Monitoring report form (Version 03.2)

Monitoring report

Title of the project activity	13.75 MW Grid connected "Wind Electricity generation Project by Tamilnadu Newsprints and Papers Limited"
Reference number of the project activity	5500
Version number of the monitoring report	01
Completion date of the monitoring report	23/06/2014
Registration date of the project activity	04/04/2012
Monitoring period number and duration of this monitoring period	1 04/04/2012 to 13/01/2014
Project participant(s)	M/s Tamil Nadu Newsprint and Papers Limited
Host Party(ies)	India
Sectoral scope(s) and applied methodology(ies)	1: Energy industries (renewable - / non-renewable sources)
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	49,778 tCO_2e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	50,929 tCO_2e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)	26,463 tCO_2e (04/04/2012 to 10/12/2012)
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	24,465 tCO_2e (10/12/2012 to 13/01/2014)

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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The main purpose of the project activity is to generate electrical energy through sustainable means of using wind power resources and to sell the generated electricity to State Electricity Board for meeting the energy shortages in the state and to contribute to climate change mitigation efforts. Apart from generation of renewable electricity, the project has also been conceived for the following:

- To enhance the propagation of wind turbines in the region
- To contribute to the sustainable development of the region, socially, environmentally and economically
- To reduce the prevalent regulatory risks for this wind park through revenues from the CDM

Brief description of the installed technology and equipment

The CDM project activity consists of installation of 13.75 MW grid connected wind energy project in two phases, (Sub bundle 1: 6.25 MW with date of commissioning: 18/02/2006 and Sub bundle II: 7.5 MW with date of commissioning: 23/03/2007 to 29/03/2007). The project activity has been implemented using 1.25 MW each Wind Electric Generator (WEG) supplied by M/S Suzlon Energy Limited in the state of Tamil Nadu, India. The project is promoted by **Tamil Nadu Newsprint and Papers Ltd** (TNPL) the largest state owned agro based pulp and paper industry in India. The project aims at generating electricity from renewable wind energy source, thereby displacing the electricity from the grid that is dominated by carbon intensive fossil fuels. The electricity generated from the project activity is exported to state power utility. The project activity is expected to generate about 30,715 MWh annually and would reduce equivalent 28,478 t CO_2/annum Green House Gas (GHG) emissions.

The details of Wind Electric Generators (s) for sub-bundle 1 are as follows

Location (village)	S.F. No.	TNPL WEG No.	Capacity of each in MW	No. of WEG	SC. No	Date of Commissioning
Alagiapandiapuram	413	16	1.25	1	1571	18/02/2006
Alagiapandiapuram	395	15	1.25	1	1570	18/02/2006
Alagiapandiapuram	391	14	1.25	1	1569	18/02/2006
Alagiapandiapuram	354	13	1.25	1	1568	18/02/2006
Alagiapandiapuram	344/1B	12	1.25	1	1567	18/02/2006
Total for sub-bundle 1			6.25	5		

The details of Wind Electric Generators (WEGs) for sub-bundle 2 are as follows:

Location (village)	S.F. No.	TNPL WEG No.	Capacity of each in MW	No. of WEG	SC. No	Date of Commissioning
Devarkulam	485/2, 486/1A	20	1.25	1	2268	29/03/2007
Devarkulam	9/1, 5A, 13/1,2	22	1.25	1	2257	28/03/2007
Devarkulam	482	21	1.25	1	2256	28/03/2007
Devarkulam	8/4A, 4B	18	1.25	1	2209	23/03/2007
Devarkulam	9/7	17	1.25	1	2208	23/03/2007
Devarkulam	1/1A, 2/2B, 3	19	1.25	1	2210	23/03/2007
Total for sub-bundle 2			7.5	6		

Relevant dates for the project activity: The important dates related to the project activity are listed in Table1 below

Table 1: Relevant dates for the project activity

S. NO	ACTIVITY	DATE
1.	Start Date of Project Activity	17/12/2005
2.	Date of Registration	04/04/2012
3.	First Monitoring Period	04/04/2012 to 13/01/2014

Total emission reductions achieved in this monitoring period
Based on the actual electricity generation data, the emission reduction as calculated is mentioned in Table 2 below.

Table 2: Emission reduction over the monitoring period

Monitoring Period	Emission Reduction (tCO_2e)
04/04/2012[1] to 13/01/2014	50,929

A.2. Location of project activity

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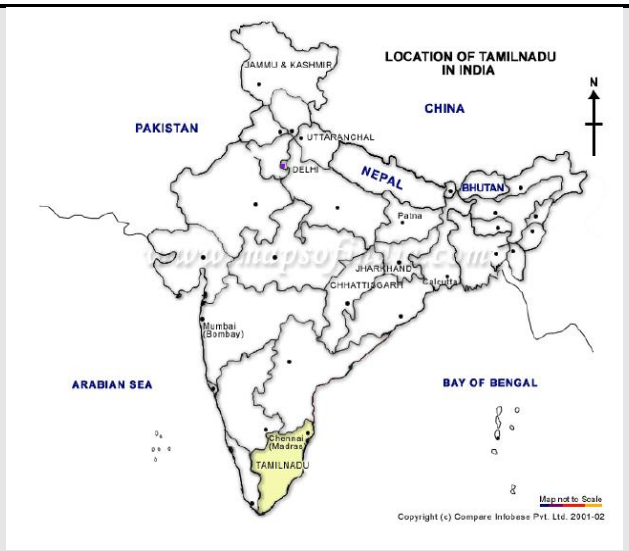
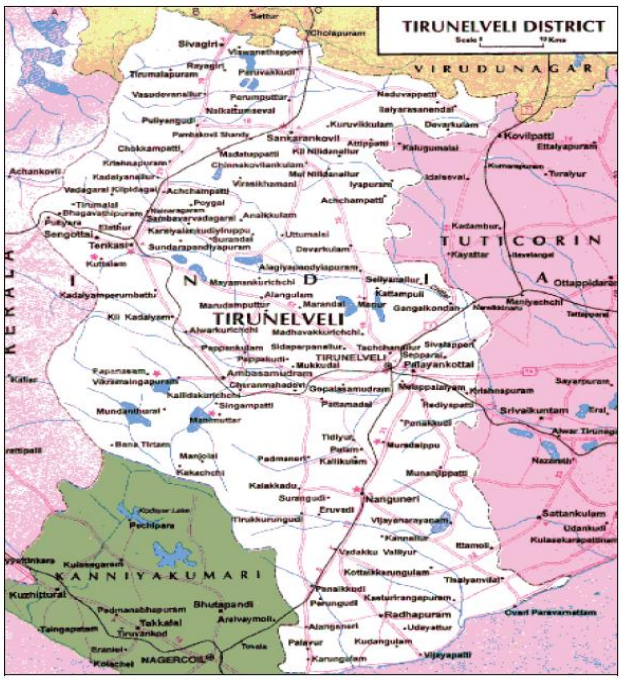
The Project is located in Alagiapandiapuram and Devarkulam villages of Tirunelveli District, Tamil Nadu.

Town: Devarkulam
Latitude: $08^0$57' N
Longitude: $78^0$38' E
Altitude: 70 m above mean sea level
Railway Station: Kovilpatti / Sankarankoil
Road Access Site is connected to NH-7 (National Highway No. 7)

Location	S.F. No.	WEG No.	Capacity in MW	Latitude	Longitude
				dd° mm' ss"	dd° mm' ss"
Alagiapandiapuram Village, Tirunelveli District, Tamilnadu State	413	16	1.25	N 08 55 51.9	E 77 39 05.2
	395	15	1.25	N 08 56 02.5	E 77 39 05.8
	391	14	1.25	N 08 56 13.1	E 77 39 04.6
	354	13	1.25	N 08 56 23.7	E 77 39 03.3
	344/1B	12	1.25	N 08 56 33.8	E 77 38.59.8
Devarkulam Village, Tirunelveli District, Tamilnadu State	485/2, 486/1A	20	1.25	N 08 58.04.0	E 77 39 16.4
	9/1, 5A, 13/1,2	22	1.25	N 08 57 38.2	E 77 39 04.6
	482	21	1.25	N 08 58 04.9	E 77 39 01.9
	8/4A, 4B	18	1.25	N 08 57 45.5	E 77 39 15.1
	9/7	17	1.25	N 08 57 33.1	E 77 39 16.7
	1/1A, 2/2B, 3	19	1.25	N 08 57 55.7	E 77 39 12.1

[1] The date of registration is 04/04/2014. The meter reading for electricity generation in WEGs are taken once in a month. For April 2012, it was taken on 16/04/2012. Hence, the data for first monitoring period is considered from 16/04/2012 instead of 04/04/2012 conservatively.





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)
India (Host Country)	Public Entity Tamil Nadu Newsprint and Papers Limited	No

A.4. Reference of applied methodology

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Methodology applicable	ACM0002
Project Type	Renewable Energy Project
Project Cateogry	Grid-connected electricity generation from renewable sources

Version	12.2.0
Sectoral scope	01
Reference	http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

A.5. Crediting period of project activity

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04/04/2012 to 03/04/2022 (Fixed)

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

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1. The starting date of operation of the project activity

The commissioning dates of the 11 WEGs (1.25 MW each) connected to 11 HT Service Connection numbers are listed in the table below:

Location (village)	S.F. No.	TNPL WEG No.	Capacity of each in MW	No. of WEG	SC. No	Date of Commissioning
Alagiapandiapuram	413	16	1.25	1	1571	18/02/2006
Alagiapandiapuram	395	15	1.25	1	1570	18/02/2006
Alagiapandiapuram	391	14	1.25	1	1569	18/02/2006
Alagiapandiapuram	354	13	1.25	1	1568	18/02/2006
Alagiapandiapuram	344/1B	12	1.25	1	1567	18/02/2006
Total for sub-bundle 1			6.25	5		

Location (village)	S.F. No.	TNPL WEG No.	Capacity of each in MW	No. of WEG	SC. No	Date of Commissioning
Devarkulam	485/2, 486/1A	20	1.25	1	2268	29/03/2007
Devarkulam	9/1, 5A, 13/1,2	22	1.25	1	2257	28/03/2007
Devarkulam	482	21	1.25	1	2256	28/03/2007
Devarkulam	8/4A, 4B	18	1.25	1	2209	23/03/2007
Devarkulam	9/7	17	1.25	1	2208	23/03/2007
Devarkulam	1/1A, 2/2B, 3	19	1.25	1	2210	23/03/2007
Total for sub-bundle 2			7.5	6		

The start date of the project activity is 17/12/2005

2. Information regarding the actual operation of the project activity during this monitoring period, including information on special events, for example overhaul times, downtimes of equipment, exchange of equipment, etc.

The operators record monthly energy output of each WEG and prepare reports on the performance of wind farm indicating turbine wise production. Till date the WEGs have been operating smoothly and there have been no case reported for downtimes or exchange of equipment.

In the current monitoring period, there has been three instances where the meter had been failed and replaced with a new meter. The details are given below:

S. No.	SC NO.	Old meter number	Reason for replacement	New meter number	Remark
1.	1568	Elster 04725712	Meter failure	Wallaby HT02120407	Old Meter Failed & New Meter on 05/06/2012
2.	1570	Elster	Meter failure	Wallaby	Old Meter Failed & New

		04725706		HT02120302	Meter on 01/11/2013
3.	1571	Elster 04725705	Meter failure	Wallaby HT02120301	Old Meter Failed & New Meter on 09/04/2013

3. A brief description of: (i) events or situations that occurred during the monitoring period, which may impact the applicability of the methodology, and (ii) how the issues resulting from these events or situations are being addressed.

No adverse event took place during the monitoring period which would have impacted the applicability of the methodology used in the project activity.

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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Not Applicable

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

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Not Applicable

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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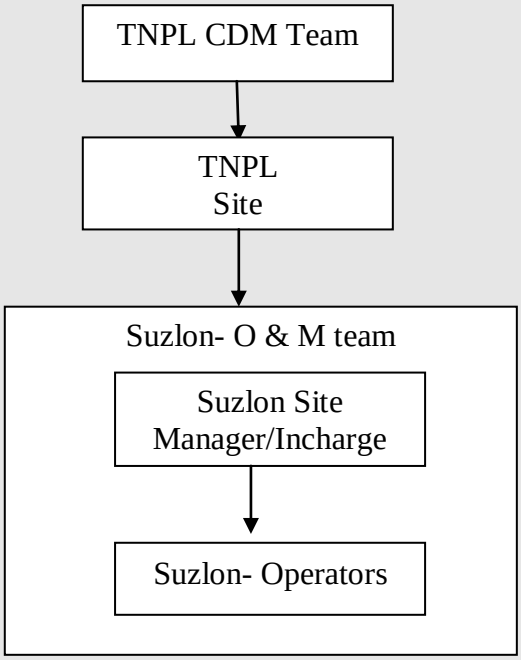
The monitoring is done in accordance with the modalities and procedures for Large-scale CDM project activities. The monitoring system implemented by the project proponent describes about the monitoring organisation, parameters to be monitored, monitoring practices, QA and QC procedures, data storage and archiving

MONITORING ORGANISATION

Roles and responsibilities:

The operational and management structure implemented by TNPL is as follows



Suzlon- O & M team:

The Operation and Maintenance contract executed by TNPL with Suzlon Wind Farm Services Limited is for a period of 30 months from the date of commissioning of the project activity. Thereafter the agreement is renewed on mutual terms.

Site Manager with the assistance of machine operators and service engineers

- Monitor, record, report and archive the CMCS and record the data
- Check, authorise and forward the monitored CMCS and recorded data to the project participant

TNPL Site Manager/Incharge:

- Monitoring the functioning of the metering arrangements and getting them calibrated for accuracy and reliability
- Ensure monthly recording of the generation particulars by state power utility authorities for both main meters and stand by meters.
- Archiving the generation certificates from state power utility properly for aggregation at the required intervals.
- Send the above data to CDM team

TNPL CDM Team:

Collects all the data from TNPL site manager/ Incharge and prepare monitoring report as per the EB guidelines of UNFCCC and sent to CDM coordinator.

TNPL CDM Coordinator:

Verify, reconciled and aggregating the net exported energy from the project activity and monitoring report and send the monitoring report to the independent entity (Designated operational Entity-DOE) for verification and issuance of Certified Emission Reductions.

Procedure handling for data uncertainity:

Meter is faulty:

a) If main meter is faulty it will be replaced by a calibrated new meter as soon as possible and the readings from the replaced meter is used thereafter. The generation during the intervening period is measured from the Standby meters.

b) If standby meter is faulty it will be replaced by a calibrated new meter as soon as possible.

Error identified during calibration:

a) During the calibration, if the main meter is found to be beyond the permissible limits of error (0.5%), the meter shall be immediately calibrated and replaced, if necessary. The error that is identified in the calibration would be applied to entire range of data from the date of last calibration till the monthly readings on which the new calibrated meter is fixed.

b) During the calibration, if the standby meter is found to be beyond the permissible limits of error (0.5%), the meter shall be immediately calibrated and replaced, if necessary. The error that is identified in the calibration would be applied to entire range of data from the date of last calibration till the monthly readings on which the new calibrated meter is fixed provided the meter readings are considered for emission reduction calculations.

Internal Audit and performance review procedure

The CDM projects are Internally monitored once in every six months The CDM team would submit their report to the management. The findings are reviewed in the ISO 14001 Management Review meetings.

Data Storage and Archiving

All the data items monitored under the monitoring plan will be kept for 2 years after the end of crediting period or till the last issuance of CERs for this project activity, whichever occurs later. The data is archived electronically or in hard copy and kept in safe storage.
The details of all meters and calibration are given below.

S. No.	TNPL WEG No.	Service Connection Numbers	Main Meter Make & Serial Number	Main Meter Calibration date	Stand by Meter Make & Serial Number	Stand by Meter Calibration date
1	12	1567	Wallaby HT2110423	03/04/2012, 03/04/2013	Elster 04804682	03/04/2012, 03/04/2013
2	13	1568	Elster 04725712, Wallaby HT02120407	03/04/2012, 05/06/2012, 03/04/2013	Elster 04804714	03/04/2012, 03/04/2013
3	14	1569	Elster 04725709	03/04/2012, 03/04/2013	Elster 05038715	03/04/2012, 03/04/2013
4	15	1570	Elster 04725706, Wallaby HT02120302	03/04/2012, 03/04/2013, 01/11/2013	Elster 04804674, Premier TN902119	03/04/2012, 28/02/2013, 03/04/2013
5	16	1571	Elster 04725705, Wallaby HT02120301	03/04/2012, 03/04/2013, 09/04/2013	Elster 04804677, Premier TN902043	03/04/2012, 08/06/2012, 03/04/2013
6	17	2208	Elster 04865233	03/04/2012, 03/04/2013	Elster 04889959, Premier TN902122	03/04/2012, 03/04/2013, 11/07/2013
7	18	2209	Elster 04865232	03/04/2012, 03/04/2013	05038768	03/04/2012, 03/04/2013
8	19	2210	Premier TN902037	03/04/2012, 03/04/2013	Elster 04889958	03/04/2012, 03/04/2013
9	21	2256	Elster	03/04/2012,	Elster	03/04/2012,

			04880987	03/04/2013	04889960	03/04/2013
10	22	2257	Elster 04880983	03/04/2012, 03/04/2013	Elster 04890024	03/04/2012, 03/04/2013
11	20	2268	Premier TN900622	03/04/2012, 03/04/2013	Elster 04865224	03/04/2012, 03/04/2013

SECTION D. Data and parameters

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

(Copy this table for each piece of data and parameter.)

Data / Parameter:	$EF_{grid,OM,y}$
Unit:	t CO_2/MWh
Description:	Operating margin CO_2 emission factor for the project electricity system in year *y*
Source of data:	Calculated
Value(s) applied):	0.9985
Purpose of data:	Baseline Emission Calculation
Additional comment:	Fixed ex-ante approach is considered

Data / Parameter:	$EF_{grid,BM,y}$
Unit:	t CO_2/MWh
Description:	Build margin CO_2 emission factor for project electricity system in year *y*
Source of data:	Source: CO_2 Baseline Data base, Version 4.0, September 2008 http://www.cea.nic.in/reports/planning/cdm_co2/database_publishing_ver4.zip
Value(s) applied):	0.7133
Purpose of data:	Baseline Emission Calculation
Additional comment:	Fixed ex-ante approach is considered

Data / Parameter:	$EF_{grid,BM,y}$
Unit:	t CO_2/MWh
Description:	Combined margin CO_2 emission factor for project electricity system in year *y*
Source of data:	Calculated
Value(s) applied):	0.9272
Purpose of data:	Baseline Emission Calculation
Additional comment:	Fixed ex-ante approach is considered

D.2. Data and parameters monitored

(Copy this table for each piece of data and parameter.)

Data / Parameter:	$EG_{PJ,\_Add,y}$
Unit:	MWh

Description:	Quantity of net electricity generation supplied to the grid in year y by the project plant/unit (all wind turbine unit) that has been added under the project activity
Measured/ Calculated / Default:	Measured and Calculated
Source of data:	Statement showing the Energy Generated through wind mill issued by state power utility
Value(s) of monitored parameter:	54,928
Monitoring equipment:	Two ways trivector meters with accuracy class +/- 0.5%. The details of all meters and calibration are provided in Section C.
Measuring/ Reading/ Recording frequency:	Once in a Month
Calculation method (if applicable):	Quantity of net electricity generation supplied to the grid by the project activity will be the summation of net electricity supplied by individual WEG. The Quantity of electricity generation supplied to the grid from the individual WEG are measured from 1. Main meters and 2. Standby meters. These meters are of two ways trivector meters with accuracy class +/- 0.5% installed grid interconnection point that will be used to measure electricity generation supplied to the grid on a continuous basis. The measurement is carried out for Main meter once in a month in presence of both parties representative of project proponent and officials of the state power utility. Both parties sign the recorded reading. The joint measurement is carried out for Standby meter once in a month in presence of both parties, representative of project proponent and officials of the state power utility. PP signs the recorded reading. Based on the Joint meter readings, official of state power utility sent Statement showing the Energy Generated through individual wind mil to PP. Then the PP raises invoice based on the above statement and receives the payment for the net electricity generation supplied to the grid by the project activity
QA/QC procedures:	The primary data as indicated in the monthly statement showing the Energy Generated through wind mill issued by official of state power utility can be cross verified with invoices raised by PP on state power utility. The invoice would have payment details related to other windmills of PP apart from project activity. The invoice details can be further cross checked with cheque received from state power utility. The calibration of the main meter and check meter will be done once in 3 years by state power utility officials. This is conservative approach as the frequency of calibration described by Central Electricity Authority is once in 5 years.
Purpose of data:	Emission Reduction Calculations
Additional comment:	The data will be archived for two years after the crediting period or of the last issuance of CER's of this project activity whichever occur later

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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$EG_{PJ,\ Add,\ y} = 54{,}928$ MWh

$EF_{grid,CM,y} = 0.9272\ tCO_2e/MWh$

$BE_y = EG_{PJ,\_Add,\ y} * EF_{grid,CM,y}$

$= (54{,}928 \text{ X } 0.9272)\ tCO_2e$

$= 50{,}929.24\ tCO_2e$

$= 50{,}929\ tCO_2e$

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

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As per page 6/20 of the methodology ACM0002 (Sectoral Scope: 01, Version: 14.0.0), the project emissions are given by the following.

"For most renewable energy project activities, $PE_y = 0$.

The proposed project activity is renewable power generation from wind energy. So there are no emissions produced during the operations of the project activity.

E.3. Calculation of leakage

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As per page 12/20 of the methodology ACM0002 (Sectoral Scope: 01, Version: 14.0.0), no leakage is 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 ($t CO_2e$)	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	50,929	0	0	50,929

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)	49,778	50,929

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

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From E.6 above, we can observe that actual emission reduction for the monitoring is higher than estimated emission reductions by 2.31 %. The difference is due to higher PLF registered by the WTGs during the monitoring period.

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)	26,463 CERs (04/04/2012 to10/12/2012)	24,465 CERs 10/12/2012 to 13/01/2014)

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Document information

Version	*Date*	*Description*
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.

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