



## Monitoring report form (Version 03.1)

### Monitoring report

<b>Title of the project activity</b>	CECIC HKE Zhangbei Lvnaobao Wind Power Project
<b>Reference number of the project activity</b>	3399
<b>Version number of the monitoring report</b>	Version 01
<b>Completion date of the monitoring report</b>	02/01/2013
<b>Registration date of the project activity</b>	28/10/2010
<b>Monitoring period number and duration of this monitoring period</b>	3rd monitoring period (01/03/2012-31/12/2012, both days inclusive)
<b>Project participant(s)</b>	CECIC HKE Wind Power CO.,LTD, P.R.China (host); Swedish Energy Agency, Sweden; Kingdom of Spain, Spain.
<b>Host Party(ies)</b>	P.R.China
<b>Sectoral scope(s) and applied methodology(ies)</b>	Sectoral scope1, Energy Industries (renewable sources). Approved Consolidated Methodology ACM0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 10.
<b>Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD</b>	213,747 tCO <sub>2</sub> e
<b>Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period</b>	158,412 tCO <sub>2</sub> e

**SECTION A. Description of project activity****A.1. Purpose and general description of project activity**

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CECIC HKE Zhangbei Lvnaobao Wind Power Project (hereafter referred as “the Project”) is located at Zhangbei County, northwest region of Hebei Province, China. The purpose of the Project is to generate electricity using wind power resources in the project region and to deliver to the North China Power Grid (NCPG) which is predominated by connected fossil fuel fired power plants, especially coal fired plants. So the Project can reduce GHG emissions by replacing the electricity generated by fossil fuel fired power plants in NCPG.

The Project involves the installation of 67 wind turbines with 1.5MW capacity per unit, with a total installed capacity of 100.5 MW. Total of 241,700 MWh electricity generated by the Project are expected to be delivered to the NCPG annually. Accordingly, normally the Project estimated can reduce GHG emissions about 254,960 tCO<sub>2</sub>e annually.

The Project started construction on 30/03/2008. The wind turbines of the Project commissioning started on 26/07/2010. The Project started full commissioning on 24/09/2010. The wind farm operates normally and smoothly.

This is the 3rd monitoring period of the Project which from 01/03/2012 to 31/12/2012. The total emission reduction of the first monitoring period is: 158,412 tCO<sub>2</sub>e.

**A.2. Location of project activity**

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The Project is located at Zhangbei County, Zhangjiakou City, Hebei Province, P.R.China. The Project has geographical coordinates with North Latitude of 41°03'50", East Longitude of 114°32'30". The altitude of the site ranges from 1,450m to 1,680m above mean sea level. The Project covers a wind farm area of about 48 km<sup>2</sup>. More details shown as follow figure1.



Figure1. Location of the Project

A.3. Parties and project participant(s)

Party involved (host indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
P.R.China (Host)	CECIC HKE Wind Power CO.,LTD	No
Sweden	Swedish Energy Agency	Yes
Spain	Kingdom of Spain	Yes

**A.4. Reference of applied methodology**

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Approved consolidated baseline and monitoring methodology ACM0002: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (Version 10, 28/05/2009), and

The methodology also refers to the latest approved versions of the following tools:

- Tool for the demonstration and assessment of additionality (version 5.2),
- Tool to calculate the emission factor for an electricity system (version 02)

Reference: UNFCCC website: <http://cdm.unfccc.int/methodologies/PAmethodologies/approved>

**A.5. Crediting period of project activity**

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The Project employs the renewable crediting period (3×7yrs), and the starting date of the first crediting period (from 28/10/2010 to 27/10/2017, 7 years) is 28/10/2010.

**SECTION B. Implementation of project activity****B.1. Description of implemented registered project activity**

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The Project was started construction on 30/03/2008. The first wind turbine of the Project started commissioning on 26/07/2010. The Project started full commissioning on 24/09/2010. The electricity generated by the Project is delivered to NCPG, according to the signed power purchase agreement (PPA) with Zhangjiakou Power Grid Co., Ltd.

During this monitoring period, the Project is operated and implemented smoothly. Neither emergencies (including of overhaul times, downtimes of equipment, exchange of equipment, etc.) happened to the monitoring system in this monitoring period, nor events or situations occurred during the monitoring period, which may impact the applicability of the methodology.

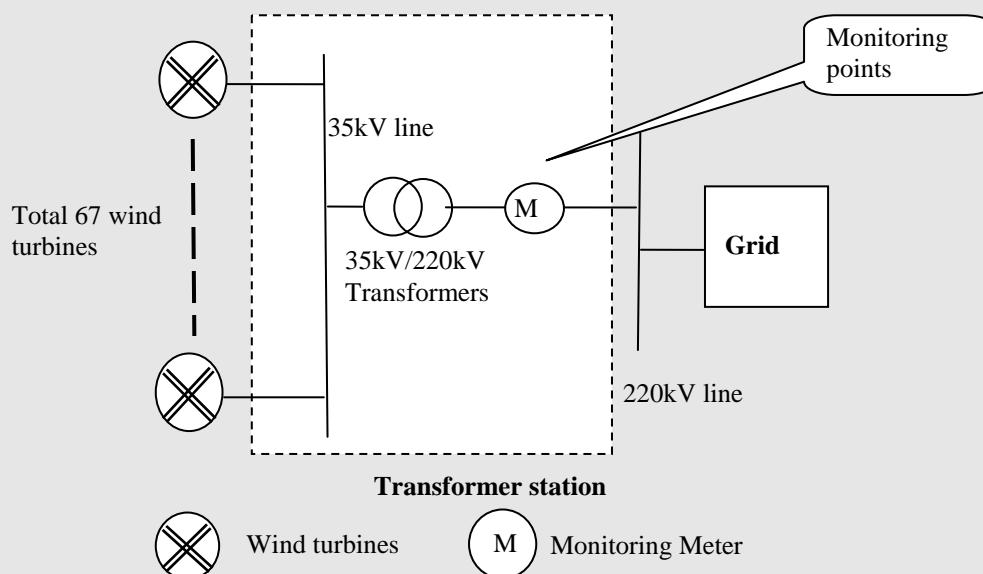
Total 67 units of wind power turbine and generators with 1.5MW unit capacity each, are installed in the Project, forming 100.5MW of total capacity. These wind turbines are manufactured by China's Dongfang Steam Turbine Co., Ltd and the model type of these wind turbines is FD77B. The main technology parameter of this type of wind power turbine can be found at Table1.

**Table1. Technology parameter of WTGs for the Project**

Key Technology Parameter	FD77B
Rated power (kW)	1500
Number of Blades	3
Rotor diameter (m)	77
Swept area(m <sup>2</sup> )	4657
Rated Rotational speed (rpm)	9.6-17.3
Cut-in wind speed (m/s)	3
Rated wind speed (m/s)	12.5
Cut-out wind speed (m/s)	20
Hub height of the wind turbines (m)	70
Capacity (kW)	1500
Rated Voltage (V)	690

Each wind turbine has a transformer from 690V to 35kV. The wind farm was connected with one new-built 35kV/220kV substation located within the project site, and then to NCPG via a series of substation. The

technical process in the Project can be shown as following diagram:



## B.2. Post registration changes

### B.2.1. Temporary deviations from registered monitoring plan or applied methodology

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There are no any temporary deviations have been applied during this monitoring period.

### B.2.2. Corrections

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There are no any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report.

### B.2.3. Permanent changes from registered monitoring plan or applied methodology

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There are no any permanent changes from the registered monitoring plan or applied methodologies have been approved during this monitoring period or submitted with this monitoring report.

### B.2.4. Changes to project design of registered project activity

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There are no any changes to the project design of the project activity have been approved during this monitoring period or submitted with this monitoring report.

### B.2.5. Changes to start date of crediting period

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There are no any changes to the start date of the crediting period have been approved during this monitoring period or submitted with this monitoring report.

### B.2.6. Types of changes specific to afforestation or reforestation project activity

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Not Applicable

## SECTION C. Description of monitoring system

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The implementation of monitoring system and Management organization for the Project are fully in consistent with the description in the PDD Monitoring Plan.

**1. Organizational structure and responsibilities**

Overall responsibility for monitoring and carrying out the monitoring following this monitoring plan lies with CECIC HKE Wind Power Co., Ltd. The CDM Manager of the CECIC HKE Wind Power Co., Ltd is responsible for the monitoring and reporting of the generation and emission reductions of the project activity. The operating and management structure is illustrated as followed:

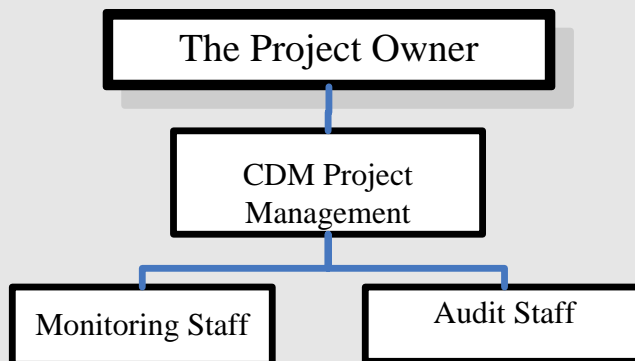
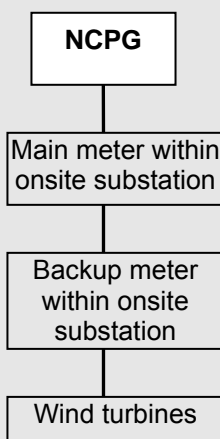


Figure2. Monitoring system organizations

**2. Data collection and management**

As described in the monitoring plan, the Project wind farm records reading monthly from the meter equipment within the project site.

The net electricity generation of the Project was monitored through the main bi-directional metering equipment installed at the high level of the onsite 220kV substation, recording exported to the grid by the Project ( $EG_{to\text{grid},v}$ ) and imported from the grid by the Project ( $EG_{from\text{grid},v}$ ). The meters reading are recorded monthly at the last day 24:00 each month. The Net generation supplied is calculated as exports minus imports. The data was monitored continuously, and the results of reading was recorded and supplied to Zhangjiakou Electric Power Company monthly. The monitoring points shows below:



Designated personnel of the wind farm read and record the readings of the meters mentioned above monthly. The CDM manager of the Project wind farm checked out the reported data against with the sales receipts before archived.

All data including calibration records was kept until 2 years after the end of the total crediting period of the Project.

**Emergency Procedures**

If any errors are detected the party owning the meter shall repair, recalibrate or replace the meter giving the

other party sufficient notice to allow a representative to attend during any corrective activity.

Should any previous month's reading of the main meter be inaccurate by more than the allowable error, or otherwise functioned improperly, the net generation output shall be determined by:

- (a) first, by reading backup meter, unless a test by either party reveals it is inaccurate;
- (b) if the backup system is not with acceptable limits of accuracy or operation is performed improperly the project owner and the grid company shall jointly prepare a reasonable and conservative estimate of the correct reading, and provide sufficient evidence that this estimation is reasonable and conservative when DOE undertakes verification; and
- (c) if the two parties fail to agree then the matter will be referred for arbitration according to agreed procedures.

The Project is operated and implemented smoothly during this monitoring period. Neither emergencies happened to the monitoring system, nor events or situations occurred during the monitoring period.

**SECTION D. Data and parameters**

**D.1. Data and parameters fixed ex ante or at renewal of crediting period**

<b>Data / Parameter:</b>	$EF_{grid,CM,y}$	
Unit:	tCO <sub>2</sub> e/MWh	
Description:	Baseline emission factor: the combined emission factor of the project grid system.	
Source of data:	Source from the Section B.6 of the registered PDD for the Project.	
Value(s) applied:	1.05485	
Purpose of data:	Used for baseline emission calculations.	
Additional comment:	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.	

**D.2. Data and parameters monitored**

<b>Data / Parameter:</b>	$EG_{togrid,y}$				
Unit:	MWh				
Description:	Quantity of electricity exported to the grid by the Project.				
Measured/ Calculated / Default:	Measured				
Source of data:	Meter reading records of onsite main meter.				
Value(s) of monitored parameter:	150,482.750 MWh				
Monitoring equipment:	Serial No.	Accuracy	Calibration date	Validity of the Calibration	Calibration frequency
	37006426 Main meter	0.2s	16/01/2012	15/01/2013	Annually
	37006420 Backup meter	0.2s	16/01/2012	15/01/2013	Annually

Measuring/ Reading/ Recording frequency:	Measuring continuously/Reading monthly				
Calculation method (if applicable):	-				
QA/QC procedures:	Monthly power exported and imported to the NCPG are cross-checked against sales receipts. The calibrations are done by a qualified organization once per year for the main meter and backup meter according to local industry standards.				
Purpose of data:	Used for the baseline emission calculations.				
Additional comment:	-				
<b>Data / Parameter:</b>	<b><math>EG_{fromgrid,y}</math></b>				
Unit:	MWh				
Description:	Quantity of annual electricity imported from the grid by the Project.				
Measured/ Calculated / Default:	Measured				
Source of data:	Meter reading record of onsite main meter.				
Value(s) of monitored parameter:	307.175 MWh				
Monitoring equipment:	Serial No.	Accuracy	Calibration date	Validity of the Calibration	Calibration frequency
	37006426 Main meter	0.2s	16/01/2012	15/01/2013	Annually
	37006420 Backup meter	0.2s	16/01/2012	15/01/2013	Annually
Measuring/ Reading/ Recording frequency:	Measuring continuously/Reading monthly				
Calculation method (if applicable):	-				
QA/QC procedures:	Monthly power exported and imported to the NCPG are cross-checked against sales receipts. The calibrations are done by a qualified organization once per year for the main meter and backup meter according to local industry standards.				
Purpose of data:	Used for the baseline emission calculations.				
Additional comment:	-				
<b>Data / Parameter:</b>	<b><math>EG_y</math></b>				
Unit:	MWh				
Description:	Net electricity supplied to the grid by the Project.				

Measured/ Calculated / Default:	Calculated				
Source of data:	Meter reading record of onsite main meter.				
Value(s) of monitored parameter:	150,175.575 MWh				
Monitoring equipment:	Serial No.	Accuracy	Calibration date	Validity of the Calibration	Calibration frequency
	37006426 Main meter	0.2s	16/01/2012	15/01/2013	Annually
	37006420 Backup meter	0.2s	16/01/2012	15/01/2013	Annually
Measuring/ Reading/ Recording frequency:	Measuring continuously/Reading monthly				
Calculation method (if applicable):	$EG_y = EG_{to\text{grid},y} - EG_{from\text{grid},y}$ $EG_y$ is electricity exported to the grid by the project ( $EG_{to\text{grid},y}$ ) minus electricity imported from the grid by the project ( $EG_{from\text{grid},y}$ ).				
QA/QC procedures:	Monthly power exported and imported to the NCPG are cross-checked against sales receipts. The calibrations are done by a qualified organization once per year for the main meter and backup meter according to local industry standards.				
Purpose of data:	Used for the baseline emission calculations.				
Additional comment:	-				

### D.3. Implementation of sampling plan

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Not Applicable

## SECTION E. Calculation of emission reductions or GHG removals by sinks

### E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

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According to ACM0002 and the registered PDD of the Project, The baseline emission  $BE_y$  during the monitoring period results from:

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

$$EG_y = EG_{\text{togrid},y} - EG_{\text{fromgrid},y}$$

Where:

$BE_y$  is the baseline emissions of the Project;

$EF_{\text{grid,CM},y}$  is the combined margin baseline emission factor of the NCPG;

$EG_y$  is the net electricity supplied to the grid by the Project;

$EG_{\text{togrid},y}$  is the quantity of electricity exported to the grid by the Project;

$EG_{\text{fromgrid},y}$  is the quantity of electricity imported from the grid by the Project.

The monthly electricity data is listed in following table 2:

Table2. Calculation of the net electricity supplied to the grid by the Project

Period	Electricity exported to the grid by the Project $EG_{\text{to grid,y}}$ (MWh)	Electricity imported from the grid by the Project $EG_{\text{from grid,y}}$ (MWh)	Net electricity supplied to the grid by the Project $EG_y$ (MWh)
	A	B	$EG_{\text{to grid,y}}$ minus $EG_{\text{from grid,y}}$ <b>C=A-B</b>
01/03/2012-31/03/2012	22,943.250	52.250	22,891.000
01/04/2012-30/04/2012	26,528.150	14.575	26,513.575
01/05/2012-31/05/2012	21,487.125	25.025	21,462.100
01/06/2012-30/06/2012	18,242.400	19.525	18,222.875
01/07/2012-31/07/2012	11,744.150	34.100	11,710.050
01/08/2012-31/08/2012	8,168.050	44.825	8,123.225
01/09/2012-30/09/2012	7,952.175	45.375	7,906.800
01/10/2012-31/10/2012	11,474.650	12.925	11,461.725
01/11/2012-30/11/2012	9,223.500	34.100	9,189.400
01/12/2012-31/12/2012	12,719.300	24.475	12,694.825
<b>Total</b>	<b>150,482.750</b>	<b>307.175</b>	<b>150,175.575</b>

The baseline emission during this monitoring period calculated as following:

$$\begin{aligned}
 BE_v &= EG_v \times EF_{\text{grid,CM,v}} \\
 &= 150,175.575 \text{ MWh} \times 1.05485 \text{ tCO}_2\text{e /MWh} \\
 &= 158,412 \text{ tCO}_2\text{e}
 \end{aligned}$$

#### E.2. Calculation of project emissions or actual net GHG removals by sinks

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Project emission ( $PE_v$ ) is 0 tCO<sub>2</sub>e as per the registered PDD.

#### E.3. Calculation of leakage

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No leakage emissions are considered as per the applied methodology ACM0002 and the registered PDD.

#### E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

Item	Baseline emissions or baseline net GHG removals by sinks (t CO <sub>2</sub> e)	Project emissions or actual net GHG removals by sinks (t CO <sub>2</sub> e)	Leakage (t CO <sub>2</sub> e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO <sub>2</sub> e)
<b>Total (01/03/2012-31/12/2012)</b>	158,412	0	0	158,412

#### E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

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The estimated annual emission reduction in the registered PDD is 254,960 tCO<sub>2</sub>e which is equals to 698.5205 tCO<sub>2</sub>e per day. So, the estimated emission reduction is 213,747 tCO<sub>2</sub>e in 306 days (total days of this monitoring period) based on the registered PDD.

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO <sub>2</sub> e)	213,747 <sup>1</sup>	158,412

#### E.6. Remarks on difference from estimated value in registered PDD

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The actual emission reductions during this monitoring period are 158,412 tCO<sub>2</sub>e, which is 25.89% less than the estimated value in the registered PDD. There is no any significant increase compared with the estimated emission reduction in the registered PDD.

#### E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks (t CO <sub>2</sub> e)	158,412	N/A

<sup>1</sup> 213,747 tCO<sub>2</sub>e = 254,960 tCO<sub>2</sub>e \*(306 days /365 days)

### History of the Monitoring Report

Version	Date	Nature of revision
01	02/01/2013	Initial adoption.

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### Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.

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