

**GOLD STANDARD – VOLUNTARY EMISSION REDUCTION
SECOND PERIODIC MONITORING REPORT**

YUNTDAG 42.5 MW WIND POWER PROJECT, TURKEY

Monitoring Period: 01/05/2009 – 31/03/2010

Completion of the report: 2.4. Version: 24 May 2010
By FutureCamp Türkiye

Project Owner:



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SECTION A GENERAL PROJECT ACTIVITY

This 2. Monitoring report was prepared to report emission reductions generated by Yuntdağ 42.5 MW Wind Power Project in the second Monitoring Period as following: **01/05/2009 – 31/03/2010**

A.1. Title of the Project Activity

Yuntdağ 42.5 MW Wind Power Project - Turkey

A.2. Gold Standard Registration

Validation date: 18 Mar 2008

Registration date: 31 Jul 2008

A.3. Short Description of the Project Activity

Innores Elektrik Üretim AŞ (in the following: Innores) has installed a 42.5 MW wind power plant in Yuntdağ/Bergama/Izmir in Turkey. The purpose of the project is to generate electricity and to feed it into the public grid. By replacing fossil fuel power generation, the greenhouse gas emission in Turkey is reduced. Yuntdağ WPP consists of 17 wind turbines Nordex N90 of the 2.5 MW output, 90m diameter and 80m hub height. The wind turbines are connected to the wind farm substation through 34.5 kV underground cables. The voltage is raised to 154 kV and is transferred to the National Electricity System (ALOSBİ Transformer Station) via a 26 km long transmission line.

A.4. Monitoring Period

Monitoring period covered by this report: 01/05/2009 – 31/03/2010 (both days are included)

A.5. Methodology Applied to the Project Activity

The reference for Baseline and Monitoring methodology is the following;

“Consolidated baseline methodology for grid-connected electricity generation from renewable sources (ACM0002) Version 6”¹

A.6. Status of Implementation Including Time Table for Major Project Parts

The project installation is completed according to the description in the PDD and completely operational. The most important milestones are included in the following table:

Date	Milestone
25.07.2007	Initial Stakeholder Consultation in Koyuneli Village

¹ http://cdm.unfccc.int/UserManagement/FileStorage/CDMWf_AM_BW759ID58ST5YEEV6WUCN5744MN763

07.03.2008	Commissioning of the first 6 turbines: Start of the first crediting period and first monitoring period
18.03.2008	Final Validation Report
04.06.2008	Commissioning of all Turbines.
31.07.2008	Gold Standard Registration
30.04.2009	End of the first monitoring period
31.03.2010	End of the second monitoring period

A.7. Intended Deviations or Revisions to the Registered PDD or Monitoring Plan

No deviations to the monitoring procedure documented in the registered monitoring plan occurred.

A.8. Changes since the Beginning of Last Verification

There has been no change since the beginning of last verification.

A.9. Person Responsible for the Preparation and Submission of the Monitoring Report

Farız Taşdan
FutureCamp İklim ve Enerji Ltd. Şti.
Çetin Emeç Blv. 19/18, 06460 Çankaya / Ankara, Turkey

T: 0090 312 481 21 42 & F: 0090 312 480 88 10

E-mail: fariz.tasdan@futurecamp.com.tr, Web page: www.futurecamp.com.tr

SECTION B	CARBON MONITORING
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B.1 Key Monitoring Activities According to the Monitoring Plan for the Monitoring Period as Stated in A.4
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B.1.1 Monitoring Equipment

B.1.1.1 Table Providing Information on the Equipment Used:

Serial Number	Device	Manufacturer	Model	Date of installation	Date of Initial-calibration
342724941	Main Electricity Meter	CIRWAT	402-LT5A-29D	30.11 2007	30.11.2007
342731903	Back-up Electricity Meter	CIRWAT	402-LT5A-29D	26.12. 2007	26.12. 2007

B.1.1.2 Calibration Procedures:
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The calibration of the monitoring equipment was carried out according to the information provided in the GS-VER PDD. The GS-VER PDD mainly includes the following obligation for the calibration of the appropriate meters:

“The Turkish Electricity Market Regulation Agency (EPDK) sets rules on the accuracy of electricity meters that are used by power plants feeding into the grid. The rules are part of the EPDK regulation 25056 from 22 March 2003. The table in Article 11 of the regulation specifies the use of electricity meters of the accuracy class 0.5S for power plants between 10 MW and 100 MW and refers to compliance with International Electrotechnical Commission’s norm EN 60687. TEIAS, whose employees will monthly visit the plant for the meter readings, is in charge of ensuring the adherence to these rules. Calibration and maintenance procedures will follow the requirements.”

B.1.2. Data Collection (Accumulated Data for the Whole Monitoring Period)
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B.1.2.1. Data concerning GHG emissions by sources of the baseline:

ID	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Comment
1. GEN _y	Net electricity delivered to the grid	Electricity Meter	MWh	m	Continuously	The data will be taken from the monthly meter readings, documented in the “meter reading record”.

B.1.2.2. List of fixed default values:

Parameter	Default value	Description
EF	0.7086 tCO ₂ /MWh	Emission factor of the Turkish grid determined ex- ante

B.1.2.3. Data concerning leakage:

No leakage needs to be considered.

B.1.2.4. Data concerning environmental impacts:

For this data we refer to the Sustainability Monitoring under Section C

B.1.3. Data Processing and Archiving

Data handling is carried out according to the description in the PDD. The officials from TEİAŞ perform monthly the measurements for both the primary and secondary device, under the control of the plant personnel of Innore. The TEİAŞ personnel comes to the plant in the first days of the month for reading the recorded values obtained at 24:00 of the last day of the month before. A reading protocol is then signed by both parties. An invoice (receipt of sale) is prepared by Innore and delivered to TEİAŞ.

B.1.3.1. A Backup Unit for Systematic Storage (Availability of the Manually Read Data in the PCs of the Project Developer)

Monthly data from TEİAŞ are stored electronically on TEİAŞ website and this data can be accessed by login of Project Developer². Innore also stores a hardcopy of the monthly meter reading protocols for back up of systematic storage of data.

B.1.4. Special Events

There is no special event other than described in A.6.

² <http://pmum.teias.gov.tr/UzlasmaWeb/>

B.2 Quality Assurance and Quality Control Measures

The Project owner is Innores Elektrik Üretim A.Ş and is therefore responsible for the operation and the monitoring of the project activities.

B.2.1. Documented Procedure and Management Plan**B.2.1.1 Roles and Responsibilities**

For Innores A.Ş Mr. İsa Alkan is the plant manager responsible for monitoring issues within this project.

B.2.1.2. Operational Handbook with its Relevant Documents

The operational handbook for maintenance of turbines exists in Turkish and English version, to guarantee maximum understanding and acceptance by all involved participants.

B.2.1.3 Trainings:

The plant engineers have been trained. The rest of staff of the Yuntdağ wind farm was already trained in 2008. Staff training list is provided in Section C, table C.1.2.

B.2.2. Involvement of Third Parties

Support and consultancy regarding the Gold Standard VER obligations is provided by FutureCamp GmbH.

B.2.3. Data Audits and Control Measures

There is analysis and maintenance system operated by Nordex. This system records automatically all electricity generation data and wind parameters of each single wind turbines. In this way any times of abnormal operation can immediately be identified and accordant measures can be initiated.

B.2.4. Troubleshooting Procedures

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

B.3 Calculation of GHG Emission Reductions

B.3.1. Used Formulas

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. There are no project emissions in this kind of project. The general equation is as follows:

$$ER_y = BE_y - PE_y - L_y \quad (1)$$

Where:

ER_y	= Emission reduction
BE_y	= Baseline emissions
PE_y	= Project emissions
L_y	= Leakage
y	= Refers to a given period

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:

$$GEN_y = EG_{export} - EG_{import} \quad (2)$$

Where:

GEN_y	= Net electricity supplied to the Grid in MWh (ID 1)
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.

$$BE_y = GEN_y * EF \quad (3)$$

Where:

BE_y	= Baseline emissions in tonnes CO ₂ e
EF	= Grid emission factor for the electricity displaced due to the project activity during the year y [tCO ₂ e/MWh].
GEN_y	= Net electricity supplied to the Grid in MWh (ID 1)
y	= Refers to a given period

B.3.2. GHG emission reductions (referring to B.2. of this document):**B.3.2.1. Project Emissions:**

There are no project emissions in this kind of project. There was a diesel generator in Yuntdağ 42.5 MW WPP project for emergency cases; however while this generator was not used so often, it was transferred from the plant on 14.10.2009. A battery system was installed in the plant to supply electricity when there is a need.

B.3.2.2. Baseline emissions:

The baseline emissions for the project activity according to the PDD are included in the following table:

Emission Factor (EF)	0.7086 tCO₂/MWh.
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Months	Electricity supplied to the grid (MWh) (1)	Electricity consumption from the grid (MWh) (2)	Net electricity supplied to the grid[MWh] (3) =(1)-(2)	Baseline emission (acc. formulae 3): (ER = GEN * EF) [tCO ₂ e]
May'09	10,765.191	17.554	10,747.637	7,615.776
June'09	10,980.394	18.541	10,961.853	7,767.569
July'09	14,448.391	8.418	14,439.973	10,232.165
August'09	19,730.824	2.828	19,727.996	13,979.258
September'09	11,176.301	13.163	11,163.138	7,910.200
October'09	9,535.650	17.660	9,517.990	6,744.448
November'09	7,797.560	24.300	7,773.260	5,508.132
December'09	11,137.970	13.930	11,124.040	7,882.495
SUM'09	95,572.281	116.394	95,455.887	67,640.042
January'10	12,257.198	14.666	12,242.532	8,675.058
February'10	10,926.806	16.633	10,910.173	7,730.949
March'10	10,948.296	20.591	10,927.705	7,743.372
SUM'10	34,132.300	51.890	34,080.410	24,149.379
Total SUM 2009-2010	129,704.581	168.284	129,536.297	91,789.420

B.3.2.3. Leakage:

Leakage is considered to be negligible.

B.3.2.4. Summary of the emissions reductions during the monitoring period:

According to the general equation

$$ER_y = BE_y = EF * GEN_y$$

$$\text{Emission reduction} = \text{Baseline emissions} = \text{Emission Factor} * \text{Supplied Net Electricity}$$

Emission reductions generated during the second monitoring period (1 May 2009 to 31 March 2010)	91,789 tCO₂e
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Thereof, the following emission reductions were generated in 2009 and 2010:

Emission reductions generated in 2009 (1 May 2009 to 31 December 2009)	67,640tCO₂e
Emission reductions generated in 2010 (1 January 2010 to 31 March 2010)	24,149 tCO₂e

SECTION C SUSTAINABILITY MONITORING

C.1. Sustainable Development Indicators

According to the requirements of Gold Standard, the project activity must be assessed against a matrix of sustainable development indicators. Project activity's contribution to sustainable development is based on indicators of;

- environmental sustainability,
- social sustainability & development
- economic & technological development

For the first verification, three indicators were added to the monitoring plan in PDD. While two of these indicators have to be monitored during periodic verifications, one of them, namely, "Use of the new road" could be taken from periodic verification according to the PDD. The indicator of "Use of the new road" was verified during initial verification with interviews with local people and there could be no further changes of this indicator. Additionally, the table related with employment during construction will be taken from the report, while it was also verified during initial verification and not subject to any changes during period verifications.

All documents regarding remaining two indicators can be presented to DOE during the on-site visit.

C.1.1 Monitored Sustainable Development Indicators

Sustainable Development Indicators	Data Variable	Measured (m), calculated (c), or estimated (e)	Rationale
Local job creation	Number and type of jobs and completed trainings	m	The direct creation of new jobs is one major positive social impact of the project activity. It could be shown that the project activity creates a respectable number of permanent and high qualified jobs (See C 2.1). Varies of these additional positions are filled by local people as well. Moreover, additional jobs are created at technology suppliers and service and consultancy providers. Employed staff was trained for new technology and all training certificates and measures can be presented during on-site visit.
Bird collisions	Number of observed bird strikes	m	Regarding affects of Turbines on biodiversity, mayors of villages have reported no bird strikes. This can be presented to Verifier.

C.1.2 Staff Trainings

Concerning local job creation in the table C.1.1, employed staff by Yuntdağ 42.5 MW WPP was trained to increase their capabilities to handle their jobs efficiently. These kinds of trainings contribute job creation as well as human and institutional capacity. Description of the training, administration of the training program, attendee and duration of the training are provided below.

Besides trainings of the staff, Yuntdağ 42.5 MW WPP has positive impact on local community and surrounding villages. Management of wind power plant signed a protocol with Directorate of National Education of Bergama District and İsmaili village for a duration of two years. The aim of the protocol is to inform students by informational trips about wind power plants. This activity which is supported by power plant increases institutional capacity of the local community.

Description of Training	Administered By	Attendee	Duration	Certificate
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High Voltage training provides technicians to handle the work under high voltage safely and enable them to work in high voltage plants.	TEIAS	Hüseyin Vergili, Faruk Avkiran (Technicians)		Authorization Certificate to work in High Voltage Plants
Theoretical and Practical Safety Instruction, climbing wind turbines	TRIWIND	Isa Alkan (Plant Manager)	2 days	Climbing Wind Turbine Certificate
Principles and practice of Audit of Quality systems compliance with ISO 9000 and 19011	IQ Global Training and Consultancy	Isa Alkan (Plant Manager)	5 days	QMS Auditor Certificate
Basic first aid training program	Health Directorate of Izmir City	Isa Alkan, Faruk Avkiran (Technicians)	2 days	First Aid Certificate
Upper-intermediate English Course	Neurolinguistic English	Isa Alkan (Plant Manager)		Upper-Intermediate English Certificate
Wind Turbine Technology, Electrical Systems and SCADA Control	Deutsche WindGuard	Isa Alkan (Plant Manager), Nurullah Çelik (technical manager), electric technicians.	3 days	N.A.

C.2. Employment Created During Project Activities

C.2.1 Employment Created During Operation of the WPP

Employment	Description	Number of employee	Duration of the Contract	Training?	Employment; Local or Not?
Technical Manager	Responsible for operational organizations and Izmir technical office. Coordinates the works with grid and turbine supplier companies.	1	Salaried employee. Min. 1 year, rest is undefined.	Yes	Local
Plant Manager	Responsible for all kind of operational activities as well as maintenance and management. Reports to Izmir technical office and head office in Istanbul.	1	Salaried employee. Min. 1 year, rest is undefined.	Yes	Local
Electric Technicians:	Work on alternating shifts. Apart from routine controls, intervene to electrical breakdowns.	4	1 year	Yes	3 of them is Local
Turbine Supplier Technicians	Intervene to serious breakdowns.	2	5 years	Yes	Not Local

(Nordex):					
Security Guards:	Work on alternating shifts, maintain security of plant.	4	1 year	Yes	Local

SECTION D OPEN ISSUES FROM PREVIOUS VERIFICATION

There were two Forward Action Requests (FAR) from previous verification that took place in 2009 which were agreed by Project participants to be implemented:

- **FAR 1:** A guide on quality management measures regarding the Yuntdağ Wind Farm should be prepared and implemented.

A guide on quality management system of monitoring of emission reduction is implemented by Monitoring Manual. This could be presented to DOE.

- **FAR 2:** Continuous noise measurements in the surrounding villages by a 3rd Party may be necessary for clear evidence.

A noise measurement of WPP was done by a third party and the report could be submitted to DOE.

Annex 1: Definitions and Acronyms

ACM	: Approved Consolidated Methodology
CDM	: Clean Development Mechanism
DOE	: Designated Operational Entity
GS	: Gold Standard
PDD	: Project Design Document
TEİAŞ	: Turkish Electricity Transmission Company
ALOSBİ	: Administration of Aliağa Organized Industry Location
WPP	: Wind Power Project