Gold Standard Voluntary Emission Reduction
1st periodic verification Monitoring Report

Monitoring Period:
19.03.2009 – 31.03.2010 (Both days included)

Akbük Wind Farm Project – Turkey GS no. 436

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Table 1: Definitions and acronyms

ACM	Approved Consolidated Methodology
CDM	Clean Development Mechanism
CO_2e	Amount of greenhouse gases emission equivalent to the emission of one unit of carbon dioxide
DOE	Designated Operational Entity
GHG	Greenhouse Gas
GS	Gold Standard
IPCC	Intergovernmental Panel on Climate Change
PDD	Project Design Document
PV	Periodic Verification
TEIAS	Turkish Electricity Transmission Company
UNFCCC	United Nations Framework Convention on Climate Change
VER	Verified Emission Reductions

A General project activity and monitoring information

First Monitoring Report (version/date)	Version 1.0 / 09.04.2010			
This Monitoring Report (version/date)	Version 1.1 / 06.05.2010			
Monitoring Report Template	Version 1.0			
Subject	1st periodic verification			
Project name	Akbük Wind Farm Project --- Turkey			
Project number	GS 436			
Scale	Large			
Registration Date	17.03.2009			
Applied methodology/ies	***Title***	***No.***	***Ver.***	***Scope***
	"Consolidated baseline methodology for gridconnected electricity generation from renewable sources"[1]	ACM0002	07	1
Monitoring period	19.03.2009 – 31.03.2010 (both days included)			
Monitoring Report file information	***Filename***	***Date***	***Num. of pages***	
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Person(s) responsible for the preparation of this report	Alexander Samai CO2 Operations / MVR Orbeo Am Wassermann 36 50829 Cologne, Germany T:+49 (0)221 50003930	Vincent Layec CO2 Operations / MVR Orbeo Am Wassermann 36 50829 Cologne, Germany T: +49 (0)221 50003930 vincent.layec@orbeo.com		
Short description of the project activity	The Akbük Wind Farm Project involves a 31.5 MW onshore wind farm in the region of Aydın Province, Didim District in Turkey. The generated electricity is delivered to the Turkish national grid. The Project comprises 15 turbines and a high voltage transmission line between the project area and the national grid. An estimated net electricity of 105 GWh/year will be produced by the project activity and delivered to the national grid. The annual emission reductions are estimated as 67,570 tCO2-eq/year.			

[1] http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_323M30IDF1IH6AG3GRCJ4PKR9CKM7P

A.1 Status of implementation for major project parts

Table 2: Status of implementation

Date	Milestone
30.06.2008	Start of construction
19.03.2009	Start of operation and commissioning of the first eight turbines (no. 1, 2, 3, 4, 5, 6, 10 and 15)
03.04.2009	Start of operation and commissioning of the remaining seven turbines (no. 7, 8, 9, 11, 12, 13 and 14)

The project is completely implemented and operational since 03.04.2009. The table above provides information on the two step implementation phase of the project. In a first step, from 19.03.09 eight of the turbines were operational and in the second step on 03.04.2009 the remaining seven turbines were commissioned and started operation.

A.2 Intended deviations or revisions to the registered PDD or monitoring plan

There are no deviations or revisions to the registered PDD or monitoring plan.

A.3 Changes since last verification

This is the first periodic verification.

B Key monitoring activities

B.1 Monitoring equipment

Table 3: Monitoring Equipment

Identification Code	Parameter	Device	Manufacturer	Serial no.	Date of initial calibration	Date of last official control
ID 9	EG_y	Electricity meter (Main)	ELSTER	368746	11.07.2008	19.03.2010
ID 9	EG_y	Electricity meter (Secondary)	ELSTER	368745	11.07.2008	19.03.2010

B.1.1 Calibration procedures

The calibration of the monitoring equipment was carried out according to the information provided in the PDD.

B.2 Data pool

B.2.1 Fixed parameters

Table 4: List of fixed default values

Identification Code	Parameter	Default value	Unit	Description
ID 8	$EF_{grid, CM}$	0.644	tCO_2e/MWh	Combined Margin emission factor

B.2.2 Monitored parameters

Table 5: Data concerning GHG emissions by sources of the baseline

Identification Code	Parameter	Unit	Description
ID 9	EG_y	GWh	Net electricity supplied by the Project to the grid

Table 6: Data concerning Gold Standard sustainability parameters

Identification Code	Parameter	Unit	Description
SDI 6	Employment (Quality)	-	The number of trainings provided as an improvement of the employment quality
SDI 7	Livelihood of the poor (Access to essential services)	Contracts	The building of a new bazaar area at Akyeniköy is a measure to improve the livelihood of the poor
SDI 10	Employment (Numbers)	Contracts	Jobs are created due to the project activity

B.2.3 Data concerning leakage

No leakage has to be taken into account

B.2.4 Data processing and archiving

The data processing and archiving was performed in accordance with the PDD. The officials from TEIAŞ performed monthly the measurements for both the primary and secondary device, under the

control of the plant personnel of Ayen. A reading protocol was signed by both parties. An invoice (receipt of sale) is prepared by Ayen and delivered to TEIAŞ.

Metering: The delivered electricity is being metered at 154 kV high voltage side of the step up transformer (154/34,5kV) installed at the project site. The meters measure the net electricity delivered to the grid, which is the data used in emission reduction calculations. The losses before this point will be on the account of the project owner.

Meter readings: Officials from TEIAS (Turkish Electricity Transmission Company) perform data readings under the surveillance of responsible staff from the project participant for the devices on a periodic basis. A meter reading report is prepared by TEIAS and delivered to Ayen Enerji for each month.

B.2.5 Special events

Table 7: Special event log

FAULT TYPE	DESCRIPTION	DATE	NUMBER OF STOPPED TURBINES	FAULTY TURBINE SERIAL NO:	DURATION (Days)
Turbine	Generator Fault	06.09.2009	1	2100S51009N0838S88	44
Turbine	Gearbox Displacement	10.09.2009	1	2100S51009N0834S88	43
Turbine	Generator Bearing Fault	26.09.2009	1	2100S51009N0833S88	55
Turbine	Generator Stator Fault	13.02.2010	1	2100S51009N0826S88	10
Grid	Busbar Fault	26.03.2009	1	2100S51009N0839S88	3
Grid	Ground Fault	19.04.2009	15	All turbines affected	<1
Grid	Busbar Fault	04.11.2009	1	2100S51009N0831S88	2
Grid	Line Maintenance Work	08.11.2009	15	All turbines affected	<1
Grid	Busbar Fault	02.12.2009	1	2100S51009N0827S88	2
Grid	Busbar Fault	02.12.2009	1	2100S51009N0837S88	1
Grid	High Voltage Line Fault	16.12.2009	15	All turbines affected	<1
Grid	High Voltage Line Overcurrent Fault	08.02.2010	15	All turbines affected	<1
Grid	Busbar Fault	08.02.2010	1	2100S51009N0834S88	1
Grid	High Voltage Line Power Outage	25.02.2010	15	All turbines affected	<1

C Quality assurance and quality control measures

The project owner is Ayen Enerji A.S. and as such responsible for the operation and monitoring of the project activity.

C.1 Documented procedures and management plan

C.1.1 Roles and responsibilities

For Ayen Enerji Mr. Hakan Demir is responsible for monitoring issues within the project.

C.1.2 Trainings

Please see Section D, parameter SDI.6 for information on trainings.

C.2 Involvement of third parties

Support and consultancy regarding the Gold Standard VER obligations is provided by OneCarbon International B.V., a company purchased by ORBEO.

C.3 Troubleshooting procedures

As the measuring devices are sealed by TEIAŞ, Ayen cannot intervene with the devices. In case of unforeseen problems or failures of the meters or if any differences occurs between primary and secondary devices TEIAŞ has to be informed for necessary maintenance and calibration. There is an agreement between Ayen and TEIAŞ that in case of problems or failures of the meters TEIAŞ reacts as fast as possible to solve the problem.

Furthermore, a logbook is written all the time where observations (in general, not only related to the meters) and all other information necessary to document are included.

D Gold Standard sustainable development indicators

According to the requirements of the Gold Standard, the project activity must be assessed against a matrix of sustainable development indicators. The contribution of the proposed project activity to the sustainable development of the country is based on indicators of local/global environmental sustainability, social sustainability & development and economic & technological development.

Three indicators were added to the monitoring plan. All documents regarding these additional parameters have been presented to the DOE during the on-site visit:

SDI.6: Employment (quality)

Description: N*umber of employees trained with issued certificates*

Two trainings were conducted for to employees of the Akbük Wind Farm; one by Suzlon (the turbine producer) and the second by ResQ gave trainings.

Suzlon conducted the following trainings:

Course Beginning and End Dates	Course Subject
02.03.2009 - 04.03.2009	Live Working – Low Voltage
15.03.2009 - 19.03.2009	Rescue from Heights ARL
19.03.2009 - 20.03.2009	Emergency Medical Treatment
20.03.2009 - 23.03.2009	S88 Service Essentials

The engineer in charge, the personnel Manager and 5 technicians/operators attended this training, aiming to improve the personnel´s safety during work.

ResQ conducted the following trainings:

Course Beginning and End Dates	Course Subject
27.01.2009 - 28.01.2009	Fall Arrest, Evacuation and Rescue from Heights, Basic

The engineer in charge and 3 technicians/operators attended this training, aiming to learn rescue from wind engines circumstances.

SDI.7: Livelihood of the poor

Descripion: *The building of a new bazaar area at Akyeniköy*

Ayen financed the building of the new bazaar area at Akyeniköy Municipality. The construction of the bazaar took place between May 2008 and autumn 2008.

This new bazaar area is a significant improvement for the local people of Akyeniköy as there was no dedicated bazaar area available before. On certain days of the week people used empty street sides to open their stalls. Only after the construction of the bazaar area the Akyeniköy community is in possession of an area for trading, which is a contribution to the livelihood of the poor.

SDI.10: Employment (numbers)

Description: *Number of employment created by the project monitored by the monthly salary payment sheet or from the web portal of the Social Security Institution SSK.*

Ayen established work for currently 17 employees; one engineer in charge, one personnel manager, one accountant, seven technicians serving as operators, one driver and six security guards. The project employs in particular local employees and contributes therefore to sustainable development as eight persons come from the nearby area.

E Calculation of GHG emissions reductions

E.1 Formulas used

E.1.1 Baseline emissions

The total emission reductions can be calculated with the results of the below described equations. The emission reduction is equal to the baseline emissions minus project emissions and leakage emissions. Leakage emissions in this project are considered to be zero. And the project emissions are negligible. The general equation is as follows:

$$ER_y = BE_y – PE_y + LE_y \quad \textbf{(1)}$$

Where:

ER_y	=	Emission reduction in year y (tCO2e/yr)
BE_y	=	Baseline emissions in year y (tCO2e/yr)
PE_y	=	Project emissions in year y (tCO2e/yr)
LE_y	=	Leakage in year y (tCO2e/yr)

According to the applied methodology version the emission reductions are the baseline emissions calculated as the electricity supplied to the grid multiplied by the grid emission factor.

$$ER_y = BE_y = EF_{grid,CM} * EG_y \quad \textbf{(2)}$$

Where:

ER_y	=	Emission reduction in tonnes CO_2-eq
BE_y	=	Baseline emissions in tonnes CO_2-eq
$EF_{grid,CM}$	=	Grid emission factor in tCO_2-eq/MWh (ID 8)
EG_y	=	Electricity supplied to the Grid in MWh (ID 9)

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:

$$EG_y = EG_{export} – EG_{import} \quad \textbf{(3)}$$

Where:

EG_y	=	Net electricity supplied to the Grid in MWh (ID 9)
EG_{export}	=	Electricity supplied to the Grid in MWh
EG_{import}	=	Electricity consumption from the Grid in MWh

E.1.2 Project emissions

Project emissions are negligible.

E.1.3 Leakage

No leakage occurred and do not have to be taken into account in accordance with the PDD.

E.2 GHG emission reductions (referring to section B.2 of this document)

E.2.1 Baseline emissions

Table 8: Baseline emissions during this monitoring period

Year	Month	(A) Electricity supplied to the grid [MWh]	(B) Electricity consumption from the grid [MWh]	(C) = (A) - (B) EG (ID 9) Net electricity supplied to the grid [MWh]	Baseline emission: ER = EG * EF [t CO_2e]
2009	March 2009	2,138.76	19.37	2,119.39	**1,364.89**
	April 2009	4,975.57	36.81	4,938.76	**3,180.56**
	May 2009	5,963.78	39.63	5,924.15	**3,815.15**
	June 2009	6,796.12	32.27	6,763.85	**4,355.92**
	July 2009	11,777.66	13.71	11,763.95	**7,575.98**
	August 2009	9,405.78	28.86	9,376.92	**6,038.74**
	September 2009	6,864.54	32.93	6,831.61	**4,399.56**
	October 2009	5,860.01	33.52	5,826.49	**3,752.26**
	November 2009	8,367.86	26.97	8,340.89	**5,371.53**
	December 2009	9,212.90	21.56	9,191.34	**5,919.22**
Sum 19.03.2009 until 31.12.2009:		**71,362.98**	**285.63**	**71,077.35**	**45,773.81**
2010	January 2010	11,026.00	24.57	11,001.43	**7,084.92**
	February 2010	9,717.30	21.64	9,695.66	**6,244.01**
	March 2010	7,907.27	29.38	7,877.89	**5,073.36**
Sum 01.01.2010 until 31.03.2010:		**28,650.57**	**75.59**	**28,574.98**	**18,402.29**
Total 19.03.2009 until 31.03.2010:		**100,013.55**	**361.22**	**99,652.33**	**64,176.10**

E.2.2 Summary of the emission reductions during this monitoring period

It can be followed that the emission reductions of the project activity is equal to the baseline emissions. The emission reductions for the period which is covered by this monitoring report is therefore

64,176 tCO_2e.

The final amount of GS-VERs calculated has been conservatively rounded down.

E.2.3 Comparison of the ex-post achieved emission reductions against the PDD's ex-ante estimation

According to the PDD a volume of 67,570 tCO_2e was expected to be reduced by the project activity per year. The project in operation reached 64,176 tCO_2e for the period of 378 days, which is slightly lower than expected, but still in line with the PDD and the expectations.