012 - 31/10/2012	39,052.200	30.360
01/11/2012 - 30/11/2012	38,973.000	47.520
01/12/2012 - 31/12/2012	32,864.040	72.600
Total in 2012	361,604.760	634.920
Sum	429,201.960	999.240

	Power imported from the grid via the 10kV line $PR_{10kV,y}$ (MWh)
01/09/2011 – 31/12/2012	0*
Total	0

* During this monitoring period, there is no electricity imported by the project from the grid via the 10kV line.

So, BE_y is calculated as the following table:

	$EG_{s,y}$ (MWh)	$PR_{g,y}$ (MWh)	$PR_{10kV,y}$ (MWh)	$EG_{facility,y}$ (MWh)	BE_y (tCO ₂ e)
01/09/2011 – 31/12/2011	67,597.200	364.320	0	67,232.880	70,920
01/01/2012 – 31/12/2012	361,604.760	634.920	0	360,969.840	380,769
Total	429,201.960	999.240	0	428,202.720	451,689

4.2 Project Emissions

The Project is a zero-emission renewable electricity generating activity. Therefore no emission from the project activity was identified, and $PE_y = 0$.

4.3 Leakage

According to the methodology ACM0002, the project leakage is not considered.

4.4 Net GHG Emission Reductions and Removals

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)
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01/09/2011 – 31/12/2011	70,920	0	0	70,920
01/01/2012 – 31/12/2012	380,769	0	0	380,769
Total	451,689			451,689

The estimated annual emission reductions are 329,852tCO₂e as per registered PDD. The monitoring period covers 488 days, $329,852 \times 488 / 365 = 441,007 \text{tCO}_2\text{e}$, and the emission reduction achieved by the project in this monitoring period is 451,689tCO₂e, so the emission reductions during current monitoring period are 2.42% higher than the estimates in the registered PDD.