Monitoring report form (Version 03.1)

Monitoring report

Title of the project activity	Zhangbei Manjing Windfarm Project
Reference number of the project activity	0233
Version number of the monitoring report	01
Completion date of the monitoring report	05/01/2013
Registration date of the project activity	23/03/2006
Monitoring period number and duration of this monitoring period	The ninth monitoring period First and last days included (01/09/2012-31/12/2012)
Project participant(s)	Beijing Guotou Energy Conservation Company (BJGT) – P.R. China (host) First Carbon Fund Ltd - United Kingdom of Great Britain and Northern Ireland Vitol S.A. - Switzerland
Host Party(ies)	P.R. China
Sectoral scope(s) and applied methodology(ies)	Sectoral scope 1 : Energy industries (renewable - / non-renewable sources) Applied methodology: AM0005 ver. 01 - Baseline methodology (barrier analysis, baseline scenario development and baseline emission rate, using combined margin) for small grid- connected zero-emissions renewable electricity generation and Monitoring methodology for small grid-connected zero-emissions renewable electricity generation.
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	32,705[I] tonnes CO_2 equivalent
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	24,765 tonnes CO_2 equivalent

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

>>

The purpose of the Zhangbei Manjing Windfarm Project (hereafter referred to as "the 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 generates greenhouse gas (GHG) emission reductions by avoiding CO_2 emissions from electricity generation by fossil fuel power plants that is supplied to NCPG. The Project involves the installation and operation of 30 wind turbines with unit capacity of 1,500 kW. The total installed capacity is 45 MW.

Construction start date	28/07/2004
First wind turbine commission start date	30/12/2005
Full operation commission start date	18/08/2006
Date of CDM registration	23/03/2006
First renewable crediting period	01/01/2006 – 31/12/2012 (renewable)
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)	01/03/2011 – 29/02/2012
(Volume 8)	01/03/2012 – 31/08/2012
(Volume 9)	01/09/2012 – 31/12/2012

The total emission reductions achieved in the current monitoring period are 24,765 tCO_2e.

A.2. Location of project activity

>>

Host Party(ies)	People's Republic of China
Province	Hebei
City	Zhangjiakou
County	Zhangbei
GPS coordinates	114°32′ E 41°08′ N

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)	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.4. Reference of applied methodology

>>

The approved methodology applied to this project is:

approved baseline and monitoring methodology: AM0005 (Version 01) “Baseline methodology (barrier analysis, baseline scenario development and baseline emission rate, using combined margin) for small grid-connected zero-emissions renewable electricity generation” and “Monitoring methodology for small grid-connected zero-emissions renewable electricity generation”.
The applied methodology please refer to the UNFCCC CDM website
http://cdm.unfccc.int/methodologies/DB/94GWIOIE6NL20BA94KY9ILMRUP48BN/view.html

A.5. Crediting period of project activity

>>
Renewable crediting period
First renewable crediting period, 7 years from 01/01/2006 to 31/12/2012.

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

>>
The Project was started construction on 28/07/2004 and totally 30 wind turbines (GE 1.5sle) of 1,500kW were installed and operated. The turbines were manufactured by General Electric Company (GE).

The Project shared one electricity meter (the main meter) at 220kV level with Zhangbei Mijiagou 49.5MW Windfarm Project (UNFCCC ref: 0845), so the meter at 220kV level measures the total electricity exchanged between NCPG and the two wind farms.

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 current monitoring period that may impact the applicability of the applied methodology.

B.2. Post registration changes

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

>>
The Project is implemented as the registered PDD and no deviation applied to this monitoring period.

B.2.2. Corrections

>>
The Project is implemented as the registered PDD and no corrections applied to this monitoring period.

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

>>
The Project has revised its registered monitoring plan and the revised monitoring plan was approved by EB on 19/10/2007.

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

>>
The Project is implemented as the registered PDD and no changes.

B.2.5. Changes to start date of crediting period

>>
N/A

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

>>
N/A

SECTION C. Description of monitoring system

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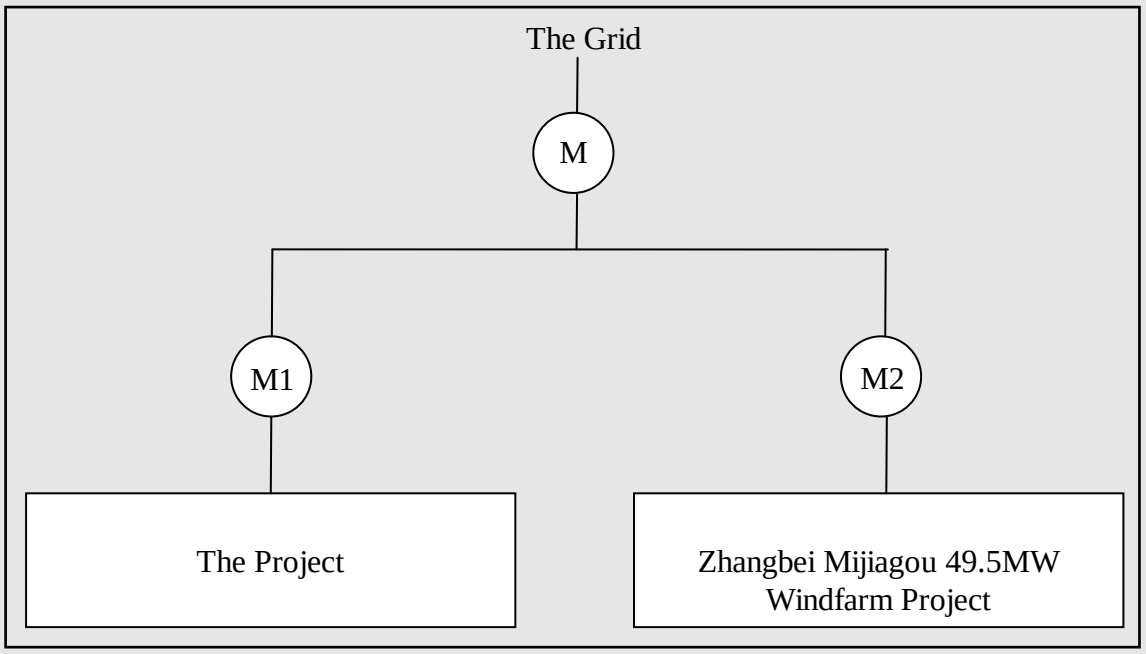
1 Data collection procedures
As described in the revised monitoring plan, the Project shared one electricity meter (the main meter) at 220kV level with Zhangbei Mijiagou 49.5MW Windfarm Project (UNFCCC Ref No. 0845), so the meter at 220kV level measures the total electricity exchanged between NCPG and the two wind farms. The net electricity supplied to the grid by the Project (EG_1II) is achieved by the following monitored parameters:

Parameters	Meter Location	Description
EG_total	220kV substation of power grid (main meter M)	Recording total net electricity supplied to the grid of the two projects at the 220kV substation. Meter readings were read and recorded daily by the Power Grid Company and reported to project owner monthly. The data could be double checked by Electricity Transaction Notes (ETNs).
E1	Exit of 110kV Project site substation (Zhangbei Manjing meter M1)	Recording the electricity generation of the Project. Meter readings were read and recorded by onsite designated staff on a weekly/monthly basis.
E2	Exit of 110kV Mijiagou project site substation (Zhangbei Mijiagou meter M2)	Recording the electricity generation of Zhangbei Mijiagou 49.5MW Windfarm Project. Meter readings were read and recorded by onsite designated staff on a weekly/monthly basis.

The cut-off time during the monitoring period is 24:00 of last day of the month to achieve net electricity supplied to the grid by the Project.

The following diagram shows the monitoring points:



As described in the revised monitoring plan, the net electricity supply from the Project (EG_1) can be

calculated as:

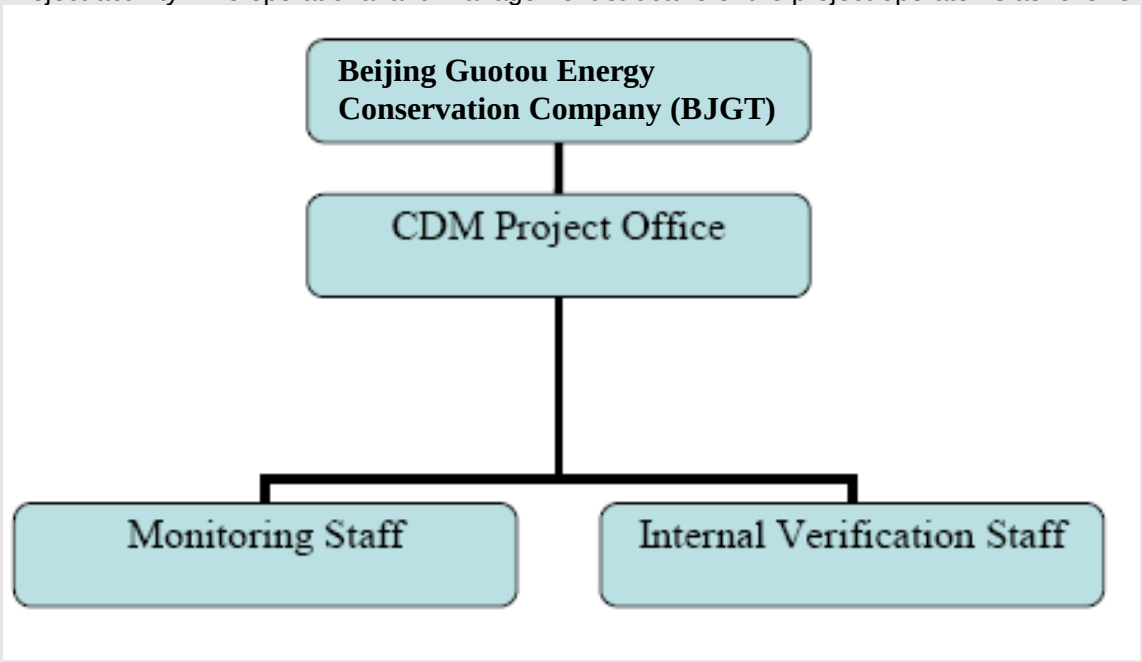
EG_1 = EG_total × E1 / (E1 + E2)

CO2 emissions factor of the grid (EFy) is calculated by EFy =ωOM * EF_OM + ωBM * EF_BM
where, ωOM and ωBM are 0.5 according to default weight factor.

Lastest data from the following sources will be obtained to calculate EF_OM and EF_BM, including:
IPCC Guidelines
China Electric Power Yearbook
China Energy Statistical Yearbook

2 Organizational structure and responsibilities:

Beijing Guotou Energy Conservation Company (BJGT) had established CDM project management office and assigned dedicated people responsible for the monitoring and report the emission reduction due to the Project activity. The operational and management structure of the project operator is as follows:



3 Emergency procedures

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

(a) first, by reading Zhangbei Manjing meter (M1), unless a test by either party reveals it is inaccurate;
(b) if Zhangbei Manjing meter (M1) is not with acceptable limits of accuracy or is otherwise performing improperly, Beijing Guotou Energy Conservation Company (BJGT) and North China Power Grid shall jointly prepare an estimate of the correct reading; and
(c) if North China Power Grid and Beijing Guotou Energy Conservation Company (BJGT) fail to agree then the matter will be referred for arbitration according to agreed procedures.

SECTION D. Data and parameters

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

Data / Parameter:	N/A
Unit:	N/A
Description:	N/A
Source of data:	N/A

Value(s) applied):	N/A
Purpose of data:	N/A
Additional comment:	N/A

D.2. Data and parameters monitored

Data / Parameter:	EFy
Unit:	tCO_2/MWh
Description:	CO_2 emissions factor of the grid
Measured/ Calculated / Default:	Calculated
Source of data:	Calculated as the average of operating margin and build margin (50:50)
Value(s) of monitored parameter:	0.7027
Monitoring equipment:	N/A
Measuring/ Reading/ Recording frequency:	N/A
Calculation method (if applicable):	EFy is given by EFy = wOM × EF_OMy + wBM × EF_BMy with respective weight factors wOM and wBM (where wOM + wBM = 1), and by default, are weighted equally (wOM = wBM = 0.5).
QA/QC procedures:	N/A
Purpose of data:	Baseline emission calculation
Additional comment:	N/A

Data / Parameter:	EF_OM
Unit:	tCO_2/MWh
Description:	CO_2 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 (2011) and China Energy Statistical Yearbook (2011)
Value(s) of monitored parameter:	0.9485
Monitoring equipment:	N/A

Measuring/ Reading/ Recording frequency:	N/A
Calculation method (if applicable):	EF_OMy = TEMy / TGENy = [Σi Fi,y×COEFi] / [Σj GENj,y] Where TEMy and TGENy are the total GHG emissions and electricity generation supplied to the grid by the power plants connected to the grid excluding zero- or low-operating cost sources in year y. Fi,y and COEFi are the fuel consumption in year y and associated carbon coefficient of the fossil fuel i consumed in the grid. GENj,y is the electricity generation at the plant j connected to the grid excluding zero- or low-operating cost sources in year y. Details calculation refers to attached Excel sheet.
QA/QC procedures:	N/A
Purpose of data:	Baseline emission calculation
Additional comment:	N/A

Data / Parameter:	EF_BM
Unit:	tCO_2/MWh
Description:	CO_2 emissions factor of the grid (build margin)
Measured/ Calculated / Default:	Calculated
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 and 2011)
Value(s) of monitored parameter:	0.4570
Monitoring equipment:	N/A
Measuring/ Reading/ Recording frequency:	N/A
Calculation method (if applicable):	EF_BMy = Σi Si,y × CEFi Where Si is the share in added generation from technology/fuel i in year y. CEFi is the CO2 emission factor for technology/fuel i. Details calculation refers to attached Excel sheet.
QA/QC procedures:	N/A
Purpose of data:	Baseline emission calculation
Additional comment:	N/A

<table>
<tr><td>Data / Parameter:</td><td>E1</td></tr>
<tr><td>Unit:</td><td>MWh</td></tr>
<tr><td>Description:</td><td>The electricity generation metered from the Project site</td></tr>
<tr><td>Measured/ Calculated / Default:</td><td>Measured</td></tr>
<tr><td>Source of data:</td><td>Meter reading record of onsite Zhangbei Manjing meter (M1)</td></tr>
<tr><td>Value(s) of monitored parameter:</td><td>Detailed monthly data and calculation is presented in section E1 of the monitoring report.</td></tr>
<tr><td>Monitoring equipment:</td><td>Zhangbei Manjing meter (M1).
<table>
<tr><th>Type</th><th>Serial No.</th><th>Accuracy</th><th>Calibration done on</th><th>Validity</th><th>Calibration frequency</th></tr>
<tr><td>Electricity meter</td><td>30089907</td><td>0.5S</td><td>02/11/2011</td><td>Yes</td><td>Annually</td></tr>
<tr><td>Electricity meter</td><td>30096860</td><td>0.5S</td><td>29/02/2012</td><td>Yes</td><td>Annually</td></tr>
</table></td></tr>
<tr><td>Measuring/ Reading/ Recording frequency:</td><td>Measuring continuously and recording weekly/monthly</td></tr>
<tr><td>Calculation method (if applicable):</td><td>N/A</td></tr>
<tr><td>QA/QC procedures:</td><td>Electricity was measured continuously by the meter M1. Trained Staff recorded the meter readings manually on a weekly/ monthly basis (each Sunday at 0:00 and each 24:00 of the last day of the month). Reading records were 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.</td></tr>
<tr><td>Purpose of data:</td><td>Baseline emission calculation</td></tr>
<tr><td>Additional comment:</td><td>The original meter (30089907) has been replaced on 22/10/2012. The Serial No. of new meter is 30096860.</td></tr>
</table>

<table>
<tr><td>Data / Parameter:</td><td>E2</td></tr>
<tr><td>Unit:</td><td>MWh</td></tr>
<tr><td>Description:</td><td>The electricity generation metered from the Zhangbei Mijiagou 49.5MW Windfarm Project site</td></tr>
<tr><td>Measured/ Calculated / Default:</td><td>Measured</td></tr>
<tr><td>Source of data:</td><td>Meter reading record of onsite Zhangbei Mijiagou meter (M2)</td></tr>
<tr><td>Value(s) of monitored parameter:</td><td>Detailed monthly data and calculation is presented in section E1 of the monitoring report.</td></tr>
</table>

Monitoring equipment:	Zhangbei Mijiagou meter (M2) Type: Electricity meter; Serial No.: 0007049D0145; Accuracy: 0.5S; Calibration done on: 02/11/2011; Validity: Yes; Calibration frequency: Annually Type: Electricity meter; Serial No.: 30096855; Accuracy: 0.5S; Calibration done on: 29/02/2012; Validity: Yes; Calibration frequency: Annually
Measuring/ Reading/ Recording frequency:	Measuring continuously and recording weekly/monthly
Calculation method (if applicable):	N/A
QA/QC procedures:	Electricity was measured continuously by the meter M2. Trained Staff recorded the meter readings manually on a weekly/ monthly basis (each Sunday at 0:00 and each 24:00 of the last day of the month). Reading records were 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.
Purpose of data:	Baseline emission calculation
Additional comment:	The original meter (0007049D0145) has been replaced on 22/10/2012. The Serial No. of new meter is 30096855.

Data / Parameter:	EG_total
Unit:	MWh
Description:	The total net electricity supplied to the grid of the two projects at the 220kV substation
Measured/ Calculated / Default:	Calculated
Source of data:	Meter reading record of main meter (M) at 220kV substation.
Value(s) of monitored parameter:	Detailed monthly data and calculation is presented in section E1 of the monitoring report.
Monitoring equipment:	Main meter (M) at 220kV substation of power grid Type: Electricity meter; Serial No.: 200407007Z0062; Accuracy: 0.2S; Calibration done on: 07/01/2012; Validity: Yes; Calibration frequency: Annually
Measuring/ Reading/ Recording frequency:	Measuring continuously and recording daily/monthly
Calculation method (if applicable):	Calculated by the electricity exported to the grid minus electricity imported from the grid by the two projects measured by the main meter (M).

QA/QC procedures:	Electricity was measured continuously by grid company at 220kV substation. The data were daily recorded and monthly summarized. ETNs from grid company were 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.
Purpose of data:	Baseline emission calculation
Additional comment:	N/A

Data / Parameter:	EG_1
Unit:	MWh
Description:	The calculated power generation from the Project
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.
Monitoring equipment:	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 E
QA/QC procedures:	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.
Purpose of data:	Baseline emission calculation
Additional comment:	N/A

D.3. Implementation of sampling plan

>>
N/A

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

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

>>
The baseline emissions in year y is calculated as
BEy = EGy × EFy = EG_1 × EFy

EFy = wOM × EF_OMy + wBM × EF_BMy

EF_OMy = TEMy / TGENy = [Σi Fi,y×COEFi] / [Σj GENj,y]

EF_BMy = Σi Si,y×CEFi

The detailed calculation of EF_OMy and EF_BMy are provided in the emission reductions calculation spreadsheet.

EF= wOM × EF_OMy + wBM × EF_BMy = 0.5*0.9485+0.5*0.4570=0.7027tCO_2e/MWh

EGy= EG_1= EG_total × E1/ (E1 + E2)

Monitoring Period	EG_v (EG_1) (MWh)	EF_v (tCO_2e/MWh)	BE_v (tCO_2e)
01/09/2012- 31/12/2012	35,243.615	0.7027	24,765

The detailed calculation of EG_v is calculated below[III]:

Unit: MWh

Period	**E1**	**E2**	**Electricity exported by the two projects**	**Total electricity imported by the two projects**	**EG_total**	**EG_y (EG_1)**
	A	**B**	**C**	**D**	**E=C-D**	**F=E*A/(A+B)**
01/09/2012-30/09/2012	5,494.720	4,893.680	10,377.444	125.664	10,251.780	5,422.458
01/10/2012-31/10/2012	6,753.120	6,614.960	13,305.204	87.912	13,217.292	6,676.947
01/11/2012-30/11/2012	11,488.400	9,580.560	21,007.536	48.048	20,959.488	11,428.708
01/12/2012-31/12/2012	11,890.560	9,956.320	21,629.520	104.280	21,525.240	11,715.502
Total	-					35,243.615

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

>>
According to the applied methodology and the registered PDD, as a renewable energy project, the project emissions of the Project are zero.

E.3. Calculation of leakage

>>
According to the applied methodology and the registered PDD, as a renewable energy project, the leakage of this project is zero.

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 ($t CO_2e$)**	**Project emissions or actual net GHG removals by sinks ($t CO_2e$)**	**Leakage ($t CO_2e$)**	**Emission reductions or net anthropogenic GHG removals by sinks ($t CO_2e$)**
Total	24,765	0	0	24,765

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 (t CO_2e)	32,705 (see endnote 1)	24,765

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

>>
The actual emission reduction achieved during the current monitoring period is lower than it was estimated in 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_2e)	24,765	N.A.

History of the Monitoring Report

Version	Date	Nature of revision
01	05/01/2013	Initial adoption.

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Document information

Version	*Date*	*Description*
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.

Decision Class: Regulatory
Document Type: Form
Business Function: issuance
Keywords: monitoring report, performance monitoring

[I] As the monitoring period is for 122 days, multiplying the annual emission reduction volume (97,848 tons) in PDD by 122/365 gives a volume of 32,705 tCO_2

[II] EG_1 here refers to EG_y in registered PDD.

[III] The monitoring results are fully consistent with the electricity transaction notes issued by the grid company. Thus, only the monitored values are listed here.