THE GOLD STANDARD:
Project Design Document for Gold Standard Voluntary Offset projects

(GS-VER-PDD)

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Explanatory information on how to complete the PDD and how to obtain Gold Standard registration can be found in the project developer's manual available on the Gold Standard website.

This template of the PDD is applicable for micro-, small- and large-scale projects. Note that the shaded boxes present information on the Gold Standard VER project development procedures. Project developers should delete these shaded boxes when preparing their PDD.

VOLUNTARY OFFSET PROJECTS

PROJECT DESIGN DOCUMENT FORM (GS-VER-PDD)
Version 01 - in effect as of: January 2006)

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Annexes

SECTION A. General description of project activity

A.1 Title of the project activity

Title: *Çataltepe 16 MW Wind Farm Project, Turkey*

Version: 09

Date: September 23rd, 2010

A.2. Description of the project activity

The *Çataltepe 16 MW Wind Farm Project, Turkey*, hereafter referred to as the Project, involves a grid-connected onshore wind farm project in Balıkesir Province, consisting of 8 wind turbines with a total installed power generation capacity of 16 MW. The Project is being implemented by Alize Enerji Elektrik Üretim A.Ş., a subsidiary of Demirer Enerji. The Project aims to generate electricity from wind energy and to feed it to the national electricity grid.

The project foresees to install 8 wind turbines with 2,000 kW installed capacity each and to feed this electricity without storing to the national grid via a transmission line of 15 km at the Edremit II transformer station. The Project area is located in Çataltepe village, Havran town, Balıkesir province, Turkey.

According to the technical feasibility study, the Project is estimated to generate a net electricity amount of 62,414 MWh per year, resulting in annual emission reductions of 39,618 metric tonnes CO_2 and a total reduction of 277,328 tCO_2 over the 7-year crediting period. The site preparation for the first wind turbines (including the construction of roads, transmission line, etc.) is started in November 2009 and generation is expected to start in July 2010.

The Project will reduce greenhouse gas emissions by displacing electricity from grid connected fossil fuel fired power plants, thereby contributing to climate change mitigation along with other environmental benefits. Given an expected operational life of 25 years, the Project activity will continue to reduce emissions further after the end of the crediting period as well.

The Project has a license for 16 MW installed capacity, which has been granted for 45 years on 18.04.2007 by EMRA.

Contribution to sustainable development:

The project significantly contributes to regional sustainable development in following ways:

- Reduction of:
  - electricity imports of Turkey,
  - dependency on fossil fuels and associated risks due to price variations;
- Diversification and assurance of energy supply;
- Reduction of greenhouse gas emissions and air pollutants (e.g. particulates, sulphur dioxide, nitrogen oxides etc.) in Turkey by displacing electricity from fossil fuel based power plants;
- Creation of jobs in Turkey and in the region during construction and operation phases;
- Support to local economy by procuring available services (like subcontractors) and equipment (like cables, transformer for the transmission line, turbine blades, general construction material, etc.) locally;
- Support to technology and know how transfer and development of the renewable energy sector in Turkey.

Sustainable Development Screen:

The Project shows mainly neutral or positive scores according to the Gold Standard sustainability screen. No negative scores have been found.

A.3. Project participants:

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Turkey (host)	Alize Enerji Elektrik Üretim A.Ş. (private entity) (a subsidiary of Demirer Enerji Üretim A.Ş.)	No
Turkey (host)	Mavi Consultants (private entity)	No

Alize Enerji Elektrik Üretim A.Ş. (private entity), the project operating company owned by Demirer Enerji Üretim A.Ş., shall be defined as the project participant. Contact details are given in Annex 1. Mavi Consultants act as consultant for this Project and are responsible for the transaction of the credits.

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

Host Country Eligibility Check:

GS Manual for VER Project Developers: **Section 3.2.2**

A Gold Standard voluntary offset project can be located in any country that does not have quantitative reduction target under the Kyoto Protocol. Turkey has officially signed the Kyoto Protocol on 26 August 2009. Turkey's position can be described as follows:

As of today, Turkey is an Annex I country. Annex I countries are potential carbon credit buyers. Turkey has, however, not set any emission reduction target; hence it is not listed as an Annex B country of the Kyoto Protocol and cannot participate to the Clean Development Mechanism (CDM) nor to the EU Emissions Trading Scheme (EU-ETS). Under these circumstances, the non-Kyoto market, which involves Voluntary Emission Reductions (VERs), is emerging in the country.

As of today, there is no DNA in Turkey. The National Focal Point of Turkey is the Ministry of Environment and Forestry. The Turkish National Focal Point has been involved in the consultation process as described in the section 3.4.3. for the Gold Standard Voluntary Project development, which significantly raised the awareness in the government about the issues around climate change and carbon trading.

Turkey has ratified the Kyoto Protocol but has no emission reduction obligations and is eligible as a host country for Gold Standard VER projects.

A.4.1.1. Host Party(ies):

Turkey

A.4.1.2. Region/State/Province etc.:

Balıkesir province, Turkey

A.4.1.3. City/Town/Community etc:

Havran district, Çataltepe village

A.4.1.4. Detail of physical location, including information allowing the unique identification of this project activity (maximum one page):

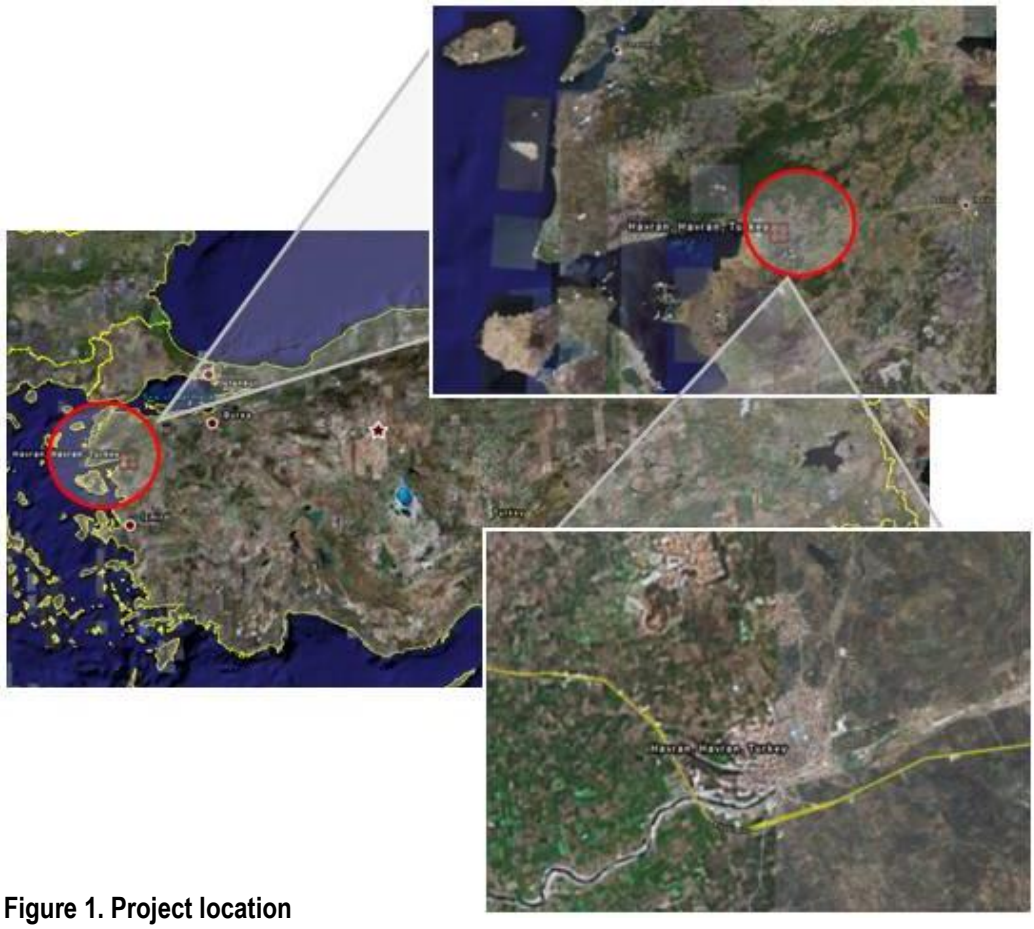

Figure 1. Project location

The Project location has a distance of 1 km to Hacımahmutlar neighbourhood, 2 km to Çataltepe village, 2.5 km to Damlar village, 5 km to Havran and 85 km to Balikesir.

The geographical location of the Project covers an area between 39º 31' N, 27 º 08' E and 39º 30' N, 27 º 09' E approximately. Details about the geographical position of the Project Activity can be found in Annex 5. Please note that the micrositing work is not finalized and the exact locations are subject to change.

A.4.2. Size of the project:

The Project is expected to reduce **39,618 tCO_2e** annually. As specified in page 2 of the Gold Standard VER Manual for Project Developers, the project qualifies as a large-scale project.

A.4.3. Category(ies) of project activity:

The Project activity falls under category "A.1. Renewable Energy (Electricity/Heat)", as specified in Appendix A of the Gold Standard VER Manual for Project Developers and is therefore eligible under the Gold Standard.

A.4.4. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed project activity, including why the emission reductions would not occur in the absence of the proposed project activity, taking into account national and/or sectoral policies and circumstances:

The Project Activity involves the generation of renewable energy from wind. It thereby displaces grid electricity that is partly generated from fossil fuel fired power plants. The wind-driven blades are connected to an electricity generator, which produces electrical energy and supplies it to the grid without storage.

Enercon, a German turbine manufacturer, has been selected as technology provider due to the quality of its products in terms of high reliability, grid friendliness, low maintenance requirements and low noise levels. The turbines will be delivered from Germany to the project site. Blades will be produced in Turkey.

The Project includes 8 units of gearless, variable speed, variable pitch control Enercon E82 wind turbines with an output of 2,000 kW each, with a rotor diameter of 82 m and a sweeping surface of 5,281 m^2. The project activity is expected to supply 62,414 MWh of net electricity per year to the national grid via a 34.5 kV transmission line of 15 km length at the Edremit II transformer station.

When the wind speed is low, the wind farm will draw some electricity from the grid, which has to be produced partly by fossil fuel fired power plants. Although power augmentation during such wind fluctuations may be necessary, these amounts are negligible and are already accounted for by considering only the net electricity generation of the Project.

A.4.4.1. Estimated amount of emission reductions over the crediting period:

The Project is estimated to export a net electricity amount of 62,414 MWh per year to the electricity grid, which will result in 39,618 tCO_2 of emission reductions annually. The total emission reduction over the 7-year crediting period is 277,328 tCO_2, dispersed over years 2010-2017.

Table 1. Estimated emission reductions of the project activity over the crediting period

Year	Annual estimation of emission reductions in tonnes of CO_2 e
2010	20,081
2011	39,618
2012	39,618
2013	39,618
2014	39,618
2015	39,618
2016	39,618
2017	19,538
Total emission reductions (tonnes of CO_2 e)	277,328 **tCO_2**
Annual average over the crediting period of estimated reductions (tonnes of CO_2e)	**39,618**

SECTION B. Application of a baseline methodology

B.1. Title and reference of the approved baseline methodology applied to the project activity:

The latest version of the approved CDM large-scale methodology ACM0002, Version 07 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (dated December 14th, 2007) is applied for calculation of emission reductions. The ACM0002 methodology is hereafter referred to as the "baseline methodology".

For baseline emission calculations, ACM0002, Version 07 refers to the "Tool to calculate the emission factor for an electricity system", Version 01.1, which is used as well.

For additionality assessment, the "Tool for the demonstration and assessment of additionality", Version 05.2 is used, which is hereafter referred to as the "additionality tool".

All calculations in this section are performed in a conservative manner in order to avoid overestimation of generated emission reductions. The applied data is based on official, publicly available data.

B.1.1. Justification of the choice of the methodology and why it is applicable to the project activity:

The ACM0002 baseline methodology has been chosen because of the following reasons:

- The project activity consists of the installation of wind turbines, which will export electricity to the national grid system;
- The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available;
- The Project supplies electricity to the national grid and thereby displaces electricity from fossil fuel based power plants connected to the grid.

B.2. Description of how the methodology is applied in the context of the project activity:

The Project mainly involves electricity capacity addition, which reduces CO_2 through the substitution of grid electricity generation with fossil fuel fired power plants by renewable electricity. According to the baseline methodology, the emission reduction ER_y by the project activity during a given year y is found as;

$$ER_y = BE_y - PE_y - LE_y \qquad (1)$$

where BE_y is calculated as;

$$BE_y = (EG_y - EG_{baseline}) * EF_{grid,CM,y} \qquad (2)$$

The operation margin refers to a cohort of power plants that reflect the existing power plants whose *electricity generation* would be affected by the proposed project activity. The build margin refers to a cohort of power plants that reflect the type of power units whose *construction* would be affected by the proposed project activity.

The combined emission factor $EF_{grid,CM,y}$ for the project activity is calculated as a weighted average of Operating Margin emission factor and Build Margin emission factor as described in the baseline methodology;

$EF_{grid,CM,y} = w_{OM} * EF_{grid,OM,y} + w_{BM} * EF_{grid,BM,y}$ (3)

Definitions and explanations regarding the equations (1), (2) and (3) are given in Table 9.

Data and parameters that are available at validation:

Data / Parameter:	**$GEN_{i,y}$**
Data unit:	GWh
Description:	The gross electricity generation by fuel type i in year y (2002-2006)
Source of data used:	Turkish Electricity Transmission Company (TEİAŞ) website http://www.teias.gov.tr/istatistik2005/39.xls (2002-2005) http://www.teias.gov.tr/ist2006/36(06).xls (2006)
Value applied:	Table 2. Gross and Net Electricity Generation [GWh] in Turkey
Justification of the choice of data or description of measurement methods and procedures actually applied :	TEİAŞ annually publishes official data regarding electricity generation. Average share of each source in the overall generation has been calculated.
Any comment:	

Data / Parameter:	**Net Electricity $Generation_y$**
Data unit:	GWh
Description:	The difference between the total quantity of electricity generated by power plants/units and the auxiliary electricity consumption of power plants/units.
Source of data used:	Turkish Electricity Transmission Company (TEİAŞ) website http://www.teias.gov.tr/ist2006/30(84-06).xls (2002-2006)
Value applied:	Table 2. Gross and Net Electricity Generation [GWh] in Turkey
Justification of the choice of data or description of measurement methods and procedures actually applied :	TEİAŞ annually publishes official data regarding *total* net electricity generation, but its *breakdown* by fuel type is unavailable.
Any comment:	

Data / Parameter:	**Net Delivery Ratio$_y$**
Data unit:	-
Description:	The ratio of the total Net Electricity Generation to the total Gross Electricity Generation in year y.
Source of data used:	Net Electricity Generation and Gross Electricity Generation data from http://www.teias.gov.tr/ist2006/30(84-06).xls http://www.teias.gov.tr/istatistik2005/39.xls (2002-2005) http://www.teias.gov.tr/ist2006/36(06).xls (2006)
Value applied:	Table 2. Gross and Net Electricity Generation [GWh] in Turkey
Justification of the choice of data or description of measurement methods and procedures actually applied :	Electricity delivered to the grid by each power plant/unit or fuel source is unavailable. The Net Delivery Ratio$_y$ is used for approximating the net electricity amount delivered to the grid by power plants/units except lc-mr sources (GEN$_y$).
Any comment:	This is a conservative assumption, since in general thermal power plants consume more energy for auxilaries than e.g. hydro plants. This assumption leads to higher net electricity amounts and lower emission reductions consequently.

Data / Parameter:	**GEN$_y$**
Data unit:	GWh
Description:	The net electricity delivered to the grid in year y
Source of data used:	Calculation steps (for each year y): 1. Gross electricity generation excluding lc-mr sources = Total gross electricity generation from all sources - total gross electricity generation from lc-mr sources 2. Net electricity generation excluding lc-mr sources = Gross electricity generation except lc-mr sources * Net Delivery Ratio 3. Net electricity delivered to the grid except lc-mr sources = Net electricity generation except lc-mr sources + Imports
Value applied:	Table 12. Electricity Supply to Grid Equation (4)
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	**$FC_{i,y}$**
Data unit:	ton or 1000 m^3
Description:	Total amount of fossil fuel type i consumed by power plants/units in year y
Source of data used:	Turkish Electricity Transmission Company (TEİAŞ) website http://www.teias.gov.tr/istatistik2005/46.xls (2002-2005) http://www.teias.gov.tr/ist2006/43.xls (2006)
Value applied:	Table 13. NCVs and Emission Factors of Fuels
Justification of the choice of data or description of measurement methods and procedures actually applied :	Fuel consumption breakdown by power plant/unit is unavailable, total consumption amounts are published annually by TEİAŞ. These data are used together with $HV_{i,y}$ for calculating the NCV of each fuel type i.
Any comment:	The total amount of fossil fuels consumed by power plants/units also includes supplementary firing in cogeneration plants for seasonal heat generation. Since detailed information about it is unavailable, therefore it could not have been filtered out. However, most power plants do not utilize excess heat and this effect can be neglected. Wood waste, liquid sulphur, black liquor, bitumen pyrite, sulphur cake, coke gas, coke oven gas, black furnace gas and refinery gas amounts are not included in the official data, which is a conservative approach as well.

Data / Parameter:	**$HV_{i,y}$**
Data unit:	Tcal
Description:	Heating values of fuels consumed in thermal power plants in Turkey by the electric utilities
Source of data used:	http://www.teias.gov.tr/istatistik2005/47.xls http://www.teias.gov.tr/ist2006/45.xls
Value applied:	Table 13. NCVs and Emission Factors of Fuels
Justification of the choice of data or description of measurement methods and procedures actually applied :	These data are used together with $FC_{i,y}$ for calculating the $NCV_{i,y}$.
Any comment:	The publicly available data do not sub-categorize the coal amount by type for 2006. For harmonization with guideline reference figures, “hard coal” is assumed as *sub-bituminous coal* and “imported coal” is assumed as *other-bituminous coal*, which have similar corresponding NCVs.

Data / Parameter:	**$NCV_{i,y}$**
Data unit:	TJ/kt or TJ/milion m^3
Description:	Net calorific value of fossil fuel type i in year y
Source of data used:	Net calorific values of fuels used for power generation are not provided directly, but they are calculated as average by dividing $HV_{i,y}$ by $FC_{i,y}$, both of which are officially published.
Value applied:	Table 13. NCVs and Emission Factors of Fuels
Justification of the choice of data or description of measurement methods and procedures actually applied :	Since NCVs can be calculated, IPCC guideline figures are not used.
Any comment:	2006 breakdown of fuel consumption data do not differentiate between coal types. 2006 hard coal consumption of IPPs and autoproducers are regarded as other-bituminous coal, which do not distort the NCV figures.

Data / Parameter:	**$EF_{CO2,i,y}$**
Data unit:	tCO_2/TJ
Description:	CO_2 emission factor of fossil fuel type i in year y
Source of data used:	The lower limits of the 95% confidence interval stated in the "2006 IPCC Guidelines for National Greenhouse Gas Inventories", Volume 2, Chapter 1 (energy) Table 1.4.
Value applied:	Table 13. NCVs and Emission Factors of Fuels Table 4. CO2 Emissions of Recent Capacity Additions by Fuel Type
Justification of the choice of data or description of measurement methods and procedures actually applied :	Emission factors are locally not available for Turkey, and there exist no national or regional average default figures, therefore industry guidelines are used instead.
Any comment:	

Data / Parameter:	EI_y
Data unit:	GWh
Description:	Net electricity imports delivered to the grid in year y
Source of data used:	Turkish Electricity Transmission Company (TEİAŞ) website http://www.teias.gov.tr/ist2006/23.xls
Value applied:	Table 12. Electricity Supply to Grid
Justification of the choice of data or description of measurement methods and procedures actually applied :	This is the total electricity imported and delivered to the national grid from connected electricity systems (neighbour countries).
Any comment:	

Data / Parameter:	Electricity Capacity Additions
Data unit:	-
Description:	Power plants which are most recently taken into operation
Source of data used:	Turkish Electricity Transmission Company (TEİAŞ) TEİAŞ Capacity Projection 2007-2016 Study http://www.teias.gov.tr/istatistik2005/7.xls http://www.teias.gov.tr/istat2004/7.xls http://www.teias.gov.tr/istatistik/7.xls
Value applied:	Table 16. Recent Capacity Additions 2003-2006
Justification of the choice of data or description of measurement methods and procedures actually applied :	Average generation values are used for hydro power plants. Since capacity additions between 2004-2006 are not sufficiently large, a natural gas / naphtha power plant has been included as well, which was taken into operation in year 2003.
Any comment:	As the methodology suggests, isolated and retrofitted power plants/units as well as performance revisions are not regarded.

Data / Parameter:	$\eta_{m,y}$
Data unit:	%

Description:	Average net energy conversion efficiency of power unit m in year y
Source of data used:	UNFCCC methodological tool "Tool to calculate the emission factor for an electricity system" v.01.1, Annex I
Value applied:	Table 4. CO2 Emissions of Recent Capacity Additions by Fuel Type
Justification of the choice of data or description of measurement methods and procedures actually applied :	There is no official efficiency values available based on each power plant or each fuel type in Turkey. Most natural gas power plants in Turkey are combined cycle, most coal power plants operate sub-critical and most liquid fuel power plants adopt an open cycle technology.
Any comment:	

Ex-ante calculation of emission reductions:

STEP 1. Identify the relevant electric power system

A *project electricity system* is defined by the *spatial extent* of the power plants that are physically connected through transmission and distribution lines to the project activity and that can be dispatched without significant transmission constraints. There is no officially available and published delineation of the project electricity system and connected electricity systems for Turkey. In the Turkish electricity system, power plants can be dispatched without significant transmission losses. In this respect, the spatial extent of the Project Boundary is defined as the *national electricity grid* of Turkey.

Some power plants, which are not connected to the national grid and are operated stand-alone, are included in the project boundary, since no detailed data are available to filter them out. However the share of these stand-alone power plants in overall gross generation is negligibly small[1]. These are some of the so-called *autoproducers*, who mostly cover their own seasonal energy demand peaks with their own stand-alone thermal power plants.

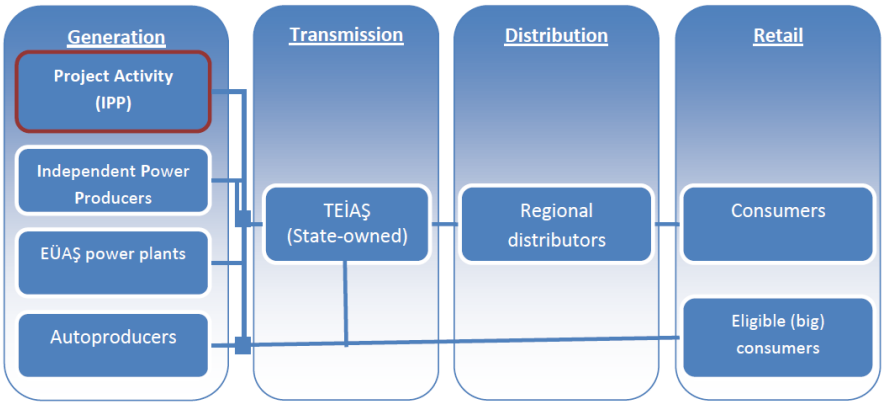

Figure 2. Overview of the Turkish electricity system

[1] Around 0.2% for recent years (http://www.teias.gov.tr/istat2004/44.xls, http://www.teias.gov.tr/istatistik2005/45.xls, http://www.teias.gov.tr/ist2006/41.xls)

A likely transmission line construction is not considered in BM emission factor calculations. Turkey imports electrical power from and exports to neighbour countries[2], which are defined as *connected electricity systems* for the Project. According to the baseline methodology, imports are regarded as a power source delivering electricity to the grid with an OM emission factor of 0 tCO_2, since electricity being imported is purchased from connected electricity systems located in other countries.

STEP 2. Select an operating margin (OM) method

There exists no nuclear power plant in Turkey, and there is no indication that coal or lignite are obviously used as must-run. Hydro, geothermal, wind power plants and other renewables are included as low-cost/must-run resources, hereafter referred as *lc-mr*, which turns out to be 26.5% of the total electricity generation on average between years 2002 and 2006:

Table 2. Gross and Net Electricity Generation [GWh] in Turkey

		2002	2003	2004	2005	2006	Avg. Share
Coal		4,093	8,663	11,998	13,246	14,217	6.7%
Lignite		28,056	23,590	22,450	29,946	32,433	18.0%
Fuel Oil		9,505	8,153	6,690	5,121	4,232	4.6%
Diesel oil		271	4	7	3	58	0.1%
LPG		35	3	33	34	0	0.0%
Naphtha & Asphaltite		933	1,036	940	326	50	0.5%
Natural Gas		52,497	63,536	62,242	73,445	80,691	43.6%
low cost-must run	**Renew. & Wastes**	174	116	104	122	154	0.1%
	Hydro	33,684	35,330	46,084	39,561	44.244	26.3%
	Geothermal	105	89	93	94	94	0.1%
	Wind	48	61	58	59	127	0.0%
Gross Total		129,400	140,581	150,698	161,956	176,300	**100%**
Gross Total, excluding lc-mr resources		95,389	104,985	104,360	122,120	131,681	**73.5%**
Net generation		123,727	135,248	145,066	155,469	169,543	
Net Delivery Ratio [%]		95.6%	96.2%	96.3%	96.0%	96.2%	

[2] Since 2001: Exports to Georgia, Azerbaijan, Iraq, Syria. Imports from Bulgaria, Iran, Turkmenistan, Georgia. Sources: http://www.teias.gov.tr/ist2006/49.xls, http://www.teias.gov.tr/ist2006/47.xls

The baseline methodology allows a choice among four methods for the calculation of OM emission factor;

(a) Simple OM, or

(b) Simple adjusted OM, or

(c) Dispatch Data Analysis OM, or

(d) Average OM

There exist no publicly available data for the dispatch data analysis (c) or for the simple adjusted OM (b). Since the average share of electricity generation by lc-mr plants for five most recent years is found to be less than 50%, option (a) is chosen. The simple OM emission factor can be calculated using either of the two data vintages:

- *Ex-ante option*, where a 3-year generation-weighted average based on the most recent data is used. Monitoring and recalculation of the emission factor is not required, or
- *Ex-post option*, where the data of the year is used, in which the project activity displaces grid electricity. Yearly update of the emission factor is required.

The *ex-ante option* is selected to carry out the baseline methodology for the Project.

Official emission figures of Turkey submitted to UNFCCC are available for the time period 2002-2004[3]. No newer official emission figures have been published. Identification of the OM emission figures for a more recent time range requires calculations. Therefore, official 2004 CO_2 emissions data stemming from electricity generation are used directly, whereas 2005 - 2006 emissions are calculated.

STEP 3. Calculate the operating margin emission factor according to the selected method

The Simple OM emission factor is calculated as the generation weighted average CO_2 emissions per unit net electricity generation of all generating power plants serving the system, excluding lc-mr sources using one of the following approaches;

- Option A: Based on data on fuel consumption and net electricity generation of each power plant/unit, or
- Option B: Based on data on net electricity generation and the average efficiency of each power unit and the fuel types used in each power unit, or
- Option C: Based on data on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

Since power plant-specific data required by Options A and B are unavailable, Option C is selected. Option C can be used, as only renewable sources are considered as lc-mr power sources and the quantity of electricity supplied to the grid by these sources is known. According to the "Tool to calculate the emission factor for an electricity system" v.01.1;

$$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} * NCV_{i,y} * EF_{CO2,i,y}}{GEN_y} \qquad (4)$$

[3] UNFCCC 2006 National GHG Emission Inventory

Definitions and details to the parameters in Equation (4) are given in Table 10 .

As a result, the Simple OM emission factor is found as below;

Table 3. Calculation of the OM emission factor

Parameter	2004	2005	2006
CO_2 Emissions [$ktCO_2$]	76,185[4]	74,426	82,787
GEN_y [GWh]	100,923	117,864	127,208
$EF_{grid,OMsimple,y}$ [tCO_2/MWh]	0.755	0.631	0.651
OM emission factor [tCO_2/MWh]	**0.679**		

STEP4. Identify the cohort of power units to be included in the build margin

In this step, a generation-weighted average emission factor is calculated based on a sample of power plants, which have been taken into operation recently. The sample group of power plants/units *m* used to calculate the build margin consists of either:

(a) The set of five power units that have been built most recently

(b) The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.

For conducting the calculations, option (b) is selected, because this option results in a larger electricity generation. In terms of vintage data, there are two options available:

Option 1: *"For the first crediting period, calculate the build margin emission factor ex-ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period."*

Option 2: *"For the first crediting period, the build margin emission factor shall be updated annually, ex-post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex-ante, as described in option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used."*

Option 1 is selected.

The data of the most recent commissioned power plants are being published by the Turkish Electricity Transmission Company (TEİAŞ) on an annual basis. For build margin calculations, the power plants/units taken into operation between 2003 and 2006 are included in the cohort of power units. Performance revisions, modifications, retrofits and

[4] Official 2004 emission figure stemming from electricity generation activities (Source: Statistical Year Book 2006, page 20). Used directly since the identified lc-mr sources (mostly hydro) do not generate CO_2 emissions.

dismantlings of power plants or are stand-alone have been excluded from the samples list for the build margin calculations.

Total capacity additions between the years 2004 -2006 are not sufficiently large to constitute 20% of the system generation; therefore for the sake of conservative approach a natural gas fired power plant from 2003 capacity additions is included as well. The final sample group represents a total generation capacity addition of 35,436 GWh and exceeds 20% of the 2006 gross electricity generation, which is 176,300 GWh. Please see Annex 2 Table 16 for details.

STEP 5. Calculate the build margin emission factor

The build margin emission factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units m during the most recent year y for which power generation data is available, calculated as follows;

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} * EF_{EL,m,y}}{\sum_m EG_{m,y}} \qquad (5)$$

The $EF_{EL,m,y}$ is found as;

$$EF_{EL,m,y} = \frac{EF_{CO2,m,i,y} * 3,6}{\eta_{m,y}} \qquad (6)$$

Definitions and explanations regarding Equations (5) and (6) are given in Table 11.

Table 4. CO_2 Emissions of Recent Capacity Additions by Fuel Type

Fuel Type	Generation of New Capacity Additions, GWh	Average Efficiency, η	Emission Factor, tCO_2/TJ	CO_2 Emissions, $ktCO_2$
Coal	1,462.5	39.0%	89.5	1,208
Lignite	11,440.0	39.0%	90.9	9,599
Fuel Oil	565.3	39.5%	75.5	389
Diesel oil	4.1	39.5%	72.6	3
LPG	0.0	60.0%	61.6	0
Naphtha & Aphaltite	322.9	39.5%	69.3	204
Natural Gas	19,592.0	60%	54.3	6,383
Renewables and wastes	127.0	0%	0	0
Hydro	1,754.9	0%	0	0
Geothermal & Wind	167.4	0%	0	0
Total	**35,436**			**17,786**
Build Margin EF	**0.502**			

Power plant-specific data are unavailable in Turkey; therefore CO_2 emissions are calculated based on fuel type consumed in sample power plants/units. As data regarding electricity generation efficiency rates in Turkey are not

available either, industry guidelines are used[5] in a conservative approach. When selecting the power plants, revisions and dismantled plants have been discarded, as the methodology suggests.

Using the Equation (5), the total CO_2 emissions (17,786 $ktCO_2$) of the sample power plants are divided by the total electricity generated (35,436 GWh), and the build margin emission factor $EF_{grid,BM,y}$ is found to be **0.502** tCO_2/MWh. Further information is available in Annex 2, Table 17.

STEP 6. Calculate the combined margin emissions factor

The combined margin emissions factor is calculated by using Equation (3);

$EF_{grid,CM,y}$ = 0.679 tCO_2/MWh * 0.75 + 0.502 tCO_2/MWh * 0.25 = **0.635 tCO_2/MWh**

Emission Reduction

The emission reduction is thus found by using Equations (1) and (2);

$ER_y = EG_y * EF_{grid,CM,y}$ = 62,414 MWh * 0.635 tCO_2/MWh = 39,618 **tCO_2**

Summary of the ex-ante estimation of emission reductions

Parameter	Definition	Value
$EF_{grid,OM,y}$	Operating Margin Emission Factor in year y	0.679 tCO_2/MWh
$EF_{grid,BM,y}$	Build Margin Emission Factor in year y	0.502 tCO_2/MWh
$EF_{grid,CM,y}$	Combined Margin Emission Factor in year y	0.635 tCO_2/MWh
EG_y	Net electricity delivered to grid by the Project	62,414 MWh/a
ER_y	Emission reduction in year y	39,618 tCO_2/a

The project is expected to generate 31,634 MWh in 2010. Beginning with 2011, the project is expected to operate with full capacity. The emission reductions are therefore foreseen as below;

[5] This is a conservative approach, as "Best Available Techniques" may not always apply to recently built power plants. Furthermore, for power plants fuelled by multiple fuel types, the fuel type with lower emission factor has conservatively been assumed.

Table 5. Emission reductions of the project activity over the crediting period

Year	Annual estimation of emission reduction [tCO_2]
2010	20,081
2011	39,618
2012	39,618
2013	39,618
2014	39,618
2015	39,618
2016	39,618
2017	19,538
Total emission reductions [tCO_2]	**277,328 tCO_2**
Annual average of estimated reductions over the crediting period [tCO_2]	**39,618**

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered VER project activity:

The Project activity consists of the installation of a new, grid-connected, renewable energy power plant. The respective baseline scenario would be the generation of grid-connected power, which would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system" v.01.1. The project activity is a green field investment, which does not modify or retrofit any existing electricity generation facility. The emission factors are calculated with the most recent data available at the date of PDD compilation. The additionality tool consists of the following steps;

- Identification of alternatives to the project activity;
- Investment analysis to determine that the proposed project activity is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible;
- Barriers analysis; and
- Common practice analysis.

STEP 1. Identification of alternatives to the project activity consistent with current laws and regulations

This step involves the definition of realistic and credible alternatives to the project activity that can be part of the baseline scenario.

Sub-step 1a. Define alternatives to the project activity:

The Project involves the generation of electricity and sales of VER credits. It will help Turkey to stimulate and commercialise the use of grid connected renewable energy technologies and markets. The two alternatives identified to the project activity are;

Alternative A. The proposed project activity will be undertaken without the generation and sale of VER credits.

- The Project Owner's experience and knowledge is focused on wind energy only. The Project Owner has no alternative plan, e.g. hydro or fossil-fuel fired power plants that it would realize as an alternative option. The Project owner has no such power plant under its ownership, no intention or any license or permit application regarding such alternatives. Therefore the Project activity is the only scenario that the Project owner can realize. The revenues derived from the sale of voluntary emission reductions have been included in the financial feasibility analysis and preliminary negotiations with the bank, and the investment decision relies upon carbon trading. Since the project is not feasible for project participants without the sales of VER credits due to its low IRR, the Project will not be realized and this alternative cannot be considered as the baseline scenario. These statements will be further elaborated within the framework of a barrier analysis in this section.

Alternative B. Continuation of the current situation: The project activity is not realized and investors do not take any actions.

- In this alternative, the same amount of electricity to be produced by the project activity will be generated by other power plants connected to grid, where the energy mix is dominated by fossil fuel fired power plants.

No realistic and credible alternative scenarios to the proposed project activity can be identified that deliver electricity with comparable quality, properties and application areas. The national grid is already increasing its installed capacity through expansion of existing power plants and constructing new power plants. As similar activities, only wind farms are identified, since organisational, technical, economical and sustainability aspects of other renewable energy technologies (e.g. hydropower, geothermal, solar etc.) are not directly comparable to wind energy. Hydropower plants are not directly comparable to wind farms, since a specific HEPP that provides the same amount of energy can have much lower or higher plant load factors[6] (i.e. installed capacity and capital expenditure) than the Project activity, making it difficult to compare them on an economical basis. Environmental and social aspects of HEPPs also vary widely (some having serious negative impacts while others can have mitigated low impacts), therefore it would not be correct to suggest that HEPPs provide the same product (clean energy) as the Project does. Furthermore, several HEPPs in Turkey require additional revenues from carbon credits, therefore they should not be regarded as alternatives to the Project. For these reasons, hydropower technology cannot be considered as an alternative to the Project activity. There is no specific HEPP project by any investor that is known to be planned as an alternative to the Project activity.

Other technologies like PV, solar thermal, geothermal[7] or biomass are also not plausible alternatives, because economic incentives are not high enough in Turkey to make them economically viable and financially feasible[8]. In the host country, electricity generated from these resources are priced the same as hydro, wind or thermal, and these technologies have not reached maturity to compete with them on the price basis[9]. Only a few biogas or geothermal power plants exist in Turkey, which are carbon projects. Commercial solar plants do not exist at all, showing that these are not alternatives to the Project either.

There is no indication (i.e. power generation license, relevant permits etc.) that another specific investor is or would be planning a specific renewable energy or thermal power plant in the host country as an alternative to the Project activity (that would be built in case the Project is not built)[10]. Thus, continuation of the current situation, with the electricity generated by the operation of grid connected power plants and by the addition of new generation sources in the Turkish National Grid can be considered as a realistic alternative for the project activity and no other alternatives other than both above mentioned alternatives have been considered as potential baseline scenarios.

Outcome of Step 1a: Identified realistic and credible alternative scenario(s) to the project activity.

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[6]Source: UNEP Risoe CDM Pipeline http://cdmpipeline.org/publications/CDMpipeline.xlsx

[7]Turkey has a geothermal heating potential rather than electricity generation. As of 2005, 170 future geothermal prospects had been identified in Turkey with 95% unsuitable for power generation. Source: http://en.wikipedia.org/wiki/Geothermal_power_in_Turkey

[8]Indicative, levelised, economic costs for renewable power exclusive of subsidies or policy incentives suggest that electricity costs of PV, solar thermal and biomass is high. Source:REN21 (2010) Renewables 2010, Global Status Report p.26 (http://www.ren21.net/globalstatusreport/REN21_GSR_2010_full.pdf)

[9]The Renewable Energy Law (Nr. 5346) sets a price cap of 5.5 EUR cents per kWh for electricity generated by renewable sources. The law does not distinguish between different renewable sources. Source: http://www.epdk.gov.tr/mevzuat/diger/yenilenebilir/reseng.doc

[10] http://www.epdk.gov.tr/lisans/elektrik/lisansdatabase/verilentesistipi.asp

Alternative B is identified as the baseline scenario, since Alternative A is not applicable, which will be further elaborated in this section. According to the baseline scenario, the electricity delivered to grid will continue to be fed by a power plant portfolio, which is highly fossil fuel dominated and CO_2 intensive (see below).

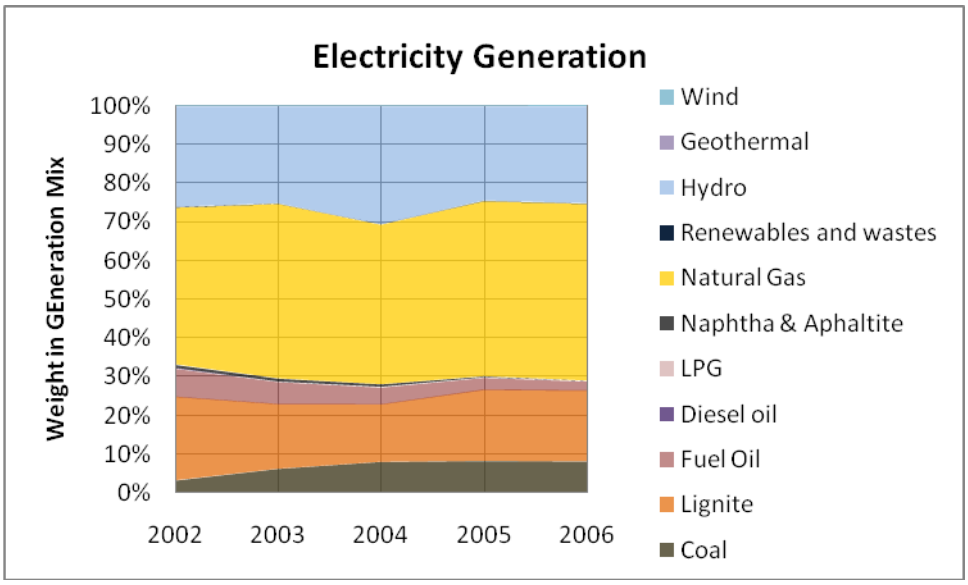

Figure 3. Electricity generation mix in Turkey[11]

Figure 3 above shows the current practice of electricity generation in Turkey; the weight of fossil fuels in electricity generation has been around 70-75% for the last five years and is not expected to change much in the future as highlighted in Figure 4.

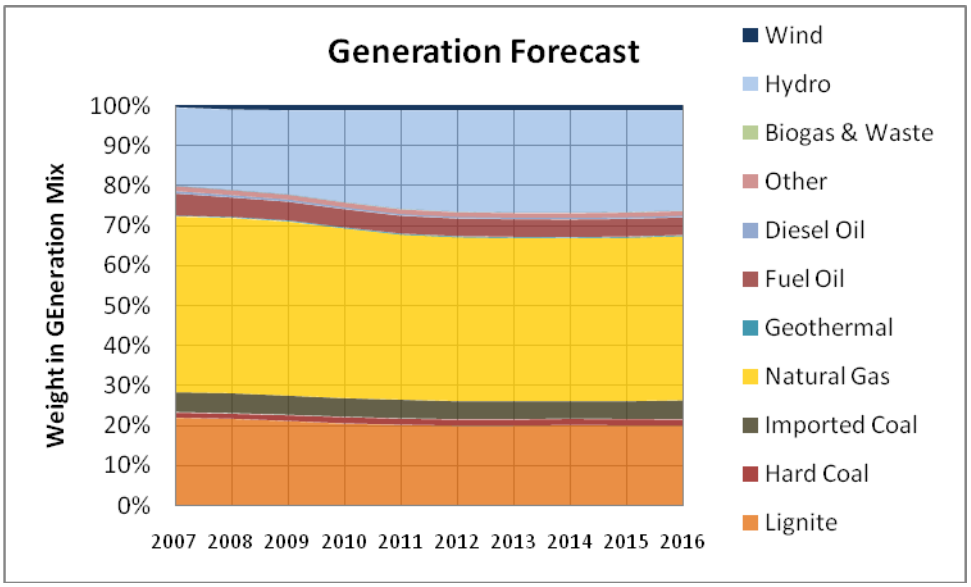

Figure 4. Electricity Generation Forecasts[12]

[11] Based on TEİAŞ data, http://www.teias.gov.tr/istatistik2005/39.xls, http://www.teias.gov.tr/ist2006/36(06).xls .
[12] TEİAŞ capacity projection 2007-2016, p.30. (http://www.teias.gov.tr/projeksiyon/projeksiyon%20Temmuz2007.pdf)

The official forecasts as displayed in Figure 4 suggest that in the future power generation in Turkey will be dominated by fossil fuel sources covering more than 70% of the overall electricity supply. In this framework, the continuation of the current situation (Alternative B) would mean carrying on this fossil fuel dominated trend.

The same forecasts show that wind energy is expected to cover around 1% of Turkey's electricity demand during 2007-2016. Thus, wind farm projects most likely will *not* become business as usual in the near future.

Sub-step 1b. Consistency with mandatory laws and regulations

Both alternatives as well as the project activity are subject to the following laws;

Relevant Laws	**Number / Enactment Date**
Electricity Market Law	Nr. 4628 / 03.03.2001
Energy Efficiency Law	Nr. 5627 / 02.05.2007
Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy	Nr. 5346 / 18.05.2005
Environmental Law	Nr. 2827 / 11.08.1983

There are various regulations in connection with these laws as well. The mandatory preliminary permits are obtained and the Project activity is in compliance with the current laws and regulations. Turkey did not ratify the Kyoto Protocol and has no national legal binding emission reduction goals for power plants. Hence, both alternatives, A and B, are consistent with the applicable legislation.

Outcome of Step 1b: As mentioned above, if the project activity is not feasible and will not be realized, the project participant does not have an alternative investment plan that would generate electricity with a comparable quality and similar amount. Alternative A cannot be considered as a plausible scenario because of financial, investment, technological and prevailing practice barriers that would prevent the project activity from being implemented, which will be further elaborated under this section. Therefore, the only plausible baseline scenario to the Project is Alternative B: the continuation of the current situation without realization of the proposed Project Activity.

For the demonstration of additionality, a barrier analysis or an investment analysis, or both can be conducted. Barrier analysis is applied.

STEP 2. Investment Analysis

The Investment Analysis is not applied.

STEP 3. Barrier Analysis

This analysis determines whether the proposed project activity faces barriers that:

(a) Prevent the implementation of this type of proposed project activity; and

(b) Do not prevent the implementation of at least one of the alternatives

Sub-step 3a. Identify barriers that would prevent the implementation of the proposed project activity:

Investment -, technical -, prevailing practice- and other barriers are explained below for the scenario identified as Alternative A, which assumes that the project activity being implemented without consideration of revenues from VER credits;

(a) Investment barriers

- Lack of Infrastructure: Legally TEİAŞ is required to construct the 15 km 34.5 kV transmission line to connect the Project site to the national grid, since the Project is located in a relatively remote location. Although associated costs are later "compensated" by TEİAŞ, the official internal price tariffs are structured such that this compensation is not based on actual up to date costs, resulting in a significant loss on behalf of the project participant.
- As of PDD development date, no similar and comparable wind energy project has been taken into operation without VER credits in Turkey.
- Access to finance: Although being one of the leading and credited wind energy companies in Turkey, the project participant experiences difficulties in securing finance for the Project because of the following reasons;
  - Transmission Fee: The transmission line system usage fee depends on the project location and can differ significantly. It constitutes a significant operating cost item for the Project, since this fee is the second highest[13] among 23 distribution grids in Turkey, reducing the feasibility of this Project in particular. Furthermore, the expected privatization process of these distribution networks contains the risk of distribution fee increases.
  - Equipment Selection: Enercon wind turbines, which are chosen for the Project, have higher prices than comparable turbines. This choice is justified by their high quality, reliability, extensive technical support, grid friendliness, low maintenance requirements and low noise. However, it amplifies the investment volume, thus posing another barrier.
  - After the recent credit crunch and the related global financial crisis, the international and the local financial sector is having a wide range of challenges. With several banks gone bankrupt or taken over by governments/competitors, the financial world has shifted its focus more to internal difficulties rather than financing projects. Nowadays, several banks have stopped new loans and even started calling their loans back before maturity. Project developers in Turkey are also facing the same difficulties, adding very significant barriers to the feasibility of the Projects. The Project proponents are not sure anymore whether financial institutions will be able to supply loans for the Projects with comparable conditions as before.

    The Turkish financial market is experiencing such high difficulties that some commercial Turkish banks are even exercising their "call back" option for their loans, which means that banks take extreme measures to ensure their survival. This, on the other hand, leaves companies in very difficult positions. Turkish banks have lately been criticized by the government for acting too much on their behalf without paying attention on their customers, and these arguments have been accepted even by the Turkish Banks' Association. In this environment, companies have very serious financial problems and new projects are having various challenges for finding finance. These developments leave no doubts about the financial additionality of the Projects under validation.

[13] http://www.emra.org.tr/tarife/elektrik/iletim/1407/1407.html

As a result of these changes, the ongoing loan discussions with the bank have been halted abruptly by the bank until February 2009. Further discussions revealed that the bank's loan conditions are not attractive for the Project Owner and the talks have been stopped in December 2009. The Project Owner has initiated talks with another commercial bank in January 2010 and has signed the loan agreement as of February 2010. The delay in securing finance clearly demonstrates the financial barriers faced.

(b) Other Barriers

- Institutional Capacity: A significant portion of the required technology and know how must be imported. The former wind farm projects of the same Project proponents have resulted in the formation of a joint venture for wind turbine blade manufacturing, demonstrating the know how transfer caused by similar projects. As of today, this JV is selling blades to internal and external buyers. Moreover, the selected Enercon wind turbines for the Project activity are grid friendly units, allowing further expansion capacity of wind power plants in the grid, which is an additional benefit of the Project. However, TEIAS prefers to limit the wind power capacity at each transformer station without differentiating between different wind turbine specifications. Therefore, the Project had to apply for a generation license with a lower installed capacity.
- Legal and bureaucratic difficulties: The first licensing application for the Project has been submitted on 29.12.2003 to EMRA. Upon consecutive requests, additional documentation is supplied until 21.01.2004. Following the license fee payment on 11.03.2004 and an inspection and examination period for more than 2 years, an information and permit update has been requested by EMRA on 31.05.2006. Desired documents are submitted on 14.09.2006. The license has been obtained on May 10th, 2007. On 26.07.2007, EMRA asked bigger turbines to be used, therefore a license amendment application is made. Apart from this aspect, a legal judgement regarding a law concerning forestry areas resulted in an abrupt halt of some energy projects in Turkey, which shows the unforeseeable nature of legal, political and bureaucratic risks investors are faced with. However, this judgement has been lifted later on, and the project is compliance with the legislative frameworks.

Outcome of Step 3a:
The identified barriers are sufficient grounds for demonstration of additionality since they prevent potential project proponents from carrying out the proposed project activity undertaken without being registered as a VER project activity. The barriers mentioned above prevent the realization of Alternative A (the proposed Project Activity undertaken without VER credits).

Sub-step 3b. Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity)

Identified barriers explained in Sub-step 3a would not prevent the implementation of the Alternative B, which is mainly the continuation of fossil fuel and hydro power plant construction because of the following reasons:

- Investment Barriers: Investment barriers partly affect ongoing power plant investments; however as the current practice of financial institutions also shows, fossil fuel powered power plant investments often face considerably lower investment barriers as a result of:
  - Smaller initial investment volumes compared to similar-capacity renewable energy projects: The Project's technology has a higher investment volume per MW[14] compared to fossil fuel fired power plants. The Project had a very hard time accessing finance and loan discussions have taken a

[14] http://www.epdk.gov.tr/lisans/elektrik/kaynakbazinda/kaynakbazinda.htm

long time. Therefore Project's alternatives (i.e. mostly fossil-fuel fire power plants) are not affected by the same financial and institutional barriers.

- Familiarity of financiers, investors and authorities: The Project had to apply for a lower capacity (as MW) because of the insufficient institutional capacity of relevant public bodies (please refer to "institutional capacity" barrier for details). Fossil fuel fired power plants are very well known by public authorities and financial institutions as they dominate electricity generation of Turkey. Only licensing, apart from other permits, took about 3.5 years. Therefore the barriers do not apply to the alternatives.

- Technological Barriers: Big hydro- and fossil fuel fired thermal power plants, which constitute a large portion in the installed capacity forecasts, utilize conventional technologies, which are well known and mature. In Turkey there are technically competent equipment suppliers, technical planners, contractors, maintenance staff etc. regarding such investments. Therefore the continuation of the current situation does not involve any identifiable technological barriers.
- Prevailing Practice: This alternative already involves the current practice and is therefore not applicable.
- Other Barriers: In general, there is an oversupply of imported natural gas in Turkey because of Turkey's international take-or-pay purchase contracts. Therefore, the national energy policy supports the expansion of natural gas networks stimulating the demand. Furthermore, the Turkish energy policy is based on a strategy acting as an energy bridge between the Eastern and the Western oil and gas markets, thereby securing its own fossil fuel supply and gaining strategic position in global energy markets. This strategy prioritizes fossil fuels at political levels, whereby renewable resources and their strategic importance are seen as secondary. In terms of licensing procedure, renewable energy investors are faced with additional permit bureaucracy (e.g. wind farm license applications are not being accepted by EMRA as of the date of GS application, projects on overlapping areas need to pay additional fees or settle with other project applicants etc.), which thermal power plant projects are not faced with, since such conventional projects do not require to be set up on natural resources).

These reasons stated above prevent Alternative B being affected by the barriers, whereas these barriers seriously affect the Alternative A.

STEP 4. Common Practice Analysis

Common Practice Analysis checks whether the proposed project type has already diffused in the relevant sector and region.

Sub-step 4a. Analyze other activities similar to the proposed project activity

As far as similar activities to the Project are concerned, wind power plants under IPP[15] model with comparable installed capacities can be identified.

Out of the 81 licenses available, only 15 are in operation (total capacity 333.35 MW) and 2 of them are under construction (total capacity 142.80 MW). The progress of the remaining wind farm projects is unknown, and several licenses and license applications have been cancelled due to various reasons in the past by EMRA. This illustrates that there is a low correlation between wind power project license ownership and project implementation and that implementation of wind power projects in Turkey is rather difficult.

[15] Independent Power Producer

EMRA has prohibited wind power license applications for an unknown period of time for an unknown reason. On November 1, 2007, the prohibition on wind farm license applications has been lifted by EMRA only for one day, and a big volume in applications has been observed. However, there have been several multiple overlapping applications for the same locations. As fees and technical requirements for the license applications are minimal, this intensive interest of applicants can be associated with:

- Obtaining licenses by companies aiming to sell their license to third parties
- Creation of a project portfolio for a potential future use
- Precaution against future uncertainty by applying for non- or semi-developed projects
- Prevention of competitors reserving attractive wind farm locations

In the past, a significant percentage of applications and granted licenses have either been rejected or cancelled later, therefore the available licenses have a low realization implication. Based on these arguments and recent experience, these recent license applications have not been considered to be significant.

Sub-step 4b. Discuss any similar options that are occurring

As discussed above, wind farms are not common practice in Turkey, as their share in overall electricity generation is and will be under 1% according to official projections. Although wind farm projects in Turkey face various barriers besides economic ones, their realization chance can be improved by the sales of VERs, which would offset some of their difficulties by means of better feasibility figures.

As of October 6th,2008, the list of wind parks in operation and under construction is given below;

Table 6. Wind farms in operation[16]

Location	Company	Operational Start	Installed Capacity [MW]	Business Model[17]
İzmir-Çeşme	Alize A.Ş.	1998	1.5	IPP*
İzmir-Çeşme	Güçbirliği A.Ş.	1998	7.2	BOT
Çanakkale-Bozcaada	Bores A.Ş.	2000	10.2	BOT
İstanbul-Hadımköy	Sunjüt A.Ş.	2003	1.2	Autoproducer
Balıkesir-Bandırma	Bares A.Ş.	I/2006	30	IPP-VER
İstanbul-Silivri	Ertürk A.Ş.	II/2006	0.85	IPP
İzmir-Çeşme	Mare A.Ş.	I/2007	39.2	IPP[18]-VER
Manisa-Akhisar	Deniz A.Ş.	I/2007	10.8	IPP-VER
Çanakkale-İntepe	Anemon A.Ş.	I/2007	30.4	IPP-VER
Çanakkale-Gelibolu	Doğal A.Ş.	II/2007	14.9	IPP-VER
Hatay- Samandag	Deniz A.Ş.	I/2008	30	IPP-VER
Manisa- Sayalar	Dogal A.Ş.	I/2008	30.6	IPP-VER
İzmir- Aliaga	Innores A.Ş.	I/2008	42.5	IPP-VER
İstanbul-Gaziosmanpaşa	Lodos A.Ş.	II/2008	24	IPP-VER[19]
İstanbul-Çatalca	Ertürk A.Ş.	II/2008	60	IPP-VER
Total			**333.35**	

*former autoproducer

[16] Source: EMRA Website, http://www.emra.gov.tr/lisans/elektrik/yek/ruzgarprojeleriningelisimi.xls. Date: October 6th,2008
[17] Source: www.iklim.cevreorman.gov.tr/belgeler/03.pdf (Ministry of Environment and Forestry Report, December 2008, p.39, Table 17)
[18] Independent Power Producer.
[19] Source: www.lodoselektrik.com.tr/PDF/GS_Paydas_Kons%C3%BCltasyonu_2cisi.pdf

Table 7. Wind farms under construction[16]

Location	Company	Operational Start	Installed Capacity [MW]	Business Model[17]
Balıkesir-Şamlı	Baki A.Ş.	II/2008	114	IPP-VER
Muğla-Datça	Dares A.Ş.	II/2008	28.8	IPP-VER
Total			**142.80**	

The first wind farms in operation have been realized under "BOT[20]" or "autoproducer" models. Autoproducers generate electricity primarily for their own electricity consumption, and they are allowed to feed only a fraction of their generation to the grid. The BOT model is not applicable in Turkey anymore, as the existent BOT projects have special contracts with the government and will be handed over to the government after a certain period of time. As BOT and autoproducer wind farms are not completely liberal electricity market players and are limited in terms of number and installed capacity, they are not considered as common practice nor similar projects.

After the "liberalization" of the electricity market, which is still in a transformation period, investors have been allowed to build and operate their own power plants for electricity production and sales to the national grid as IPPs. The 1.5 MW İzmir Çeşme wind farm has been built under the Autoproducer scheme and cannot be considered as being realized as an IPP. The only remaining IPP wind farm is the 0.85 MW İstanbul Silivri wind farm, which can be seen as an outlier in terms of number and scale. All the other wind farms in operation have either carried out or are undergone a VER procedure for facilitating additional revenues enabling the realization of projects. This shows that no other similar activity to the Project (i.e. IPP wind farm) has been realized without the consideration of carbon credits, clearly demonstrating that the Project activity is *not* common practice.

Since wind energy constitutes a very limited portion of the Turkish electricity market, the Project Activity goes beyond of "business as usual" scenario and cannot be considered as a common practice. As a result, the Project is considered to be additional.

Gold Standard Additionality Screen

Previously announced projects screen

GS Manual for VER Project Developers: **Section 3.3.1**

There has been no public announcement of the Project going ahead without the VER, prior to any payment being made for the implementation of the Project.

Prior to the implementation of the Project activity, the Project Developer has concluded a decision about VER development on 23.07.2007, indicating early consideration. The Project Developer has also sent a letter to the Turkish National Focal Point stating its intention to register the project activity under GS VER in order to inform the Turkish National Focal Point about the project.

ODA Additionality Screen

GS Manual for VER Project Developers: **Section 3.3.3**

Project financing for this project activity will not use any public funding nor Official Development Assistance (ODA) Funds as defined in the Gold Standard Manual for Project Developers. There are no loans or grants being provided by International Finance Institutions, which include ODA.

[20] Build-Operate-Transfer

Conservative Approach

GS Manual for VER Project Developers: **Section 3.3.3**

The baseline scenario selection and the calculation of green house gas emission reductions have been carried out in a conservative manner:

- Project proponents have used approved methodologies by the CDM Executive Board (ACM0002, Version 07 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" and the "Tool to calculate the emission factor for an electricity system" v.01.1) in order to determine the baseline scenario and calculate emission reductions.
- When no appropriate data is available, the assumptions are made conservatively by making choices which lead to the lowest emission reductions for the sake of conservatism.
- All calculations are based on official and publicly available data. Data sources have all been referenced in the PDD. Calculations have been done in a transparent manner providing full documentation and references to data sources to the DOE.

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the project activity:

The greenhouse gases and emission sources included in or excluded from the Project boundary are:

Table 8. Emission sources included or excluded from the Project boundary.

Source		Gas	Included?	Justification / Explanation
Baseline	CO_2 emissions that are displaced due to the Project Activity from electricity generation in fossil fuel fired power plants connected to national grid	CO_2	Yes	Main emission source. The dominant emissions from power plants are in the form of CO_2, therefore CO_2 emissions from fossil fuel fired power plants connected to the grid will be accounted for in baseline calculations.
		CH_4	No	Minor emission sources.
		N_2O	No	
Project Activity	Emissions as a result of Project Activity	CO_2	No	Minor emission sources. As suggested by the baseline methodology, project emissions (PE_y) are assumed to be 0 and will not be considered.
		CH_4	No	
		N_2O	No	

According to ACM002, the geographic and system boundaries for the relevant electricity grid must be clearly identified. According to TEIAS, the Turkish transmission system is interconnected. There is no independent regional electricity system or any significant transmission constraints. Therefore, in this Project activity the project boundaries include the project site and all power plants attached to the Turkish National Grid.

B.5. Details of baseline information, including the date of completion of the baseline study and the name of person (s)/entity (ies) determining the baseline:

This monitoring methodology and baseline study application was completed on 24.11.2008. Mavi Consultants is the carbon consultant for the project activity.

Contact Information of the project participants is given in Annex 1.

Consultant: MAVI Sürdürülebilir Kalkınma Proje ve Danışmanlık Hizmetleri Ltd. Şti.
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SECTION C. Duration of the project activity / Crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

The Project Activity is expected to start operation on 01/07/2010. The investment decision is met with the signature of the wind turbine order by both parties (the project owner and the turbine supplier Enercon) on 10.08.2008, which is the starting date of the Project activity.

C.1.2. Expected operational lifetime of the project activity:

The project is expected to run for 25 years, in agreement with the UNFCCC "Tool to determine the remaining lifetime of equipment" v.01 default values.

C.2 Choice of the crediting period and related information:

C.2.1. Renewable crediting period

The project will use a crediting period of 7 years.

C.2.1.1. Starting date of the first crediting period:

The first crediting period starts on 01/07/2010.

C.2.1.2. Length of the first crediting period:

7 years.

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

N/A

C.2.2.2. Length:

N/A

SECTION D. Application of a monitoring methodology and plan

D.1. Name and reference of approved monitoring methodology applied to the project activity:

The latest version of the CDM large-scale approved consolidated baseline and monitoring methodology ACM0002, Version 07 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (dated December 14th, 2007) is applied as the monitoring methodology for the project.

D.2. Justification of the choice of the methodology and why it is applicable to the project activity:

The ACM0002 baseline and monitoring methodology has been chosen because of the following reasons:

- The project activity consists of the installation of wind turbines, which will export electricity to the national grid system;
- The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available;
- The Project supplies electricity to the national grid and thereby displaces electricity from fossil fuel based power plants connected to the grid.

D.2. 1. OPTION 1: Monitoring of the emissions in the project scenario and the baseline scenario

The total Project emissions are stemming from the combustion of diesel oil on site by the auxiliary diesel generator unit to cover the electricity need of the office building only. The generator unit will be operated each week for a couple of minutes for maintenance purposes, and also in case of electricity blackouts in the grid, which are rare and short. The turbines will not be fed with the auxiliary diesel generator unit. In compliance with the ACM0002, the corresponding GHG emissions are negligible. For the sake of conservativeness, this will be monitored.

D.2.1.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
ID 4	*Diesel Oil consumption*	*Project Owner*	*litres*	*m*	*continuously*	*all*	*Paper (invoices of diesel oil purchases)*	*The diesel oil consumption will be negligibly small. To demonstrate this, the diesel oil invoices during the monitoring period will be checked.*

D.2.1.2. Data to be collected in order to monitor project performance on the most sensitive sustainable development indicators:

N/A

D.2.1.3. Description of formulae used to estimate project emissions (for each gas, source, formulae/algorithm, emissions units of CO2 equ.)

N/A

D.2.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary and how such data will be collected and archived :

N/A

D.2.1.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO2 equ.)

N/A

D. 2.2. OPTION 2: Direct monitoring of emission reductions from the project activity (values should be consistent with those in section E).

D.2.2.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

ID 1	***EG_y** Annual net electricity amount fed to the grid by the project activity*	*Project owner and TEİAŞ*	*MWh*	*m*	*Continuously*	*100%*	*Electronic and paper*	*There are two metering instruments (a primary and a backup) at the main switchgear station. These devices measure the net electricity supply to the national grid by the project activity, all losses before this point are on account of the project participant. Both metering instruments, which continuously monitor and measure the net electricity delivered by the project activity, are sealed and only accessible by TEİAŞ personnel. Official TEIAS data from the PMUM web site will be used for calculating EG_y. The annual emissions reductions will be updated by multiplying the ex-ante calculated baseline emission factor by the metering instrument readings. The metering device does not measure the net electricity generation but the gross generation and self consumption separately. Their difference gives the net electricity generation, which is going to be listed on a monthly basis for monitoring purposes.*

As required by the Gold Standard, sustainable development indicators are also monitored and verified. The project aims to create local employment opportunities in the project region in a sustainable way. The project participants prefer to prioritize personnel from the project region, which will be defined as a Gold Standard indicator to be verified each year as shown in the below table:

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Sustainable development indicator	Data Source	Data variable	Data unit	Measured (m), calculated (c), estimated (e)	Comment
ID 2	*Local Employment Number*	*Project Owner*	*N/A*	*N/A*	*Counted*	*Number of new jobs which the Project Activity has created in the region.*
ID 3	*Air Quality*	*Project owner and TEİAŞ*	*SO_2 and NO_x emissions*		*Calculated*	*Reduction of baseline SO_2 and NO_x emissions: The Project, by replacing electricity from fossil fuel combustion and the related fuel consumption, the baseline SO_2 and NO_x emissions from electricity generation are:* *SO_2 emissions: Total host county emissions are 936.51[21] tonnes in 2007. Net electricity generation in 2007 is 183,340[22] GWh, corresponding to 5.1 kg/MWh SO_2 intensity.* *NO_x emissions: Total host county emissions are 202.09[21] tonnes in 2007. Net electricity generation n 2007 is 183,340[23] GWh, corresponding to 1.1 kg/MWh NO_x intensity.* *The reductions of SO_2 and NO_x emissions will be calculated by mulipying net electricity generation of the Project activity with the SO_2 and NO_x intensities referred above.*
ID 5	*Noise Emission*	*Local people*	*N/A*	*N/A*	*Estimated*	*The Project is not expected to create any noise above the national thresholds at the closest settlements, as discussed in the sustainable development matrix. To ensure this, random interviews with local people will be carried out during verification site visit.*
ID 6	*Health impact of Electromagnetic Radiation*	*Credible Reports*	*N/A*	*N/A*	*Estimated*	*There is not any known information suggesting that the electromagnetic radiation created by wind turbines has negative impact on human health. For monitoring purposes, it will checked whether there is any new development (scientific research, credible studies etc.) that contradicts with the current level of information.*
ID 7	*Road quality*	*Local people*	*N/A*	*N/A*	*Estimated*	*Roads in the Project region, if damaged by the Project owner, will be improved. In addition, new roads might be built. This will be checked by randomly interviewing local people in the vicinity of the Project during verification site visit.*

[21] Source: *National GHG inventory of Turkey,* http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/tur_2009_crf_13apr.zip, Worksheet:Table1s1
[22] Source: TEIAS, http://www.teias.gov.tr/istatistik2008/30(84-08).xls
[23] Source: TEIAS, http://www.teias.gov.tr/istatistik2008/30(84-08).xls

D.2.2.2. Description of formulae used to calculate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

EG_y : Annual net electricity amount fed to the grid by the project activity

GEG_y : Gross Electricity Generation

SEC_y : Project activity's Self Electricity Consumption

$EG_y = GEG_y - SEC_y$

PMUM website publishes monthly GEG_y and SEC_y data in detail (with a breakdown into three daily time periods), however it does not show EG_y separately. Therefore, for each month GEG_y and SEC_y data need to be recorded and their difference has to be calculated on a monthly basis. The annual total net electricity generation is then found by summing up monthly EG_y values. Detailed information regarding each formulae and parameters are provided in Annex 2.

D.2.3. Treatment of leakage in the monitoring plan

The methodology suggests neglecting leakage for this type of energy projects, therefore leakage will not be monitored.

D.2.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project activity

N/A.

D.2.3.2. Description of formulae used to estimate leakage (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

N/A

D.2.4. Description of formulae used to estimate emission reductions for the project activity (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

Please See Section B.2.

D.3. Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored

Data *(Indicate table and ID number e.g. 3.-1.; 3.2.)*	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.

ID 1	*Low*	*Please see Annex 3.*
ID 2	*Low*	*Please see Annex 3.*
ID 3	*Low*	*The SO_2 and NO_x emissions data are reported in the national GHG inventory report and are sufficiently reliable. Net electricity generation of the Project is also reliable, as it is measured real time by calibrated devices. Multiplying the SO_2 and NO_x intensities with net electricity therefore provides a fairly reliable approximation for avoided SO_2 and NO_x emissions.*
ID 4	*Low*	*Diesel oil consumption will be checked using invoices as evidence.*
ID 5	*Low*	*Noise emissions are legally monitored by relevant authorities. In addition, noise emissions will be checked according to the Gold Standard monitoring plan by randomly interviewing local people in the vicinity of the Project.*
ID 6	*Low*	*There is not any known information about the health risks of electromagnetic radiation created by wind turbines. It will be monitored whether there is any new development in this issue by assessing scientific studies etc.*
ID 7	*Low*	*The quality of roads will be improved by the Project owner. This will be checked by randomly interviewing local people in the vicinity of the Project.*

D.4. Please describe the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects, generated by the project activity

SD Indicator Monitoring Plan: The project manager on site is not appointed yet, therefore for the time being his or her name is not available. Project Owner is responsible for collecting data for the monitoring of the SD indicators.

Net Electricity Generation Monitoring Plan: On behalf of the project participants, Demirer Enerji will access the PMUM web site with own ID and password and print the monthly reports for the whole verification period prior to verification process. These reports will be used to fill in the summary table, which is the final document for calculating total emission reductions, basis for GS VERs. Both the scans of monthly PMUM reports and the summary table will be prepared by the relevant personnel of the Project owner prior to verification and submitted to the verifying DOE.

D.5 Name of person/entity determining the monitoring methodology:

Mavi Consultants

Phone : +90 212 327 09 22

Fax : +90 212 327 09 25

e-mail : info@maviconsultants.com

Mavi Consultants are the consultants for this project activity and they are also listed in Annex 1 of this document.

SECTION E. Estimation of GHG emissions by sources

E.1. Estimate of GHG emissions by sources:

The relevant GHG emission source is CO_2, which will be reduced by the Project.

E.2. Estimated leakage:

No leakage is identified.

E.3. The sum of E.1 and E.2 representing the project activity emissions:

The total Project activity emissions are stemming from the combustion of diesel oil on site by the auxiliary diesel generator unit. This generator will be used only occasionally in case of electricity blackouts in the grid, which is rare, to cover the electricity need of the office building only. The turbines will not be fed with the auxiliary diesel generator unit. This unit will be operated each week for a couple of minutes for maintenance purposes. Grid electricity blackouts in the Project region are rare and last very short. The Project owner has experience from its other wind farms about the total diesel oil consumption, which is a couple of hundreds of litres every year. The corresponding GHG emissions are extremely limited. This emission is negligible and will be assumed as zero. This is in compliance with the ACM0002.

E.4. Estimated anthropogenic emissions by sources of greenhouse gases of the baseline:

The baseline emissions are estimated at 39,618 tCO2-eq/year.

E.5. Difference between E.4 and E.3 representing the emission reductions of the project activity:

The overall emission reductions from the Project activity are based solely on emissions from E.4. Since project emissions and leakage are taken as zero, emission reductions of the Project are simply found by monitoring net electricity generation by the Project and multiplying it with the combined margin emission factor.

E.6. Table providing values obtained when applying formulae above:

Year	Estimation of project activity emission reductions (tonnes CO_2 e)	Estimation of baseline emission reduction (tonnes CO2 e)	Estimation of leakage (tonnes CO_2 e)	Estimation of emission reductions (tonnes CO_2 e)
2010	0	20,081	0	20,081
2011	0	39,618	0	39,618
2012	0	39,618	0	39,618
2013	0	39,618	0	39,618
2014	0	39,618	0	39,618
2015	0	39,618	0	39,618
2016	0	39,618	0	39,618
2017	0	19,538	0	19,538

Total	**0**	**277,328**	**0**	**277,328**

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

As one of the cleanest and most sustainable renewable energy generation technologies, wind energy projects generally pose no significant environmental impacts. No Environmental Impact Assessment (EIA) has been performed for the following reasons:

- For wind farms in Turkey, an Environmental Impact Assessment report is officially not required. The copy of the document showing that EIA is legally not needed for the Project Activity is given in Annex 4.
- Environmental impacts of the project activity are not considered to be significant by the project participant, local stakeholders or the host country. No relevant comment suggesting potential negative environmental or social impacts has been expressed in the initial stakeholder consultation either.

Therefore, no EIA is necessary and no relevant negative environmental or social impact is considered.

EIA requirements

GS Manual for CDM Project Developers: **Section 3.4.2**

EIA Gold Standard Requirements according to section 3.4.2 in the Gold Standard Manual apply to the project activity as follows:

1. Host country EIA requirements
   It is not mandatory in Turkey to conduct an EIA for this type of project activity. The project site is in a remote location and a transmission line (TL) construction will be necessary. TEIAS is responsible for the construction and operation of the transmission lines in Turkey. Although the wind farm itself is not subject to EIA, in Turkey transmission lines equal or above 154 kV are subject to a TL EIA report. In theory, it is TEIAS's responsibility to prepare the EIA reports, however in practice the project participants have to finance this report. Authorized EIA consulting companies prepare and submit this TL EIA reports in the name of TEIAS. If any critical issue regarding TL environmental impacts is seen by the Ministry, then a revision is requested. After the TL EIA report is authorized, the TL can be built. The rights of the TL EIA belong to TEIAS and project participants have only the role to provide the finance for it.
2. Gold Standard Initial Stakeholder Consultation
   The Gold Standard Initial Stakeholder Consultation was held in Salih Tozan Kültür Merkezi, Balıkesir, Turkey on April 30th, 2008. The results of the Gold Standard Initial Stakeholders Consultation did not show any significant environmental and/or social impact (see Initial Stakeholder Consultation report below).
3. None of the indicators in the Sustainable Development Assessment Matrix scores -1.

By reducing fossil fuel consumption indirectly, the Project Activity will help in decreasing pollutants, which are being generated by thermal power plants, resulting in improved air quality.

Summary: The Project is exempt from a national Environmental Impact Assessment report or approval. For this reason, a project description study is prepared evaluating the potential environmental impacts of the Project. The Project has complied with all relevant environmental regulations that apply in the host country. This study does not highlight any problems. The study does not report any bat population in the area, therefore an impact on bat populations is not expected. The species which are listed in the study that are living in the area are *not* vulnerable or

not under threat according to IUCN[24]. The Project is not located on or close to any bird migration route; therefore the Project is not expected to affect migrating bird populations. The Project results in limited number of tree logging, which is mitigated by paying a significant amount of aforestation fee to be used for planting new trees by public institutions. Local people do *not* express any environmental concern which should be taken into account. Shadow flickering is deemed irrelevant as it is more of an issue in regions such as northern Europe, where the sun shines at an oblique angle for more hours of the day and more days of the year, which is not the case for Turkey. Noise emissions will be under national thresholds of 50 dBA[25], which will be monitored by public authorities. The chosen Enercon wind turbines use a special gearless drive technology, which reduces noise and waste oil. The Project does *not* lie on a sensitive area, where surface or underground water would be endangered. Local people and animals will be able to access Project site without limitation, except the vicinity of the turbines for safety reasons, thus enabling them to carry on their former life styles as it is. Therefore, no significant negative impact is foreseen in terms of water quality and quantity, biodiversity, soil condition, air quality or other pollutants.

F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

N/A

Sustainable Development Matrix

Component Indicators	**Score** (-2 to +2)	**Explanation**
Local / Regional / Global Environment		
• Water quality and quantity	0	There is no running surface water at the Project site and the foundations of the turbines are highly unlikely to disturb any ground water, as the Project area is not an aquifer*. The waste water on site will be generated by the personnel, and not from processes. This domestic waste water will be stored in closed underground tanks and disposed of properly. Compared to the baseline, risks of groundwater contamination due to the acid rains as well as process wastewater leakages into the groundwater will slightly be reduced. The amount of discharging of cooling water into the surface waters, as well as water consumption of cooling towers in the baseline will also be decreased. "In Turkey, 2.72 billion m^3 of water was used by thermal power plants in 2006. The amount of wastewater discharged in 2006 was 2.66 billion m^3"**. Source*: EIA project description report, p.39

[24] International Union for Conservation of Nature

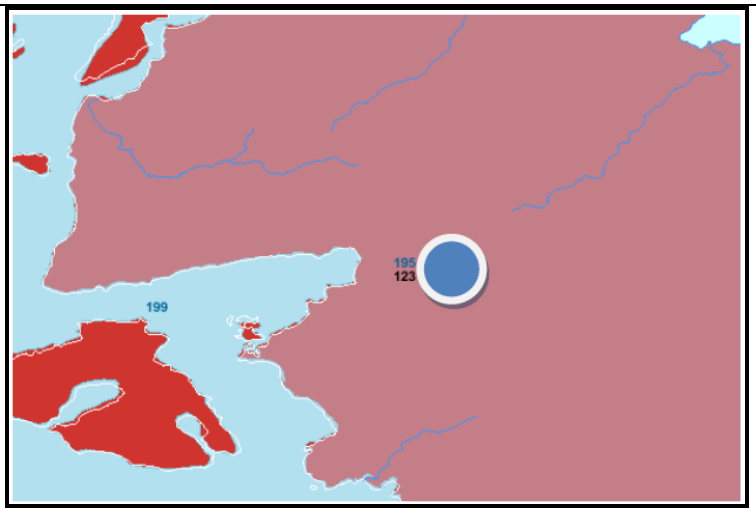
[25] National upper noise limit for housing areas in the night.

		Source**: Turkish Statistical Institute (*www.turkstat.gov.tr/PreHaberBultenleri.do?id=1927)*
• Air quality (emissions other than GHG)*	+1	Expected dust emissions during construction is 0.4 kg/h, which is lower than legal thresholds of 1.5 kg/h*. Dust emissions created during construction phase (land excavation and transport) will be minimized by paying utmost care not to scatter excavated material, by operating lorries at low speeds and by keeping roads wet. No dust emissions are expected during operation. Air quality will be improved compared to the emission levels of fly ash, odour, SO_x and NO_x related to the thermal energy generation, since energy generation constitutes the largest GHG emission source in Turkey**. Marmara and Aegean Regions are responsible for half of the CO_2 emission of Turkey. The highest ground level CO_2 concentrations are in the Marmara Region***. The Project is located in the Marmara region on the border of Aegean region; therefore the Project is expected to have a positive impact on air quality in the area. Source*: EIA project description report, p.25 Source**: Turkish Statistical Institute (http://www.turkstat.gov.tr/PreHaberBultenleri.do?id=4078) Source***: "Estimation of CO_2 Concentration Over Turkey by Using Dispersion Model", p.3 *(www.ukidek.org/bildiriler/Cozumler_2.doc)*
• Other pollutants (including, where relevant, toxicity, radioactivity, POPs, stratospheric ozone layer depleting gases)*	0	Wind farms do not generate radioactive pollution. In terms of electromagnetic interference, the Project is only allowed by public authorities if it is deemed that the Project will not cause interference to television, radio, aviation communications or navigation aids or other networks. In this respect, no adverse impact is expected. Noise Pollution: Noise will be generated during operation, but owing to the gearless technology of Enercon wind turbines and the distance from local residential areas the level of noise will be below national thresholds. Noise level of the Project will be measured at the initial acceptance process and also in cases where a complaint is received. In breach of these thresholds, the Project will be banned from operation by public authorities. Measurement of noise will be carried out by public authorities, ensuring quality control and assurance. In settlement areas, the maximum allowed noise level from industrial activities is 60 dBA for day and 50 dBA for night**. The noise emission will be monitored, as this is a concern of local stakeholders[26]. Shadow Flickering: When the sun passes behind the rotor of a wind turbine and casts a shadow, the shadow can appear to flick on and off

[26] This issue had been explained during the stakeholder consultation adequately and the stakeholders have been satisfied.

		within buildings where the shadow appears through a narrow window under certain combinations (e.g. no cloud, clear weather, window of the house directed to the wind turbine, no trees or other buildings between the receptor and the blades, close distance, the receptor being on the same line with the blades and the sun, windy weather, etc.). Dwellings within 130 degrees either side of north relative to and within 10 rotor diameters of the wind turbine can experience shadow flickering***. Shadow flickering is more of an issue for regions such as northern Europe, where the sun shines at an oblique angle for more hours of the day and more days of the year; this is not the case for Turkey. Apart from them, disposal of metal compounds as Co, Cd, Zn, Pb and Cu in the flue gas and in the waste ash will slightly be diminished. The Project is not expected to create electromagnetic radiation that could be harmful for human health. "In general the effects of wind turbine generators on electromagnetic waves will be relatively limited. The tower and blades (…) tend to disperse rather obstruct or reflect waves. Typically blades are made from GRP, which is essentially transparent to EM waves****". There is not any known information that suggests any health risk related to EM radiation created by wind turbines. However, the existence of harmful electromagnetic radiation will be monitored, as this is a concern of local stakeholders. Taking these impacts into account, the Project is expected to have neutral or slightly positive impacts. Source*: Turkish Statistical Institute (www.turkstat.gov.tr/PreHaberBultenleri.do?id=1927) Source**: Regulation on Assessment and Management of Environmental Noise (Official Gazette Date: 07.03.2008, 2002/49/EC), Annex VIII, Table 4. Source***: "Onshore Wind Energy Planning Conditions Guidance Note", British Department for Business, Innovation and Skills (Link: http://www.berr.gov.uk/files/file35240.pdf) Source****: "The Electromagnetic Compatibility and EM Field Implications for Wind Farming in Australia" (http://www.wind.appstate.edu/reports/BP10_EMC&EMF.pdf)
• Soil condition (quality and quantity)	0	Solid Waste: "The amount of waste generated by thermal power plants in Turkey was 16.01 million tonnes in 2006. On average, out of the waste generated during the 2003-2006 period, 10% was recovered outside the plants and 90% was disposed. 79% of the disposed waste was dumped onto ash disposal area/ash dam, on average. The major component of the waste generated by thermal power plants was observed to be mineral wastes (ash, slug, fly ash, and gypsum)"*. The solid waste on site will be generated by the personnel, and not from processes. This domestic solid waste will be stored in closed containers

		on site and disposed of properly. Compared to the baseline, which causes high amounts of solid waste during mining, fuel processing and combustion processes for thermal power plants, the Project positively contributes to soil quality. The Project is not expected to have a significant impact on soil erosion. In order to minimize erosion, the minimum length of roads will be built that will follow natural terrain contours. In order to carry the towers and turbines, the new roads will be built by the Project owner with strong materials, which mostly prevent erosion on the roads. The slope of these roads will be minimal to enable trucks to carry the equipment easily, which results in a smoother shape, hindering soil erosion as much as possible. Comparing with the baseline scenario, where fossil fuel mining activities cause significant soil erosion, the Project is not expected to have a negative impact on soil erosion. Regarding land area use, wind turbine basements cover a relatively small area as compared to other power plants having similar electrical production capacity. Regarding the waste oil used as lubricant in the turbines, national legal disposal requirements will be applied. Licensed private companies will collect the waste oil on site, once the oil reaches a certain amount, and dispose of it properly. The selected Enercon turbines have minimal moving components and can operate for years without oil change. The turbines are also equipped with oil absorption systems which prevent any leaks, thereby minimizing the risk of spillage and soil contamination. It is expected that Enercon E-82 type turbines will require ca. 10 liters grease each year and ca. 100 liters gearbox oil every 4 years**. Considering that there will be 8 turbine units, the average oil consumption will be ca. 300 liters per year, which is a low value. The Project is expected to result in the removal of a certain amount of trees. The Project area is not densely populated with large trees and road construction will be / is being planned such that the harm to trees is minimized. These trees will be logged by public authorities for the Project. The Project proponents have paid a high amount of reforestation fee to the relevant public authority. These fees will be used to plant new trees by public authorities, which will mitigate the impact of the Project. Source*: Turkish Statistical Institute (www.turkstat.gov.tr/PreHaberBultenleri.do?id=1927) Source**: Enercon Servis Ltd. (maintenance company of the Project)
• Biodiversity (species and habitat conservation)	0	In terms of WWF “Global 200: Priority Areas”*, the Project region falls into two general “Critical/Endangered” habitats: (195) Anatolian Freshwater and (123) Mediterranean Forests, Woodlands and Scrub.;



Threats in these regions are listed as: “Habitat loss, excessive water diversions, pollution from industry, agriculture, and domestic sources, overfishing, draining of wetlands for malarial control, dams, and introduced species (particularly Zander - Stizostedion lucioperca) are the principle threats to this ecoregion.” (195); and “Most natural communities have been degraded or permanently altered throughout the Mediterranean basin. The ecoregion is threatened by continuing conversion to agriculture, pasture, and urban areas. Frequent fires, logging of remaining native woodlands, exotic species, and intensive grazing are also threats.” (123).

According to the National Geographic “Terresterial Ecoregions of the World**” classification, the Project region is located on (PA1202) “Anatolian conifer and deciduous mixed forests”, where “This ecoregion is facing threats from all sides. Untreated wastes from cities and villages and from industries such as the local olive oil processing plants are released into water sources, killing fish and other aquatic organisms. Also affected are the birds and terrestrial creatures that the fish and other aquatic organisms support. Industrial pollution causes acid rain. Ski areas and recreational trekking and camping disturb wildlife and destroy habitat. Illegal felling of trees and the construction of small farms increasingly spoil alluvial forests. Cattle and sheep grazing also destroy habitat. And dunes are rapidly being destroyed to provide sand for human uses.”

Taking the current practice in the region and the foreseen impacts of the Project into account, the Project can be expected to have neutral or slightly positive contribution against these threats in these critical ecoregions.

The EIA Project description report (p.44) lists the following avian species in the Project area:

- Coturnix coturnix
- Alectoris graeca
- Passer domesticus

		• Upupa epops • Hirundinidae • Streptopelia decaocto • Phasianus colchicus • Garrulus glandarius • Turdus pilaris • Alauda arvensis • Corvus frugilegus • Turdus merula According to the IUCN Red List of Threatened Species (www.iucnredlist.org), *all* these species are categorized as "least concern" and the EIA project description report confirms that the Project does not impose any threat to biodiversity. The Balikesir Provincial Environment and Forest Directorate sent a document on 16.10.2008 to the Project proponents that the Project does *not* lie on major bird migration routes. Therefore, the Project is not expected to have adverse impact on migrating birds. In general, "Bat species appear to be at risk during key movement periods. Almost nothing is known about current populations of these species and the impact on bat numbers as a result of mortality at windpower locations.***" The EIA Project description report (p.44) does not include any bat types in the Project region or any expected impacts on bats. Compared to the baseline, the Project will also have a slight positive impact by reducing the temperature increase of cooling water resources of thermal power plants, thereby protecting marine habitats. Source*: WWF (www.panda.org), National Geographic (www.nationalgeographic.com/wildworld/global.html) Source**: National Geographic (www.nationalgeographic.com/wildworld/terrestrial.html, www.nationalgeographic.com/wildworld/profiles/terrestrial/pa/pa1202.html) Source***: Wikipedia (http://en.wikipedia.org/wiki/Environmental_effects_of_wind_power)
Sub Total	**+1**	
Social Sustainability and Development		
• Employment (including job quality, fulfilment of labour	+1	Local economy dominantly relies on agricultural activities and most families in the region are either unemployed or work at their own farmland. There is no or minimal industrial activity in the vicinity, therefore the Project will improve the overall job quality in the region.

standards)		Health and Safety trainings will be given to employees to ensure safe operation of the Project. The employment of the skilled staff will have an impact on job quality and promote education in the rural context of the Project. The jobs do not include tasks related to hazardous materials or dangerous works. The Project will employ people, local if possible and will fulfil relevant safety and labour standards, ensuring social security, health and safety of the Project staff.
• Livelihood of the poor (including poverty alleviation, distributional equity, and access to essential services)*	0	The Project will have a positive impact on the livelihood of local people by contributing to the local economy. This will be achieved with the income of local employees that will be spending locally. As a result of heavy trucks, some parts of the existing roads might be harmed during construction. During operation, no impact on roads is foreseen. The Project proponents will not only build new roads at the Project site, they will also improve the roads before and after the construction to allow shipping of equipment to the site and to repair any damage due to equipment transportation. This will also improve local infrastructure and increase land values which did not have roads before, positively contributing to the livelihood of local population. It will be monitored that the existing roads are not damaged by the Project, or in case they are damaged that they are repaired adequately. The Project will not be located on agricultural land, therefore will have no impact on agricultural production. The Project might initiate entrepreneurial opportunities associated with the wind farm (e.g. tourism attractions, market etc.). Apart from this, the Project proponents also plan some Corporate Social Responsibility activities in the Project region.
• Access to energy services	0	The generated electricity can legally and technically not be supplied to the nearby communities. These communities are already connected to the national grid, therefore no significant change is expected as compared to the baseline.
• Human and institutional capacity (including empowerment, education, involvement, gender)	0	Employing high voltage switchgear operators is required by TEIAS. Such operators obtain an “operator license” from TEIAS or TEDAS, after completing a special training course. This also ensures that these employees are trained properly. During hiring, the Project proponents do not discriminate potential employees based on sex, race, ethnicity or any other similar personal information, and will promote the employment of women for the Project if there are any potential appropriate applicants available.
Sub Total	**+1**	
Economic and Technological		

Development		
• Employment (numbers)*	+1	Several temporary jobs will be generated directly and indirectly (by subcontractors) during the construction of the project activity. 1 wind farm engineer and 3 security personnel are expected to be employed for the Project for operation and maintenance of the wind power plant. Local people will be preferred as much as possible for these positions. Source: Project proponents
• Balance of payments (sustainability)	0	Electricity generation from renewable energy sources substitutes the electricity generated from fossil fuels and thus decreases fossil fuel consumption overall, thereby having a slightly positive effect on balance of payments in the medium/long term.
• Technological self reliance (including project replicability, hard currency liability, institutional capacity, technology transfer)	0	Improvement of technical adequacy of companies working in the wind energy sector and creation of high quality technical labour force. The blades of the wind turbines of the Project will be produced in Turkey. Justification: First wind farms imported most of the wind turbine components (generator, blades, tower etc.) from international suppliers. Starting with the first wind investments in Turkey, new domestic investments in this field have been initiated (e.g. blade factory, wind farm service companies, wind turbine tower production facility etc.). These indirect outcomes also improve the technological self reliance of local industries and companies.
Sub Total	**+1**	
Total	**+3**	

SECTION G. Stakeholders' comments

G.1. Brief description how comments by local stakeholders have been invited and compiled:

Initial Stakeholder Consultation

The initial stakeholder consultation was held in Salih Tozan Kültür Merkezi, Balıkesir, Turkey on April 30th, 2008.The meeting was attended by representatives from the local authorities, local residents, local media and local university of the project activity. In addition to the local meeting, Gold Standard supporting NGOs in Turkey have been invited by email to send their comments on the project activity.

Main Stakeholder Consultation

The Gold Standard Main Stakeholder Consultation is based on a set of additional criteria in addition to UNFCCC requirements. Full documentation of the project activity is made publicly available for two months prior to conclusion of validation at www.maviconsultants.com, including:

- The original and complete PDD
- A non-technical summary of the project design document (in appropriate local language)
- Relevant supporting information

During the consultation period, stakeholders are invited to submit their comments and questions related to the project activity. The report on the Main Stakeholder Consultation process is available and sent to the DOE for validation.

G.2. Summary of the comments received:

In the Initial Stakeholder Consultation, the overall response to the project, from all invited stakeholders, was encouraging and positive. It is evident from the stakeholder consultation process, that the project is perceived as a good example for the energy generation in Turkey and that it contributes to sustainable development of the country. No major environmental concerns were raised during the entire initial stakeholder consultation process. No adverse reaction, comments or clarifications related to socio-economic aspects have been received during the Initial Stakeholder Consultation process.

No comments have been declared by any stakeholder during the Main Stakeholder Consultation period.

G.3. Report on how due account was taken of any comments received:

The comments did not require any change in the Project design.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

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Annex 2

BASELINE INFORMATION

Table 9. Definitions and Explanations regarding Equations (1), (2), (3)

Parameter	Definition	Explanation
ER_y	Emission reductions in year y (tCO_2/yr)	Calculated using Equation (1)
BE_y	Baseline emissions in year y (tCO_2/yr)	Calculated using Equation (2)
PE_y	Project emissions in year y (tCO_2/yr) Project emissions involve direct emissions (such as fossil fuel consumption of construction equipment or vehicles for on-going operations and maintenance).	0 tCO_2/yr This is suggested by the baseline methodology, and the quantity of fossil fuels used for the Project Activity is negligibly small.
LE_y	Leakage emissions in year y (tCO_2/yr) Leakage is emissions arising due to activities such as power plant construction, fuel handling and land inundation.	0 tCO_2/yr The baseline methodology suggests not considering these emission sources as leakage.
EG_y	Electricity supplied by the project activity to the grid (MWh)	Net electricity generation estimation of Project developer is given above. The monitoring methodology involves actualization of this figure annually.
$EG_{baseline}$	Baseline electricity supplied to the grid in the case of modified or retrofit facilities (MWh)	0 MWh No modification or retrofitting.
$EF_{grid,CM,y}$	Combined Margin CO_2 emission factor (tCO_2/MWh) for grid connected power generation in year y	Calculated using Equation (3)
$EF_{grid,OM,y}$	Operation Margin CO_2 emission factor (tCO_2/MWh) for grid connected power generation in year y	Calculated based on the "Tool to calculate the emission factor for an electricity system" v.01.1 (EB 35)
$EF_{grid,BM,y}$	Build Margin CO_2 emission factor (tCO_2/MWh) for grid connected power generation in year y	Calculated based on the "Tool to calculate the emission factor for an electricity system" v.01.1 (EB 35)
w_{OM}	Weighting of operation margin emissions factor (%)	75% (default value), as "Tool to calculate the emission factor for an electricity system" v.01.1 suggests
w_{BM}	Weighting of build margin emissions factor (%)	25% (default value), as "Tool to calculate the emission factor for an electricity system" v.01.1 suggests

Table 10. Definitions and Explanations regarding Equation (4)

Parameter	Definition	Explanation
$EF_{grid,OMsimple,y}$	Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)	Calculated using Equation (4) Data in Table 15
$FC_{i,y}$	Amount of fossil fuel type *i* consumed in the project electricity system in year y (ton or $000m^3$)	
$NCV_{i,y}$	Net calorific value (energy content) of fossil fuel type *i* in year y (TJ/kt or TJ/mil m3)	Data in Table 13
$EF_{CO2,i,y}$	CO_2 emission factor of fossil fuel type *i* in year y (tCO_2/TJ]	Data in Table 13
GEN_y	Net electricity generated and delivered to the grid by all power sources serving the system, not including lc-mr power plants/units, in year y (GWh)	Data in Table 12
i	All fossil fuel types combusted in power sources in the project electricity system in year y	

Table 11. Definitions and Explanations regarding Equations (5) and (6)

Parameter	Definition	Explanation
$EF_{grid,BM,y}$	Build margin CO_2 emission factor in year y [tCO_2/MWh]	Calculated using Equation (5) Data in Table 4
$EG_{m,y}$	Net quantity of electricity generated and delivered to the grid by power unit m in year y [MWh]	Data in Table 16
$EF_{EL,m,y}$	CO_2 emission factor of power unit m in year y [tCO_2/MWh]	
$EF_{CO2,m,i,y}$	CO_2 emission factor of fuel type i used in power unit m in year y (tCO_2/TJ)	Data in Table 13
$\eta_{m,y}$	Average net energy conversion efficiency of power unit m in year y (%)	Data in Table 4
m	Power units included in the build margin	
y	Most recent historical year for which power generation data is available	

Table 12. Electricity Supply to Grid

	2002	2003	2004	2005	2006
Net Generation, GWh	123,727	135,248	145,066	155,469	169,543
Net Delivery Ratio	95.6%	96.2%	96.3%	96.0%	96.2%
Imports, GWh	3,588	1,158.0	463.5	635.9	573.2
Net Delivered to Grid, exc. lc-mr	*94,796*	*102,161*	*100,923*	*117,864*	*127,208*

Table 13. NCVs and Emission Factors of Fuels

NCV [TJ/kt or TJ/mil m^3]	**2002**	**2003**	**2004**	**2005**	**2006**	**Emission Factors [tCO_2/TJ]**
Hard Coal	15.1	14.4	15.1	13.6	14.9	92.8
Imported Coal	25.1	25.7	25.5	24.7	24.7	89.5
Lignite	7.5	7.5	7.6	5.9	6.9	90.9
Fuel Oil	40.1	40.1	39.9	40.2	40.2	75.5
Diesel Oil	42.8	43.3	42.4	42.8	42.7	72.6
Lpg	46.1	44.1	45.9	46.0	0.0	61.6
Naphta	44.9	40.0	44.0	44.3	43.9	69.3
Natural Gas	36.5	37.2	36.9	37.3	37.0	54.3

Table 14. CO_2 Emissions Breakdown by Fuel Type

CO_2 Emissions, $ktCO_2$	**2002**	**2003**	**2004**	**2005**	**2006**
Hard Coal	2,161	2,057	1,860	2,155	2,162
Imported Coal	1,145	4,986	7,388	7,858	8,963
Lignite	28,875	24,191	23,207	26,057	31,921
Fuel Oil	9,635	8,669	7,242	6,085	5,297
Diesel Oil	306	44	90	88	190
Lpg	27	2	36	37	0
Naphta	682	733	637	260	41
Natural Gas	22,882	25,455	26,687	31,886	34,212
Total Calculated	65,713	66,138	67,145	**74,426**	**82,787**
UNFCCC Data	74,056	74,196	**76,185**		

Table 15. Operating Margin EF Calculations

Operating Margin EF	2004	2005	2006
CO_2 Emissions, $ktCO_2$	76,185	74,426	82,787
Net electricity supplied to grid, GWh	100,923	117,864	127,208
OM Emission Factor, [$ktCO_2$/GWh]	0.755	0.631	0.651
EF_{OM} average 2004-2006, $ktCO_2$/GWh	**0.679**		

Table 16. Recent Capacity Additions 2003-2006

Year	Plant	Installed capacity (MW)	Average Generation (GWh)	Fuel Type	Commissionary date
2003	ENERJİ-SA(Mersin) GR GT	41.65	312	N.GAS+NAPHTA	05/10/2003
2004	TÜPRAŞ BATMAN GR V	1.5	4.1	D.OIL	2003
2004	ECZACIBAŞI BAXTER HAS.ÜRÜN.	1.0	5.8	N.GAS	13/01/2001
2004	ÇIRAĞAN SARAYI İŞL.	1.4	11.0	N.GAS	01/11/2002
2004	ANKARA D.G.(BAYMİNA) GR-I-II-III	798.0	6,500.0	N.GAS	08/01/2004
2004	ENTEK GR-IV	31.1	255.7	N.GAS+NAPHTA	12/02/2004
2004	ATATEKS 2 GM	5.6	45.0	N.GAS	20/02/2004
2004	TANRIVERDİ 4 GM	4.7	38.7	N.GAS	24/03/2004
~~2004~~	~~VAN SANT (Dismantled)~~	~~(-26)~~	~~(-195.0)~~	~~FUEL OIL~~	~~06/04/2004~~
2004	ÇOLAKOĞLU(KAPASİTE ARTIRIMI)	45	337.5	IMPORTED COAL	05/05/2004
2004	TEKBOY TEXTILE 1 GM	2.2	16.0	N.GAS	18/05/2004
2004	GÜL ENERJİ GR-II	12.5	96.5	FUEL-OIL	03/06/2004
2004	KOMBASSAN KAĞIT GIDA VE TEKS	5.5	38.1	N.GAS	09/06/2004
2004	AYEN OSTİM ENERJİ ÜRETİM	31.1	264.1	N.GAS	11/06/2004
2004	BİS ENERJİ 2 GT	73.0	602.7	N.GAS	16/06/2004
2004	ENERJİ-SA ADANA 1 BT	49.8	322.9	NAPHTA	23/06/2004
2004	ŞAHİNLER ENERJİ 1 GM	3.2	22.2	N.GAS	29/06/2004
2004	BESLER GR-2, BT (5,2+7,5)	12.7	97.7	N.GAS	07/07/2004
~~2004~~	~~KAREGE (Revision)~~	~~(-7.7)~~	~~(-57.9)~~	~~N.GAS~~	~~08/07/2004~~
2004	ÇELİK ENERJİ ÜR.ŞTİ. 2 GM	2.4	18.6	N.GAS	09/07/2004
~~2004~~	~~ÇİNKUR (Dismantled)~~	~~(-30.0)~~	~~(-150)~~	~~FUEL-OIL~~	~~20/07/2004~~
~~2004~~	~~OTOPRODÜKTÖR (Revision)~~	~~6.4~~	~~43.2~~		~~20/07/2004~~
2004	KOMBASSAN KAĞ. MATBAA GIDA	5.5	35.7	N.GAS	24/09/2004
2004	AYEN OSTİM ENERJİ ÜRETİM(BT)	9.9	84.0	N.GAS	01/10/2004
2004	HABAŞ ALİAĞA GRUP I-II	89.2	713.9	N.GAS	08/10/2004
2004	STANDART PROFİL 3 GM	6.7	49.2	N.GAS	22/10/2004
2004	KARKEY-II 3+3 DGM	54.3	369.7	FUEL-OIL	12/11/2004

~~2004~~	~~HAKKARİ 1~~	~~(-15.3)~~	~~(-114.8)~~	~~MOBILE~~	~~30/11/2004~~
~~2004~~	~~EÜAŞ Revision (ADALAR)~~	~~(-8.2)~~	~~0~~	~~D.OIL~~	~~09/12/2004~~
2004	ALTINMARKA GIDA GR I-II-III	3.6	28.8	N.GAS	17/12/2004
2004	ERE(BİR KAPILI HES) GRUP-I	48.5	170.6	RUN OF RIVER	11/03/2004
2004	ELTA ELK(DODURGA) GR-I-II-III-IV	4.1	12.3	RUN OF RIVER	26/04/2004
2004	İSKUR TEKSTİL(SÜLEYMANLI) GR I-II	4.6	17.86	RUN OF RIVER	28/04/2004
2004	BEREKET EN.(Feslek Hes) Gr-1-2	9.5	41	RUN OF RIVER	05/08/2004
2005	ÇAN GR I	160.0	1,040.0	LIGNITE	15/02/2005
2005	ÇAN GR II	160.0	1,040.0	LIGNITE	15/03/2005
2005	ELBİSTAN-B GR I	360.0	2,340.0	LIGNITE	15/02/2005
~~2005~~	~~AKBAŞLAR GR II (Isolated)~~	~~8.8~~	~~73~~	~~N.GAS~~	~~24.06.2005~~
2005	AKÇA ENERJİ GR-III	8.7	65.4	N.GAS+NAPHTHA	14/12/2005
2005	AYKA TEKSTİL GR-I	5.5	40.0	N.GAS	24/09/2005
2005	BAYDEMİRLER GR IV-V-VI	6.2	51.4	N.GAS	04/02/2005
2005	BOSEN GR-III	50.0	350.0	N.GAS	30/12/2005
~~2005~~	~~BOSEN (Revision)~~	~~(-6.5)~~	~~(-45.5)~~	~~N.GAS~~	~~30/12/2005~~
2005	ÇUMRA ŞEKER	16.0	40.0	N.GAS+LIGNITE	01/01/2005
~~2005~~	~~ETİ MAD.(BAN.ASİT) Dismantled~~	~~(-3.8)~~	~~(-28.5)~~	~~RENEW.+WASTES~~	~~15/07/2005~~
2005	ETİ MAD.(BAN.ASİT)GR-I	11.5	85.0	RENEW.+WASTES	15/07/2005
2005	EVYAP GR I-II	5.1	30.0	N.GAS	27/08/2005
2005	GRANİSER GRANİT GR-I	5.5	42.0	N.GAS	14/11/2005
2005	HABAŞ ALİAĞA GR III	47.7	381.6	N.GAS	02/06/2005
2005	HABAŞ ALİAĞA GR IV	47.7	381.6	N.GAS	21/09/2005
2005	HABAŞ ALİAĞA GR-V	24.6	196.8	N.GAS	24/11/2005
~~2005~~	~~HABAŞ ALİAĞA (Revision)~~	~~6.2~~	~~49.3~~	~~N.GAS~~	~~24/11/2005~~
2005	HAYAT KAĞIT GR-I	7.5	56.0	N.GAS	27/05/2005
2005	İÇDAŞ ÇELİK GR-I	135.0	1,080.0	IMPORTED COAL	30/11/2005
2005	KAHRAMANMARAŞ KAĞIT GR-I	6.0	45.0	IMPORTED COAL	08/12/2005
2005	KORUMA KLOR GR I-II-III	9.6	77.0	N.GAS	03/12/2005
2005	KÜÇÜKÇALIK TEKSTİL GR I-II-III-IV	8.0	64.0	N.GAS	27/11/2005
2005	MERCEDES BENZ TURK GR I-II-III-IV	8.3	68.0	N.GAS	04/02/2005
2005	MODERN ENERJİ GR-III	8.4	62.9	N.GAS	14/06/2005
~~2005~~	~~MODERN ENERJİ (Revision)~~	~~(-10.0)~~	~~(-75)~~	~~N.GAS~~	~~14/06/2005~~
2005	MODERN ENERJİ GR-II	6.7	50.4	N.GAS+LPG	14/06/2005
~~2005~~	~~MOSB GR I-II-III (Dismantled)~~	~~(-54.3)~~	~~(-407.3)~~	~~F.OIL~~	~~01/05/2005~~
2005	MOSB GR I-II-III-IV-V-VI-VII	84.8	434.0	N.GAS	01/03 - 01/08/2005
2005	ORS RULMAN	12.4	99.4	N.GAS	25/08/2005
2005	PAK GIDA(Kemalpaşa) GR-I	5.7	45.0	N.GAS	07/12/2005
2005	TEZCAN GALVANİZ GR I-II	3.7	29.0	N.GAS	27/05/2005
2005	YONGAPAN(KAST.ENTG) GR-II	5.2	32.7	N.GAS	25/05/2005
2005	ZEYNEP GİYİM SAN. GR-I	1.2	9.0	N.GAS	07/07/2005
~~2005~~	~~OTOP Revision~~	~~0.0~~	~~0.0~~	~~RENEW.+WASTES~~	

~~2005~~	~~OTOP Revision~~	~~(-0.2)~~	~~0.0~~	~~N.GAS~~	
~~2005~~	~~OTOP Revision~~	~~(-7.2)~~	~~(-55.2)~~	~~N.GAS+LIQUID~~	
~~2005~~	~~OTOP Revision~~	~~(-1.0)~~	~~(-6.0)~~	~~F.OIL~~	
~~2005~~	~~OTOP Revision~~	~~2.1~~	~~5.2~~	~~SOLID+LIQUID~~	
~~2005~~	~~OTOP Revision~~	~~0.1~~	~~0.0~~	~~LIGNITE~~	
~~2005~~	~~OTOP Revision~~	~~(-0.3)~~	~~0.0~~	~~NAPHTHA~~	
~~2005~~	~~OTOP Revision~~	~~0.6~~	~~1.8~~	~~D.OIL~~	
2005	AK ENERJİ(K.paşa) GR- III	40.0	256.9	N.GAS	09/11/2005
2005	AK ENERJİ(K.paşa) GR I-II	87.2	560.1	N.GAS	30/04/2005
2005	ALTEK ALARKO GR I-II	60.1	420.0	N.GAS	14/10/2005
2005	BİS ENERJİ GR VII	43.7	360.8	N.GAS	18/03/2005
2005	CAN ENERJİ GR-I	3.9	28.0	N.GAS	25/08/2005
2005	ÇEBİ ENERJİ BT	21.0	164.9	N.GAS	27/08/2005
2005	ÇEBİ ENERJİ GT	43.4	340.1	N.GAS	23/08/2005
2005	ENTEK ELK.A.Ş.KOÇ ÜNİ.GR I-II	2.3	19.0	N.GAS	07/02/2005
2005	KAREGE GR IV-V	18.1	141.9	N.GAS	07/04/2005
2005	KARKEY(SİLOPİ-4) GR-IV	6.2	47.2	F.OIL	30/06/2005
2005	KARKEY(SİLOPİ-4) GR-V	6.8	51.9	F.OIL	23/12/2005
2005	METEM ENERJİ(Hacışıramat) GR I-II	7.8	58.0	N.GAS	29/01/2005
2005	METEM ENERJİ(Peliklik) GR I-II-III	11.7	89.0	N.GAS	29/01/2005
2005	NOREN ENERJİ GR-I	8.7	70.0	N.GAS	24/08/2005
2005	NUH ENERJİ-2 GR I	47.0	319.7	N.GAS	24/05/2005
2005	ZORLU ENERJİ KAYSERİ GR-I-II-III	149.9	1,144.1	N.GAS	22/07/2005
2005	ZORLU ENERJİ KAYSERİ GR-IV	38.6	294.9	N.GAS	26/10/2005
2005	ZORLU ENERJİ YALOVA GR I-II	15.9	122.0	N.GAS	26/11/2005
2005	TEKTUĞ(Kargılık) GR I-II	23.9	83.0	RUN OF RIVER	25/04/2005
2005	İÇTAŞ ENERJİ(Yukarı Mercan) GR I-II	14.2	44.0	RUN OF RIVER	22/05/2005
2005	MURATLI GR I-II	115.0	444.0	DAM	03/06/2005
2005	BEREKET EN.(DALAMAN) GR XIII-XIV-XV	7.5	35.8	RUN OF RIVER	16/07/2005
2005	YAMULA GRUP I-II	100.0	422.0	DAM	31/07/2005
2005	SUNJÜT(RES) GR I-II	1.2	2.4	WIND	23/04/2005
2006	EKOTEN TEKSTİL GR-I	1.9	14	N.GAS	16/02/2006
2006	ERAK GİYİM GR-I	1.4	10	N.GAS	22/02/2006
2006	ALARKO ALTEK GR-III	21.9	158	N.GAS	23/02/2006
2006	AYDIN ÖRME GR-I	7.5	60	N.GAS	25/02/2006
2006	NUH ENERJİ-2 GR II	26.1	180	N.GAS	02/03/2006
2006	MARMARA ELEKTRİK (Çorlu) GR I	8.7	63	N.GAS	13/04/2006
2006	MARMARA PAMUK (Çorlu) GR I	8.7	63	N.GAS	13/04/2006
2006	ENTEK (Köseköy) GR IV	47.6	378	N.GAS	14/04/2006
2006	ELSE TEKSTİL (Çorlu) GR I - II	3.2	25	N.GAS	15/04/2006
2006	BARES IX. GRUP	13.5	43	WIND	20/04/2006

2006	SÖNMEZ ELEKTRİK (Çorlu) GR I – II	17.5	126	N.GAS	03/05/2006
~~2006~~	~~DENİZLİ ÇİMENTO (Revision)~~	~~0.4~~		~~N.GAS~~	~~04/05/2006~~
2006	MENDERES ELEKTRİK GR I	8.0	56	GEOTHERMAL	10/05/2006
2006	KASTAMONU ENTEGRE (Balıkesir) GR I	7.5	54	N.GAS	24/05/2006
~~2006~~	~~ÇIRAĞAN SARAYI (Deleted by the Ministry)~~	~~(-1.4)~~		~~N.GAS~~	~~24/05/2006~~
2006	BARES X. ve XX GRUPLAR	16.5	52	WIND	26/05/2006
2006	BOZ ENERJİ GR I	8.7	70	N.GAS	09/06/2006
2006	ADANA WASTEWATER TREATMENT PLANT	0.8	6	BIOGAS	09/06/2006
~~2006~~	~~AMYLUM NİŞASTA (ADANA)~~	~~(-6.2)~~		~~F.OIL~~	~~09/06/2006~~
2006	AMYLUM NİŞASTA (ADANA)	14.3	34	N.GAS	09/06/2006
2006	ŞIK MAKAS (Çorlu) GR I	1.6	13	N.GAS	22/06/2006
2006	ELBİSTAN B GR III	360.0	2,340	LIGNITE	23/06/2006
2006	ANTALYA ENERJİ GR I - II - III - IV	34.9	245	N.GAS	29/06/2006
2006	HAYAT TEM. VE SAĞLIK GR I - II	15.0	108	N.GAS	30/06/2006
2006	EKOLOJİK EN. (Kemerburgaz) GR I	1.0	6	LANDFILL GAS	31/07/2006
2006	EROĞLU GİYİM (Çorlu) GR I	1.2	9	N.GAS	01/08/2006
2006	CAM İŞ ELEKTRİK (Mersin) GR I	126.1	1,008	N.GAS	13/09/2006
2006	ELBİSTAN B GR II	360.0	2,340	LIGNITE	17/09/2006
2006	YILDIZ ENT. AĞAÇ (Kocaeli) GR I	6.2	40	N.GAS	21/09/2006
2006	ÇERKEZKÖY ENERJİ GR I	49.2	390	N.GAS	06/10/2006
2006	ENTEK (Köseköy) GR V	37.0	294	N.GAS	03/11/2006
2006	ITC-KA EN. MAMAK TOP.M. GR I-II-III	4.2	30	LANDFILL GAS	03/11/2006
2006	ELBİSTAN B GR IV	360.0	2,340	LIGNITE	13/11/2006
2006	MARE MANASTIR RÜZGAR (X GRUP)	8.0	12	WIND	08/12/2006
2006	ÇIRAĞAN SARAYI GR I	1.3	11	N.GAS	01/12/2006
2006	ERTÜRK ELEKTRİK Tepe RES GR I	0.9	2	WIND	22/12/2006
2006	AKMAYA (Lüleburgaz) GR I	6.9	50	N.GAS	23/12/2006
2006	BURGAZ (Lüleburgaz) GR I	6.9	54	N.GAS	23/12/2006
~~2006~~	~~VAN-2~~	~~(-24.7)~~	~~0~~	~~F.OIL~~	
~~2006~~	~~KARACAÖREN-II~~	~~(-0.8)~~		~~HYDRO~~	~~20/02/2006~~
2006	SEYHAN I-II	0.3	1.7	HYDRO	20/02/2006
2006	ŞANLIURFA GR I-II	51.8	124	HYDRO	01/03/2006
2006	BEREKET ENERJİ GÖKYAR HES 3 Grup	11.6	43.3	HYDRO	05/05/2006
2006	MOLU EN. Zamantı Bahçelik GR I - II	4.2	16.7	HYDRO	31/05/2006
2006	SU ENERJİ (Balıkesir) GR I - II	4.6	20.7	HYDRO	27/06/2006
2006	BEREKET EN.(Mentaş Reg) GR I	26.6	108.7	HYDRO	31/07/2006

	- II				
2006	EKİN (Başaran Hes) (Nazilli)	0.6	4.5	HYDRO	11/08/2006
2006	ERE(Sugözü rg. Kızıldüz hes) GR I - II	15.4	31.6	HYDRO	08/09/2006
2006	ERE(AKSU REG.ve ŞAHMALLAR HES) GR I-II	14.0	26.7	HYDRO	16/11/2006
2006	TEKTUĞ(Kalealtı) GR I - II	15.0	52	HYDRO	30/11/2006
2006	BEREKET EN.(Mentaş Reg) GR III	13.3	54.4	HYDRO	13/12/2006
Total		**5,017**	**35,436**		

Table 17. Electricity Generation of Selected Recent Capacity Additions by Fuel Type

Capacity Additions by Fuel Type	Average Generation, GWh				
	2003	**2004**	**2005**	**2006**	**Total**
Coal	0	337.5	1,125.0	0,0	1,462.5
Lignite	0	0.0	4,420.0	7,020.0	11,440.0
Fuel Oil	0	466.2	99.1	0.0	565.3
Diesel oil	0	4.1	0.0	0.0	4.1
LPG	0	0.0	0.0	0.0	0.0
Naphtha & Aphaltite	0	322.9	0.0	0.0	322.9
Natural Gas	312.0	8,827.2	6,995.4	3,457.4	19,592.0
Renewables and wastes	0	0.0	85.0	42.0	127.0
Hydro	0	241.8	1,028.8	484.3	1,754.9
Geothermal & Wind	0	0.0	2.4	165.0	167.4
Total	**312**	**10,120**	**13,756**	**11,169**	**35,436**

Annex 3

MONITORING INFORMATION

The Project Activity will be connected to the national grid at the Edremit II transformer station. 8 wind turbines with a rated output of 2,000 kW each will be connected to the measurement instruments through a transformer. The switchgear station, where the measurement instruments are read periodically by TEİAŞ, is only accessible to trained TEİAŞ staff. On the first days of each succeeding month, the TEİAŞ staff performs the reading, upon which the invoicing will be based.

There are two measurement instruments monitoring the generated electricity continuously. Furthermore, a SCADA system will monitor and store various data including the electricity generation of each wind turbine separately. The project participant is able to monitor the electricity generation data read by the SCADA system as well as the two measurement instruments from distance, however it has no control over or access to the measurement devices and cannot perform any type of maintenance or calibration.

Energy generation and consumption of the Project Activity is measured and recorded with a single primary metering device and another secondary metering device for high data quality. A TEIAŞ personnel comes each month to the Project site and connects to the primary and secondary metering devices using his own equipment, without any interference from the project participants. This personnel takes readings from both devices and compares them. If the difference of both devices is higher than 0.002, then technical precautions described below are taken by TEIAS to ensure data quality. Under normal conditions, the digital readings are uploaded by the TEIAS personnel to TEIAS on site and a print-out of the preceding month's generation and consumption summary is signed by both the site engineer and the TEIAS personnel.

The net electricity generated and delivered to the grid can be monitored from TEİAŞ invoices, from the PMUM - Market Financial Settlement Centre- (MFSC) website[27] or the SCADA system. To ensure high quality data, PMUM web site data will be used to calculate the net electricity generation.

Apart from the electricity generation, number of local employees will be monitored as well. The total number of new jobs created by the Project Activity will be checked whether it is positive.

Detailed Description of the Monitoring Plan

The monitoring plan involves

1. The determination of the baseline emissions occurring within the project boundary during the crediting period. As the project boundary is defined as the national grid of Turkey, the baseline emissions from electricity generation activities in Turkey will be calculated and monitored based on national official data.
2. The determination of the local employment as an SD indicator. The project aims to create local employment opportunities in the project region in a sustainable way. The project participants prefer to prioritize personnel from the project region, which will be defined as an Gold Standard indicator to be verified each year.
3. The final locations of the wind turbines will be identified during the first monitoring of the Project.

Indicator 1: Net electricity generation [ID 1]

[27] http://www.teias.gov.tr/mali/maliuz.htm.

The leakage during crediting period will be negligibly small and will not be monitored, as fossil fuel consumption during construction and operation of the project activity is minimal.

Hence, the monitoring plan involves the net electricity generation by the project activity;

- The two measurement instruments, which are located at the high voltage side of the main switchgear station (34.5 kV), are not accessible by the project participant or any other party except TEİAŞ. This prevents any intervention and assures the accuracy and quality of the measurements.
- The measurement instruments give two types of data; the total gross electricity generated and the total electricity consumed by the wind farm. The difference of these two data is the net electricity generated. Furthermore, TEİAŞ cuts a certain percentage of the generation to account for transmission losses. The net electricity generation, which is to be monitored and to be used for baseline emissions, is the net electricity generation, which is the difference of gross electricity generation and self electricity consumption.
- At the end of each monitoring period, the data from the monthly meter readings will be added up to obtain the total monitoring period net electricity generation. This figure will be multiplied with the combined margin emission factor, which has been calculated ex-ante.

Self consumption of the Project activity:

The Project Activity itself consumes some amount of energy for operation. This self consumption is also measured with a primary and a secondary metering device. Similar to energy generation, energy consumption is also recorded and accounted for the invoicing.

Self electricity consumption of the project activity is also measured and recorded by a primary and a secondary metering device. The TEIAS personnel comes on the first days of each succeeding month and takes the readings of the previous month in terms of gross electricity generation and self electricity consumption (beside others), with a breakdown into 3 time periods (T1 for 06:00-17:00, T2 for 17:00-22:00, T3 for 22:00-06:00) for invoicing. Following this reading, the results are transmitted on site to the TEIAS network by the TEIAS personnel electronically without any intervention. Based on this reading, a protocol form is printed out, which lists in detail the energy generation and consumption values in a similar way the PMUM web site lists them, and is then signed by the site manager and the TEIAS personnel. Therefore, self consumption values are recorded, read and treated similar to the generation values. Project participants have no access to the metering devices and the self electricity consumption data is of high quality.

Data Source:

At the first days of each month, a TEIAS personnel comes to the sites and makes a reading regarding the last period from the beginning to the end of the previous month. After making the reading from the metering device, a standard protocol showing the generation and consumption data is signed by the site manager and the TEIAS personnel. Under normal conditions, these figures are used for invoicing purposes.

Based on these monthly protocols, a detailed breakdown of generation and consumption figures is also supplied by the TEIAS Market Financial Clearing Center (PMUM) website. The project participant can access its own consumption and generation data through the web site of PMUM (http://pmum.teias.gov.tr) by using a secured ID and password. After accessing this web site, the project participant is able to call actual and historical data. These

data are used by TEIAS for invoicing, and the same data source will be used for the determination of emission reductions.

TEIAS invoices according to the net electricity supply, which takes transmission line losses into account. This means that the invoiced amount of electricity is the difference of gross generation, self consumption and transmission line losses, which is determined by TEIAS every month as a certain percentage.

For emission reductions calculations, however, transmission line losses shall not be subtracted, therefore the invoiced amount of energy cannot be used. Instead, **EG_y** (Annual net electricity amount fed to the grid by the project activity) will be used, which is the monitoring parameter, is the difference between the Gross Electricity Generation (GEG_y) and project activity's Self Electricity Consumption (SEC_y):

$EG_y = GEG_y - SEC_y$

PMUM website publishes monthly GEG_y and SEC_y data in detail (with a breakdown into three daily time periods), however it does not show EG_y separately. Therefore, for each month GEG_y and SEC_y data need to be recorded and their difference has to be calculated on a monthly basis. The annual total net electricity generation is then found by summing up monthly EG_y values.

An example of a monthly PMUM web site report is provided below[28]:

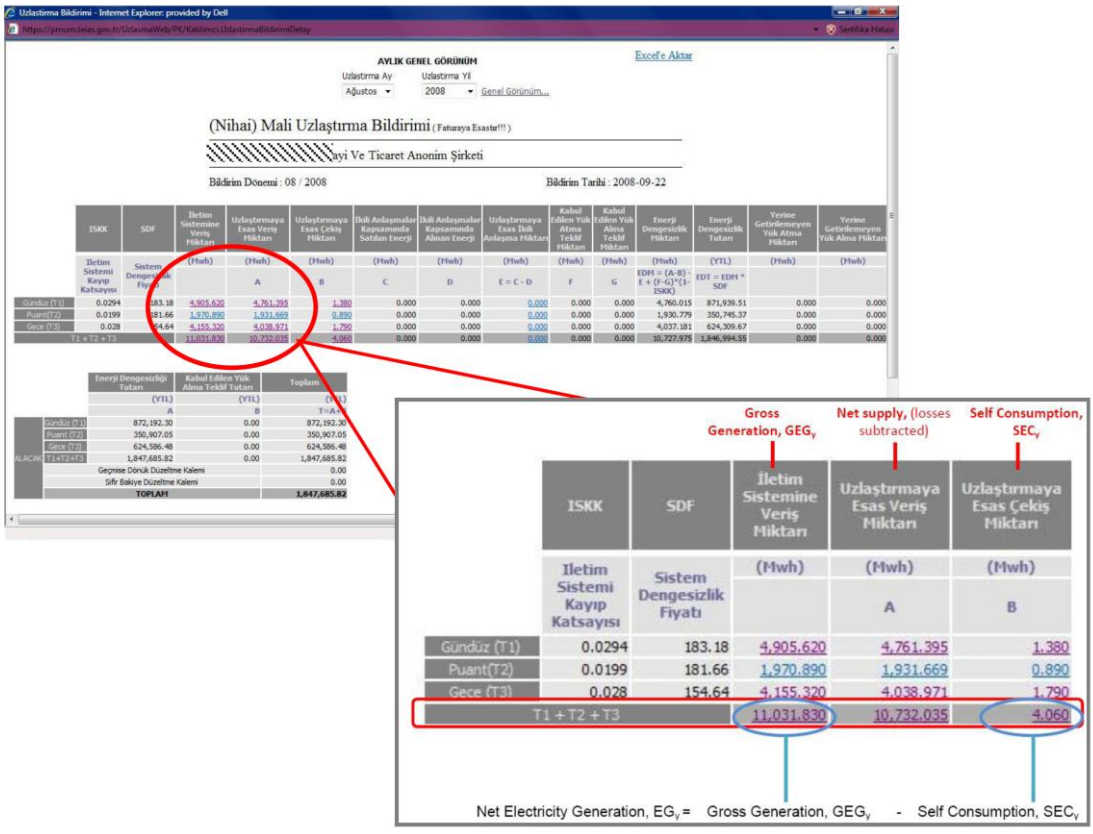


Figure 5. Official PMUM Report used for Invoicing and Monitoring (figures not relevant)

[28] This report belong to another GS project of the project participant.

These monthly figures will be used to fill in the Net Electricity Generation Monitoring Plan spreadsheet. This table is provided below and is also submitted to the DOE as a separate file. The monthly and annual emission reductions are calculated with this table. The scans of monthly PMUM report print-outs will be also be supplied as proof to the DOE.

Data Quality, Storage and Accuracy:

Concerning metering system accuracy, project participants have to comply with relevant national legislation. The project must ensure that the metering devices are in line with the technical requirements which are set out by the "Elektrik Piyasasında Kullanılacak Sayaçlar Hakkında Tebliğ" (Communiqué for Metering Devices to be used in the Electricity Market). Metering devices are technically checked by independent companies for their accuracy and certified. Afterwards, TEIAS also tests each metering device in order to ensure that the devices satisfy all requirements.

The table in the Section II, Article 11 of this communiqué describes the minimum accuracy requirement the metering devices have to fulfil, which are categorized according to the installed capacity. As the rated output of the project activity is between 10 MW and 100 MW, the metering device has to have an accuracy equal to or better than 0.5%:

*Sayacın bağlı olduğu devrenin gücü	100 MVA'dan büyük	100 MVA ile 10 MVA arasında (100 MVA ve 10 MVA dahil)	10 MVA'dan küçük
Aktif enerji sayaçları	IEC-EN 60687 0.2S sınıfı	IEC-EN 60687 0.5S sınıfı	IEC-EN 60687 0.5 sınıfı
Reaktif enerji sayaçları	**IEC-EN 61268 2 sınıfı	**IEC-EN 61268 2 sınıfı	**IEC-EN 61268 2 sınıfı

Figure 6. The table in the Section II, Article 11 of this communiqué

This requirement of 0.5% is stricter than 1% and thus fulfils the requirement. The original and valid version of the communiqué (in Turkish language) is also submitted to the DOE.

The collected data will be kept by Demirer Enerji during the credit period and stored at least two years after the issuance of VER credits for the all wind power project activity in the concerning crediting period. Furthermore, the data will be accessible through the PMUM database as well. As the PMUM web site provides all the final relevant valid data in detail for an unlimited time period (which are also used as the basis for invoicing), the energy generation and consumption figures are of high quality.

According to the "Communiqué for Metering Devices to be used in the Electricity Market", Article 9, paragraph b, the periodic calibration shall be made every 10 years[29]. The calibration will be carried out by TEIAS. The devices are sealed during first operation of the plant. In case there is a significant inconsistency (assessed by TEIAS) between two devices, the meters will be calibrated by TEIAS before the 10 years period. In such a case, a template[30] will be used. The Project owner can also request calibration of the meter(s). The calibration stations are inspected by the central organization of the same Ministry[31].

[29] "Communiqué for Metering Devices to be used in the Electricity Market", Article 9, paragraph b. (Document already submitted to the DOE.)
[30] http://www.teias.gov.tr/mali/GDUY/PRO_FORM/OLCUM/DAG02.xlsa
[31] Source: "Communiqué for Metering Devices to be used in the Electricity Market", Article 10

Failure of the metering device:

In case of unforeseen problems or failures of the meters or if any difference occurs between primary and secondary device TEIAŞ has to be informed for necessary maintenance and calibration. An agreement between the project participant and TEIAŞ will ensure that in case of problems or failures of the meters TEIAŞ reacts as fast as possible to solve the problem, TEIAŞ performs the necessary maintenance and calibration. Since the electricity generation data is used for the billing and accounting between TEIAŞ and Alize Enerji the data is of high quality. The plant manager is responsible for the plant as well as the monitoring issues on behalf of Alize Enerji on sight.

If it is determined by TEIAS that the seal of the primary metering device is torn apart or any intervention is made; correct power amounts are determined over the secondary meter, beginning from the latest measurement when the recorded values of the primary and the secondary metering devices match.
In case of unforeseen problems or failures of the meters or if any difference occurs between primary and secondary device TEIAŞ has to be informed for necessary maintenance and calibration. TEIAŞ performs the necessary maintenance and calibration. If TEIAS determines that the seal of the primary metering device is torn apart or any intervention is made; correct power amounts are determined over the secondary meter, beginning from the latest measurement when the recorded values of the primary and the secondary metering devices match.

Maintenance Plan (by TEIAS):
The following maintenance plan will be carried out by TEIAS every 5 years without any interference of the project participants:

FIVE-YEAR PERIODICAL MAINTENANCE FOR METERS (CODE 04.04)		DONE	NOT DONE	REMARKS
04.04.1	Maintenance of the primary metering device shall be made in accordance with related contracts and legislation.			
04.04.2	Periodical maintenance of meters that are not used for the calculation of sales invoice shall be made every 5 years. However, in case totals of index values of total of bar meter and feeder meter do not match, measurement circuits shall be completely tested.			
04.04.3	Seals of meters shall be renewed every 10 years. Values shall be obtained from, if available, the secondary meter. If not available, a meter with the same characteristics shall be assembled temporarily until the meters are sealed.			
04.04.4	Factors of meters shall be checked in accordance with ATO (current transformer ratio) and GTO (voltage transformer ratio) rates to which they are dependent on.			
04.04.5	Metering devices shall be tested in accordance with IEC/TSE standards and/or measurement adjustment regulations by using an etalon meter. In case there are differences, faulty meters shall be checked and adjusted if necessary.			
04.04.6	Voltage, current and angle magnitudes coming to the meter shall be read.			
04.04.7	Time meters of electromechanical d-phase meters shall be checked and if necessary, changed.			
04.04.8	Characteristic values of metering devices shall be compared to book records.			
04.04.9	The following documents shall be drawn by the parties and signed			

	under their titles; 1- Transformer station panel personnel 2- Customer representative 3- RÖA unit 4- Conduction Plan and Management Group Management 5- TETAŞ General Management 6- TEİAŞ General Management			

SUSTAINABLE DEVELOPMENT INDICATOR MONITORING

According to the Gold Standard Manual for CDM Project Developers, Gold Standard monitoring requirements in addition to regular CDM monitoring procedures are defined based on the outcomes of the stakeholder consultation meeting and the Sustainable Development Assessment conducted. The Sustainable Development Assessment Matrix shows that local employment is an indicator, which would be critical for a positive contribution of the project to Sustainable Development.

Local stakeholders have indicated no issues of potentially significant importance related to questions from the Gold Standard Public Consultation Checklist (Appendix E to the Gold Standard Manual for VER Project Developers) during the initial stakeholder consultation. A detailed report of the issues raised and the answer provided by the project owner are provided in the Initial Stakeholder Consultation Report.

Issues -except local employment- of potentially significant importance during the stakeholder consultation cannot be converted into additional monitoring requirements because:

- the monitoring requirements already prescribe monitoring of all relevant parameters, or
- the indicated issues cannot be influenced by the project owner during the operation of the plant (e.g. risk of seismic activities), or
- the indicated issues are considered to be positive (social impact) or neutral (visibility of the project).

Therefore, only the Project's contribution to local employment as an additional Gold Standard specific monitoring criteria has been added to the regular monitoring plan.

Indicator 2: Employment (Numbers) [ID 2]

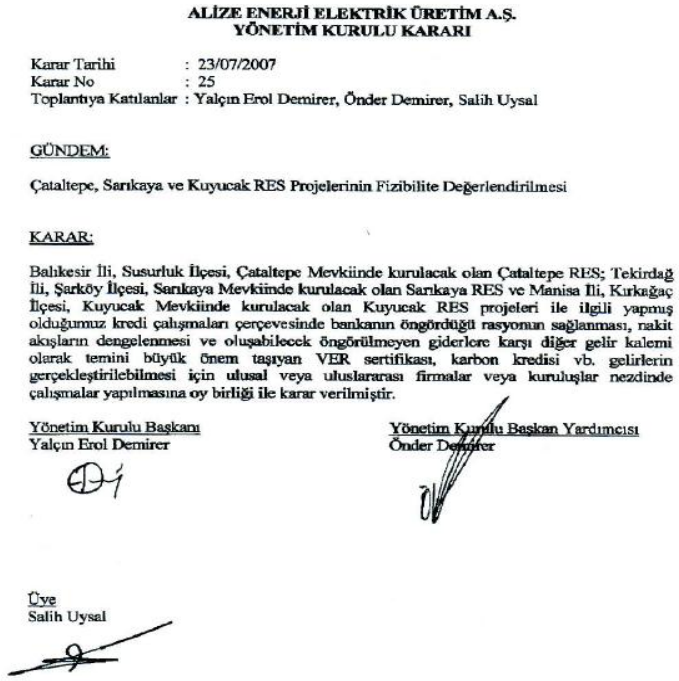
The project aims to create employment in the local region. The number of local employees will be monitored yearly to demonstrate that the project activity has contributed to local employment. The reason of selecting employment as a Sustainable Development Indicator is its significance for the local community. During the stakeholder consultation process, local stakeholders have indicated that their most relevant expectation from the project activity is the creation of new jobs for their villages. As the stakeholders have emphasized local employment as the most important social contribution, it is determined as the SD monitoring indicator.

The number of local personnel employed by the Project will be determined during monitoring and verified by the DOE.

Indicator 3: Air Quality: [ID 3]

As indicator parameter, the avoided SO_2 and NO_x emissions is selected. The SO_2 and NO_x emissions in 2007 caused by electricity generation are already reported in Turkey's GHG inventory submitted to UNFCCC in 2009, from which the SO_2 and NO_x intensities are calculated. Using these intensity figures and the net electricity generation of the Project activity, the SO_2 and NO_x emission reduction of the Project will be computed.

Annex 4
RELEVANT DOCUMENTS



ALİZE ENERJİ ELEKTRİK ÜRETİM A.Ş.
YÖNETİM KURULU KARARI

Karar Tarihi : 23/07/2007
Karar No : 25
Toplantıya Katılanlar : Yalçın Erol Demirer, Önder Demirer, Salih Uysal

GÜNDEM:

Çataltepe, Sarıkaya ve Kuyucak RES Projelerinin Fizibilite Değerlendirilmesi

KARAR:

Balıkesir İli, Susurluk İlçesi, Çataltepe Mevkiinde kurulacak olan Çataltepe RES; Tekirdağ İli, Şarköy İlçesi, Sarıkaya Mevkiinde kurulacak olan Sarıkaya RES ve Manisa İli, Kırkağaç İlçesi, Kuyucak Mevkiinde kurulacak olan Kuyucak RES projeleri ile ilgili yapmış olduğumuz kredi çalışmaları çerçevesinde bankanın öngördüğü rasyonun sağlanması, nakit akışların dengelenmesi ve oluşabilecek öngörülmeyen giderlere karşı diğer gelir kalemi olarak temini büyük önem taşıyan VER sertifikası, karbon kredisi vb. gelirlerin gerçekleştirilebilmesi için ulusal veya uluslararası firmalar veya kuruluşlar nezdinde çalışmalar yapılmasına oy birliği ile karar verilmiştir.

Yönetim Kurulu Başkanı
Yalçın Erol Demirer

Yönetim Kurulu Başkan Yardımcısı
Önder Demirer

Üye
Salih Uysal

Figure 7. Early Consideration: Board Resolution of the Project Participant regarding VER financing

Translation

ALİZE ENERJİ ELEKTRİK ÜRETİM A.Ş. BOARD RESOLUTION

Resolution Date: 23.07.2007

Resolution Nr: 25

Participants: Yalçın Erol Demirer, Önder Demirer, Salih Uysal

AGENDA

Çataltepe, Sarıkaya and Kuyucak Wind Farm Projects Feasibility Assessment

DECISION:

Regarding our Çataltepe Wind Farm Project in Çataltepe, Susurluk Town, Balıkesir province; our Sarıkaya Wind Farm Project in Sarıkaya, Şarköy Town, Tekirdağ province and our Kuyucak Wind Farm Project in Kuyucak, Kırkağaç town, Manisa province; the participants have agreed to take necessary steps to get into contact with national and international companies and institutions for the acquisition of VER certificates, which are vital for the realization of the above stated projects by the generation of additional revenues offsetting unforeseen costs, balancing cash flow and meeting financial ratio requirements of the bank, which have been discussed during our credit meetings with the bank.

Chairman
Yalçın Erol Demirer
[signature]

Vice Chairman
Önder Demirer
[signature]

Member
Salih Uysal
[signature]

T.C.
ENERJİ PİYASASI DÜZENLEME KURUMU

EPDK

ÜRETİM LİSANSI

Bu Lisans kapsamındaki üretim tesisi
Yenilenebilir Enerji Kaynağı kullanmaktadır.

Lisans No : EÜ/1167-2/835

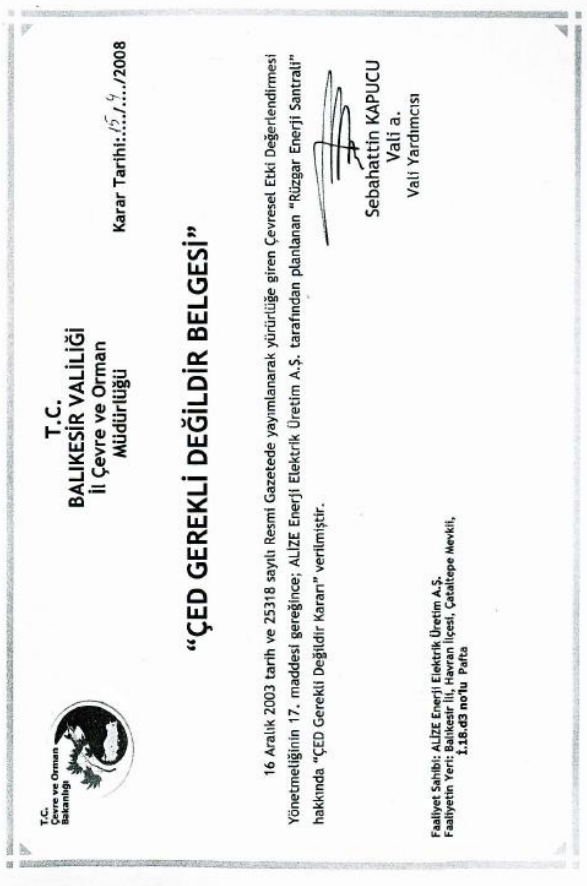
Tarih : 18/04/2007

Bu Lisans; **Alize Enerji Elektrik Üretim Anonim Şirketi**'ne, Balıkesir ili, Havran ilçesinde, rüzgar enerjisine dayalı Çataltepe RES projesi kapsamında, 18/04/2007 tarihinden itibaren 45 yıl süreyle üretim faaliyeti göstermek üzere 4628 sayılı Elektrik Piyasası Kanunu ve ilgili mevzuat uyarınca Enerji Piyasası Düzenleme Kurulu'nun 18/04/2007 tarihli ve 1167-2 sayılı Kararı ile verilmiştir.

Yusuf GÜNAY
Başkan

Bu lisans, genel ve özel hükümleri ile ayrılmaz bir bütündür.

Figure 8. Generation License



T.C.
BALIKESİR VALİLİĞİ
İl Çevre ve Orman Müdürlüğü

Karar Tarihi: 15/4/2008

"ÇED GEREKLİ DEĞİLDİR BELGESİ"

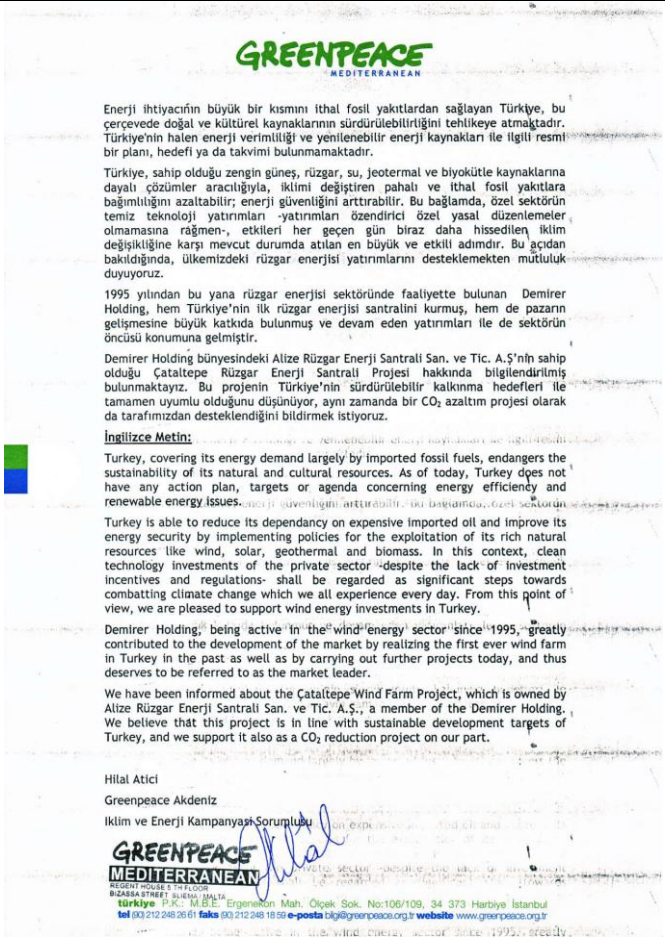
16 Aralık 2003 tarih ve 25318 sayılı Resmi Gazetede yayımlanarak yürürlüğe giren Çevresel Etki Değerlendirmesi Yönetmeliğinin 17. maddesi gereğince; ALİZE Enerji Elektrik Üretim A.Ş. tarafından planlanan "Rüzgar Enerji Santralı" hakkında "ÇED Gerekli Değildir Kararı" verilmiştir.

Sebahattin KAPUCU
Vali a.
Vali Yardımcısı

Faaliyet Sahibi: ALİZE Enerji Elektrik Üretim A.Ş.
Faaliyetin Yeri: Balıkesir İli, Havran İlçesi, Çataltepe Mevkii,
1.18.d3 no'lu Pafta

T.C. Çevre ve Orman Bakanlığı

Figure 9. Notice of exemption from EIA



GREENPEACE
MEDITERRANEAN

Enerji ihtiyacının büyük bir kısmını ithal fosil yakıtlardan sağlayan Türkiye, bu çerçevede doğal ve kültürel kaynaklarının sürdürülebilirliğini tehlikeye atmaktadır. Türkiye'nin halen enerji verimliliği ve yenilenebilir enerji kaynakları ile ilgili resmi bir planı, hedefi ya da takvimi bulunmamaktadır.

Türkiye, sahip olduğu zengin güneş, rüzgar, su, jeotermal ve biyokütle kaynaklarına dayalı çözümler aracılığıyla, iklimi değiştiren pahalı ve ithal fosil yakıtlara bağımlılığını azaltabilir; enerji güvenliğini arttırabilir. Bu bağlamda, özel sektörün temiz teknoloji yatırımları -yatırımları özendirici özel yasal düzenlemeler olmamasına rağmen-, etkileri her geçen gün biraz daha hissedilen iklim değişikliğine karşı mevcut durumda atılan en büyük ve etkili adımdır. Bu açıdan bakıldığında, ülkemizdeki rüzgar enerjisi yatırımlarını desteklemekten mutluluk duyuyoruz.

1995 yılından bu yana rüzgar enerjisi sektöründe faaliyette bulunan Demirer Holding, hem Türkiye'nin ilk rüzgar enerjisi santralini kurmuş, hem de pazarın gelişmesine büyük katkıda bulunmuş ve devam eden yatırımları ile de sektörün öncüsü konumuna gelmiştir.

Demirer Holding bünyesindeki Alize Rüzgar Enerji Santrali San. ve Tic. A.Ş'nin sahip olduğu Çataltepe Rüzgar Enerji Santrali Projesi hakkında bilgilendirilmiş bulunmaktayız. Bu projenin Türkiye'nin sürdürülebilir kalkınma hedefleri ile tamamen uyumlu olduğunu düşünüyor, aynı zamanda bir CO_2 azaltım projesi olarak da tarafımızdan desteklendiğini bildirmek istiyoruz.

İngilizce Metin:

Turkey, covering its energy demand largely by imported fossil fuels, endangers the sustainability of its natural and cultural resources. As of today, Turkey does not have any action plan, targets or agenda concerning energy efficiency and renewable energy issues.

Turkey is able to reduce its dependancy on expensive imported oil and improve its energy security by implementing policies for the exploitation of its rich natural resources like wind, solar, geothermal and biomass. In this context, clean technology investments of the private sector -despite the lack of investment incentives and regulations- shall be regarded as significant steps towards combatting climate change which we all experience every day. From this point of view, we are pleased to support wind energy investments in Turkey.

Demirer Holding, being active in the wind energy sector since 1995, greatly contributed to the development of the market by realizing the first ever wind farm in Turkey in the past as well as by carrying out further projects today, and thus deserves to be referred to as the market leader.

We have been informed about the Çataltepe Wind Farm Project, which is owned by Alize Rüzgar Enerji Santrali San. ve Tic. A.Ş., a member of the Demirer Holding. We believe that this project is in line with sustainable development targets of Turkey, and we support it also as a CO_2 reduction project on our part.

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Figure 10. Support Letter from Greenpeace Mediterranean

Annex 5

LOCATIONS OF THE WIND TURBINES

Turbine Nr.	E	N
T1	5 12 066.00	43 74 648.00
T2	5 12 130.00	43 74 493.00
T3	5 12 182.00	43 74 331.00
T4	5 12 176.00	43 75 322.00
T5	5 12 232.00	43 75 164.00
T6	5 13 326.00	43 74 529.00
T7	5 13 515.00	43 74 480.00
T8	5 13 643.00	43 74 376.00

Figure 11. Location of the Project Activity

Locations of wind turbines are not finalized and are subject to change. The final locations will be identified during the first monitoring of the Project.

Annex 6

GOLD STANDARD INFORMATION

Introductory Notes

This document contains the PDD Annex to validate the Project *Çataltepe 16 MW Wind Farm* against the Gold Standard.

The project activity comprises the installation of 8 units of 2,000 kW with a total capacity of 16 MW. The project activity implies a series of sustainable development aspects including technology transfer, environmental and social benefits.

In the scope of the project, local roads will be repaired and improved, an additional transmission line will be built. A significant amount of equipment (blades, cable, transformer etc.) will be procured in Turkey, which will contribute to local development as well. In addition to environmental and social benefits the project will trigger locally, it will increase the share of renewable and clean energies in the Turkish electricity market, will reduce the dependency on foreign sources and will fuel the development of a wind energy sector in Turkey. The Project, located in the less developed area of Turkey, will also contribute to regional economic development and generate direct jobs during the operation of the plant and temporary jobs during the construction of the plant.

Çataltepe 16 MW Wind Farm Project will significantly contribute to the national electricity grid in terms of energy supply and will create considerable amounts of carbon emission reductions, which will help in climate change mitigation. These aspects will help to get more public attention on renewable energies and will create a more sound basis for the wind energy as a serious alternative in terms of reputation, dependability, electricity generation and local sustainable development. Thus, it will be able to open the path to further renewable energy projects in Turkey.

Project Type Eligibility Screen

GS Manual for VER Project Developers: **Section 3.2**

Wind energy projects fall into the renewable energy categories outlined in the pre-assessment section Box 1 in Chapter 2.2 of the Gold Standard Manual for CDM Project Developers as eligible project types.

Annex 7

INFORMATION REGARDING PUBLIC FUNDING

There is no public funding in the project.