

## **MONITORING REPORT FORM (CDM-MR) \***

**Version 01 - in effect as of: 28/09/2010**

### **CONTENTS**

- A. General description of the project activity
  - A.1. Brief description of the project activity
  - A.2. Project participants
  - A.3. Location of the project activity
  - A.4. Technical description of the project
  - A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity
  - A.6. Registration date of the project activity
  - A.7. Crediting period of the project activity and related information
  - A.8. Name of responsible person(s)/entity(ies)
- B. Implementation of the project activity
  - B.1. Implementation status of the project activity
  - B.2. Revision of the monitoring plan
  - B.3. Request for deviation applied to this monitoring period
  - B.4. Notification or request of approval of changes
- C. Description of the monitoring system
- D. Data and parameters monitored
  - D.1. Data and parameters used to calculate baseline emissions
  - D.2. Data and parameters used to calculate project emissions
  - D.3. Data and parameters used to calculate leakage emissions
  - D.4. Other relevant data and parameters
- E. Emission reductions calculation
  - E.1. Baseline emissions calculation
  - E.2. Project emissions calculation
  - E.3. Leakage calculation
  - E.4. Emission reductions calculation
  - E.5. Comparison of actual emission reductions with estimates in the registered CDM-PDD
  - E.6. Remarks on difference from estimated value

**MONITORING REPORT**  
Version 01, Date 20/04/2012

**Zhangbei Manjing Windfarm Project**  
**Reference number: 0233**  
**The 7<sup>th</sup> monitoring period (01/03/2011 - 29/02/2012)**

**SECTION A. General description of the project activity**

**A.1. Brief description of the project activity: >>**

>>

The objective of the Zhangbei Manjing Windfarm Project is to generate renewable electricity using wind power resources and to sell the generated output to the North China Power Grid (NCPG) on the basis of a power purchase agreement (PPA). The project activity will generate greenhouse gas (GHG) emission reductions by avoiding CO<sub>2</sub> emissions from electricity generation by fossil fuel power plants that is supplied to NCPG. The project activity involves the installation and operation of 30 wind turbines with unit capacity of 1500kw. The total installed capacity is 45 MW.

Construction start date	28/07/2004
Commission start date	30/12/2005
Date of CDM registration	23/03/2006
First renewable crediting period	01/01/2006 – 31/12/2012
Monitoring period	
(Volume 1)	01/01/2006 – 31/08/2006
(Volume 2)	01/09/2006 – 31/08/2007
(Volume 3)	01/09/2007 – 30/06/2008
(Volume 4)	01/07/2008 – 31/05/2009
(Volume 5)	01/06/2009 – 30/04/2010
(Volume 6)	01/05/2010 – 28/02/2011
(Volume 7)	
Start of this monitoring period	01/03/2011
End of this monitoring period	29/02/2012

The total emission reductions achieved in the current monitoring period are 71,987 tCO<sub>2</sub>e.

**A.2. Project Participants**

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Name of Party involved	Private and/or public entity(ies) project participants (as applicable)	Party involved wishes to be considered as project participant (Yes/No)
P.R. China (host)	Beijing Guotou Energy Conservation Company(BJGT)	No
United Kingdom of Great Britain and Northern Ireland	First Carbon Fund Ltd	No
Switzerland	Vitol S.A.	No

**A.3. Location of the project activity:**

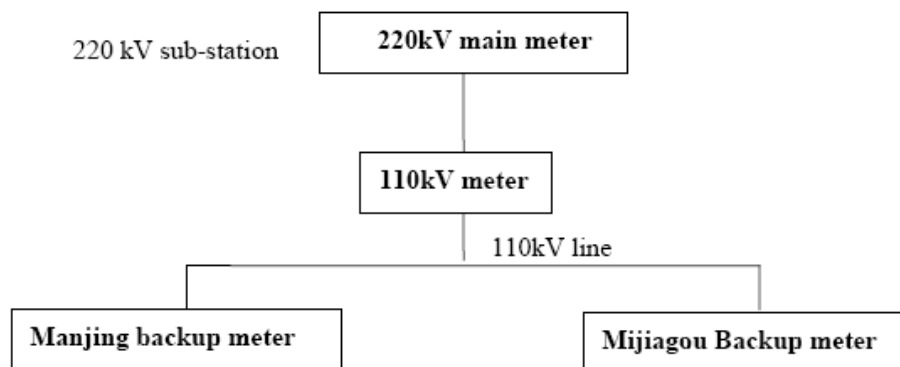
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Host country	People's Republic of China
Province	Hebei
City	Zhangjiakou
County	Zhangbei
GPS coordinates	Longitude 114°32'

**A.4. Technical description of the project**

&gt;&gt;

The 1500kW wind turbines was GE 1.5sle. The electricity supplied to NCPG by the Zhangbei Manjing Windfarm currently shares one electric flow meter (the main meter) at 220kV level with Zhangbei Mijiagou windfarm as the following figure shows, so the meter at 220KV level measures the total electricity the two windfarms delivered to the NCPG.

**A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:**

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The approved methodology applied to this project is the approved baseline methodology: AM0005 (Version 1, Valid from 13/04/2004 to 01/03/2006) "baseline methodology (barrier analysis, baseline scenario development and baseline emission rate, using combined margin) for small grid- connected zero-emissions renewable electricity generation". These documents are available from <http://cdm.unfccc.int/methodologies/DB/94GWIOIE6NL20BA94KY9ILMRUP48BN/view.html>

**A.6. Registration date of the project activity:**

&gt;&gt;

The registration date of the project is 23/03/2006.

**A.7. Crediting period of the project activity and related information (start date and choice of crediting period):**

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Crediting period	First renewable crediting period
Starting date of crediting period	01/01/2006
End date of crediting period	31/12/2012

**A.8. Name of responsible person(s)/entity(ies):**

&gt;&gt;

Contact information of the person(s)/entity(ies) responsible for completing the monitoring report form(CDM-MR):

The persons preparing the documentation were:

Mr. Shen Hongshuai, shenhongshuai@cecwpc.cn, Tel: +86 10 62248705;  
 Mr. Yao Xi, yaoxi@cecwpc.cn, Tel: +86 10 62248706;  
 Ms. Chen Dongjuan, chendongjuan@cecwpc.cn, Tel: +86 10 62248705.

## **SECTION B. Implementation of the project activity**

### **B.1. Implementation status of the project activity**

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The project activity was started construction on 28/07/2004. The full operation commission date started from 30/12/2005.

During this monitoring period, the wind farm has a good running, smooth data transfer and grid connection, and no special events happened.

No events or situations occurred during the monitoring period, which may impact the applicability of the methodology.

### **B.2. Revision of the monitoring plan**

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The monitoring plan was revised, and has been approved by the CDM EB on 19/10/2007 and is listed on the project page.

The detailed description of the monitoring system is presented in the section "SECTION C. Description of the monitoring system". <http://cdm.unfccc.int/Projects/DB/DNV-CUK1136989231.92/view>

### **B.3. Request for deviation applied to this monitoring period**

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N/A

### **B.4. Notification or request of approval of changes**

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The project activity is implemented as in the registered CDM-PDD, there is no notification or request of approval of changes from the project activity as described in the registered CDM-PDD.

## **SECTION C. Description of the monitoring system**

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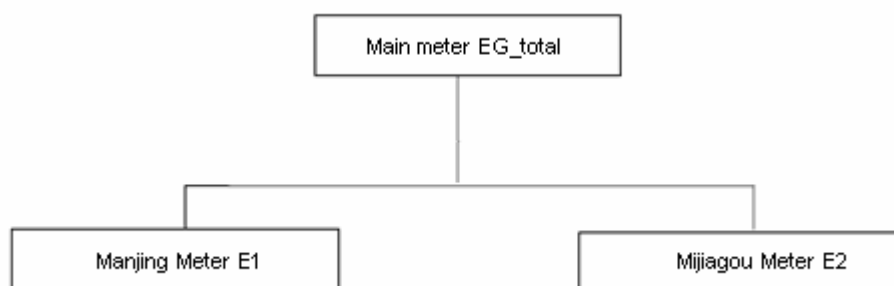
### **1. Data collection procedures**

#### **① Data generation and aggregation:**

As described in the monitoring plan, the electricity supplied to NCPG by the project currently shares the main electricity meter at the 220kv substation level with the Zhangbei Mijiagou 49.5MW Windfarm project (CDM project number:0845), the net electricity supplied to the grid by the project (EG\_1) is achieved by the following monitored parameters:

Meters	Location	Description
EG_total	220KV substation of power grid	Recording the electricity exported and imported to the power grid. Meter reading were read and recorded by the Power Grid Company and reported to project owner monthly.
E1	110KV project site substation	Recording the electricity exported to the power grid by zhangbei manjing project. Meter reading was read and record by onsite designated staff on a weekly/monthly basis.
E2	110KV project site substation	Recording the electricity exported to the power grid by zhangbei mijiagou project. Meter reading was read and record by onsite designated staff on a weekly/monthly basis.

The monitoring points shows below:



②Data calculation:

As described in the monitoring plan, the electricity delivered by Zhangbei Manjing Windfarm (EG\_1) can be calculated as:

$$EG_1 = EG_{total} * E1 / (E1 + E2)$$

Where:

EG\_1 is the calculated net electricity supply from the project activity;

EG\_total is the total net electricity supplied to the grid at the Zhangbei substation metered by the main meter;

E1 is the electricity generation metered from the Zhangbei Manjing Windfarm Project from the onsite meters;

E2 is the electricity generation metered from the Zhangbei Mijiagou 49.5MW Windfarm Project from the onsite meters.

## 2. Organizational structure and responsibilities:

Overall responsibility for monitoring and carrying out the monitoring following this monitoring plan lies with the Beijing Guotou Energy Conservation Company (BG).

Mr. Liu Bin, Head of the Management Office of the Zhangbei Manjing Windfarm, is responsible for the monitoring and reporting of the windfarm project.

Ms. Chen Dongjuan, CDM Project Manager, is responsible for the daily monitoring and reporting.

Beijing Guotou Energy Conservation Company (BG), in co-operation with Carbon Resource Management Ltd and the North China Power Grid Company will train the staff carrying out the monitoring work.

## SECTION D. Data and parameters

### D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

*(Copy this table for each data and parameter. To report multiple values, a table may be used)*

Data / Parameter:	N/A
Data unit:	N/A
Description:	N/A
Source of data used:	N/A
Value(s) :	N/A
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	N/A
Additional comment:	N/A

### D.2. Data and parameters monitored

*(Copy this table for each data and parameter. To report multiple values, a table may be used)*

\* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

<b>Data / Parameter:</b>	EF
Data unit:	tCO <sub>2</sub> e/MWh
Description:	CO <sub>2</sub> emissions factor of the grid
Measured /Calculated /Default:	Calculated
Source of data:	Calculated as the average of operating margin and build margin
Value(s) of monitored parameter:	0.733
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	N/A
Calculation method (if applicable):	EF is given by $EF = w_{OM} * EF_{OMy} + w_{BM} * EF_{BMy}$ with respective weight factors $w_{OM}$ and $w_{BM}$ (where $w_{OM} + w_{BM} = 1$ ), and by default, are weighted equally ( $w_{OM} = w_{BM} = 0.5$ ).
QA/QC procedures applied:	N/A

<b>Data / Parameter:</b>	EF OM
Data unit:	tCO <sub>2</sub> e/MWh
Description:	CO <sub>2</sub> emissions factor of the grid (operating margin)
Measured /Calculated /Default:	Calculated
Source of data:	Calculated as TEM divided by TGEN, excluding the zero and low operating cost generating sources. Related data is from China Electric Power Yearbook (2008, 2009,2010) and China Energy Statistical Yearbook (2010)
Value(s) of monitored parameter:	0.962
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	N/A
Calculation method (if applicable):	$EF_{OMy} = TEM_y / TGEN_y = [\sum_i F_{i,y} * COEF_i] / [\sum_j GEN_{j,y}]$ Details calculation refers to attached Excel sheet.
QA/QC procedures applied:	N/A

<b>Data / Parameter:</b>	EF BM
Data unit:	tCO <sub>2</sub> e/MWh
Description:	CO <sub>2</sub> emissions factor of the grid (build margin)
Measured /Calculated	Calculated

/Default:	
Source of data:	Calculated as the build margin in the last few years, which is about 20% additions and the most conservative. First the build margin is calculated for the two years nearest 20% additions (above and below), then the most conservative (lowest) is chosen. Related data is from China Electric Power Yearbook (2008, 2009,2010)
Value(s) of monitored parameter:	0.504
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	N/A
Calculation method (if applicable):	$EF_{BMy} = \sum_i S_{i,y} * CEF_i$ Details calculation refers to attached Excel sheet.
QA/QC procedures applied:	N/A

Data / Parameter:	E1				
Data unit:	MWh				
Description:	The electricity generation metered from the Zhangbei Manjing Windfarm Project				
Measured /Calculated /Default:	Measured				
Source of data:	Meter reading record of onsite zhangbei manjing meter				
Value(s) of monitored parameter:	Detailed monthly data and calculation is presented in section E1 of the monitoring report.				
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline Emission calculation				
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Serial No.	Accuracy	Calibration done on	Calibration due on	Calibration frequency
	30089907	0.5S	14/10/2010	13/10/2011	Annually
			12/08/2011	11/08/2012	
Measuring/ Reading/ Recording frequency:	Measuring continuously/Recording weekly				
Calculation method (if applicable):					
QA/QC procedures applied:	Electricity was measured continuously by the meter E1. Trained Staff from the Wind Farm recorded the meter readings manually on a weekly/ monthly basis (each Sunday at 0:00 and last day of the month). Reading records was saved as both hard and electrical copy. The meter readings were also transferred via a remote transmission line to the grid company. The meter was calibrated according to the national standard. The calibration is carried out annually by a qualified organization with the records being supplied to the grid company and				

	project owner.
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Data / Parameter:	E2																
Data unit:	MWh																
Description:	The electricity generation metered from the Zhangbei mijiagou Windfarm Project																
Measured /Calculated /Default:	Measured																
Source of data:	Meter reading record of onsite zhangbei mijiagou meter																
Value(s) of monitored parameter:	Detailed monthly data and calculation is presented in section E1 of the monitoring report.																
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline Emission calculation																
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	<table><tr><td>Serial No.</td><td>Accuracy</td><td>Calibration done on</td><td>Calibration due on</td><td>Calibration frequency</td></tr><tr><td rowspan="2">0007049 D0145</td><td rowspan="2">0.5S</td><td>14/10/2010</td><td>13/10/2011</td><td rowspan="2">Annually</td></tr><tr><td>12/08/2011</td><td>11/08/2012</td></tr></table>					Serial No.	Accuracy	Calibration done on	Calibration due on	Calibration frequency	0007049 D0145	0.5S	14/10/2010	13/10/2011	Annually	12/08/2011	11/08/2012
Serial No.	Accuracy	Calibration done on	Calibration due on	Calibration frequency													
0007049 D0145	0.5S	14/10/2010	13/10/2011	Annually													
		12/08/2011	11/08/2012														
Measuring/ Reading/ Recording frequency:	Measuring continuously/Recording weekly																
Calculation method (if applicable):																	
QA/QC procedures applied:	Electricity was measured continuously by the meter E2. Trained Staff from the Wind Farm recorded the meter readings manually on a weekly/ monthly basis (each Sunday at 0:00 and last day of the month). Reading records was saved as both hard and electrical copy. The meter readings were also transferred via a remote transmission line to the grid company. The meter was calibrated according to the national standard. The calibration is carried out annually by a qualified organization with the records being supplied to the grid company and project owner.																

Data / Parameter:	EG total				
Data unit:	MWh				
Description:	The total net electricity supplied to the grid of these two projects at the Zhangbei substation metered by the main meter				
Measured /Calculated /Default:	Measured				
Source of data:	Meter reading record of main meter at Zhangbei substation.				
Value(s) of monitored parameter:	Detailed monthly data and calculation is presented in section E1 of the monitoring report.				
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline Emission calculation				
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Serial No.	Accuracy	Calibration done on	Calibration due on	Calibration frequency
	200407007 z0062	0.2S	04/02/2011	03/02/2012	Annually
			07/01/2012	06/01/2013	



				3	
Measuring/ Reading/ Recording frequency:	Measuring continuously/Recording daily				
Calculation method (if applicable):	-				
QA/QC procedures applied:	Electricity was recorded continuously by grid company at 220kv substation. The data was daily recorded and monthly summarized. Monthly records from grid company was issued, stamped and sent to project owner. The meter was calibrated according to the national standard. The calibration is carried out annually by a qualified organization with the records being supplied to the grid company and project owner.				

<b>Data / Parameter:</b>	EG_1
Data unit:	MWh
Description:	The calculated power generation from the project activity
Measured /Calculated /Default:	Calculated
Source of data:	Meter readings from E1,E2 and EG_total
Value(s) of monitored parameter:	Detailed monthly data and calculation is presented in section E1 of the monitoring report.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline Emission calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	N/A
Calculation method (if applicable):	It was calculated from equation: $EG\_1 = EG\_total * E1 / (E1 + E2)$ More details are described in SECTION C
QA/QC procedures applied:	The data are calculated by project owner before reported to DOE. Internal auditing reduced the risk of error caused by data transfer and calculation mistakes.

## SECTION E. Emission reductions calculation

### E.1. Baseline emissions calculation

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The latest EF is calculated as the following equations:

$$EF = w_{OM} * EF_{OMy} + w_{BM} * EF_{BMy}$$

$$EF_{OMy} = TEM_y / TGEN_y = [\sum_i F_{i,y} * COEF_i] / [\sum_j GEN_{j,y}]$$

$$EF_{BMy} = \sum_i S_{i,y} * CEF_i$$

The baseline emissions in year y is calculated as:

$$BE_y = EG\_1 * EF$$

Monitoring Period	EG_1 (MWh)	EF (tCO <sub>2</sub> e/MWh)	BE_y (tCO <sub>2</sub> e)
01/03/2011-29/02/2012	98209.905	0.733	71987.860

The detailed calculation of EG\_y is calculated below:

$$EG_y = EG_1 = EG_{total} * E1 / (E1 + E2)$$

Months	E1	E2	EG_Total	EG_1	ETN
01/03/2011-31/03/2011	14250.720	11281.600	25333.704	14139.864	14139.864
01/04/2011-30/04/2011	10780.000	9075.440	19454.292	10562.207	10562.207
01/05/2011-31/05/2011	12955.360	10945.440	23746.668	12871.813	12871.813
01/06/2011-30/06/2011	6393.200	5778.960	11965.800	6284.813	6284.813
01/07/2011-31/07/2011	5199.040	4962.320	10027.908	5130.760	5130.760
01/08/2011-31/08/2011	4569.840	4584.800	9011.244	4498.259	4498.259
01/09/2011-30/09/2011	4531.120	4526.720	8920.164	4462.249	4462.249
01/10/2011-31/10/2011	7049.680	7050.560	13844.688	6921.912	6921.912
01/11/2011-30/11/2011	7250.320	6540.160	13434.300	7063.059	7063.059
01/12/2011-31/12/2011	8892.400	7077.840	15708.792	8746.823	8746.823
01/01/2012-31/01/2012	6609.680	5731.440	12067.968	6463.385	6463.385
01/02/2012-29/02/2012	11123.200	9696.720	20710.536	11064.761	11064.761
<b>Total</b>				98209.905	

## **E.2. Project emissions calculation**

>>

According to the applied methodology, as a renewable energy project, the project emissions of this project are zero.

## **E.3. Leakage calculation**

>>

According to the applied methodology, as a renewable energy project, the Leakages of this project are zero.

## **E.4. Emission reductions calculation / table**

>>

According to the applied methodology, the emission reductions in year y (ER<sub>y</sub>) should be calculated as:

$$ER_y = BE_y - PE_y - L_y$$

Total baseline emissions: 71,987 tCO<sub>2</sub>e

Total project emissions: 0 tCO<sub>2</sub>e

Total leakage: 0 tCO<sub>2</sub>e

Total emission reductions: 71,987 tCO<sub>2</sub>e

## **E.5. Comparison of actual emission reductions with estimates in the CDM-PDD**

>>

This section shall include a comparison of actual values of the emission reductions achieved during the monitoring period with the estimations in the registered CDM-PDD.

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO <sub>2</sub> e)	97,848 tCO <sub>2</sub> e	71,987 tCO <sub>2</sub> e

**E.6. Remarks on difference from estimated value in the PDD**

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The actual emission reductions during this monitoring period are 71,987 tCO<sub>2</sub>e, which is 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.

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**History of the Monitoring Report**

Version	Date	Nature of revision
01	20/04/2012	Initial adoption.

**History of the document**

Version	Date	Nature of revision
01	EB 54, Annex 34 28 May 2010	Initial adoption.
<b>Decision Class:</b> Regulatory <b>Document Type:</b> Guideline, Form <b>Business Function:</b> Issuance		