Hebei Guyuan County Dongxinying 199.5MW Wind Power Project

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Hebei Guyuan County Dongxinying 199.5MW Wind Power Project (hereafter referred as "the project") is a Greenfield grid-connected wind power project. The project is invested, constructed and operated by Hebei Construction Investment New Energy Co., Ltd. The project has been registered as a CDM project on 15/09/2011.

The objective of the project is to generate electricity by using wind resource and to sell the generated output to North China Power Grid (NCPG). Total installed capacity of the project is 199.5MW, involving 133 sets of wind turbine-generator (WTG), each set with a rated capacity of 1.5MW. Applying grid-connected electricity generation by wind energy technology and by displacing equal amount electricity generated by NCPG which is dominated by fossil fuel-fired power plants, and the project contributes to annual GHG reductions estimated at 427,936tCO_2e.

The main equipments of the project are 133 sets of WTGs manufactured by Dongfang Steam Turbine Co., Ltd.

Relevant dates for the project are as follows:

The date to start construction: 25/08/2008;

The date of first wind turbine started operation: 25/05/2010;

The date of all 133 WTGs started full operation: 06/10/2010;

CDM registration date: 15/09/2011;

CDM crediting period (Renewable): 15/09/2011 – 14/09/2018.

During the monitoring period (from 04/10/2012 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 implementation of monitoring activities. The net feed-in electricity during this period is 131,358.700MWh, and the emission reduction achieved by the project in this monitoring period is 138,563tCO_2e.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
Address	Room 501, Building B, Yuyuan Plaza, Shijiazhuang City, Hebei Province, P.R. of China
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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
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1.5 Project Start Date

25/05/2010. (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, and the start date of the crediting period has been requested to change from 01/12/2011 to 15/09/2011, and the request has been accepted by the Board, so the first 7-year renewable crediting period is from 15/09/2011 to 14/09/2018.

1.7 Project Location

The project is located in southern area of Guyuan County, Zhangjiakou City, Hebei Province, P.R. China. The GPS coordinates of the geographical area the project covered are 115.2997°E – 115.7508°E, 41.3169°N – 41.5661° N.

1.8 Title and Reference of Methodology

Approved consolidated baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (Version 12.1.0).

1.9 Other Programs

Emission Trading Programs and Other Binding Limits:

The project has been registered as a CDM project on 15/09/2011, 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 04/10/2012 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 903.

The Project has been registered as a CDM project with registration number 4853.

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 199.5MW equipped with 133 sets of wind turbines with a unit installed capacity of 1.5MW.

Construction of the project was started on 25/08/2008. The date of first wind turbine started operation was 25/05/2010. And the date of all wind turbine started full operation was 06/10/2010.

The project applies WTG-box transformer unit to boost voltage of the generated electricity from 690V to 35kV. Then the electricity will be transmitted to the main transformers via 35kV collection lines. After boosted its voltage to 220kV by the main transformers, the electricity will be transmitted to Xiaochang Substation and exported to NCPG.

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

Parameter	Unit	Value
Type of turbine	-	FD77B
Tybe of generator	-	double-fed asynchromous motor
Nominal output	kW	1500
Rotor diameter	m	77
Hub height	m	61.5
Rated voltage	V	690
Cut-in wind speed	m/s	3.5
Nominal wind speed	m/s	12

During this monitoring period from 04/10/2012 - 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_2e/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	*Notification on 2008 baseline emission factors for regional power grids in China*, issued by China 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

Data / Parameter	$EG_{facility,y}$
Data unit	MWh
Description	Net electricity supplied to the grid by the project in year y
Source of data	Calculated
Description of measurement methods and procedures to be applied	Calculated as follows: $EG_{facility,y} = EG_{export,y} – EG_{import,y} - EG_{backupline,y}$
Frequency of monitoring/recording	calculated and recorded monthly
Value monitored:	131,358.700
Monitoring equipment	-
QA/QC procedures to be applied	Crosscheck with electricity sales receipts
Purpose of the data	Calculation of baseline emissions
Calculation method	Calculated as $EG_{export,y} – EG_{import,y} - EG_{backupline,y}$
Comments	-

Data / Parameter	$EG_{export,y}$
Data unit	MWh
Description	Annual electricity exported to the grid by the project in year y
Source of data	Project activity site and measured by electricity meter

	(M1 and M2)
Description of measurement methods and procedures to be applied	$EG_{export,y} = EG_{export,y,1} + EG_{export,y,2}$ Here, $EG_{export,y}$ refer to annual electricity exported to the grid and equals to sum of $EG_{export,y,1}$ and $EG_{export,y,2}$ $EG_{export,y,1}$ and $EG_{export,y,2}$ refer to annual electricity exported to the grid by the two groups of wind turbine generators respectively.
Frequency of monitoring/recording	Continuously measurement and monthly recorded
Value monitored:	131,431.575
Monitoring equipment	Meter: M_1 Type: ACE8000 Accuracy Class; 0.2S Serial Number: ZG37006390 Calibration date: 24/09/2012; Validity: Yes Meter: M_2 Type: ACE8000 Accuracy Class; 0.2S Serial Number: ZG37002994 Calibration date: 24/09/2012; Validity: Yes Meter: M_3 Type: DSSD331 Accuracy Class; 0.2S Serial Number: 09080144840023 Calibration date: 24/09/2012; Validity: Yes Meter: M_4 Type: DSSD331 Accuracy Class; 0.2S Serial Number: 09080144840005 Calibration date: 24/09/2012; Validity: Yes
QA/QC procedures to be applied	The metering equipments at the substation will be calibrated at least once a year according to national standard.

Purpose of the data	Calculation of baseline emissions
Calculation method	$EG_{export,y} = EG_{export,y,1} + EG_{export,y,2}$ Here, $EG_{export,y}$ refer to annual electricity exported to the grid and equals to sum of $EG_{export,y,1}$ and $EG_{export,y,2}$ $EG_{export,y,1}$ and $EG_{export,y,2}$ refer to annual electricity exported to the grid by the two groups of wind turbine generators respectively.
Comments	-

Data / Parameter	$EG_{import,y}$
Data unit	MWh
Description	Annual electricity imported from the grid to the project in year y
Source of data	project activity site with electricity meter (M1 and M2)
Description of measurement methods and procedures to be applied	$EG_{import,y} = EG_{import,y,1} + EG_{import,y,2}$ Here, $EG_{import,y}$ refer to annual electricity imported from the grid and equals to sum of $EG_{import,y,1}$ and $EG_{import,y,2}$ $EG_{import,y,1}$ and $EG_{import,y,2}$ refer to annual electricity imported from the grid by the two groups of wind turbine generators respectively.
Frequency of monitoring/recording	Continuously measurement and monthly recorded
Value monitored:	72.875
Monitoring equipment	The parameters listed above are also measured by bilateral meter M1(M3) and M2 (M4). Relevant information to the meters refers to the corresponding section of parameter $EG_{export,y}$.
QA/QC procedures to be applied	The metering equipments at the substation will be calibrated at least once a year according to national standard.
Purpose of the data	Calculation of baseline emissions
Calculation method	$EG_{import,y} = EG_{import,y,1} + EG_{import,y,2}$ Here, $EG_{import,y}$ refer to annual electricity imported from the grid and equals to sum of $EG_{import,y,1}$ and $EG_{import,y,2}$ $EG_{import,y,1}$ and $EG_{import,y,2}$ refer to annual electricity imported from the grid by the two groups of wind turbine generators respectively.

Comments	-

Data / Parameter	$EG_{backupline,,y}$
Data unit	MWh
Description	Electricity delivered to the project through the backup line in year y
Source of data	project activity site with electricity meter (M5)
Description of measurement methods and procedures to be applied	-
Frequency of monitoring/recording	Continuously measurement and monthly recorded
Value monitored:	0
Monitoring equipment	Meter: M5 Type: DSSD22 Accuracy class: 0.5s Serial number: B24T0P812403001807 Calibration date: 24/09/2012; Validity: Yes
QA/QC procedures to be applied	Calibration has been conducted to guarantee the accuracy and normal functions of M5, according to the relevant national or industrial standards by qualified institution;
Purpose of the data	Calculation of baseline emissions
Calculation method	-
Comments	-

3.3 Monitoring Plan

The project owner, Hebei Construction Investment New Energy Co., Ltd., is the user of this monitoring plan and is responsible for this monitoring plan. The project owner must maintain credible, transparent, and adequate data estimation, measurement, collection, and tracking systems to maintain the information required for an audit of an emission reduction project.

These records and monitoring systems are needed to allow the DOE to verify project performance as part of the verification and certification process.

Emission reductions will be achieved through displacing part of the electricity from the NCPG due to the power generated by the proposed project. The net grid-connected output is therefore defined as the key data to monitor.

The monitoring plan has been revised in PDD version 7.0 dated 27/07/2012. The monitoring plan is established according to the request of approved baseline and monitoring methodology ACM0002 (Version 12.1.0).

1. Monitoring subject

The net electricity ($EG_{facility,y}$) supplied to the grid by the project will not be measured directly. It is the difference of the following parameters.

1) $EG_{export,y}$ is the electricity exported to the grid by the project through the main power line;

2) $EG_{import,y}$ is the electricity imported from the grid by the project through the main power line;

3) $EG_{backupline,y}$ is the electricity delivered to the project through the backup line.

2. Project Integrate Management

This monitoring plan has been implemented by Hebei Construction Investment New Energy Co., Ltd., the project owner. The project manager is responsible for the implementation and monitoring of the monitoring activity. There are two departments organized for data report, quality control. There is a manager responsible for data report and quality control department. 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.

3. Metering system

The electricity generated by the project will be transmitted to on-site transformers which increase the voltage to 220 kV, and then delivered to Xiaochang Substation by 220kV transmission line. The simplified electrical grid connection diagram is shown in the following figure:

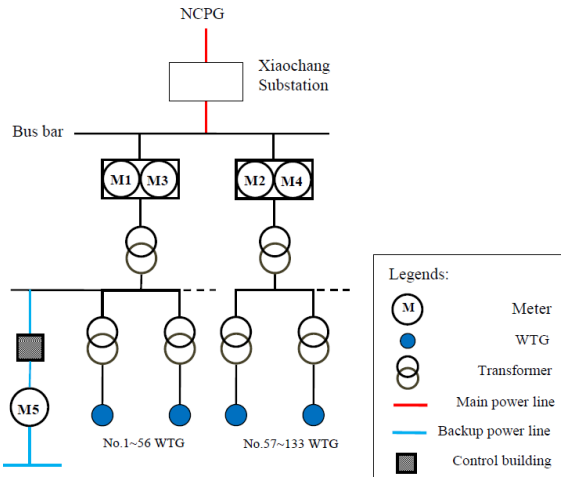

Figure 1. Simplified electrical grid connection diagram

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

M1 is installed at high voltage side of No. 1 main transformer; M2 is installed at the high voltage side of No. 2 main transformer. Both M1 and M2 are bi-directional meters. M1 is used for measurement of electricity exported by Group 1 WTGs ($EG_{export,y,1}$) and electricity imported from the grid by Group 1 WTGs ($EG_{import,y,1}$). M2 plays the same role as M1, that is, measuring electricity exported by Group 2 WTGs ($EG_{export,y,2}$) and electricity imported from the grid by Group 2 WTGs($EG_{import,y,2}$). $EG_{export,y,1}$ plus $EG_{export,y,2}$ makes total electricity exported to the grid by the projec ($EG_{export,y}$). Similarly, $EG_{import,y,1}$ plus $EG_{import,y,2}$ make total electricity imported from the grid by the project($EG_{import,y}$).

The meter M3 which is of the same type, accuracy and function and serves as the backup meter of M1, can also record electricity of Group 1 WTGs bidirectionally and works with M1 simultaneously; the meter M4 also acts as backup meter of M2 and measures electricity of Group 2 WTGs together with M2 simultaneously.

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 project through a backup power line ($EG_{backupline,\ y}$) is metered by instruments at M5 which is operated by the grid company.

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

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

Where:

$EG_{facility,\ y}$ is the calculated power generation from the proposed project;

$EG_{export,y}$ is the electricity exported to the grid through the main power line metered by the instruments at M1 and M2 (or backup meter M3 and M4);

$EG_{import,y}$ is the electricity imported from the grid through the main power line metered by the instruments at M1 and M2 (or backup meter M3 and M4);

$EG_{backupline,\ y}$ is the electricity delivered to the project through the backup line metered by the instruments at M5.

Net electricity supplied to the grid by the project activity is crosschecked with electricity sales receipts.

4. Quality Assurance and Quality Control

The metering equipments will be properly calibrated and checked annually by an independent third party according to relevant national standard, e.g. the DL/T448—2000 or other national standard, to ensure its accuracy. The accuracy of meter M1, M2, M3 and M4 which have been installed are 0.2s. The accuracy of meter M5 is 0.5s.

The relative recording files will be supplied to the project owner. These recording files will be preserved by the project owner and provide to DOE in Verification.

The relevant training will be implemented by the project owner and the equipment manufacturer before operation of the proposed project.

5. Information collection and management

It is the responsibility for the project owner to provide necessary information and data for validation and verification. The measurement of the whole production data is controlled and stored by the project owner.

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 in case of damaged mater equipment

In case metering equipment is damaged and no reliable readings can be recorded the project owner will estimate net supply by the proposed 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 (1) the background to the damage to metering equipment; (2) 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.

7. Monitoring Report

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

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

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.

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

$$EG_{facility,y} = EG_{export,y} - EG_{import,y} - EG_{backupline,y} \quad (2)$$

Where:

$EG_{facility,y}$ is the calculated power generation from the proposed project;

$EG_{export,y}$ is the electricity exported to the grid through the main power line metered by the instruments at M1 and M2 (or backup meter M3 and M4);

$EG_{import,y}$ is the electricity imported from the grid through the main power line metered by the instruments at M1 and M2 (or backup meter M3 and M4);

$EG_{backupline,y}$ is the electricity delivered to the project through the backup line metered by the instruments at M5.

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

Table1 Electricity supplied to the Grid ($EG_{export,y}$)(MWh)

	Meter readings			Data on ETNs	Data for ERs calculation
Date	M1	M2	$EG_{export,y}$	$EG_{export,y}$	$EG_{export,y}$
	A	B	C=A+B	D	E=min (C,D)
04/10/2012 - 31/10/2012	15,180.550	21,920.250	37,100.800	37,100.800	37,100.800
01/11/2012 - 30/11/2012	17,076.675	31,254.575	48,331.250	48,331.250	48,331.250
01/12/2012 - 31/12/2012	18,645.550	27,353.975	45,999.525	45,999.525	45,999.525
Total	50,902.775	80,528.800	131,431.575	131,431.575	131,431.575

Table2 Electricity imported via 110kv line ($EG_{import,y}$)(MWh)

	Meter readings			Data on ETNs	Data for ERs calculation
Date	M1	M2	$EG_{import,y}$	$EG_{import,y}$	$EG_{import,y}$
	F	G	H=F+G	I	J=max (H,I)
04/10/2012 - 31/10/2012	11.000	14.025	25.025	25.025	25.025
01/11/2012 - 30/11/2012	5.225	8.800	14.025	14.025	14.025
01/12/2012 - 31/12/2012	10.450	23.375	33.825	33.825	33.825
Total	26.675	46.200	72.875	72.875	72.875

Table 3 Electricity imported via 10kV line($EG_{backupline,y}$) (MWh)

Date	Meter readings （M_5）	Data on ETNs	$EG_{backupline,y}$ Data for ERs calculation
	K	L	M=max (K,L)
04/10/2012 - 31/10/2012	0	0	0
01/11/2012 - 30/11/2012	0	0	0
01/12/2012 - 31/12/2012	0	0	0
Total			0

Date	$EG_{export,y}$	$EG_{import,y}$	$EG_{backupline,y}$	$EG_{facility,y}$	$EF_{grid,CM,y}$	BE_y
	MWh	MWh	MWh	MWh	tCO_2e/MWh	tCO_2e
04/10/2012 - 31/12/2012	131,431.575	72.875	0	131,358.700	1.05485	138,563

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, and therefore,

4.4 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)

04/10/2012 - 31/12/2012	138,563	0	0	138,563

The estimated annual emission reductions are 427,936tCO_2e as per registered PDD. The monitoring period covers 89 days, 427,936*89/365= 104,060tCO_2e, and the emission reduction achieved by the project in this monitoring period is 138,563tCO_2e, so the emission reductions during current monitoring period are 33.15% higher than the estimates in the registered PDD.

Because this monitoring period (04/10/2012 - 31/12/2012) belongs to period of rich wind, the further discussed is needed.

According to the statistical data, the net electricity produced by the project during 25/05/2010 - 31/12/2012 is illustrated the following table.（Because baseline emissions are calculated as multiplying the fixed baseline emission factor by net electricity supplied by the Project, baseline emissions are proportion to the net electricity; therefore, discussing the tendency of net electricity can be as the analysis of baseline emission.）

Monitoring period	$EG_{facility}$ (MWh)	Note
25/05/2010 – 14/09/2011	493,191.505	Data resource: http://www.vcsprojectdatabase.org/#/project_details/903
15/09/2011 – 09/01/2012	108,443.775	Data resource: (http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1306303373.74/view)
10/01/2012 – 03/10/2012	295,712.244	Data resource: (http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1306303373.74/view)
04/10/2012 - 31/12/2012	131,358.700	
Sum	1,028,706.224	Actually electricity produced from 25/05/2010 to 31/12/2012
Estimated electricity produced from 25/05/2010 to 31/12/2012 according to PDD	1,057,003.932	Estimated electricity produced annually in PDD is 405,685 MWh
Comparison between	2.67%	

actual electricity and estimated electricity		

Total of 951 days are covered from 25/05/2010 to 31/12/2012, and according to the data from the above table, the actual electricity is 2.67% lower than the estimated electricity. So the emission reduction 138,563tCO_2e achieved by the project in this monitoring period (from 04/10/2012 to 31/12/2012) is reasonable.