



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

MONITORING REPORT

Title of the project activity	Çanakkale WPP
Reference number of the project activity	GS 906
Version number of the monitoring report	V2
Completion date of the monitoring report	26/12/2013
Registration date of the project activity	03/08/2012
Monitoring period number and duration of this monitoring period	2 nd periodic monitoring report 01/09/2012- 30/09/2013 (both days are included)
Project participant(s)	Enerjisa Enerji Üretim A.Ş.
Host Party(ies)	Turkey
Sectoral scope(s) and applied methodology(ies)	Sectoral Scope:1, category “Energy Industries (renewable/ non- renewable sources)” Applied methodology: ACM0002 version 12.1
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	60,534 tCO ₂ e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	53,896 tCO ₂ e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

Çanakkale Wind Power Plant is located between Üvecik Village and Mahmudiye Town of Çanakkale Province in the Western part of Turkey. The total installed capacity is 29.9 MW. The project consists of 13 Siemens SWT 101 wind turbines, each having a capacity of 2.3 MWs. The electricity will be transmitted to an existing substation at Çanakkale Natural Gas Fired Power Plant via an underground power line.

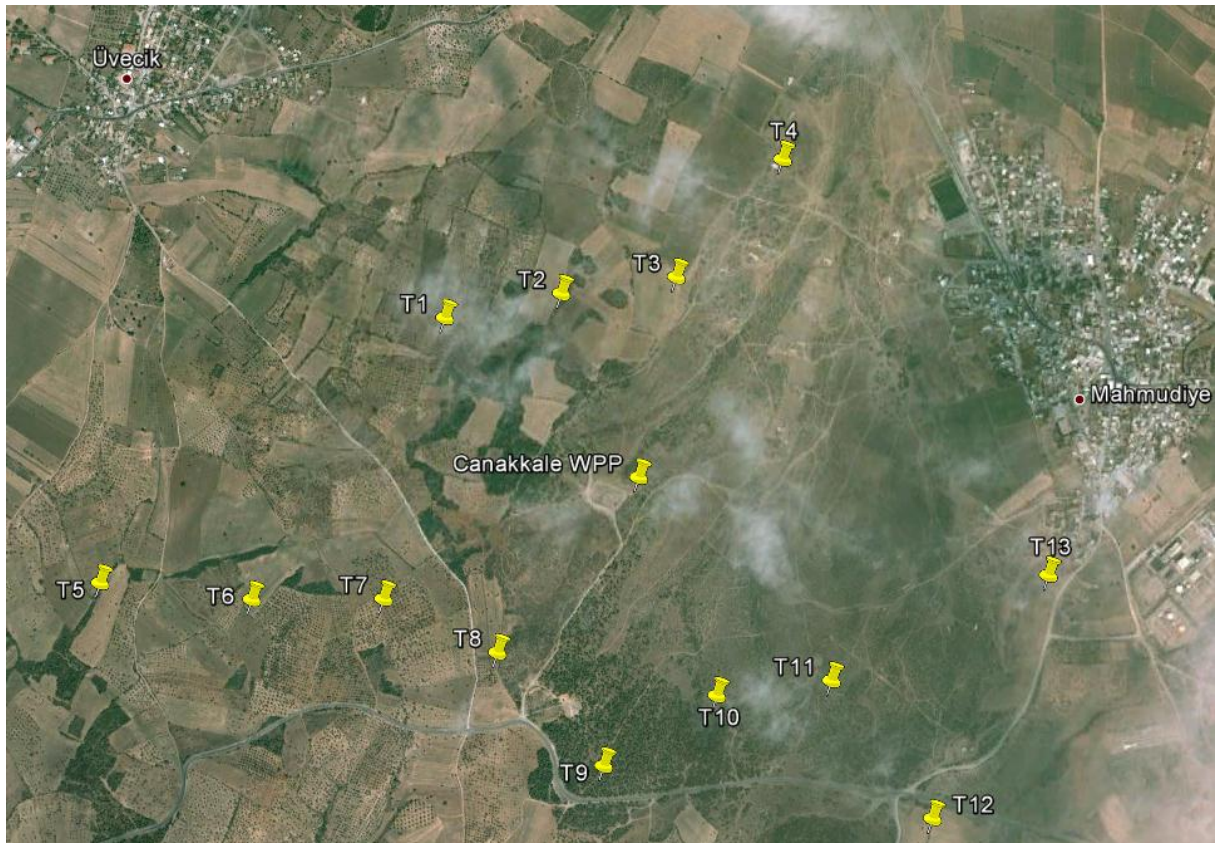


Figure.1. The project site is between Üvecik Village and Mahmudiye Town.

The purpose of the Project is to produce renewable electricity using wind as the power source and to contribute to Turkey's growing electricity demand through a sustainable and low carbon technology. The project will displace the same amount of electricity generated by the grid dominated with fossil fired power plants. During its second crediting year covering the period between 01/09/2012- 30/09/2013, the power plant generated 88,354 MWh. Therefore, the annual emission reduction has been calculated as 53,896 tonnes of CO₂eq.

The project was operational on 11/02/2011 and registered on 03.08.2012 under the Gold Standard Registry with the registration number GS906. The project timeline is given in the table below:

Table.1. Time schedule of the project development

Activity	Date
License	21.02.2008
Consultancy agreement for carbon asset development	19.12.2008
Finance secured	02.03.2009
Board decision	25.03.2009
Turbine purchase and service agreement	01.04.2009
Stakeholder meeting	14-15.07.2009
Feasibility study finalized	08.09.2009
EIA exemption letter	September.2009
Construction agreement	28.04.2010
Commissioning	11.02.2011 and 06/05/2011
Final Validation Report	13.09.2012
Registration	03.08.2012

A.2. Location of project activity

Mahmudiye Town and Üvecik Village, Çanakkale Province, Turkey. Please see below the coordinates of the turbines as per the current generation license:

Table 2: Coordinates of the turbines

	E	N
T1	433141	4414154
T2	433435	4414261
T3	433739	4414308
T4	434019	4414624
T5	432220	4413490
T6	432626	4413451
T7	432986	4413460

	E	N
T8	433289	4413317
T9	433558	4413026
T10	433854	4413211
T11	434154	4413253
T12	434422	4412897
T13	434727	4413532

With regard to the project coordinates, the latitude is 39° 52' 14.83" N, and the longitude is 26° 13' 26.86" E, a representative midpoint which has been selected for the project coordinates.

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)
Turkey (host country)	Enerjisa Enerji Üretim A.Ş. (Private entity)	No

A.4. Reference of applied methodology

The applied methodology is ACM0002 “Consolidated baseline methodology for grid connected electricity generation from renewable sources”, version 12.1.

A.5. Crediting period of project activity

Crediting period of seven years. The first crediting period is from 11/02/2011 to 10/02/2018.

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

The Project Scenario entails the installation of thirteen Siemens SWT 101 wind turbines, each having a capacity of 2.3 MW. The turbines are 3 bladed with a horizontal axis. The turbine blades have the ability to change angles according to wind direction. The towers will have a hub height of 80 m. The diameter of the blades is 101m. The blade length is 49 m.

The turbines are connected to the substation at the natural gas fired power plant operated by the project owner, then to the grid via 154kV Çan electricity transmission line. The metering has been done at substation before electricity is fed into the grid.

The turbines have a predicted life of 20 years from the manufacturer. The wind speeds in the area and predicted capacity factors are within the manufacturer's specifications for this predicted life. The Load Factor is 35%.

The amount of electricity generated by the project is not influenced by factors outside the project boundary such as other power plants or demand for electricity. Rather, the governing factor is the wind speed at the project site.

With regard to the actual operation of the project activity, the first temporary acceptance protocol signed by the Ministry of Energy and Natural Resources is dated 11/02/2011 for the commissioning of the 11 turbines. The second temporary acceptance protocol with the Ministry was signed on 06/05/2011 for the remaining two turbines.

Please see below the meter specifications:

Table 3: Specifications of the meters

Specifications	Main Meter	Back-up Meter
Manufacturer:	ACTARİS	ACTARİS
Type:	SL761A071	SL761BXXX
Serial No:	53035219	35004263
Accuracy class:	0.2	0.5
Date of initial installation:	21/04/2009	03/08/2009
Date of initial calibration:	21/04/2009	03/08/2009
Calibration frequency:	Every 10 th year	Every 10 th year

During the first monitoring period, neither special events such as overhaul times, downtimes of equipment, exchange of equipment nor events which may affect the applicability of the methodology have been experienced. During the power plant's second crediting year, only one incident that affected the electricity generation was experienced. The main bearing of WTG 03 was replaced as per Siemens's decision. The power plant manager reported that the replacement of the main bearing had taken 9 days. No other malfunction, resettlement, repair service or any other relevant activity regarding the measurement devices have been experienced during this crediting year.

The current periodical metering test was realised on 26.09.2013 by TEIAS.¹

B.2. Post registration changes

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

No deviations occurred.

¹ The document has been presented to the verification DOE.

**B.2.2. Corrections**

None.

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

None.

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

None.

B.2.5. Changes to start date of crediting period

None.

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

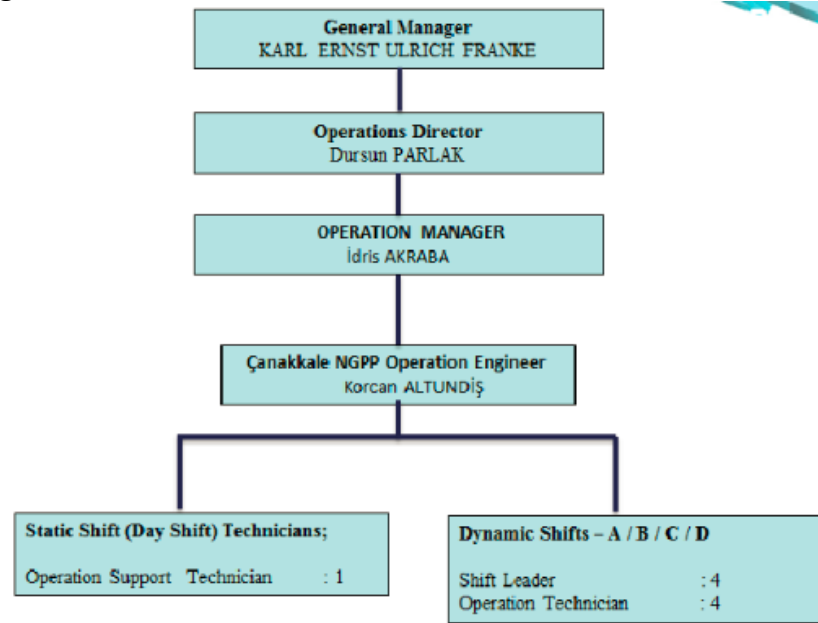
N/A

SECTION C. Description of monitoring system**Monitoring parameters**

According to the methodology applied, ACM0002, the electricity supplied to the national grid by the proposed project and the electricity consumed by the project activity shall be monitored. The net electricity is the difference of the electricity supplied and consumed by the project and shall be taken into account for emission reduction calculations.

Monitoring Organization and System

The Project Owner is responsible for the overall management of the monitoring procedures including recording, data collection, calculating emission reductions and project emissions. Please see below the organisational chart:

Figure.2. The organisational chart

Monthly power meter readings are the basis for monitoring net electricity fed into the grid. Those readings are done by governmental officers accompanied with an observer from the project owner company at the end of each month. A measuring protocol is prepared including day, peak and night hour electricity generation of the plant and signed and approved by both parties.²

The gross electricity produced is controlled and managed by means of a sophisticated electronic system (Web WPS SCADA). This system offers remote control and a variety of status views and useful reports from a standard internet web browser. The status view present electrical and mechanical data, operation and fault status, meteorological data and grid station data. The system offers remote control and a variety of status views and useful reports from a standard internet web browser. The status views present electrical and mechanical data, operation and fault status, meteorological data and grid station data. In addition to Web WPS SCADA system, the turbine is equipped with a web-base Turbine Condition Monitoring (TCM) system. The TCM system carries out precise condition diagnostics on main turbine components continuously and in real time. It gives early warning of possible component failures by continuous comparison of current vibration spectra with previously established reference spectra. The TCM system has various alarm levels, from informative through alerting level to turbine shutdown.

The gross electricity generated does not comprise the energy losses through transformer before electricity fed into the national grid. Therefore, subtracting the internal consumption from the gross generation the project owner cross-checks the data presented in the monthly power meter reading reports.

² The monthly reading protocols are provided to the DOE.

Data Management and Quality Control

Two power meters are installed at the grid interface of the proposed project. One is the main meter and the other is the back-up meter of the main meter for cross-checking. Both meters are jointly inspected and sealed in order to be protected from interference by any of the parties.

The main and spare meter readings are recorded monthly and cross-checked whether calibration is required. The capacity of the transmission line connected is 154 kVA, the accuracy class for main power meter has been defined in the Communiqué for Power Meters³ as 0.2S class. The back-up meter has accuracy class of 0.5S. The calibration will be implemented in accordance with the related standard procedures (IEC-EN 60687) by either TEIAS or the provider company in the name of TEIAS.

When the main meter has a breakdown, the readings of the back-up meter will be used. If both meters fail, conservative data substitution procedures based on the internal SCADA data will be used.

All data collected as part of monitoring will be archived electronically by the project owner and be kept at least for 2 years after the end of the last crediting period.

Monitoring data for Sustainable Development Matrix Indicators

Environmental and social commitments of the project have been monitored and relative reports were prepared for the construction period. As for the second year of the first crediting period, quality of employment has been ensured by job related trainings.

Quantity of employment is proved by social security records. Currently, there are 10 local workers who are working at the power plant.⁴

³ <http://www.epdk.gov.tr/web/elektrik-piyasasi-dairesi/44>

⁴ Although the quantity of employment is to be monitored only once throughout the crediting period, social security reports may be presented if DOE requests.

SECTION D. Data and parameters

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

Data/Parameter	$EF_{grid,CM,y}$
Unit	tCO ₂ e/MWh
Description	Emission factor of the Turkish grid estimated ex-ante
Source of data	Calculated
Value(s) applied	0.610
Purpose of data	To calculate the emission reduction of the project activity
Additional comment	-

D.2. Data and parameters monitored

Data/Parameter	EG_y
Unit	MWh
Description	Net electricity generated by the power plant in year y
Measured/Calculated/Default	Measured
Source of data	Monthly official electricity metering reports issued by governmental officers and signed by both parties.
Value(s) of monitored parameter	88,354
Monitoring equipment	Electricity meters
Measuring/Reading/Recording frequency	Continuously measured, monthly recorded
Calculation method (if applicable)	The net electricity is the difference of the electricity supplied and consumed by the project and shall be taken into account for emission reduction calculations.
QA/QC procedures	-
Purpose of data	To determine the annual emission reduction by displacing the same amount of electricity that would otherwise been used from the national grid which is heavily composed of fossil fuel fired plants.
Additional comment	Both the project participant and TEİAŞ perform the readings and compare the values. The results are cross checked from the official website of TEİAŞ. TEİAŞ is responsible for calibration and maintenance of the devices.

No	1
Indicator	Soil condition
Mitigation measure	Hazardous waste (waste oil and fuel) will be handled appropriately in closed containers and transported by licensed transporters to the licensed processing and disposal facilities.
Chosen parameter	Storage of hazardous waste.
Current situation of parameter	Handling of hazardous waste has been conducted as per the



		related regulation
Estimation of baseline situation of parameter		No chemical leakage exists in the project site.
Future target for parameter		No hazardous waste leakage.
Way of monitoring	How	Inspection of the storage area during verification site visits and inspection of the invoices to justify that hazardous wastes are transported by licensed firms to the licensed disposal facilities
	When	Quarterly during construction and once for each year of operation
	By who	Third party consultant during construction and then the project owner

No		2
Indicator		Other pollutants
Mitigation measure		-Turbines with reduced noise operation systems will be selected. -Positioning will be done in terms of possible noise emissions. -The turbines are equipped with optional noise reduced power operation mode. -Mitigation measures to lower the noise pollution in the nearest houses.
Chosen parameter		Noise monitoring during daytime and nighttime including the nearest residents.
Current situation of parameter		Below limits (51.7 dBA) allowed by Turkish regulations. ⁵
Estimation of baseline situation of parameter		Below limits allowed by Turkish regulations.
Future target for parameter		Limits provided in Regulation on Assessment and Management of Environmental Noise.
Way of monitoring	How	Noise measurement conducted by the project team
	When	Once for each year of operation
	By who	Project site team

No		3
Indicator		Biodiversity
Mitigation measure		-Wind turbines will be painted and lighting will be installed of minimize the risk of bird collision. -Storm water management measures.
Chosen parameter		Number of effected birds and bats
Current situation of parameter		5 bird fatalities, 4 bat fatalities
Estimation of baseline situation of parameter		No barrier for bird and bat flights
Future target for parameter		None
Way of monitoring	How	Bat and Bird monitoring report dated July 2012 prepared by a third party ⁶
	When	At the end of the first and second year of operation
	By who	Project site team

No	4
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⁵ The regulation requires that the noise level during operational phase should be below 55 dBA.

⁶ The report has been provided to the DOE.



Indicator		Biodiversity
Mitigation measure		-New trees are planted for the compensation of trees that were cut during the construction phase. ⁷ -Compensation is paid. ⁸
Chosen parameter		Number of trees planted
Current situation of parameter		250 trees are planted
Estimation of baseline situation of parameter		No trees are planted
Future target for parameter		None
Way of monitoring	How	Biodiversity monitoring
	When	First and second year of operation
	By who	Project site team

No		5
Indicator		Quality of Employment
Mitigation measure		The project will train all employees on construction and operation of the plant. The project owner is willing to ensure safety at the site.
Chosen parameter		Number of operation related trainings
Current situation of parameter		Related trainings are performed
Estimation of baseline situation of parameter		Labour culture as usual.
Future target for parameter		All of the workers have been trained on environmental & health & safety issues.
Way of monitoring	How	Participation list of the employees ⁹
	When	Annually
	By who	Project site team

No		6
Indicator		Human and institutional capacity
Mitigation measure		Local education is supported
Chosen parameter		Support to education.
Current situation of parameter		Support to education
Estimation of baseline situation of parameter		No support to education
Future target for parameter		Improved educational activities
Way of monitoring	How	Protocols or relevant documentation
	When	Annually
	By who	Project site team

No		7
Indicator		Quantitative employment and income generation
Mitigation measure		N/A
Chosen parameter		Number of temporary and permanent jobs created for local people.
Current situation of parameter		Local workers are hired.
Estimation of baseline situation of		Jobless locals

⁷ The supporting document is dated 2010 and presented to the DOE.

⁸ The compensation document has been presented to the DOE.

⁹ Related documentations have been presented to the DOE.

parameter		
Future target for parameter		Construction workers and security guards to be employed from the neighbouring town and the village.
Way of monitoring	How	Social security records
	When	Once during construction and annually
	By who	Project site team

D.3. Implementation of sampling plan

N/A

SECTION E.

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

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

According to the baseline methodology ACM0002, the emission reduction ER_y by the project activity during a given year y is defined as;

$$ER_y = BE_y - PE_y$$

Where:

ER_y : Emission reductions achieved by the project activity in year y (tCO₂e).

BE_y : Baseline Emission in year y (tCO₂e).

PE_y : Project Emission in year y (tCO₂e).

Project emissions are taken as zero as per the methodology. Therefore;

$$ER_y = BE_y$$

The electricity meters are measuring two parameters: The electricity supplied to the grid (EG_{export}) and the electricity consumption from the grid (EG_{import}). To achieve the net amount of supplied electricity, the difference has to be calculated:

$$GEN_y = EG_{\text{export}} - EG_{\text{import}}$$

Where:

GEN_y = Net electricity supplied to the Grid in MWh

EG_{export} = Electricity supplied to the Grid in MWh

EG_{import} = Electricity consumption from the Grid in MWh

According to the applied methodology version the emission reduction is the baseline emissions calculated as the net electricity supplied to the grid multiplied by the grid emission factor.

The baseline emissions are the product of electrical energy baseline EG_{PJ} , y expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor:

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

where :

BE_y	: Baseline emissions in year y (tCO_2/y)
$EG_{PJ,y}$	: Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)
$EF_{grid,CM,y}$	: Combined margin CO_2 emission factor for grid connected power generation in year y calculated by using the latest version of the “Tool to calculate the emission factor for an electricity system “ (tCO_2/MWh)

$EF_{grid,CM,y}$ value is fixed as **0.610 tCO_2/MWh** for the crediting period of seven years.

The table below shows the baseline emissions for the verification period:

Months	(A) Electricity Supplied to the Grid (MWh)	(B) Electricity Consumed by the Project (MWh)	(C) = (A)- (B) Net Electricity Supplied (EG) (MWh)	(ER= EG*EF) Emission reductions achieved (tCO_2)
September 2012	6,021.17	15.88	6,005.290	3,663.23
October 2012	5,951.97	23.81	5,928.160	3,616.18
November 2012	7,892.96	16.01	7,876.950	4,804.94
December 2012	8,294.23	18.68	8,274.55	5,047.48
Vintage'12	28,159.33	74.38	28,084.95	17,131.82
January 2013	8,793.38	22.13	8,771.25	5,350.46
February 2013	6,682.16	13.1	5,669.06	3,458.13
March 2013	7,301.68	18.32	7,283.36	4,442.85
April 2013	5,131.47	22.69	5,108.58	3,116.23
May 2013	5,265.72	26.46	5,239.26	3,195.95
June 2013	4,478.94	30.15	4,448.79	2,713.76
July 2013	10,238.23	10.65	10,219.58	6,233.94
August 2013	9,690.67	15.18	9,675.49	5,902.05
September 2013	2,890.63	45.41	2,845.22	1,735.58
Vintage'13	60,472.88	204.09	60,268.79	36,763.96
Sum	88,633.21	278.47	88,354.74	53,896.00

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

None

F.3. Calculation of leakage

No leakage is to be accounted by the Project. This is in line with the registered PDD and applicable methodology ACM0002 version 12.1. Therefore;
 $L = 0 \text{ tCO}_2\text{-eq}$

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

The total emission reductions can be calculated with the results of the below described equation:

$$ER = BE - PE - L$$

Where:

ER = Emission reductions in $\text{tCO}_2\text{-eq}$

BE = Baseline emissions in $\text{tCO}_2\text{-eq}$

PE = Project emissions in $\text{tCO}_2\text{-eq}$

L = Leakage emissions in $\text{tCO}_2\text{-eq}$

Total baseline emissions (BE): 79,298 $\text{tCO}_2\text{-eq}$

Total project emissions (PE): 0 $\text{tCO}_2\text{-eq}$

Total leakage (L): 0 $\text{tCO}_2\text{-eq}$

It can be followed that the emission reductions of the project activity is equal to the baseline emissions.

The emission reductions per vintage and for the period which is covered by this monitoring report are therefore:

Time Period	Baseline emissions or baseline net GHG removals by sinks (tCO_2e)	Project emissions or actual net GHG removals by sinks (tCO_2e)	Leakage (tCO_2e)	Emission reductions or net anthropogenic GHG removals by sinks (tCO_2e)
01/09/2012-31/12/2012	17,132.43	0	0	17,132.43
01/01/2013-30/09/2013	36,763.96	0	0	36,763.96

F.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_2e)	60,534 $\text{tCO}_2\text{e/year}$	53,896 $\text{tCO}_2\text{e/year}$

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

The estimated annual emission reduction value calculated ex-ante in the registered PDD can be regarded as consistent with the actual values; therefore, the difference between the estimated and actual values can be regarded as negligible.



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.
Decision Class: Regulatory Document Type: Form Business Function: Issuance		