



Monitoring report form (Version 03.1)

Monitoring report

Title of the project activity	Shandong Huaneng Shouguang 49.5MW Wind Farm Project
Reference number of the project activity	CDM Reference No. 3391
Version number of the monitoring report	Version 02.1
Completion date of the monitoring report	04/03/2013
Registration date of the project activity	19/07/2010
Monitoring period number and duration of this monitoring period	3rd monitoring period: 25/12/2011- 31/12/2012 (both days included)
Project participant(s)	Huaneng Shouguang Wind Power Co., Ltd The Kansai Electric Power Co., Inc.
Host Party(ies)	People's Republic of China
Sectoral scope(s) and applied methodology(ies)	Sectoral Scope Number: 1. Energy Industry-Renewable resources Approved methodology ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 09).
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	103,995tCO₂e (373days in total) {Calculated as 373*(estimated emission reductions in the registered PDD/365days in a year) = 373*(101,765/365) = 103,995}
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	88,764tCO₂e

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

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Shandong Huaneng Shouguang 49.5MW Wind Farm Project (hereinafter referred as "the project") is located on the west of the old river mouth, Dajiawa town, Shouguang county, Weifang City, Shandong province, P. R. China. It is designed to generate electricity from wind, a clean and renewable resource and provide annual net on-grid power generation of 96.4788GWh and achieve 101,765tCO₂e GHGs reductions per annum.

The area covered by North China Power Grid (hereinafter referred as NCPG) is abundant in coal and oil resources, and thermal power plant is the major power source of NCPG. By avoiding operation of existing thermal power plants and future expansion of fossil fuel-based generation by the NCPG, the project displaces part of thermal power in NCPG by making use of clean and renewable energy.

Relevant dates for the project activity refers to the following table.

Date	Key events
15/04/2008	The starting date of construction ¹
16/12/2008	The project began commissioning and turned into full operation ²
19/07/2010	Registration date and starting date of the crediting period
19/07/2010-24/12/2010	The 1st monitoring period
25/12/2010-24/12/2011	The 2nd monitoring period
25/12/2011-31/12/2012	The 3rd monitoring period

From 25/12/2011-31/12/2012, the net power supplied to the grid by the project is 84,152.64MWh, which corresponds to the emission reductions of 88,764tCO₂e.

A.2. Location of project activity

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The project is located on the west of the old river mouth of Dajiawa township, Shouguang county, Weifang city, Shandong Province, P.R. China, 10km away from Dajiawa town, 40km away from Shouguang City and 150km from Jinan city (provincial capital). Shouguang city lies in the north of Shandong province, in the middle part of Shandong peninsula and southwest to the Laizhou Bay. It is east to the Hanting district and Weicheng district of Weifang city, south to Qingzhou city and Changle city, west to the Guangrao county of Dongying city and north to Bohai Sea. According to the data measured by the Marine Environment Monitoring Center Station, the project's geographical coordinate is longitude 118°56'59.636''~119°02'53.821''E and latitude 37°13'44.198''~37°16'02.668''N, and with its geographical coordinate of substation at longitude 118°56'59.636''~118°57'11.300''E and latitude 37°14'14.110''~37°14'20.603''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)
People's Republic of China (Host)	Huaneng Shouguang Wind Power Co., Ltd (Private entity)	No
Japan	The Kansai Electric Power Co., Inc. (Private entity)	No

¹ Please refer to the Construction Contract.

² Please refer to the Project Operation Log.

A.4. Reference of applied methodology

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The project operation has been monitored in accordance with the requirements of the applicable monitoring methodology as described in PDD and the approved monitoring methodology ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (ACM0002/Version 09, Sectoral Scope: 01, EB45); Tool to calculate emission factor for an electricity system (version 01.1).

Please refer to:

<http://cdm.unfccc.int/methodologies/DB/UB3431UT9I5KN2MUL2FGZXZ6CV71LT>

A.5. Crediting period of project activity

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The project employs the renewable crediting period (7 years*3), and the first crediting period is from 19/07/2010 to 18/07/2017, and there was no post-registration change to the start date of the crediting period.

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

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The project installs 33 IEC3 type three-blade rotor wind turbines of SL1500/77 with rated capacity of 1500KW which is manufactured by the Sinovel Wind Group Co., Ltd, and build a control centre including a 35kV switchyard and central control centre, and extend 110kV transmission lines for power transmission. The project is connected to Shouguang Power Grid (SGPG), and then to the North China Power Grid (hereinafter referred as NCPG) finally. Please refer to Section C for the diagram. The main specific parameters of the wind turbine are provided as follows:

Total installed capacity	49.5MW
Rated capacity per turbine	1500KW
No. of blades	3
Diameter	77m
Cut in wind speed	4.0m/s
Cut out wind speed	25m/s
Nominal out put at velocity	12m/s
Rated output voltage	690V
No. of turbines	33
Equivalent annual operating hours	1949.1h
Load factor	22.25%

And the project boundary included is shown in the Figure below:

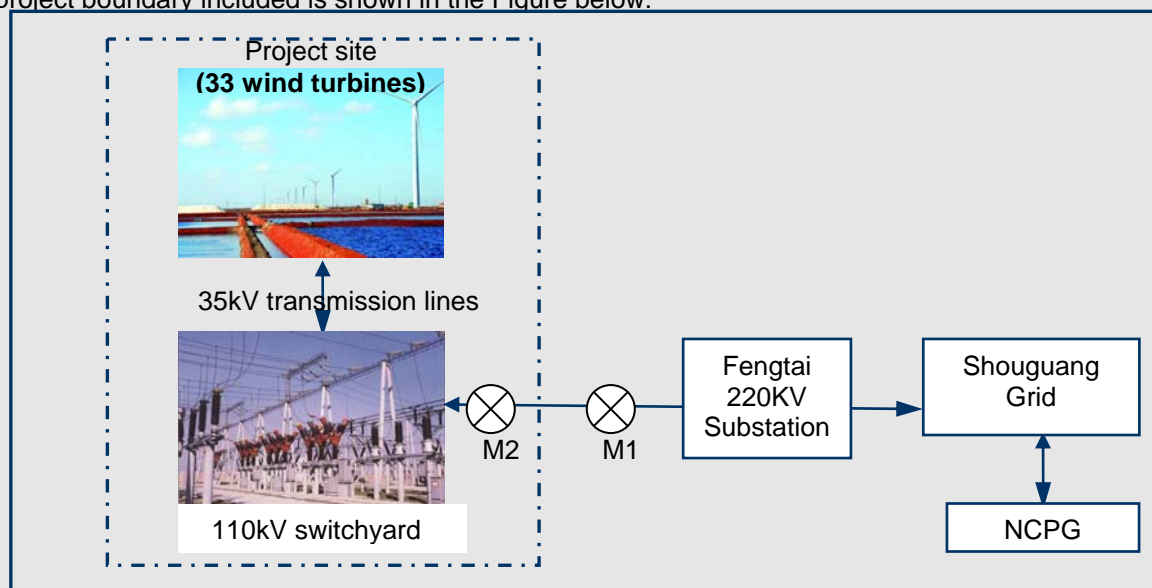


Figure: Structure of the project boundary

The project started construction on 15/04/2008, and was put into operation on 16/12/2008. During this monitoring period, there was an overhaul on the three days of 11/07/2012, 12/07/2012 and 13/07/2012, thus caused the shutdown of the equipment and without any generation.

No equipment exchange happened.

No events or situation occurred during this 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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Not applicable.

B.2.2. Corrections

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There was a typo error in the table 2 of the registered PDD: the construction activities began on 15/04/2008 rather than 15/04/2007. Relevant evidence and revised PDD with version 05 and dated as 04/03/2013 in VVS-Track have been submitted for checking.

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

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There was some contradictory information in regard to the M2 in the monitoring plan in the registered PDD. As for the M2, it is just a backup meter, which is in function only when the main meter M1 is out of order. Therefore, to avoid misunderstanding, a more accurate monitoring plan has been revised in accordance with the actual monitoring practice.

The revised PDD of version 05 dated as 04/03/2013 has been submitted for approving for post registration change.

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

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Not applicable.

B.2.5. Changes to start date of crediting period

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Not applicable.

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 project is connected to SGPG within NCPG, the power delivered to the grid is determined and monitored by a bidirectional meter (M1) installed at the Fengtai Substation. This meter can measure both of the electricity supplied to the grid ($EG_{out,y}$) and the electricity purchased from the grid ($EG_{in,y}$), and the net on-grid power supply (EG_y) is defined as $(EG_{out,y} - EG_{in,y})$. This meter is owned, operated and maintained by the grid company. When the main meter M1 is out of order, the readings from the back-up meter M2 which is operated by the project owner are used for reference. The locations of the meters are shown in Figure as follows.

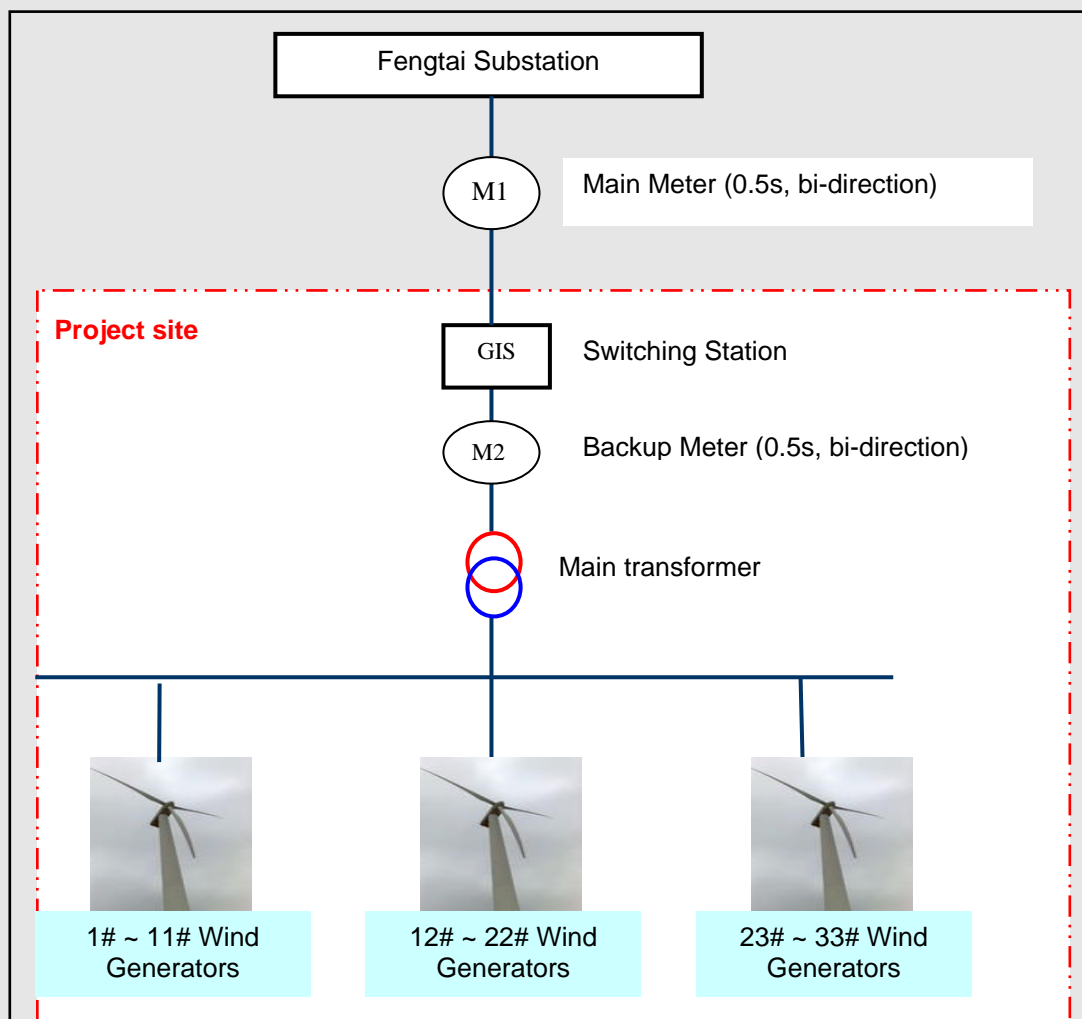


Figure: Diagram of the Grid Connection

※ Data collection system

- Main meter (M1) installed in the Fengtai Substation is recorded data monthly by the grid company together with the project owner.
- The Project owner monitors on-site backup meter M2 at the project site and records data continuously, and prepare monthly reading records.
- After checking the readings, the sales receipts of electricity supplied to the grid are issued in accordance with the readings of the M1 monthly, while the sales receipts of electricity purchased from the grid are issued quarterly from this monitoring period.

※ The Organizational Structure, Role and Responsibility

Overall responsibility for monitoring and carrying out the monitoring following this monitoring plan lies with the project owner. And the Beijing Changjiang River International Holding had advised the project developer on how to perform the monitoring work. The staffs who were responsible for electricity meter readings and recording, and who were responsible for auditing the metered data had been trained according to the CDM

requirements.

※ Emergency Procedures

If inaccuracy of the reading data from the main meter M1 is malfunctioned, the grid-connected electricity generated by the project should be determined by the reading of the backup meter M2.

Moreover, in case of both meters failed, the project owner will not claim emission reductions due to project activity for the duration of the emergency. The project owner will adopt the following two procedures for declaring this emergency period to be over:

- The project owner will ensure that all requirements for monitoring of emission reductions have been re-established;
- The monitoring officer and the general manager will sign a statement declaring the emergency situation to have ended and normal operations to have resumed.

If any error is identified, the project company shall inform the grid company of the error. Then necessary calibration and/or repair are required.

After processing error, the project owner must prepare a report/explanation regarding the emergency to explain to DOE that the handling method is reasonable.

SECTION D. Data and parameters

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

Data / Parameter:	EF_y
Unit:	tCO ₂ /MWh
Description:	Combined margin CO ₂ emission factor for the NCPG
Source of data:	Calculated according to the procedure outlined in B.6.1 of the registered PDD
Value(s) applied:	1.0548
Purpose of data:	Baseline emission calculation
Additional comment:	Determined ex-ante and fixed for the first crediting period

D.2. Data and parameters monitored

Data / Parameter:	EG_{out,y}
Unit:	MWh
Description:	Electricity supplied to SGPG within NCPG by the project
Measured/ Calculated / Default:	Measured continuously
Source of data:	Meter measured continuously and reported on a monthly basis
Value(s) of monitored parameter:	The actual power supplied to the grid by the project that measured by M1 is 84,460.64MWh from 25/12/2011 to 31/12/2012. The detailed data are provided in Table 1.

Monitoring equipment:	<p>The electricity is monitored continuously through the bidirectional meter M1 and recorded monthly installed in the Fengtai substation by the Grid company, which is also the data resource of the sale receipts. When the main meter is out of order, the readings from the back-up meter M2 are used for reference. And during this monitoring period, the M1 worked properly, no data from M2 are used. Detailed information refers to the following Table.</p> <table><tr><th rowspan="2">Meter</th><th rowspan="2">Accuracy</th><th rowspan="2">Meter No.</th><th colspan="2">Calibration Period</th><th rowspan="2">Calibration frequency</th></tr><tr><th>Date of Calibration</th><th>Validity</th></tr><tr><td rowspan="2">M1</td><td rowspan="2">0.5S</td><td rowspan="2">20070808020043</td><td>04/06/2011</td><td>Yes</td><td rowspan="2">Yearly</td></tr><tr><td>30/05/2012</td><td>Yes</td></tr><tr><td rowspan="2">M2</td><td rowspan="2">0.5S</td><td rowspan="2">09100170220042</td><td>04/06/2011</td><td>Yes</td><td rowspan="2">Yearly</td></tr><tr><td>30/05/2012</td><td>Yes</td></tr></table> <p>(Note: These meters were checked and calibrated by the Weifang Power Company Meter Measuring Centre.)</p>	Meter	Accuracy	Meter No.	Calibration Period		Calibration frequency	Date of Calibration	Validity	M1	0.5S	20070808020043	04/06/2011	Yes	Yearly	30/05/2012	Yes	M2	0.5S	09100170220042	04/06/2011	Yes	Yearly	30/05/2012	Yes
Meter	Accuracy				Meter No.	Calibration Period		Calibration frequency																	
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			30/05/2012	Yes																					
M2	0.5S	09100170220042	04/06/2011	Yes	Yearly																				
			30/05/2012	Yes																					
Measuring/ Reading/ Recording frequency:	Measure continuously and reported on a monthly basis																								
Calculation method (if applicable):	N/A																								
QA/QC procedures:	<ul style="list-style-type: none">● The reading of meter M1 is monitored continuously and recorded monthly;● Meters have been calibrated annually;● Data measured by meters are double checked by sales receipt.																								
Purpose of data:	Baseline emission calculation																								
Additional comment:	Not applicable																								

Data / Parameter:	EG_{in,y}
Unit:	MWh
Description:	Electricity purchased from SGPG within NCPG by the project
Measured/ Calculated / Default:	Measured continuously
Source of data:	Meter measured continuously and reported on a monthly basis
Value(s) of monitored parameter:	The actual power imported from the grid that measure by the M1 is 308.00MWh from 25/12/2011 to 31/12/2012. The detailed data are provided in Table 2.

Monitoring equipment:	<p>The electricity is monitored continuously through the bidirectional meter M1 and recorded monthly installed in the substation by the Grid company, which is also the data resource of the sale receipts. When the main meter is out of order, the readings from the back-up meter M2 are used for reference. And during this monitoring period, the M1 worked properly, no data from M2 are used. Detailed information refers to the following Table.</p> <table><tr><th rowspan="2">Meter</th><th rowspan="2">Accuracy</th><th rowspan="2">Meter No.</th><th colspan="2">Calibration Period</th><th rowspan="2">Calibration frequency</th></tr><tr><th>Date of Calibration</th><th>Validity</th></tr><tr><td rowspan="2">M1</td><td rowspan="2">0.5S</td><td rowspan="2">20070808020043</td><td>04/06/2011</td><td>Yes</td><td rowspan="2">Yearly</td></tr><tr><td>30/05/2012</td><td>Yes</td></tr><tr><td rowspan="2">M2</td><td rowspan="2">0.5S</td><td rowspan="2">09100170220042</td><td>04/06/2011</td><td>Yes</td><td rowspan="2">Yearly</td></tr><tr><td>30/05/2012</td><td>Yes</td></tr></table> <p>(Note: These meters were checked and calibrated by the Weifang Power Company Meter Measuring Centre.)</p>					Meter	Accuracy	Meter No.	Calibration Period		Calibration frequency	Date of Calibration	Validity	M1	0.5S	20070808020043	04/06/2011	Yes	Yearly	30/05/2012	Yes	M2	0.5S	09100170220042	04/06/2011	Yes	Yearly	30/05/2012	Yes
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			30/05/2012	Yes																									
Measuring/ Reading/ Recording frequency:	Measure continuously and reported on a monthly basis																												
Calculation method (if applicable):	N/A																												
QA/QC procedures:	<ul style="list-style-type: none">● The reading of meter M1 is monitored continuously and recorded monthly;● Meters have been calibrated annually;● Data measured by meters are double checked by sales receipt.																												
Purpose of data:	Baseline emission calculation																												
Additional comment:	Measure continuously and reported on a monthly basis																												

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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Baseline emissions are calculated with baseline emission factor (EF_y) and electricity supplied by the Project to the grid (EG_y), as follows:

$$BE_y = EG_y \cdot EF_y = (EG_{out,y} - EG_{in,y}) \times 1.0548$$

where

EF_y is the emission factor in year y; the emission factor is determined ex-ante.

EG_y is the net power supplied to the grid by the project in year y which is calculated as $EG_y = EG_{out,y} - EG_{in,y}$.

The following tables 1-3 provide the calculation of the baseline emissions during monitoring period.

(Note: During this monitoring period, the M1 worked properly and all data from M1 are adopted for calculation, no data from M2 need to be used. And the detailed electricity calculation with the start and stop of the meter as well as the magnification has been provided to DOE for checking.)

Table 1 The comparison process of electricity supplied to the grid by the Project (MWh)

Monitoring Period	Readings from reading records of M1	Readings from sales receipts	Conservative data applied
	A1	A2	A=Min(A1,A2)
25/12/2011-19/01/2012	3,736.48	3,736.48	3,736.48
20/01/2012-23/02/2012	8,402.24	8,402.24	8,402.24
24/02/2012-24/03/2012	8,569.44	8,569.44	8,569.44
25/03/2012-23/04/2012	11,973.28	11,973.28	11,973.28
24/04/2012-24/05/2012	8,264.96	8,264.96	8,264.96
25/05/2012-23/06/2012	5,302.88	5,302.88	5,302.88
24/06/2012-23/07/2012	4,468.64	4,468.64	4,468.64
24/07/2012-24/08/2012	5,146.24	5,146.24	5,146.24
25/08/2012-23/09/2012	4,352.48	4,352.48	4,352.48
24/09/2012-24/10/2012	5,503.52	5,503.52	5,503.52
25/10/2012-23/11/2012	7,937.60	7,937.60	7,937.60
24/11/2012-18/12/2012	7,828.48	7,828.48	7,828.48
19/12/2012-31/12/2012	2,974.40	2,974.40	2,974.40
Total	84,460.64	84,460.64	84,460.64

Table 2 The comparison process of electricity purchased from the grid by the Project (MWh)

Monitoring Period	Readings from reading records of M1	Data from sales receipts	Conservative data applied
	B1	(B2)	B=Max(B1,B2)
25/12/2011-19/01/2012	49.28	123.20	-
20/01/2012-23/02/2012	52.80		-
24/02/2012-24/03/2012	21.12		-
Subtotal (25/12/2011-24/03/2012)	123.20	123.20	123.20
25/03/2012-23/04/2012	10.56	49.28	-
24/04/2012-24/05/2012	19.36		-
25/05/2012-23/06/2012	19.36		-
Subtotal (25/03/2012-23/06/2012)	49.28	49.28	49.28
24/06/2012-23/07/2012	17.60	70.40	-
24/07/2012-24/08/2012	29.92		-
25/08/2012-23/09/2012	22.88		-
Subtotal (24/06/2012-23/09/2012)	70.40	70.40	70.40
24/09/2012-24/10/2012	19.36	52.80	-
25/10/2012-23/11/2012	19.36		-
24/11/2012-18/12/2012	14.08		-
Subtotal (24/09/2012-18/12/2012)	52.80	52.80	52.80
19/12/2012-31/12/2012	12.32	12.32	12.32
Total	308.00	308.00	308.00

(Note: As for the electricity purchased from the grid, its sales receipts are issued quarterly. In addition, the relevant document which has clearly indicated the reading records of M1 also together with the total sales electricity during 19/12/2012-31/12/2012 has been issued by the Grid Company.)

Table 3 Baseline Emissions during the Monitoring Period

Monitoring Period	EG _{out,v} (MWh)	EG _{in,v} (MWh)	EG _v (MWh)	EF _v tCO ₂ e/MWh	Baseline Emission tCO ₂
	A	B	C=A- B	D	E=C×D
25/12/2011-19/01/2012	3,736.48	123.20	-	-	-
20/01/2012-23/02/2012	8,402.24		-	-	-
24/02/2012-24/03/2012	8,569.44		-	-	-
25/03/2012-23/04/2012	11,973.28	49.28	-	-	-
24/04/2012-24/05/2012	8,264.96		-	-	-
25/05/2012-23/06/2012	5,302.88		-	-	-
24/06/2012-23/07/2012	4,468.64	70.40	-	-	-
24/07/2012-24/08/2012	5,146.24		-	-	-
25/08/2012-23/09/2012	4,352.48		-	-	-
24/09/2012-24/10/2012	5,503.52	52.80	-	-	-
25/10/2012-23/11/2012	7,937.60		-	-	-
24/11/2012-18/12/2012	7,828.48		-	-	-
19/12/2012-31/12/2012	2,974.40	12.32	-	-	-
Total	84,460.64	308.00	84,152.64	1.0548	88,764

(Note: The cut-off time is 24:00 in the cut off-date. As for the cut-off date each month, it has been regulated on around 24th of each month, but for the detailed date, it is usually determined by the availability of the Grid Company. However, once the cut-off date is chosen, the project owner could be informed in advance.)

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

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As per methodology and the registered PDD, there are no expected project emissions related to the generation of electricity, as generation is based on a renewable resource. Therefore, the project emission (PE_v) is zero, PE_v=0.

E.3. Calculation of leakage

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According to methodology, as a newly built hydropower plant, there is no energy generating equipment be transferred from another activity and no existing equipment be transferred to another activity involved in the project activities. Therefore, the leakage is not to be considered.

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 ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO ₂ e)
Total	88,764	0	0	88,764

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 CO₂e)	The estimated emission reduction is 103,995tCO ₂ in this monitoring period (373days in total) based on the registered PDD	The actual emission reduction is 88,764tCO ₂ during this monitoring period

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

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To demonstrate the actual emission reduction claim in the monitoring period did not have significant increase compare to the estimate in the registered PDD, we made the following comparison:
Based on the registered PDD, the estimated CERs covering the monitoring period shall be 103,995tCO₂e. However, actual emission reduction amount is 88,764tCO₂e in this monitoring report due to the lack of wind, and this data is smaller than we estimated. Therefore, there is no risk about the great increase.

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 CO₂e)	88,764	N/A

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