

**MONITORING REPORT FORM (F-CDM-MR)**  
**Version 02.0****MONITORING REPORT**

<b>Title of the project activity</b>	<b>Zhangjiakou Chabei Wind Farm Project</b>
<b>Reference number of the project activity</b>	<b>4844</b>
<b>Version number of the monitoring report</b>	<b>01</b>
<b>Completion date of the monitoring report</b>	<b>17/07/2012</b>
<b>Registration date of the project activity</b>	<b>27/05/2011</b>
<b>Monitoring period number and duration of this monitoring period</b>	<b>Monitoring period Number: 01</b> <b>Monitoring period Dates: 27/05/2011 – 01/07/2012 (first and last days included)</b>
<b>Project participant(s)</b>	<b>Project Owner: CGN (Chabei) Wind Power Co., Ltd.</b> <b>The buyer: Carbon Resource Management Ltd.</b>
<b>Host Party(ies)</b>	<b>People's Republic of China</b>
<b>Sectoral scope(s) and applied methodology(ies)</b>	<b>Approved consolidated baseline methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (Version 12.1.0, Sectoral Scope 01)</b>
<b>Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD</b>	<b>223,677 tCO<sub>2</sub>e</b>
<b>Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period</b>	<b>221,015 tCO<sub>2</sub>e</b>

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

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The project is located in Chabei District, Zhangjiakou City, Hebei Province, People's Republic of China. The project involves the installation of 67 wind turbines with each capacity of 1,500 kW, and totals up an installation capacity of 100.5MW. Therefore, it's expected to generate approximately 213,735MWh per year which are sold to the North China Power Grid (NCPG).

The project helps the local government to promote economic development and to improve the air quality. The project assists China in stimulating and accelerating the commercialization of grid-connected wind power technologies and markets which are an important objective of the Chinese government. The project therefore helps reduce GHG emissions versus the high-growth, coal-dominated business-as-usual scenario. The project improves air quality and local livelihoods, promote sustainable renewable energy industry development.

The Project commenced construction on 08/2010. The first wind turbine was put into commercial operation on 03/2011 and the last wind turbine was put into commercial operation on 05/2011.

The expected technical lifetime of the Project is 20 years as stated in the registered PDD.

This Monitoring Report is for the first phase of monitoring period, which is from 27/05/2011-01/07/2012. The total emission reduction achieved in this monitoring period is 221,015 tCO<sub>2</sub>e.

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

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The project is located within Chabei District, Zhangjiakou City, Hebei Province, People's Republic of China. The central geographical coordinates of the project are east longitude 114.8158° and north latitude 41.4569°.

**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)
People's Republic of China (host)	CGN (Chabei) Wind Power Co., Ltd.	No
The United Kingdom of Great Britain and Northern Ireland	Carbon Resource Management Ltd.	No

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

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Approved consolidated baseline methodology ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 12.1.0, Sectoral Scope 01).

Reference:

<http://cdm.unfccc.int/methodologies/DB/C505BVV9P8VSNNV3LTK1BP3OR24Y5L>

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

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After the project was registered on 27/05/2011, the first crediting period of the project was set from 27/05/2011 to 26/05/2018 (Renewable).

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

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The Project commenced construction on 08/2010. The first wind turbine was put into commercial operation on 03/2011 and the last wind turbine was put into commercial operation on 05/2011. The project implementation follows monitoring plan in the registered PDD.

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. Post registration changes****B.2.1. Temporary deviations from registered monitoring plan or applied methodology**

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There is no deviation request proposed for the current monitoring period.

**B.2.2. Corrections**

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There is no corrections request proposed for the current monitoring period.

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

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There is no permanent change from registered monitoring plan or applied methodology request proposed for the current monitoring period.

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

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There is no change to project design of registered project activity request proposed for the current monitoring period.

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

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The crediting period of the Project is 27/05/2011 to 26/05/2018 (Renewable) (changed from the original crediting period 01/07/2011 to 30/06/2018).

The change to start date of crediting period has been approved by EB and can be found on the website: <http://cdm.unfccc.int/Projects/DB/DNVCUK1306154648.92/view>

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

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NA

**SECTION C. Description of monitoring system**

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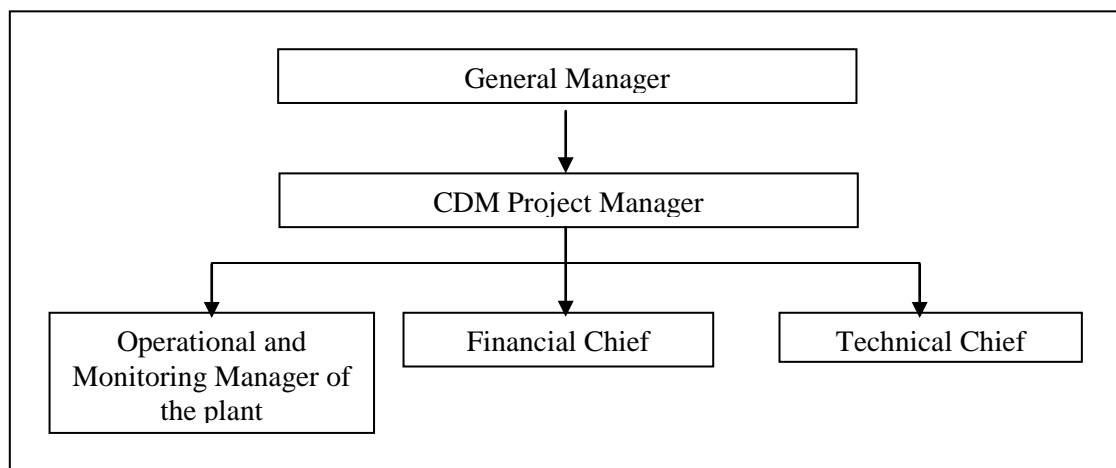
In accordance with the Monitoring Methodology ACM0002, Ver 12.1.0, the key data that must be monitored ex-post for the specific crediting period (since the emission factor has been calculated ex ante), the monitoring system is specified as below:

**1. Introduction**

The proposed Project adopts the approved consolidated monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources (version 12.1.0) to determine the emission reductions from the net electricity generation from the wind farm.

## 2. Responsibility

Overall responsibility for monitoring and carrying out the monitoring following this monitoring plan lies with the Project owner. The Project owner was responsible for the monitoring related work, including the relevant data collection, monitoring and verification. A CDM working panel was established internally. The operational and organizational structure for the monitoring process is showed as in the Figure below.



## 3. Training

The CDM project management office assign and train the dedicated people carrying out the monitoring work. The CDM project manager completed the monitoring personnel training to ensure that relevant personnel are capable of performing their designated tasks to high standards.

Furthermore, a CDM manual was designed as a guideline for the project owner for management of the Project and monitoring of the data during the operation period. Details on the authority and responsibility for monitoring, measurement and reporting, the procedures for the training of monitoring personnel, the procedures for day-to-day records handling, the procedures for internal audits, the procedures for corrective actions and so on are provided in the CDM manual for the Project owner.

## 4. Installation of meter

The annual net supplied power of the proposed project activity to the grid is monitored through the use of main meter at the onsite substation of the wind farm project, recording quantity of annual electricity exported to the grid ( $EG_{\text{export},y}$ ) and quantity of annual electricity imported to the grid ( $EG_{\text{import},y}$ ). Annual net generation is calculated as  $EG_{\text{export},y}$  minus  $EG_{\text{import},y}$ . The backup meter is installed at the onsite substation. The accuracy of the main meter and backup meter are 0.2s. The main meter monitor the flow continuously and are reported monthly. The main meter is read by the qualified operating staff of the wind farm. A monthly report of the net on-grid electricity from the main meter installed at the onsite substation is established on the basis of the data.

## 5. Calibration

The metering equipment is calibrated and checked for accuracy in accordance with industry standards. The accuracy of the main meter and backup meter are 0.2s. The net generation output by the meter alone suffices for the purpose of billing and emission reduction verification during the monitoring period.

The metering equipment shall be jointly inspected and sealed on behalf of the parties concerned and shall



not be interfered with by either party except in the presence of the other party or its accredited representatives.

Calibration is carried out by the qualified entity with the records being supplied to CGN (Chabei) Wind Power Co., Ltd., and these records has been maintained by CGN (Chabei) Wind Power Co., Ltd..

The metering equipment installed shall be tested by qualified entity after: the detection of a difference larger than the allowable error in the readings of main meter; the repair of all or part of meter caused by the failure of one or more parts to operate in accordance with the specifications.

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 months 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 within acceptable limits of accuracy or operation is performed improperly CGN (Chabei) Wind Power Co., Ltd.. and the Power Grid Company shall jointly prepare an 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 Power Grid Company and CGN (Chabei) Wind Power Co., Ltd. fail to agree then the matter will be referred for arbitration according to agreed procedures.

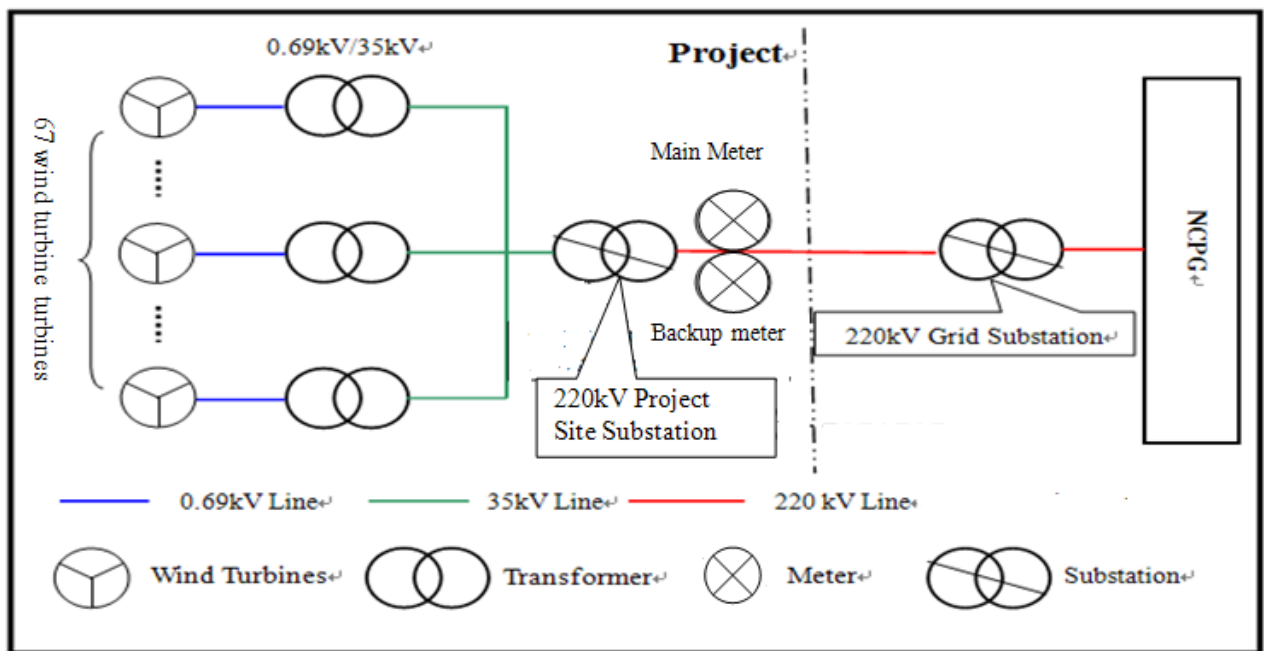
No events or situations that occurred during this monitoring period.

#### 6. Monitored data

Grid-connected electricity generated by the proposed project is monitored through the main metering equipment. Every month CGN (Chabei) Wind Power Co., Ltd. obtains the on-grid electricity generation from the substation.

Due to the regulation of the local Grid Company, the monthly cut-off time for electricity supplied to and imported from the grid is at 24:00 on the first day of every month. The records of the electricity supplied to the grid by this proposed project and the electricity imported from the grid are be issued based on the power purchase agreement (PPA) signed between the project entity and the power grid company and the readings from the main meter. The net generation is calculated as exports to the grid minus imports from the grid.

A diagram shows how parameters are monitored is presented as follows:



## 7. Quality control

Monthly net generation data is approved and signed off by CDM manager before it is accepted and stored.

This audit checks compliance with operational procedures in this monitoring plan.

This internal audit also identifies potential improvements to procedures to improve monitoring and reporting in future years.

## 8. Data management system

Physical document such as paper-based maps, diagrams and environmental assessments has been collated in a central place, together with this monitoring plan. In order to facilitate auditors' reference of relevant literature relating to the proposed project, the project material and monitoring results will be indexed. All paper-based information has been stored by the technology department of CGN (Chabei) Wind Power Co., Ltd. and all the material have a copy for backup.

And all data including calibration records is kept until 2 years after the end of the total crediting period of the CDM project.

## 9. Reporting and Verification

- CGN (Chabei) Wind Power Co., Ltd. records readings from the main meter monthly.
- CGN (Chabei) Wind Power Co., Ltd. carries out an internal audit on the readings and calculations.
- CGN (Chabei) Wind Power Co., Ltd., after the internal audit, reports the readings, grid data and calculations to the DOE for verification.

## SECTION D. Data and parameters

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

<b>Data/Parameter</b>	$EF_{grid,CM,y}$
<b>Unit</b>	tCO <sub>2</sub> /MWh
<b>Description</b>	Combined margin emission factor.
<b>Source of data</b>	<a href="http://qhs.ndrc.gov.cn/qjzjz/t20090703_289357.htm">http://qhs.ndrc.gov.cn/qjzjz/t20090703_289357.htm</a>
<b>Value(s) applied</b>	0.9502
<b>Purpose of data</b>	Baseline emission calculation.
<b>Additional comment</b>	The baselines emission factor was determined ex ante and will be used throughout the first crediting period.

### D.2. Data and parameters monitored

Data/Parameter	$EG_{export,y}$					
Unit	MWh					
Description	Quantity of annual electricity exported to the grid by the proposed project					
Measured/Calculated /Default	Continuously measured by the main meter at the onsite substation of the wind farm project					
Source of data	Meters at the onsite substation of the wind farm project					
Value(s) of monitored parameter	233,437.116					
Monitoring equipment	Meters	Serial No.	Accuracy class	Calibration date	Validity	Calibration frequency
	Main Meter	96212980	0.2s	09/10/2010 09/07/2011	Yes	annually
	Backup Meter	96212981	0.2s	09/10/2010 09/07/2011	Yes	annually
Measuring/Reading/Recording frequency	Continuously measurement and monthly recording					
Calculation method (if applicable)	NA					
QA/QC procedures	The metering equipment is calibrated annually for accuracy by a qualified third party in accordance with industry standard. Monthly generation data is approved and signed off by CDM manager before it is accepted and stored. The supply of electricity to the grid is cross-checked against records for sold electricity. Data will be archived for 2 years following the end of the last crediting period.					
Purpose of data	Baseline emission calculation					
Additional comment	-					



Data/Parameter	EG <sub>import,y</sub>					
Unit	MWh					
Description	Quantity of annual electricity imported from the grid by the proposed project					
Measured/Calculated /Default	Continuously measured by the main meter at the onsite substation of the wind farm project					
Source of data	Meters at the onsite substation of the wind farm project					
Value(s) of monitored parameter	838.200					
Monitoring equipment						
	Meters	Serial No.	Accuracy class	Calibration date	Validity	Calibration frequency
	Main Meter	96212980	0.2s	09/10/2010 09/07/2011	Yes	annually
	Backup Meter	96212981	0.2s	09/10/2010 09/07/2011	Yes	annually
Measuring/Reading/Recording frequency	Continuously measurement and monthly recording					
Calculation method (if applicable)	Not applicable					
QA/QC procedures	The metering equipment is calibrated annually for accuracy by a qualified third party in accordance with industry standard. Monthly generation data is approved and signed off by CDM manager before it is accepted and stored. The supply of electricity to the grid is cross-checked against records for sold electricity. Data will be archived for 2 years following the end of the last crediting period.					
Purpose of data	Baseline emission calculation					
Additional comment	-					





<b>Data/Parameter</b>	$EG_{facility,y}$					
<b>Unit</b>	MWh					
<b>Description</b>	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y					
<b>Measured/Calculated/Default</b>	Calculated by $EG_{export,y}$ minus $EG_{import,y}$					
<b>Source of data</b>	Meters at the onsite substation of the wind farm project					
<b>Value(s) of monitored parameter</b>	232,598.916					
<b>Monitoring equipment</b>	Meters	Serial No.	Accuracy class	Calibration date	Validity	Calibration frequency
	Main Meter	96212980	0.2s	09/10/2010 09/07/2011	Yes	annually
	Backup Meter	96212981	0.2s	09/10/2010 09/07/2011	Yes	annually
<b>Measuring/Reading/Recording frequency</b>	Continuously measurement and monthly recording					
<b>Calculation method (if applicable)</b>	Net generation is calculated as exports minus imports. $EG_{facility,y} = EG_{export,y} - EG_{import,y}$					
<b>QA/QC procedures</b>	The metering equipment is calibrated annually for accuracy by a qualified third party in accordance with industry standard. Monthly generation data is approved and signed off by CDM manager before it is accepted and stored. The supply of electricity to the grid is cross-checked against records for sold electricity. Data will be archived for 2 years following the end of the last crediting period.					
<b>Purpose of data</b>	Baseline emission calculation					
<b>Additional comment</b>	-					

### D.3. Implementation of sampling plan

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The parameters monitored described in section D.2 above are not involved the sampling approach.

## 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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The baseline emission  $BE_y$  (tCO<sub>2</sub>) during the monitoring period results from:

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y} = (EG_{export,y} - EG_{import,y}) \times EF_{grid,CM,y}$$

Where:

$EG_{export,y}$  is the quantity of annual electricity exported to the grid by the proposed project(MWh);

$EG_{import,y}$  is the quantity of annual electricity purchased from the grid by the proposed project(MWh);

$EG_{facility,y}$  is the quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh).

#### Electricity exported to the NCPG by the Project

Monitoring period	Electricity exported to the grid ( $EG_{export,y}$ ) unit: MWh	Electricity imported from the grid ( $EG_{import,y}$ ) unit: MWh	Quantity of net electricity generation supplied to the Grid ( $EG_{facility,y}$ ) unit: MWh
27/05/2011 0:00-01/06/2011 24:00	6,048.504	2.376	6046.128
02/06/2011 0:00-01/07/2011 24:00	13,742.124	32.076	13710.048
02/07/2011 0:00-01/08/2011 24:00	9,394.044	55.044	9339.000
02/08/2011 0:00-01/09/2011 24:00	10,271.448	76.428	10195.020
02/09/2011 0:00-01/10/2011 24:00	14,068.164	47.124	14021.040
02/10/2011 0:00-01/11/2011 24:00	16,853.892	98.076	16755.816
02/11/2011 0:00-01/12/2011 24:00	10,382.988	181.104	10201.884
02/12/2011 0:00-01/01/2012 24:00	15,192.672	118.404	15074.268
02/01/2011 0:00-01/02/2012 24:00	17,786.736	88.440	17698.296
02/02/2011 0:00-01/03/2012 24:00	24,963.048	37.752	24925.296
02/03/2011 0:00-01/04/2012 24:00	24,416.436	31.944	24384.492
02/04/2011 0:00-01/05/2012 24:00	26,103.132	21.648	26081.484
02/05/2011 0:00-01/06/2012 24:00	22,956.912	26.136	22930.776
02/06/2011 0:00-01/07/2012 24:00	21,257.016	21.648	21235.368
<b>Total</b>	<b>233,437.116</b>	<b>838.200</b>	<b>232,598.916</b>

#### Net Electricity supplied to the NCPG by the Project

Monitoring Period	Electricity supplied to the grid for CERs calculation $EG_{export,y}$ (MWh)	Electricity imported from the grid for CERs calculation $EG_{import,y}$ (MWh)	Quantity of net electricity generation supplied to the Grid for CERs calculation $EG_{facility,y}$ (MWh)
	<b>A</b>	<b>B</b>	<b>C=A-B</b>
<b>27/05/2011-01/07/2012</b>	<b>233,437.116</b>	<b>838.200</b>	<b>232,598.916</b>

According to the registered PDD, the Emission factor of the grid is determined ex-ante; the ex-ante determined emission factor is 0.9502 tCO<sub>2</sub>e/MWh.

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y} = 232,598.916 \text{ MWh} \times 0.9502 \text{ tCO}_2\text{e/MWh} = 221,015 \text{ tCO}_2\text{e}.$$

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

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According to ACM0002 (Version 12.1.0), no Project Emissions is to be counted by the Project.

Hence,  $PE_y = 0 \text{ tCO}_2\text{e}$

## E.3. Calculation of leakage

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According to the applied methodology, as a renewable energy project, the project leakage of the Project is zero.

$$L_y = 0 \text{ tCO}_2\text{e}$$

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

Time Period	Baseline emissions or baseline net GHG removals by sinks (tCO <sub>2e</sub> )	Project emissions or actual net GHG removals by sinks (tCO <sub>2e</sub> )	Leakage (tCO <sub>2e</sub> )	Emission reductions or net anthropogenic GHG removals by sinks (tCO <sub>2e</sub> )
27/05/2011-01/07/2012	221,015	0	0	221,015

## E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in 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 (tCO <sub>2e</sub> )	223,677 (203,090/365*402)	221,015

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

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The comparison shows that the actual emission reduction is lower than the expectation in the registered PDD.

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### History of the document

Version	Date	Nature of revision
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	EB 54, Annex 34 28 May 2010	Initial adoption.
<b>Decision Class:</b> Regulatory <b>Document Type:</b> Form <b>Business Function:</b> Issuance		