GOLD STANDARD – VOLUNTARY EMISSION REDUCTION
2ND PERIODIC MONITORING REPORT

Version 4 on 11/07/2011
Keltepe Wind Farm Project - Turkey
Gold Standard Project ID: GS437

Monitoring Period: 01/03/2010 – 30/04/2011 (first and last days included)

CONTENTS

SECTION A. General Description of the Project Activity

A.1 Title of the project activity:

Keltepe Wind Farm Project – Turkey

A.2 Brief description of the project activity:

The Keltepe Wind Farm Project activity (also referred as Keltepe Project) comprises the operation of a 20.7 MW onshore wind farm in the Balıkesir Province in Turkey. The generated electricity is delivered to the national grid. The project consists of 23 units of E44 turbines with an installed capacity of 900 kW each. The generated electricity is delivered to the grid at 34.5 kV MV Göbel transformer stations. The project helps reduce GHG emissions generated from the national grid, which is significantly based on fossil fuel electricity generation.

The project installation is finished according to the description in the PDD and completely operational. Relevant dates for the project activity are as followed:

Table 1 Major milestones of the project activity

Date	Milestone
01/07/2008	Start of construction
04/12/2008	Validation of Project Activity
10/07/2009	Start of operation
10/07/2009	Start of first crediting period and first monitoring period
18/09/2009	Gold Standard registration of the Project Activity
28/02/2010	End of first monitoring period
01/03/2010 – 30/04/2011	Second monitoring period

During this monitoring period from 01/03/2010 – 30/04/2011, the total emission reduction achieved is 45,231 tCO_2-eq.

A.3 Project participants:

Name of Party Involved	Private and/or public entity(ies) project participants	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Turkey (Host Country)	Alize Enerji Elektrik Üretim A.Ş.	No

A.4 Location of the project activity:

The Keltepe Wind Farm Project is located in Balıkesir-Susurluk Region.
The geographical coordinates of Keltepe Wind Farm is $39^0$57’ N $28^0$02’ E.

A.5 Technical description of the project activity:

The project involves electricity generation from 23 units of E44 wind turbines. Each unit has an installed capacity of 900 kW reaching to a total installed capacity of 20.7 MW. The installed turbines are direct drive turbines manufactured by Enercon GmbH.

Table 2 Technical details of installed turbines

Model of turbine	Rated power [kW]	Number of blades	Rotor diameter [m]	Rotor swept area [m^2]	Hub height [m]
E44	900	3	44	1,521	55

A.6 Methodology and versions applied to the project activity:

Approved baseline methodology ACM0002 "Consolidated baseline methodology for grid connected electricity generation from renewable sources", version 7.

For more information regarding methodologies please refer to http://cdm.unfccc.int/methodologies/index.html

The project activity was also developed and registered as a Gold Standard VER project. The following Gold Standard rules are applicable to the project activity:

GS-VER Project Developers Manual (also referred as GS v1 documents)

For more information regarding Gold Standard please refer to
http://www.cdmgoldstandard.org/Gold-Standard-Version-1.338.0.html

A.7 Registration date of the project activity:

The project was registered on 18/09/2009 under the Gold Standard registry with the registration number GS 437.

A.8 Crediting period of the project activity and related information (start date and choice of crediting period):

The project was validated on 04/12/2008 with a renewable crediting period. The first crediting period is from 10/07/2008 to 09/07/2015.

A.9 Name of responsible person(s)/entity(ies):

Name of the person/entity completing the monitoring report:
Mr. Ömer Akyürek
OakDanışmanlık
Acıbadem Mah. Şemibey Sok.
Belkıs Apt. N:3 D:6
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Phone: +90 216 3471671
E-mail: oak@oakdanismanlik.com

OakDanışmanlık is not a project participant.

SECTION B. Implementation of the Project Activity

B.1 Implementation status of the project activity:

The commissioning date of the project activity was 10/07/2009. The project activity consists of only one site with no phased implementation. There were no special events or any emergency reported for the project during the 2nd monitoring period between 01/03/2010 – 30/04/2011.

B.2 Changes since last verification:

Changes in employment
During the 2nd monitoring period, the following changes have been occurred in organisational structure of Keltepe Wind Farm:

Joined the team	Resigned from his/her duties
Hüseyin Avcı	Önder Balaban

Introduction of OSOS:
In accordance with the introduction of OSOS (Automatic Meter Reading System), UEDAŞ is currently in the phase of adaptation of remote reading practice through the projects in Turkey. As per the minute sent by UEDAŞ on 08/05/2010[1], UEDAŞ will perform the meter readings remotely via GPRS technology[2]. Previously the readings from UEDAŞ were made on the site. OSOS is in use since May 2010 and monthly meter readings starting for November 2010 electricity generation is based on OSOS.

[1] Minute is available to the DOE
[2] This is done through an external modem which has no impact on the quality and quantity of data reading.

The introduction of OSOS has no impact on the quantity and quality of the data readings and hence the amount of emission reduction calculations.

B.3 Revision of the monitoring plan:

No revisions to the registered monitoring plan are required.

B.4 Request for deviation applied to this monitoring period:

No deviations occurred in this monitoring period.

B.5 Notification or request of approval of changes:

No notification or request of approval of changes has been made.

SECTION C. Description of the Monitoring System

C.1 Data processing and archiving:

Data handling was carried out according to the description in the PDD. Both TEİAŞ and project responsible perform data readings on the first day of the month. TEIAŞ will read the values at 00:00 on the first day of each month and a meter reading protocol will be also submitted to TEİAŞ for reciprocal affirmance. The results of the readings were saved electronically and made available by TEİAŞ via a website. Invoicing is based according to the data published on the website.

The project participants also archived a hardcopy of meter reading protocols, scanned them and stored them. The collected data will be kept by Demirer Holding during the crediting period and stored at least two years after the issuance of VER credits.

C.2 Special event log:

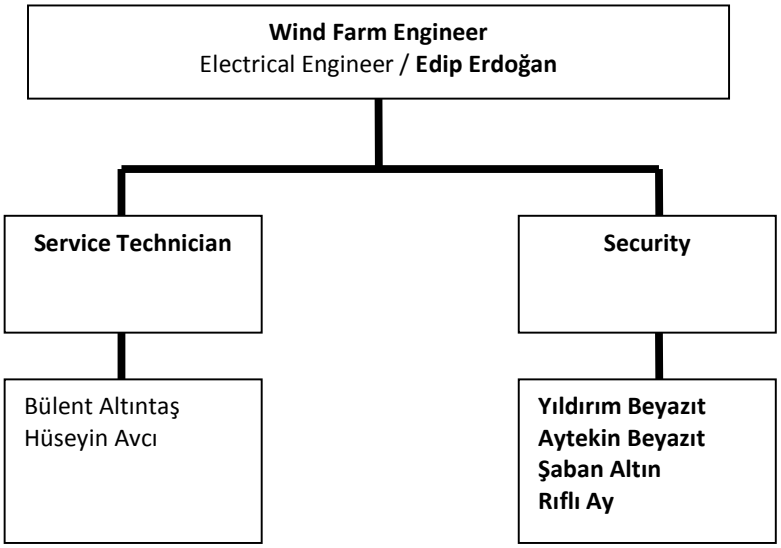
The electricity generated from Keltepe Wind Farm was delivered to the grid via a head over medium voltage distribution line which is under the responsibility of the distribution company. However due to faulty design, ever so often the distribution line was cutoff especially on heavy weather conditions. To prevent this, the overhead distribution line is carried to underground. The new underground distribution line is expected to get in service within end of March or the beginning of April.

Switching from overhead to underground distribution line will have no qualitative or quantitative impact on the monitoring plan.

C.3 Roles and responsibilities:

Roles and responsibilities have been summarized in the following chart.

Keltepe Wind Farm / Organization Chart



C.4 Trainings:

Management of training procedures is decentralized. In general the training topics could be summarized as followed:

i) First Aid Training: If deemed necessary, first aid training is provided to the selected staff. This training covers generally the basic knowledge and skills to be applied to sick and injured people. The training was given by Governship of İzmir Heath Department.

ii) High Voltage Training: As the electricity is transferred via 34.5 kV Medium Voltage distribution line, high voltage training is not relevant or applicable to Keltepe Wind Farm Project.

iii) Safety Trainings: Two general topics on safety are covered with the trainings.

- Trainings on various Enercon instructions which cover safety issues are provided by the responsible engineer and the service technicians on a rotating shift.
- Trainings on occupational safety, which is provided by Mr. Faruk Ecevit (Health and Safety Officer).

iv) Technical Trainings: SQA Department of Enercon GmbH Service Dispatch is the only responsible body that is able to give technical trainings on Enercon equipment. SQA Department has adopted a regional approach and has planned their training services based on the regions. According to the schedule, trainings for Keltepe Wind Farm service technicians will be organized in April 2011. Trainings do cover a wide range of technical topics from basic turbine specifications to more detailed technical aspects. These trainings are only oriented for Service Technicians.

C.5 Internal audits and control measures

The internal control procedures maintain the reliability and accuracy in the data transfer and calculations. The plant personal records the data on regular basis from both meters and compares the values for consistency. The responsible staff performs regular checks of this procedure at the first day of the month and controls the monthly data of main and second meters. If any difference occurs between the two meters, TEİAŞ has to be informed for the necessary maintenance and calibration. Furthermore, the monthly data is shared with Mrs. Çağla Balcı Eriş for the control and data storage.

Reliability and accuracy of monthly values is reached by comparative readings both from the project participant and TEİAŞ, where high accuracy is guaranteed and needed by the requirements of billing purposes.

C.6 Troubleshooting procedures:

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

SECTION D. Data and Parameters

D.1 Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors:

Data / Parameter:	**EF**
Data unit:	tCO_2-eq/MWh
Description:	Emission factor of the Turkish grid
Source of data used:	Keltepe Wind Farm Project PDD registered under GS (GS437)
Value(s) :	0.644
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Additional comment:	The emission factor of the Turkish grid is calculated ex-ante and has been fixed for the first crediting period.

Data / Parameter:	**NCV Diesel**
Data unit:	GJ/L
Description:	Net Calorific Value of diesel
Source of data used:	Keltepe Wind Farm Project PDD registered under GS (GS437)
Value(s) :	0.0366
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission calculation
Additional comment:	

Data / Parameter:	**$EF_{CO2,Diesel}$**
Data unit:	tCO_2-eq/GJ
Description:	CO_2 emission factor of diesel
Source of data used:	Keltepe Wind Farm Project PDD registered under GS (GS437)
Value(s) :	0.074
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission calculation
Additional comment:	

D.2 Data and parameters monitored:

<table>
<tr><td>Data / Parameter:</td><td>EG_y</td></tr>
<tr><td>Data unit:</td><td>MWh</td></tr>
<tr><td>Description:</td><td>Electricity supplied by the project activity to the grid</td></tr>
<tr><td>Measured /Calculated /Default:</td><td>Measured</td></tr>
<tr><td>Source of data:</td><td>Electricity meter readings</td></tr>
<tr><td>Value(s) of monitored parameter:</td><td>70,298</td></tr>
<tr><td>Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)</td><td>Baseline emission calculation</td></tr>
<tr><td>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</td><td>Information of the meters are listed as followed:

<table><tr><td></td><td>Electricity Meter (Primary)</td><td>Electricity Meter (Secondary)</td></tr><tr><td>Manufacturer</td><td>Schlumberger</td><td>Schlumberger</td></tr><tr><td>Model</td><td>SL7000</td><td>SL7000</td></tr><tr><td>Serial number</td><td>53031748</td><td>53031749</td></tr><tr><td>Date of installation</td><td>12/08/2009</td><td>12/08/2009</td></tr><tr><td>Date of initial callibration</td><td>12/08/2009</td><td>12/08/2009</td></tr></table>
The calibration of the monitoring equipments were carried out according to the information provided in the PDD. The PDD mainly includes the following obligation for the calibration of the appropriate meters:

“TEİAŞ is responsible for callibration and maintenance of the devices. If any difference occures between primary and secondary device TEİAŞ performs necessary and calibration”</td></tr>
<tr><td>Measuring/ Reading/ Recording frequency:</td><td>Continuous measurement and monthly reading.</td></tr>
<tr><td>Calculation method (if applicable):</td><td>n.a.</td></tr>
<tr><td>QA/QC procedures applied:</td><td>Both the project participant and TEİAŞ perform the readings and compare the values. The results are cross checked from the official website of TEİAŞ.</td></tr>
</table>

Data / Parameter:	**FC_Diesel**
Data unit:	L (liters)
Description:	Diesel consumption of the auxiliary power unit
Measured /Calculated /Default:	Measured
Source of data:	Diesel consumption of the auxiliary power unit
Value(s) of monitored parameter:	1535
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emission calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	n.a.
Measuring/ Reading/ Recording frequency:	The consumption of diesel used by the auxiliary power unit will be monitored by collecting invoices of diesel purchase.
Calculation method (if applicable):	n.a.
QA/QC procedures applied:	n.a.

SECTION E. Emission Reduction Calculation

E.1 Baseline emissions calculation:

The baseline emission BE_y (tCO_2eq) during the monitoring period results from:

$$BE = EF * EG \qquad \textbf{(1)}$$

Where:

BE = Baseline emissions in tones CO_2-eq
EF = Grid emission factor in tCO_2-eq/MWh (a value of 0.644 tCO_2-eq/MWh has been fixed during the first crediting period)
EG = Electricity supplied to the grid in MWh

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

Table 3 Baseline emissions

Month	(A) Electricity supplied to the grid [MWh]	(B) Electricity consumption from the grid [MWh]	(C)=(A)-(B) Net electricity supplied to the grid [MWh]	Baseline emissions (equation 2) [tCO_2-eq]
March 2010	5,204.23	2.478	5,201.752	3,349.93
April 2010	5,913.838	4.288	5,909.550	3,805.75
May 2010	2,763.305	6.745	2,756.560	1,775.22
June 2010	3,212.768	5.510	3,207.258	2,065.47
July 2010	5,490.403	1.017	5,489.386	3,535.16
Augest 2010	6,203.116	2.551	6,200.565	3,993.16
September 2010	6,150.399	1.458	6,148.941	3,959.92
October 2010	7,124.969	2.445	7,122.524	4,586.91
November 2010	6,625.841	8.484	6,617.357	4,261.58
December 2010	7,502.305	11.003	7,491.302	4,824.40
January 2011	3,601.154	10.932	3,590.222	2,312.10
February 2011	4,178.257	3.402	4,174.855	2,688.61
March 2011	300.763	1.964	298.799	192.43
April 2011	6,027.495	1.565	6,025.930	3,880.70
Sum (01/03/2010 – 31/12/2010)	56,191.174	45.979	56,145.195	36,157.51
Sum (01/01/2011 – 30/04/2011)	14,107.669	17.863	14,089.806	9,073.84
Sum 2nd Monitoring Period (01/03/2010 – 30/04/2011)	70,298.843	63.842	70,235.001	45,231.34

E.2 Project emissions calculation:

Project emissions are negligible; however the auxiliary emissions will be monitored and reported.

In accordance to the registered PDD, the auxiliary emissions are calculated as followed.

$$PE = FC_{Diesel} * NVC_{Diesel} * EF_{CO2Diesel} \quad \textbf{(2)}$$

Where:

PE = Project emissions due to auxiliary power unit in tCO_2-eq
FC_{Diesel} = Consumption of diesel in auxiliary power unit in L
NCV_{Diesel} = Net Calorific Value of Diesel in GJ/L
$EF_{CO2Diesel}$ = CO_2 emission factor of diesel tCO_2-eq/GJ

According to the invoices, 1535 liters of diesel have been used for the auxiliary generator. The auxiliary emissions could be calculated in accordance to equation 2:

FC_{Diesel}	1535 L
NCV_{Diesel}	0.0366 GJ/L
$EF_{CO2Diesel}$	0.074 tCO_2-eq/GJ
PE	4.15 tCO_2-eq

As PE<<1%BE, the project emissions are negligible and considered to be 0

PE=0 **tCO_2-eq**

E.3 Leakage calculation:

No leakage is to be accounted by the Project. This is in line with the registered PDD and applicable methodology ACM0002 version 7. Therefore;

L= 0 **tCO_2-eq**

E.4 Emission reduction calculation

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

$$ER = BE - PE - L \quad \textbf{(3)}$$

Where:
ER = Emission reductions in tCO_2-eq
BE = Baseline emissions in tCO_2-eq
PE = Project emissions in tCO_2-eq
L = Leakage emissions in tCO_2-eq

Total baseline emissions (BE): 45,231 tCO_2-eq
Total project emissions (PE): 0 tCO_2-eq
Total leakage (L): 0 tCO_2-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:

Table 4 Emission reductions for 2nd monitoring period

Vintage 2010 (01/03/2010 – 31/12/2010)	36,157 tCO_2-eq
Vintage 2011 (01/01/2011 – 30/04/2011)	9,074 tCO_2-eq
Total emission reductions for 2nd Monitoring Period (01/03/2010 – 30/04/2011)	45,231 tCO_2-eq

E.5 Comparison of actual emission reductions with estimates in the PDD

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO_2e)	**46,501** tCO_2-eq	**45,231** tCO_2-eq

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

The ex-ante estimated yearly volume in the PDD is 46,501 tCO_2-eq. The ex-post achievements are slightly lower but consistent with performance monitored during the previous years of operation.

SECTION F. Gold Standard Sustainable Development Indicators

According to the requirements of 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 environment sustainability, social sustainability & development and economic & technological development.

With regards to the project activity, three indicators were added to the monitoring plan. All documents regarding these additional parameters can be presented to the DOE during the on-site visit:

SDI 1: Water Quality

Description:	Documents proving the disposal of waste water

The project includes a wastewater tank and the monitoring consists of recording the bills related to emptying the tank. Due to its large size the wastewater tank has a high capacity and it was emtied only once during the monitoring period.

SDI 2: *Employment (job quality)*
The details on trainings are summarized as followed:

Table 5 Trainings during the 2nd monitoring period

Trainee	Responsibility	Trainer	Subject	Date	Certification	Scope of training
Bülent Altıntaş	Service Technician	İzmir Governship, Provincial Heath Department	First Aid	10.04.2010	Certificate	First Aid
Muhammet Edip Erdoğan	Engineer	Faruk Ecevit	Safety	09.07.2010	Certificate	Maintenance of personal protection eqipment / Maintenance of personal protection equipment (Milan) / Bringing down a fainted person from the top of the tower / Rules and protocols to obey during working on the turbine and the plant / İSG Documentation and Forms
Hüseyin Avcı	Service Technician	Faruk Ecevit	Safety	09.07.2010	Certificate	Maintenance of personal protection eqipment / Maintenance of personal protection equipment (Milan) / Bringing down a fainted person from the top of the tower / Rules and protocols to obey during working on the turbine and the plant / İSG Documentation and
Bülent Altıntaş	Service Technician	Faruk Ecevit	Safety	09.07.2010	Certificate	Maintenance of personal protection eqipment / Maintenance of personal protection equipment (Milan) / Bringing down a fainted person from the top of the tower / Rules and protocols to obey during working on the turbine and the plant / İSG Documentation and
Muhammet Edip Erdoğan	Engineer	Deniz Kültür	High Voltage	22.10.2010	Certificate	Protection / Evaluation of indicators received during fault / Reading project schemes
Hüseyin Avcı	Srevice Technician	İzmir	First Aid	29.11.2010	Certificate	First Aid

		Governship, Provincial Heath Department				
Hüseyin Avcı	Service Technician	Elite Group	Safety	01.12.2010	Certificate	Ocupational Health and Safety
Bülent Altıntaş	Service Technician	Elite Group	Safety	13.01.2011	Certificate	Ocupational Health and Safety
Bülent Altınbaş	Service Technician	İzmir Fire Department	Fire and Natural Disasters	12.01.2011	Certificate	Basic fire training
Hüseyin Avcı	Service Technician	İzmir Fire Department	Fire and Natural Disasters	07.02.2011	Certificate	Basic fire training
Edip Erdoğan	Engineer	İzmir Fire Department	Fire and Natural Disasters	07.02.2011	Certificate	Basic fire training
Hüseyin Avcı	Service Technician	İzmir Governship, Provincial Heath Department	First Aid	29.11.2010	Certificate	First Aid
Edip Erdoğan	Engineer	TMMOB	Occupational Health and Safety	19.03.2010	Certificate	Ocupational Health and Safety
Bülent Altıntaş	Service Technician	Hüseyin Avcı		03.12.2010	Log Book	Enercon Instructions
M. Edip Erdoğan	Service Technician	Enercon (SQA)	Technical	11.04.2011	Certificate	WET operational instructions and principles / WET faults / WET elevator operation / Basics of SCADA monitoring system / Basics of SCADA remote system
Bülent Altıntaş	Service Technician	Enercon (SQA)	Technical	11.04.2011	Certificate	WET operational instructions and principles / WET faults / WET elevator operation / Basics of SCADA monitoring system / Basics of SCADA remote system
Hüseyin Avcı	Service Technician	Enercon (SQA)	Technical	11.04.2011	Certificate	WET operational instructions and principles / WET faults / WET elevator operation / Basics of SCADA monitoring system / Basics of SCADA remote system

Trainings on Enercon Instructions are periodic trainings repeating on monthly basis. Only December trainings have been included in this report.

SDI 3: Employment (quantity)

Description:	Number of employment created by the project monitored by the monthly salary payment sheets.

It could be shown that the project activity creates a respectable number of permanent and high qualified jobs. Currently 7 full time positions for local people are directly related to the project (1 engineer, 2 positions for service technicians and 4 positions for

security personal. Moreover, additional jobs are created at technology suppliers and service and consultancy providers.

A detailed organizational chart has been provided under section C.3 of this report.

SECTION G. Open Issues from Previous Verification

Two Forward Action Requests (FARs) were formulated in the verification final report covering the 1st monitoring period.

Forward Action Request FAR P1:
Implementation of training procedures as described in the letter by Mr. Sarper Başak, detailing the training procedures of Demirer's wind farms shall be verified during the next periodic verification.

Actions taken during the 2nd monitoring period:
Training procedures are presented under the section C.4 in this report.

Forward Action Request FAR P3:
Since monitoring of electricity generation is going to be simplified according to TEİAŞ schedule in 2009 utilizing GPRS technology, the monitoring measures by Alize / UEDAŞ should ensure that adequate monthly meter reading protocols are established for verifying the respective data.

Actions taken during the 2nd monitoring period:
In accordance with the minute sent by UEDAŞ on 08/05/2010, the meter readings from TEİAŞ are performed remotely as from May and onwards (OSOS). Within the 2nd monitoring period, the readings for electricity generation in May and onwards were performed based on this system. As requested in the FAR P3, adequate monthly meter reading protocols are established for verifying the respective data.

ANNEX 1

Definitions & Acronyms

ACM	**Approved Consolidated Metholdology**
CDM	**Clean Development Mechanism**
DOE	**Designated Operational Entity**
EPDK	**Electricity Market Regulatory Authority**
GHG	**Green House Gases**
GS	**Gold Standard**
GPRS	**General Packet Radio Service**
IPCC	**Intergovernmental Panel on Climate Change**
OSOS	**Automatic Meter Reading System**
PDD	**Project Design Document**
tCO_2-eq	**Amount of greenhouse gases emission equivalent to the emission of one ton of carbon dioxide**
TEİAŞ	**Turkish Electricity Transmission Company**
UNFCCC	**United Nations Framework Convention on Climate Change**
VER	**Verified Emission Reductions**