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

(GS-VER-PDD)

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April 2006

This document was developed by: ECOFYS

The Gold Standard for VERs has received financial support from:

reeep renewable energy & energy efficiency partnership

WWF climatecare my climate The Climate Protection Partnership David Suzuki Foundation SOLUTIONS ARE IN OUR NATURE

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.

CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006

CONTENTS

Annexes

SECTION A. General description of project activity

A.1 Title of the project activity:

Keltepe Wind Farm Project – Turkey
Version number of the document: 06
Date: 04.08.2009

A.2. Description of the project activity:

Summary:
The Keltepe Alize Wind Farm Project (hereafter referred to as the Project) involves the development of a 20.7 MW onshore wind farm located in the Balıkesir province, Susurluk district in Turkey. The Project involves the installation of 23 turbines and the development of a medium voltage transmission line between the proposed project area and the national grid. An estimated 72,232 MWh/year[1] of electricity generated by the Project will be delivered to the Turkish national grid. The annual emission reductions are estimated as 46,501 tCO_2-eq/year.

Contribution to sustainable development:
The project contributes significantly to the region's sustainable development in the following ways:

- Reduction of the greenhouse gas emissions in Turkey by replacing electricity otherwise generated by the Turkish grid, which has a large share of fossil fuel power generation.
- Contribution to the development of the wind energy sector in Turkey.
- Creation of local employment both during the construction and operational phase. The latest data available shows the unemployment level in Turkey as 12.6%[2]. The project will mainly have an impact on the local area.
- Contribution to local and regional economy since the cables, transformer, masts, blades, construction equipments and subcontractors are procured locally.
- Technology and know-how transfer as the employees are trained by both Demirer Holding and German wind turbine manufacturer ENERCON on maintenance, safety and operational issues.
- Contribution to the reduction of pollutants such as sulphur dioxide, nitrogen oxides and particles resulting from the electricity generation using fossil fuels in Turkey.
- Reduction of Turkish dependency on electricity imports.

[1] The estimates of the generation capacitiy is based on the micro-siting study based on 20.7 MW installed capacity. This change accrued from the amendment in the legislative structure of related law on 09/07/2008 (Law # 5784 article 3 / http://www.tbmm.gov.tr/kanunlar/k5784.html) allowing the project owner to use the nominal capacity of each turbine. The technical feasibilities are being revised according top the new capacities as per date 08/08/2008. The technical feasibility study is available for DOE. ..

[2] Reference: Turkish Statistical Institute, Unemployment rate for October-December 2007 http://www.turkstat.gov.tr/ (website accessed on 15.02.2008)

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 country)	• Alize Enerji Elektrik Üretim A.Ş. (private company)	No

Alize Enerji Elektrik Üretim A.Ş. is the operating company of the project activity, which was established by Demirer Enerji Üretim Sanayi ve Ticaret A.Ş.

Full contact information for the project participants is provided in Annex 1.

OneCarbon International B.V. is the carbon consultant for this project.

Ecofys Netherlands BV is the baseline study and monitoring methodology developer for this project.

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

Turkey

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

Marmara Region / Balıkesir Province / Susurluk District

A.4.1.3. City/Town/Community etc:

The Project will be located in Susurluk District in Balıkesri Province. In the vicinity of the project site there are the following villages: İrşadiye, İclaliye, Yaylaköy, Günaydın and Kurucuoluk. The economy of the region is based on livestock.

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

Figure 1. Map of Turkey and location of the project area

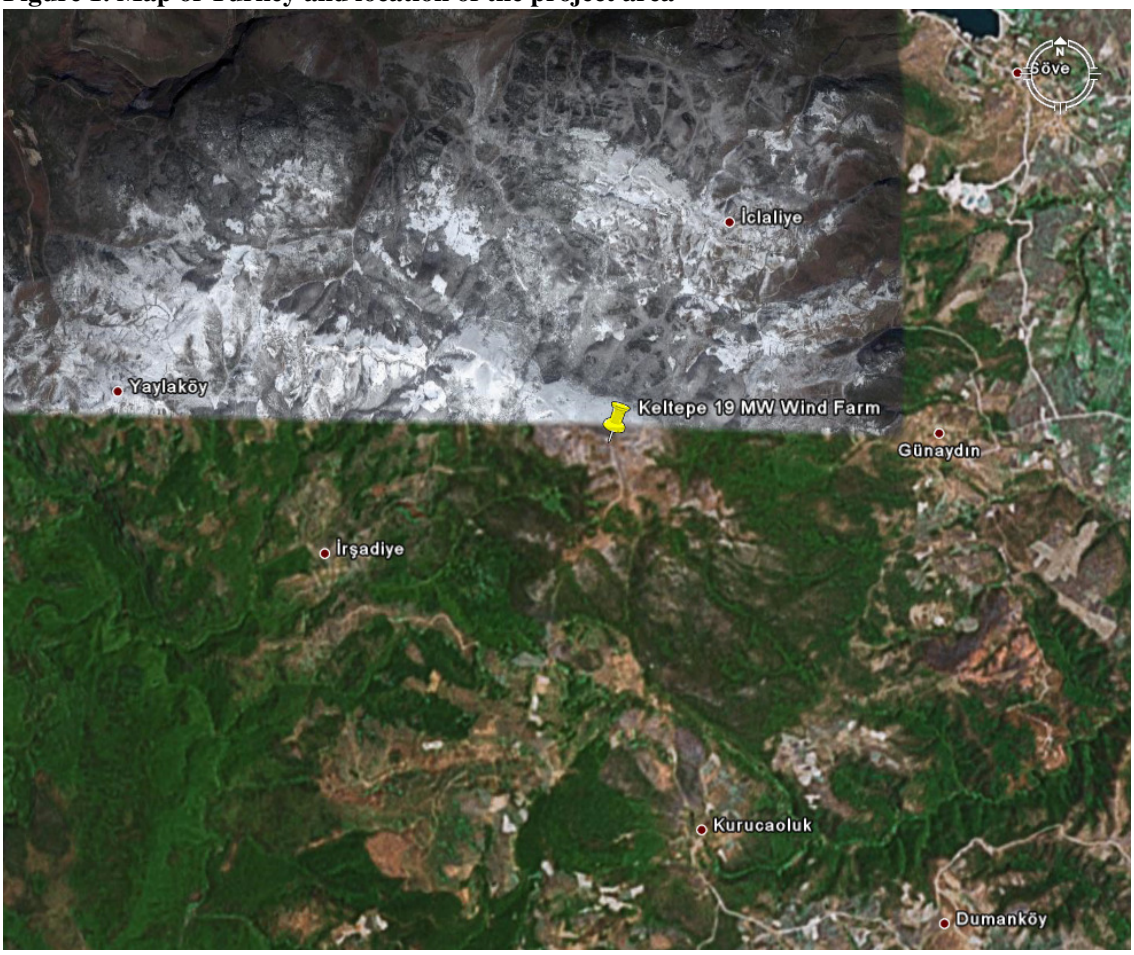

Figure 2. Map of the vicinity of the project area

Location of Turbine T12 (approximate mid-point of the wind farm site) located in the map above is $39^0$57' N $28^0$02' E. The coordinates of all of the wind turbines are included in the technical feasibility[3].

A.4.2. Category(ies) of project activity:

The project consist renewable energy source and therefore it falls into sectoral scope: 1 - Energy industries (renewable - / non-renewable sources).

A.4.3. Technology to be employed by the project activity:

The project involves the installation of 23 ENERCON direct drive turbines with a total installed capacity of 20.7 MW and the establishment of a grid connection. The Project is expected to generate 72,232 MWh/year of electricity.

Wind turbines
The Project participants have chosen the sophisticated direct drive[4] turbines manufactured by ENERCON GmbH. The turbines are more expensive compared to the common turbines; however they are of higher quality which is expressed in higher reliability and less noise, besides the turbines are grid friendly. 23 units of ENERCON E44 will be installed. Technical description of turbines is presented in more details in table 2 below.

Table 2: Technical details of ENERCON wind turbines

Model of turbine	Rated power [kW][5]	Number of blades	Rotor diameter [m]	Rotor swept area [m^2]	Hub height [m]
E44	900	3	44	1,521	55

Turbines will be transported from Germany to the project site. However, the other components (blades, masts, cables etc.) will be supplied from local manufacturers. This will result in creating new job opportunities and also will increase the local manufacturers' incomes.

Grid connection
The proposed project activity further involves the development of a connection to the national grid. The grid connection consists of 13 km transmission line. The sub-transformer station at the project area will be connected to the Göbel Transformer station via 34.5 kV Medium Voltage transmission line.

[3] Technical feasibility is available for the DOE.

[4] The rotor hub and annular generator are directly connected to each other without gears. Compared to conventional geared systems that have a large number of bearing points in a moving drive train, ENERCON's drive system has only two slow-moving roller bearings. [reference: www.enercon.de]

[5] Rated power of 900kW for E44 model is for the turbine without power limiter.

Auxiliary Power Unit
In case of emergency situations that might result in disconnection to the grid a small sized diesel engine will be used.

A.4.4 Estimated amount of emission reductions over the chosen crediting period:

Years	Annual estimation of emission reductions in tonnes of tCO_2.eq
2009	42,626
2010	46,501
2011	46,501
2012	46,501
2013	46,501
2014	46,501
2015	46,501
2016	3,875
Total emission reductions (tonnes of CO_2-eq)	325,506
Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tonnes of CO_2-eq)	46,501

A.4.5. Public funding of the project activity:

The project does not obtain public funding.

SECTION B. Application of a baseline and monitoring methodology

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

Approved consolidated baseline methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 07)[6].

"Tool for the demonstration and assessment of additionality" (version 04)[7].

"Tool to calculate the emission factor for an electricity system" (version 01)[8].

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

The approved consolidated baseline methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 07), is applicable to the proposed Project because it meets the required criteria:

- The project consists of a wind power electricity capacity addition and is a grid-connected electricity generation project;
- The project does not involve switching from fossil fuel use to renewable energy at the site of the project activity; and
- The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available.

B.3. Description of the sources and gases included in the project boundary

Emission sources:
According to the methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 7), the only emission sources are the emissions associated with the electricity that is displaced from the grid due to the project activity.

Table 3. Sources and gases included in the project boundary

	Source	Gas	Included?	Justification/Explanation
Baseline	CO2 emissions from electricity generation in fossil fuel fired power plants that are connected to the Turkish National Grid	CO_2	Yes	Main emission source
		CH_4	No	Excluded for simplification. This is conservative.
		N_2O	No	Excluded for simplification. This is conservative.

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

[7] Reference: http://cdm.unfccc.int/methodologies/PAmethodologies/AdditionalityTools/Additionality_tool.pdf

[8] Reference: http://cdm.unfccc.int/methodologies/Tools/EB35_repan12_Tool_grid_emission.pdf

Project activity	Project emissions	CO_2	No	As per ACM0002 (version 07) there are no expected project emission related to the generation of electricity by wind turbines[9].
		CH_4	No	
		N_2O	No	

According to the methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 07), the spatial extent of the project boundary includes the project site and all power plants connected physically to the Turkish National Grid.

B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

According to the methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 07), the baseline scenario is the electricity delivered to the grid by the project activity, 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".

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):

As required in the Gold Standard Voluntary Emission Reductions Manual for Project Developers, the project additionality is demonstrated through use of the "Tool for the demonstration and assessment of additionality" (version 04).

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

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

If the proposed project activity would not be implemented, the shareholders of Alize Enerji Elektrik Üretim A.Ş. do not have alternative investment options which generate a similar amount of electricity production as the proposed VER project activity. An alternative to the project activity therefore would be "no action" from the project participants.

Considering the above, the following alternatives have been identified, for the generation of the same amount of electricity as generated by the project activity:

[9] Although there are no project emissions according to the methodology, emissions from the auxilary power unit will be taken into account.

Alternative A	Keltepe wind farm without VER credits
Alternative B	Same amount of electricity produced by other facilities not under the control of project participant (No action from the investors)

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

The following applicable mandatory laws and regulations have been identified:

(1) Electricity Market Law [Law Number: 4628 Ratification Date: 20.02.2001 Enactment Date: 03.03.2001]

(2) Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy [Law Number: 5346 Ratification Date: 10.05.2005 Enactment Date: 18.05.2005]

(3) Environment Law [Law Number: 2827 Ratification Date: 09.08.1983 Enactment Date: 11.08.1983]

All the alternatives to the project outlined in sub-step 1a above are in compliance with applicable laws and regulations.

Step 2. Investment analysis
This step has not been applied

Step 3. Barrier analysis

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

Implementation of the Project without the VER revenues (alternative A defined under sub-step 1a) faces barriers that prevent the realisation of this alternative. An overview of the barriers is presented in table 4. Each barrier is described in more details in the section below.

Table 4. Identified barriers for development of the project activity

Type of barrier		Identified barrier	Internal/ External
Investment	Barriers related to access to finance	Low project IRR and ADSCR	INT
		High level of financing and long pay back period	INT
		Country risk	EXT
	Barriers related to the project design	Development of grid connection	EXT
		Direct drive turbines	INT
		Transmission line fee	EXT
Technical		No Turkish manufacturers of wind turbines	EXT
		Conditions in the project site	EXT
Prevailing practice		Wind capacity constitutes a low share of the total generation capacity	EXT
Other		Bureaucratic and legislative	EXT

The major barriers that project developers have to cope with are listed below:

- *Low project IRR and ADSCR*
- *Wind capacity constitutes a low share of the total generation capacity*

Investment Barriers

Part of barriers for the development of the project is related to the access to finance. The project participants had difficulties securing a loan for development of the project, for the following reasons:

- *Low project IRR and ADSCR:* The Internal Rate of Return (IRR) and Annual Dept Service Cover Ratio (ADSCR) of the project without the income from VERs were too low to secure project financing. The IRR of the proposed project with and without the revenues from the sale of VERs is presented in table 5 below.

Table 5. IRR comparison[10]

Project IRR	10 Years	20 years
Without VERs	n.a.	0.34 %
With VERs	-14.04	1.63 %

The additional income from VERs has increased the IRR of the project and positively affected the ADSCR (Annual Dept Service Coverage Ratio), which in consequence influenced the decision of the bank to issue the loan.

- *High level of financing and long pay back period*: Wind farms require a high level of financing and have long pay back periods compared to other investment options.
- *Country risk:* In the international markets the risk for investments in Turkey is considered as high. After an economic crisis in 2001, Turkish economy has seen a positive development. However investments in Turkey are still considered as relatively high risk investments. In early-to-mid 2006 the raise of interest rate in major industrial countries has strongly affected the Turkish economy, the currency depreciated significantly, long-terms interest rates rose and inflation accelerated. Together with the high current account deficit, a still high public debt ratio, a large stock of rapid foreign investments and non-supportive political environment Turkey is vulnerable to a sudden stop in capital inflows[11]. It can be concluded that the economical and political situation has an adverse impact on the international perception of Turkey as investment country and, this is an important barrier to the Project.

Other investment barriers identified for the project are:

- *Development of grid connection:* The Keltepe wind farm has to be connected to the national grid via 35.4 kV Medium Voltage overhead transmission line. The project participant will have to develop 13 km of the transmission line. This investment will be covered totally by Demirer Holding. The total investment cost is approximately €520,000.

[10] Updated (the financials are based on 20.7 MW installed capacity) financial feasibility of Keltepe Wind Farm Project submitted to the creditor bank, available for the DOE.

[11] Reference: IMF Fifth Review – Turkey 2007, http://www.imf.org/external/pubs/ft/scr/2007/cr07161.pdf ; OECD Economic Survey of Turkey 2006, http://www.oecd.org/dataoecd/50/53/37529636.pdf; OECD Country Risk Classification February 2008, http://www.oecd.org/dataoecd/47/29/3782900.pdf (websites accessed on 22.02.2008)

- *Direct drive turbines*: The project involves the installation of direct drive variable speed turbines supplied by ENERCON. These are more expensive compared to the common turbines; however they are of higher quality which is expressed in higher reliability, more 'grid friendly' and have a lower noise level.[12].
- *Transmission line fee:* Each project that delivers electricity to the Turkish national grid is obliged to pay a 'transmission line use fee'. The amount of the fee is determined by the location of the project. For this Turkey is divided into 23 zones. The proposed project activity is located in the Susurluk District in Balıkesri Province, which is identified as zone 1[13]. This zone has the second highest transmission line fee, namely 8,671.42 €/MWyear[14], while the lowest fee is 40.29 €/MWyear[15]. This results in extra costs for the operation of the project activity.

Technical Barriers

- *No Turkish manufacturers of wind turbines*: Currently, there are no manufactures of wind turbines in Turkey. Therefore the project participants have to import wind turbines from abroad. The transfer of the equipment results in higher operational risk and higher investments costs. Furthermore the new technology and foreign equipment requires the training of personnel for construction, operational and maintenance of the wind farm.
- *Conditions in the project site*: Due from harsh weather conditions, which occur especially between November and March, the construction works are hindered and limited. Moreover, the project site is located on the mountain ridge, at the altitude of approximately 850 m above sea level, where bedrock is crust and rocky. Thus project participant meets with obstacles during construction works.

Barriers due to prevailing practice

Wind capacity constitutes a low share of the total generation capacity: As a country whit a rapid growing economy, Turkey's demand for electricity has also been continuously growing during the past decade. In 2006 the electricity demand was 174,230 GWh with an increase of 8.3% compared to the previous year. The increase or decrease rates for electricity are presented in table 6 below.

[12] For more technical details please refer to ENERCON website: http://www.enercon.de

[13] Reference: http://www.epdk.org.tr/tarife/elektrik/iletim/1029/ek1.xls (website accessed on 22.02.2008)

[14] Calculation based on exchange rate on 22.02.2008: 1€ = 1.7890 YTL (source: European Central Bank http://www.ecb.int/stats/exchange/eurofxref/html/eurofxref-graph-try.en.html)

15,513.17 TRY = 8,671.42 €; 71.16 TRY = 40.29 €

[15] Reference: http://www.epdk.org.tr/tarife/elektrik/iletim/1029/1029.html (website accessed on 22.02.2008)

Table 6. The energy demand and increase rates between years 1997-2006[16]

Year	Energy Demand [GWh]	% of increase
1997	105,517	11.3
1998	114,023	8.1
1999	118,485	3.9
2000	128,276	8.3
2001	126,871	-1.1[17]
2002	132,553	4.5
2003	141,151	6.5
2004	150,018	6.3
2005	160,794	7.2
2006	174,230	8.3

It is expected that on the long term the share of wind will not change and remain insignificant within the long-term projections for energy supply. In table 7 the projection of the installed capacity for Turkey until 2016 is given. The share of wind energy (including other sources of renewable energy sources) in 2016 is foreseen to be 2.8%. The majority share belongs to thermal plants with 61%.

Table 7. Projection of installed capacity balance of Turkey[18]

Energy Source [MW]	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Thermal	27,778	28,101	28,939	31,039	34,029	36,749	39,464	42,544	46,059	48,074
Hydro	13,614	14,302	15,899	18,209	20,044	21,814	23,412	24,970	26,415	27,898
Wind + other renewables	786	1,113	1,328	1,453	1,578	1,703	1,828	1,953	2,078	2,203
MW TOTAL	42,178	43,515	46,166	50,701	55,601	60,266	64,704	69,467	74,552	78,175

Note: the actual realised installed wind capacity in 2007 is 131 MW (please see table 8 below), while in the projection this was estimated as 786 MW.

A breakdown of the installed capacity is presented in table 8 below; this is based on official 2006 statistics of TEIAS.

Table 8. Breakdown of installed capacity of the Turkish grid[19]

[16] Reference: Derived from Turkish Electricity Transmission Company Projection report 2007 (p.4 , table 1) / www.teias.gov.tr

[17] On 21 February 2001, Turkish economy was hit by a crisis, where the exchange rate system collapsed. For more detail please refer to http://www.econ.brown.edu/fac/Herschel_Grossman/courses/122readings/Ozatay&Sak.pdf (website accessed on 20.12.2007)

[18] Reference: Turkish Electricity Transmission Company, Turkish Electrical Energy 10 Year Projection of Generation Capacity (2007-2016) (p.35 table 22)/ http://www.teias.gov.tr/

Primary Energy Source	2006 [MW]	% of installed capacity 2006
Lignite	8,210.8	20.2
Hard + Imported Coal	1,986.0	4.9
Natural Gas	11,462.2	28.3
Fuel Oil	2,123.2	5.2
Diesel Oil	251.9	0.6
LPG	0	0
Naphtha	21.4	0.1
Solid + Liquid	471.0	0.2
Natural Gas + Liquid	2,852.4	7.0
Hydro	13,062.7	32.2
Geothermal + Wind	***81.9***	***0.2***
TOTAL	40,564.8	100

Based on the above can be concluded that wind farms constitute a small share of the total electricity generation capacity of Turkey. This results in barriers for the development of wind farms as a result of limited experience in construction and operation of wind farms.

Other Barriers

Bureaucratic and legislative:

The first wind measurements for the Keltepe Wind Farm Project were performed by Demirer Holding in 1999. However the project is planned to start in May 2008. This delay can be explained by the bureaucratic and legislative barriers the project faced:

- *The structural change in the energy market*: On 3 of March 2001 the "Turkish Electricity Market Law[20]" was enacted and the structure of the electricity market changed from a monopolised market model, to a liberalised market model. In the monopolised model private companies' could participate through BOT (Built Operate and Transfer) projects, this involved low risks since the projects where after construction transferred to the state. In the current electricity market private companies can only develop BO (Built and Operate) projects within a competitive market frame, without the security of the state buying the project. The conjuncture and legal basis before 2001 (the enactment of Electricity Market Law) allowed wind farm projects to have a 20 year purchase guarantee with a fixed price[21]. The current participation of private companies to the market is relatively weak in terms of financial attractiveness of wind projects compared to pre 2001 condition. In addition, the private companies, especially those

[19] Reference: Turkish Electricity Transmission Company Statistics / derived from the distribution of installed capacity by primary energy resources and the electric utilities in Turkey http://www.teias.gov.tr/ist2006/7.xls (website accessed on 22.02.2008).

The figure of geothermal and wind divers from the sum ginven in table 8 due to frequency of updating internal information within TEIAS.

[20] Reference: Official website of Energy Market Regulatory Authority http://www.epdk.gov.tr/mevzuat/kanun/elektrik/elektrik.html (website accessed on 22.02.2008)

[21] Other projects developed by Demirer as BOT projects show that there are significant deviations of financial benefits compared to current projects developed as BO projects.

who invest in new technologies such as wind energy, encounter delays due to the immature structure of the new electricity market.

- *Uncertainties in the market*: The legal basis of renewable energy generation, including wind energy, is laid down in the "Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy" enacted on 18 of May 2005[22]. This law provides a guaranteed electricity price over a period of time. The enactment of this law reduced the uncertainty in payback which obstructed the private sector to invest in wind energy projects and reduced the high risk perception for wind energy projects from creditors' point of view. .
- *Political demeanour of the government*:
  In addition to the energy projection presented above, temporary article 2 of the newly enacted "Law on Installation, Operation and Sales of Energy of Nuclear Power Plants[23]" (enacted on 09.11.2007) constitutes a subsidy scheme for coal fired power plants with a capacity over 1000 MW.

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):
Alternative B, the same amount of electricity produced by other facilities not under the control of the project participants, is not hindered by the identified barriers.

Step 4. Common practice analysis

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

Wind farms constitute a small share of the installed generation capacity. The generation mix of the grid is dominated by fossil fuel fired power plants and this share is expected to grow.

The total installed capacity of wind farms in Turkey is relatively small compared to the total installed capacity The current wind power projects in Turkey add up to 146.25 MW., where the total where the total installed capacity equals 40,564.8 MW.

[22] Reference: Official website of Energy Market Regulatory Authority http://www.epdk.gov.tr/mevzuat/diger/yenilenebilir/reseng.doc (website accessed on 22.02.2008)

[23] Reference: Official website of Energy Market Regulatory Authority / http://www.epdk.gov.tr/mevzuat/diger/nukleer/5710.htm (website accessed on 15.02.2008)

Table 9. Most recent wind farms installed in Turkey[24]

Location	Company	Installed Capacity (MW)	Developed as	Year
İzmir – Çeşme	Alize A.Ş.	1.5	BOT	1998
İzmir – Çeşme	Güçbirliği A.Ş.	7.2	BOT	1998
Çanakkale – Bozcaada	Bores A.Ş.	10.2	BOT	2000
Istanbul – Hadımkoy	Sunjüt A.Ş.	1.2	BOT	2003
Balıkesir – Bandırma	Bares A.Ş.	30	VER	2006
Istanbul – Silivri	Ertürk A.Ş.	0.85	BO	2006
İzmir – Çeşme	Mare A.Ş.	39.2	BO-VER	2007
Manisa – Akhisar	Deniz A.Ş.	10.8	BO-VER	2007
Çanekkale – Intepe	Anemon A.Ş.	30.4	BO-VER	2007
Çanakkale – Gelibolu	Doğal A.Ş.	14.9	BO-VER	2007
TOTAL		**146.25**		

Note: BOT = Build Operate Transfer; BO = Build Operate, VER = developed with income from the sale of carbon credits. All older wind farms have been developed as BOT project.

Sub-step 4b. Discuss any similar options that are occurring:
The most recent wind farms of comparable size to the project activity, based on installed capacity, were developed as VER project.

The additionality analysis shows that the project activity faces barriers that prevent the implementation of the project without VER revenues. Therefore the project activity can be considered as 'additional'.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

Emission reductions
In accordance with the methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 07) to calculate emission reductions the following equation is applied:

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

Where:
ER_y = Emission reductions in year y (tCO_2/year)
BE_y = Baseline emissions in year y (tCO_2/year)
PE_y = Project emissions in year y (tCO_2/year)
LE_y = Leakage emissions in year y (tCO_2/year)

[24] Reference: Energy Market Regulatory Authority, http://www.epdk.gov.tr/lisans/elektrik/yek/ruzgarprojeleriningelisimi.doc (website accesed on 15.02.2008)

Baseline emissions
According to the methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 07), baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The baseline emissions are calculated as follows:

$$BE_y = \left(EG_y - EG_{baseline}\right) EF_{grid,CM} \qquad \textbf{(2)}$$

Where:
BE_y = Baseline emissions in year y (tCO2/year)
EG_y = Electricity supplied by the project activity to the grid (MWh)
$EG_{baseline}$ = Baseline electricity supplied to the grid in the case of modified or retrofit facilities (MWh).
$EF_{grid,CM}$ = Combined margin CO2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"

For new power plants EGbaseline value is taken as zero. Therefore:

$$BE_y = EG_y \cdot EF_{grid,CM} \qquad \textbf{(3)}$$

For the purpose of calculating combined margin emission factor ($EF_{grid,CM,y}$) the methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 07) refers to the "Tool to calculate the emission factor for an electricity system" (version 01). This tool provides the following six steps to calculate combined margin emission factor:

Step 1. Identify the relevant electric power system.
Step 2. Select an operating margin (OM) method.
Step 3. Calculate the operating margin emission factor according to the selected method.
Step 4. Identify the cohort of power units to be included in the build margin (BM).
Step 5. Calculate the build margin emission factor.
Step 6. Calculate the combined margin (CM) emissions factor.

Step 1. Identification of the relevant electric power system

According to the "Tool to calculate the emission factor for an electricity system" (version 01), a project electricity system has to be 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. Correspondingly, in this project activity the project electricity system include the project site and all power plants attached to the Interconnected Turkish National Grid.

Electricity transfers from connected electricity systems to the project electricity system are defined as electricity imports. For the purpose of determining the operating margin emission

factor, 0 tCO_2/GWh emission factor has been determined for net electricity imports ($EF_{grid, import, y}$) from the connected electricity system.

Step 2. Selection of an operating margin (OM) method

According to the "Tool to calculate the emission factor for an electricity system" (version 01), in calculating the operating margin ($EF_{grid,OM,y}$), project developers have the option to select from four potential methods:

(a) Simple OM, or
(b) Simple adjusted OM, or
(c) Dispatch Data Analysis OM, or
(d) Average OM.

Options (b) and (c) are not selected due to the limited availability of data for Turkey. Option (d) is not selected since low-cost/must run resources do not constitute more than 50% of total grid generation. As prescribed in the tool, the Simple OM (a), can only be used if low-cost/must run resources constitute less than 50% of total grid generation, where low-cost/must run resources include hydro, geothermal, wind, low-cost biomass, nuclear and solar generation. The share of the installed capacity of renewable energy sources excluding hydro power is 0.1% of the total electricity generation and is therefore not taken into consideration (see table 10). There is no indication that coal is used as a must-run and no nuclear energy plants are located in Turkey. That leaves hydro power as the only relevant low-cost must run source for electricity. The electricity generation from hydro power is 25.1% of the total electricity generation (see table 10). Therefore the requirements for the use of the Simple OM calculations (option a) are satisfied.

Table 10. Breakdown by sources of the electricity generation from the Turkish grid 2006[25]

Power plants by fuel type	2006 Generation	
	Generation (GWh)	Share (%)
Natural Gas	80,691	45.8
Coal	46,649	26.5
Hydro power	44,244	25.1
Fuel Oil	4,340	2.5
Renew.+Geoth.+Waste+Wind	220	0,1
Total	**176,299**	**100**

Since the Simple OM calculation (option a) is selected, the emission factor is calculated by the generation-weighted average emissions per electricity unit (tCO_2/GWh) and averaged over the past three years of all generating sources serving the system, not including low-operating cost and must-run power plants.
The tool gives two options for the calculation of $EF_{grid, OM, y}$:

- Ex-ante option: A 3-year generation–weighted average, based on the most recent data available at the time of submission of the VER-PDD to the DOE for validation, without

[25] Reference: TEIAS (Turkish Electricity Transmission Company) / "The distribution of gross electricity generation by primary energy resources and the electricity utilities in Turkey 2006" http://www.teias.gov.tr/ist2006/40.xls (website accessed on 20.02.2008)

the requirement to monitor and recalculate the emissions factor during the crediting period, or

- Ex post option: The year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during the monitoring.

For this project the ex ante approach is selected. Data for calculating the three year average is obtained from the period 2004 – 2006[26] which are the most recent data available at the time of submission of the PDD to DOE.

Step 3. Calculating 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 (tCO_2/MWh) of all generating power plants serving the system, not including low-cost / must run power plants / units. It may be calculated:

- Based on data on fuel consumption and net electricity generation of each power plant / unit (Option A), or
- Based on the data on net electricity generation, the average efficiency of each power unit and the fuel type(s) used in each power unit (Option B), or
- 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 (Option C)

As the fuel consumption and the average efficiency data for each power plant / unit is not available Option C is used for simple OM calculation[27].

As Option C is used , the simple OM emission factor is calculated based on the net electricity supplied to the grid by all power plants serving the system, not including low-cost / must run power plants / units, and based on the fuel type(s) and total fuel consumption of the project electricity system as follows:

$$EF_{grid,OM,y} \frac{\sum FC_{i,y} \cdot NCV_{i,y} \cdot EF_{CO_2,i,y}}{\sum EG_y} \qquad \textbf{(4)}$$

Where:

$EF_{grid, OM, y}$ = Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)

$FC_{i, y}$ = Amount of fossil fuel type I consumed in the project electricity system in year y (mass or volume unit)

$NCV_{i, y}$ = Net calorific value (energy content) of fossil fuel type I in year y (GJ / mass or volume unit)

$EF_{CO2, i,y}$ = CO_2 emission factor of fossil fuel type I in year y (tCO_2/GJ)

EG_y = Net electricity generated and delivered to the grid by all power sources serving

[26] On 06.11.2007 an official information request has been made to TEIAS regarding for 2007 data. However, TEIAS rejected the inquiry, giving reference to the "Law on Procurement of Information".

[27] There are no nuclear power plants in Turkey and the share of the renewable energy is very small (please refer to table 10). The quantity of the electricity supplied to the grid by renewable power generation is known (please refer to table 17).

the system, not including low-cost / must run power plants / units, in year *y* (MWh)

Step 4. Identifying the cohort of the power units to be included in the build margin

The sample group of power units *m* used to calculate the build margin consists of either;

(a) The set of five power units that have been built most recently, or
(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[28].

Option (b) has been chosen to identify the cohort of power units to be included in the build margin as the set of power units comprise the larger annual generation.

The list of the power plants is defined under Annex 3, Baseline information of this PDD.

Step 5. Calculation of the build margin emission factor

The built margin emissions factor is the generation-weighted average emissions 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:

$$EF_{grid,BM,y} = \frac{\sum EG_{m,y} \cdot EF_{EL,m,y}}{\sum_{m} EG_{m,y}} \qquad \textbf{(5)}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emissions factor in year *y* (tCO_2/MWh)
$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)
$EF_{EL,m,y}$ = CO_2 emission factor of the power unit *m* in year *y* (tCO_2/MWh)

As per the "Tool to calculate the emission factor for an electricity system" (version 01), the CO_2 emission factor of each power unit *m* ($EF_{EL,m,y}$) should be determined as per the guidance from the tool in step 3 for simple OM, using options B1, B2 or B3, using for *y* the most recent historical year for which power generation data is available, where *m* is the power units included in the build margin.

As plant specific fuel consumption data is not available for Turkey, option B2 has been selected for the calculation of the CO_2 emission factor of each power unit m ($EF_{EL,m,y}$) as follows:

$$EF_{EL,my} = \frac{EF_{CO_2,m,i,y} \cdot 3.6}{\eta_{m,y}} \qquad \textbf{(6)}$$

[28] If 20% falls on part capacity of a unit, that unit is fully included in the calculation.

Where:

$EF_{EL,m,y}$	CO_2 emission factor of the power unit m in year *y* (tCO_2/MWh)
$EF_{CO2,m,I,y}$	Average CO_2 emission factor of fuel type I used in power unit m in year *y* (tCO_2/GJ)
$n_{m,y}$	Average net energy conversion efficiency of power unit m in year *y* (%)

Where several fuel types are used in the power unit, the lowest CO_2 emission factor for $EF_{CO2,m,I,y}$ has been used.

Step 6. Calculation of the combined margin emission factor

The combined margin emissions factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \cdot w_{OM} + EF_{grid,BM,y} \cdot w_{BM} \quad \textbf{(7)}$$

Where:

$EF_{grid,CM,y}$	=	Combined Margin emission factor in year *y* (tCO_2/MWh)
$EF_{grid,OM,y}$	=	Operating margin emission factor in year *y* (tCO_2/MWh)
$EF_{grid,BM,y}$	=	Build margin emission factor in year *y* (tCO_2/MWh)
w_{OM}	=	Weight of the operating margin emission factor (%)
w_{BM}	=	Weight of the build margin emission factor (%)

According to the "Tool to calculate the emission factor for an electricity system" (version 01), as the proposed project is a wind farm, the weighs for the operating margin and build margin emission factors are by default 0.75 and 0.25 respectively.

Project Emissions

The proposed project activity involves the generation of electricity by development of wind farm. The generation of electricity does not result in greenhouse gas emissions. In case of emergencies an auxiliary power unit will be used. Therefore the monitoring of the project emission is not a part of the methodology. The associated project emissions will be negligible but will be taken into account.

$$PE = FC_{Diesel} * NCV_{Diesel} * EF_{CO2,Diesel}$$

Where:

PE	=	project emissions due to auxiliary power unit [tCO_2-eq]
FC_{Diesel}	=	Consumption of diesel (Fossil Fuel) in auxiliary unit (L)
NCV_{Diesel}	=	Net Calorific Value of Diesel (GJ/L)
$EF_{CO2,Diesel}$	=	CO_2 emission factor of diesel (tCO_2-eq/GJ)

Leakage

The energy generation equipment is not transferred from or to another activity. Therefore leakage does not has to be taken into account.

B.6.2. Data and parameters that are available at validation:

Data / Parameter:	**ID.1 / EG_{gross}**
Data unit:	GWh
Description:	Gross electricity production by fossil fuel power sources (2004-2006)
Source of data used:	TEIAS (Turkish Electricity Transmission Company) The distribution of gross electricity generation by primary energy resources and the electricity utilities in Turkey (2004, 2005, 2006). http://www.teias.gov.tr/istat2004/42.xls http://www.teias.gov.tr/istatistik2005/43.xls http://www.teias.gov.tr/ist2006/40.xls
Value applied:	Table 13, Table 14
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to "Turkish Statistics Law and Official Statistics Program"[29] TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Any comment:	

Data / Parameter:	**ID.2 / FC_i**
Data unit:	m^3 / tons (m^3 for gaseous fuels)
Description:	Amount of fossil fuel consumed in the project electricity system by generation sources (2004-2006)
Source of data used:	TEIAS (Turkish Electricity Transmission Company) Fuels consumed in thermal power plants in Turkey by the electric utilities (2004-2005, 2006) http://www.teias.gov.tr/ist2006/42.xls for 2004 and 2005 data http://www.teias.gov.tr/ist2006/43.xls for 2006 data
Value applied:	Table 11
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to "Turkish Statistics Law and Official Statistics Program" TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Any comment:	

[29] Reference: http://rega.basbakanlik.gov.tr/Eskiler/2005/11/20051118-1.htm (website accessed on 20.02.2008)

Data / Parameter:	**ID.3 / Electricity Imports**
Data unit:	GWh
Description:	Electricity transfers from connected electricity systems to the project electricity system by years (2004-2006)
Source of data used:	TEIAS (Turkish Electrical Transmission Company) Monthly distribution of imported electrical energy by years (2004, 2005, 2006) http://www.teias.gov.tr/ist2006/47.xls
Value applied:	Table 15
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to "Turkish Statistics Law and Official Statistics Program" TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Any comment:	

Data / Parameter:	**ID.4 / NCV**
Data unit:	TJ/Gg
Description:	Net calorific value (energy content) of fossil fuel type
Source of data used:	TEIAS (Turkish Electricity Transmission Company) Heating values of fuels consumed in thermal plants in Turkey by the electricity utilities (2004-2005, 2006) http://www.teias.gov.tr/ist2006/44.xls for 2004 and 2005 data http://www.teias.gov.tr/ist2006/45.xls for 2006 data
Value applied:	Table 12
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to "Turkish Statistics Law and Official Statistics Program" TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Any comment:	

Data / Parameter:	**ID.5 / EF_{C02}**
Data unit:	kg CO_2/TJ
Description:	Default CO_2 emission factor of fossil fuel type
Source of data used:	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter 1 of Volume 2 (Energy) of the 2006 IPCC Guidelines for National Greenhouse Gas Inventory http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.htm
Value applied:	Table 12, Table 16
Justification of the choice of data or description of measurement methods and procedures actually applied :	There is no information on the fuel specific default emission factor in Turkey, hence, IPCC values has been used as referred in the "Tool to calculate the emission factor for an electricity system" (version 1).

Any comment:	

Data / Parameter:	**ID.6 / η**
Data unit:	%
Description:	Plant specific generation efficiency for type of fuel
Source of data used:	"Environmental Map" published by Environmental Inventory Head Department under Ministry of Environment and Forestry / http://www.cedgm.gov.tr/dosya/cevreatlasi.htm (p.197, table X.3.1; Thermal Plants and Environment)
Value applied:	Table 16
Justification of the choice of data or description of measurement methods and procedures actually applied :	The average values of thermal plants in Turkey are taken from the report "Environmental Map" published by the Ministry of Environment and Forestry.
Any comment:	

Data / Parameter:	**ID.7 / Capacity additions**
Data unit:	Name of the plant; Installed capacity (MW); Fuel type; Generation (GWh); Comissionary date
Description:	Capacity additions to the grid that comprises 20% of the total generation (2003-2006)
Source of data used:	TEIAS (Turkish Electricity Transmission Company) Generation units put into operation in 2003; 2004; 2005; 2006 http://www.teias.gov.tr/istatistik/7.xls for 2003 http://www.teias.gov.tr/istat2004/7.xls for 2004 http://www.teias.gov.tr/istatistik2005/7.xls for 2005 http://www.teias.gov.tr/projeksiyon/ekler.htm for 2006[30]
Value applied:	Table 17, Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to "Turkish Statistics Law and Official Statistics Program" TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Any comment:	

[30] The capacity additions of 2006 are listed in Annex 2 (Ek 2) of this web page.

Data / Parameter:	**ID.8 / $EF_{grid,CM}$**
Data unit:	tCO_2/MWh
Description:	Combined Margin emission factor
Source of data used:	Official utility documents
Value applied:	0.644
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated *ex-ante* according to the "Tool to calculate emission factor for an electricity system" version 01, EB35 Annex 12.
Any comment:	

Data / Parameter:	**ID.9 / NCV Diesel**
Data unit:	GJ/L
Description:	Net Calorific value of Diesel
Source of data used:	Energy Statistics Manual, IEA, OECD, 2005
Value applied:	0.0366
Justification of the choice of data or description of measurement methods and procedures actually applied :	Energy Statistics Manual, IEA, OECD, 2005 http://www.iea.org/textbase/nppdf/free/2005/statistics_manual.pdf Table A.3.8 Where density = 0.8429 kg/L and NCV=43.38 MJ/kg
Any comment:	

Data / Parameter:	**ID.10 / $EF_{CO2,Diesel}$**
Data unit:	tCO_2-eq/GJ
Description:	CO_2 Emission factor of diesel
Source of data used:	-
Value applied:	0.074
Justification of the choice of data or description of measurement methods and procedures actually applied :	2006 IPCC Guidelines for National Greenhouse Gas Inventories, vol 2, page 2.16
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

For the purpose of calculation of emission reductions, the following steps have to be applied:

Calculation of the Simple Operating Margin Emission Factor ($EF_{grid,OM,}$)
For the calculation of the Simple OM, the amount of fuel consumption ($FC_{i, y}$) is taken from website of TEİAŞ, which is the official source of related data. The fuel consumption values for relevant years are given in table 11 below.

Table 11. Fuel consumption of generation sources connected to the grid (2004-2006)[31]

$FC_{i, y}$ 1000m^3 or tons (m^3 is used for gaseous fuels)				
	2004	**2005**	**2006**	**Total**
Natural Gas	13,325,721	15,756,764	17,034,548	**46,117,033**
Lignite	33,776,660	48,319,143	50,583,810	**132,679,613**
Coal	4,564,713	5,259,058	5,617,863	**15,441,634**
Fuel Oil	2,653,901	2,131,730	1,821,357	**6,606,988**

Turkey specific net calorific values ($NCV_{i, y}$) values for fossil fuel types are used, however data from IPCC guidelines for national greenhouse gas inventory has been used for emission factor of fossil fuel types ($EF_{CO2, I, y}$) as the source of data. The NCV and emission factors are presented in table 12 below.

Table 12. IPCC values for NCV and emission factor of fossil fuel type[32]

	NCV_i (TJ/Gg)			**$EF_{CO2, I}$ ($kgCO_2/TJ$)**
	2004	2005	2006	
Natural Gas	36.9	37.3	37.0	54,300
Lignite	7.6	5.9	6.9	90,900
Coal	22.5	21.1	22.0	94,600
Fuel Oil	40.3	40.4	40.3	72,600

The electricity generated to the grid by all power sources serving the system, not including low-cost / must run power plants / units ($EG_{gross,y}$) is obtained from TEIAS (Turkish Electricity Transmission Company). Table 13 shows the gross electricity production for 2004-2006 produced by fossil fuel power sources.

[31] For further information please refer to section B.6.2.

[32] For further information please refer to section B.6.2.

Table 13. Gross electricity production by fossil fuel power sources 2004-2006[33]

$EG_{gross,y}$ GWh				
	2004	**2005**	**2006**	**Total**
Natural Gas	62,241.8	73,444.9	80,691.2	**216,377.9**
Lignite	22,449.5	29,946.3	32,432.9	**84,828.7**
Coal	11,998.1	13,246.2	14,216.6	**39,460.9**
Fuel Oil	7,670.3	5,482.5	4,340.4	**17,493.2**

The gross electricity production includes the electricity consumption of the power plants. To be able to calculate the net electricity fed into the grid by specific fuel sources, an average correction factor had to be calculated from the overall gross/net electricity generation data. The annual publication of TUIK (Turkish Statistical Institute) is the most accurate official source of data, which provides most up-to-date information publicly available. This relation is derived in table 14 below.

Table 14. Relation between net and gross electricity generation 2002-2004[34]

	2002	**2003**	**2004**
Gross generation [GWh]	129,400	140,581	150,698
Net generation [GWh]	123,727	135,248	145,066
Relation	95.6%	96.2%	96.3%
Average correction factor	96%		

The net electricity delivered to the grid by the fossil fuel plants ($EG_{net,y}$) is calculated in table 15. The calculation of $EF_{grid,OM,\ y}$ requires the inclusion of electricity imports with an emission factor of 0 tCO_2/GWh. By including the imports in the electricity production this requirement is fulfilled.

Table 15. Net electricity production by fossil fuel power plants and electricity imports 2004-2006[35]

		2004	**2005**	**2006**	**Total**
Net electricity production $EG_{net,y}$ [GWh]	**Natural Gas**	59,752.1	70,507.1	77,463.6	207,820.1
	Lignite	21,551.5	28,748.4	31,135.6	81,473.7
	Coal	11,518.2	12,716.4	13,647.9	37,900.2
	Fuel Oil	7,363.5	5,263.2	4,166.8	16,801.3
Electricity imports [GWh]		463.5	635.9	573.2	1,672.6
Electricity supplied to grid EG_y [GWh]		**100,648.8**	**117,871.0**	**126,987.1**	**345,667.9**

The simple operating margin emission factor **$EF_{grid,OM,}$** is calculated through equation (4) with the data from table 11, table 12 and table 15 as 0.**652 tCO_2-eq/MWh**.

[33] For further information please refer to section B.6.2.

[34] For further information please refer to section B.6.2.

[35] For further information please refer to section B.6.2.

Calculation of the Built Margin Emission Factor ($EF_{grid,BM,}$)
For the calculation of the CO_2 emission factor of power units *m* ($EF_{EL,m,}$), the average CO_2 emission factor of fuel types ($EF_{CO2,m}$) and the average net energy conversion efficiency of the power plants ($\eta_{m,y}$) are used. The results of the calculations through equation (6) are presented in table 16 below.

Table 16. Emission factor of the power units[36]

	Average emission factor ($EF_{CO2,m}$)	Average net conversion efficiency (η_m)	Emission factor of the power units ($EF_{EL,m,y}$)
	[tCO_2/GWh]	[%]	[tCO_2/GWh]
Natural Gas	54,300	46	425
Lignite	90,900	33	1001
Coal	94,600	34	1014
Fuel Oil	72,600	33	788
Hydro	n.a.	n.a.	n.a.
Wind	n.a.	n.a.	n.a.

The data regarding the electricity generated and delivered to the grid by power units ($EG_{m,y}$) are presented in table 17 below.

Table 17. Electricity generated by the power units included in the build margin calculation[37].

$EG_{m,y}$ [GWh]					
	2003	**2004**	**2005**	**2006**	**TOTAL**
Natural Gas	692.3	8,877.4	7,117.8	3,283.5	19,971.0
Lignite			4,420.0	7,020.0	11,440.0
Coal		337.5	1,125.0		1,462.5
Fuel Oil		793.3	100.9		894.2
Hydro		241.8	1,028.8	478.1	1,748.6
Renewables			87.4	100.0	187.4
TOTAL					**35,703.7**

The build margin emission factor $\mathbf{EF_{grid,BM}}$ is calculated through equation (5) with the data from table 16 and table 17 as 0.**619 tCO_2-eq/MWh**.

Calculation of the Emission Factor Combined Margin ($EF_{grid, CM,}$)
The $\mathbf{EF_{grid, CM,}}$ is calculated through equation (7) as 0.**644 tCO_2-eq/MWh.**

Project emissions
The proposed project activity involves the generation of electricity by development of a wind farm. The generation of electricity does not result in greenhouse gas emissions and therefore PE_y = 0 tCO_2-eq/year.

[36] For further information please refer to section B.6.2.

[37] For further information please refer to section B.6.2.

Leakage
The energy generating equipment is not transferred from or to another activity. Therefore leakage does not has to be taken into account and LE_y = 0 tCO_2-eq/year.

Emission reductions

The ex-ante emission reductions are calculated based on the amount of electricity generated by the grid that is displaced by the project activity. Due to both project emissions and leakage are zero, the equation (1) and (3) are adjusted and emission reductions are calculated as follows:

$$ER_y = BE_y = EG_y \cdot EF_{grid,CM} \qquad (8)$$

Where:
ER_y = Emission reductions in year *y* (tCO_2/year)
BE_y = Baseline emissions in year *y* (tCO_2/year)
EG_y = Electricity supplied by the project activity to the grid (MWh)
$EF_{grid,CM}$ = Combined margin emission factor for grid connected power generation (tCO_2-eq/MWh)

The Project will generate **72,232 MWh/year** of electricity, which will be delivered to the grid. The combined margin emission factor is calculated as **0.644 tCO_2-eq/MWh**.

As per equation (8), the annual emission reductions of the Project are **46,501 tCO_2-eq**.

B.6.4 Summary of the ex-ante estimation of emission reductions:

Year	Estimation of project activity emissions (tCO_2-eq)	Estimation on baseline emission (tCO_2-eq)	Estimation of leakage (tCO_2-eq)	Estimation of overall emission reduction (tCO_2-eq))
2009	0	42,626	0	42,626
2010	0	46,501	0	46,501
2011	0	46,501	0	46,501
2012	0	46,501	0	46,501
2013	0	46,501	0	46,501
2014	0	46,501	0	46,501
2015	0	46,501	0	46,501
2016	0	3,875	0	3,875
Total	**0**	325,506	**0**	325,506

B.7 Application of the monitoring methodology and description of the monitoring plan:

B.7.1 Data and parameters monitored:

Data / Parameter:	**ID.11 / EG_y**
Data unit:	MWh
Description:	Annual electricity supplied by the Project to the grid
Source of data to be used:	Two energy meters (primary and secondary) working parallel and installed in the main switchgear station.
Value of data	72,232 MWh/year[38]
Description of measurement methods and procedures to be applied:	The measurements will be performed by two measuring devices, which are the main (primary) measuring device and the backup (secondary) measuring device. The measuring frequency of both devices is continuous.
QA/QC procedures to be applied:	The metering devices will be calibrated and sealed by TEIAŞ. Regular maintenance of devices will be performed periodically by TEIAŞ. As TEIAS charges fees for the readings in the invoice the data is accurate.
Any comment:	The detailed procedures are described in section B.7.2.

Data / Parameter:	**ID.12 / FC_Diesel**
Data unit:	L (liter)
Description:	Diesel consumption of the auxiliary power unit
Source of data to be used:	invoices
Value of data	n/a
Description of measurement methods and procedures to be applied:	The consumption of diesel used by the auxiliary power unit will be monitored by collecting invoices of diesel purchase.
QA/QC procedures to be applied:	-
Any comment:	-

B.7.2 Description of the monitoring plan:

All monitoring procedures and requirements of the Keltepe Wind Farm Project are in accordance with the methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 07). Due from the payback of the project depends on the electricity delivered to the grid, the meters have to be accurate, reliable and continuously measuring the electricity delivered to the national grid and thus can be considered as representative.

[38] The source of this value is technical description of the project, available for the DOE.

Metering: The amount of electricity generated by the project and delivered to the national grid will be monitored continuously. A main and a backup electricity meter are available. The measurements will be made in the main switchgear station at 34.5 kV medium voltage level at the project site. The meters will measure the net electricity delivered to the grid. Data obtained from measurements will be used in calculations of emission reductions. The losses before this point will be on the account of the project owner.

Meter readings: Once a month, officials from TEIAŞ (Turkish Electricity Transmission Company) will perform data readings under the surveillance of responsible staff from Demirer Holding.. An invoice (receipt of sale) will be prepared by TEIAŞ and delivered to Demirer for each month.

Data storage: Data will be stored electronically, during the crediting period and at least two years after the last issuance of VER credits for Datça wind farm project activity in the concerning crediting period. Both Demirer Holding and TEIAŞ will be responsible for storage of data received from the measuring devices.

Quality assurance and quality control: All metering devices will be calibrated and sealed by TEIAŞ and thus Demirer Holding cannot intervene within meters. The specification of the meters will be in compliance with the "Measurement Communiqué of Turkey" (Turkish Standards and International Electro technical Commission standards).

Monitoring frequency: A high level of accuracy of the measurements will be achieved due to the use of high-precision equipment and due to strict compliance with the recommendations for calibration frequency of the equipment provider.

Training: Demirer Holding together with TEIAŞ will provide training to designated employees to ensure accuracy and completeness of data recorded.

Scope of responsibility:

Responsibility	**TEIAŞ**	**Demirer Holding**
Data readings	Yes	Yes
Invoice preparation and delivery	Yes	No
Data storage	Yes	Yes
Reporting of any malfunction of metering devices	No	Yes
Calibration of metering devices	Yes	No
Maintenance of metering devices	Yes	No
Training	Yes	Yes
Preparation of monitoring report	No	Yes (with the support of OneCarbon)

Monitoring of the most sensitive sustainable development indicators: According to the Gold Standard rules, crucial Sustainable Development indicators have to be included in the monitoring

plan. For this project job quality and number of employment are considered as crucial indicators. These indicators and monitoring procedures are presented below.

Employment (Quality)

Respective staff is trained regarding health and safety issues and first aid. There is also technical training regarding the operation of the equipment. The trainees receive a certificate after these trainings. Therefore the training given to the respective staff will be monitored by the certificates that they will obtain following their education[39].

Employment (Quantity)

The project activity will create a substantial number of jobs in the project area. Job contracts will be archived. The number of jobs created can be derived from the number of contracts.

Water Quality

During operation of the project activity, the domestic waste from the employees will be collected in a sealed septic tank and will be collected periodically. During verification, documents proving the disposal of the waste water will be gathered.

Soil Condition

Excavation wastes that will be generated during the land preparation and construction will be stored temporarily on the site and will be used for the road constructions to minimise the needed construction material. During first verification, the site will be visually inspected with regards to the excavation wastes.

Auxiliary Unit

An auxiliary diesel generator will be used in cases of emergency. Although the emissions from the auxiliary unit are far below 1% of emission reductions[40] these will be taken into account. Calculations are based on data taken from the invoices.

Additional data parameters to monitor the critical sustainable development indicators can be found in annex 4.

B.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)

Date of completing the final draft of this baseline section: 04th of March 2008

Name of person/entity determining the baseline:

[39] Respective certificates are available to the DOE.

[40] Current UNFCCC regulations do not require taking into account Project emissions that are less than 1% of overall emission reductions.

The baseline has been prepared by Ecofys Netherlands BV in consultation with Demirer Holding.

Company name: Ecofys Netherlands BV
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3526 KL Utrecht
The Netherlands
Contact Person: Mr. Ömer Akyürek
Telephone number: +90 212 3256780
Fax number: +90 212 2823480
e-mail: o.akyurek@ecofys.com

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:

15th May 2008

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

45 years

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

C.2.1. Renewable crediting period

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

1st of February 2009

C.2.1.2. Length of the first crediting period:

7 years, 0 months

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

N/A

C.2.2.2. Length:

N/A

SECTION D. Environmental impacts

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

No Environmental Impact Assessment (EIA) has been performed for the proposed VER project activity, for the following reasons:

1. Executing an EIA for a project of this kind is not legally obliged in Turkey. The proposed project is exempted from an EIA.

2. The Sustainable Indicator Matrix, as can be found in section A.2 of this PDD, has a total score of +7 and does not contain any negative scores. According to the 'Gold Standard Voluntary Emission Reductions (VERs) Manual for Project Developers', indicators scoring -1 must be subject to the EIA pre-screen checklist to determine the necessity of an EIA. Since no indicator has a negative score it is not necessary to perform an EIA.

3. The outcomes of the Initial Stakeholders Consultation did not result in any negative comments on significant impacts of the proposed project on the environment. In order to ensure adequate consideration of all relevant impacts, stakeholders have been asked to address the impacts and their significance based on the Social Impacts Checklist of the 'Gold Standard Voluntary Emission Reductions (VERs) Manual for Project Developers'. Detailed information regarding the Initial Stakeholders Consultation Process can be found under section E.

D.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:

There have not been identified any significant environmental impacts of the Project. Therefore, there is no need to establish mitigation measures.

SECTION E. Stakeholders' comments

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

As required by the Gold Standard an Initial Stakeholder Consultation (ISC) and Main Stakeholders Consultation (MSC) have been undertaken.

Initial Stakeholder Consultation

The ISC was organised on 22nd of October 2007 in Susurluk Municipality, which is located in the vicinity of the Project site. The stakeholders have been identified according to the Gold Standard rules, which include the following stakeholders:

- National, Regional and Local Policy Makers
- Local People directly impacted by the project
- Local NGO's
- Local and national NGO's that endorse the Gold Standard

The complete list of all stakeholders invited to participate in ISC is presented in supportive documentation available to the DOE.

For the purpose of invitation of all relevant stakeholders to the ISC the project participants chose e-mail, phone and local newspaper as a sufficient media. The invitation e-mails were sent by Demirer Holding on 10th of October, 2007. One stakeholder was invited via phone call. Moreover, the announcement and invitation to the meeting was made in a newspaper named as "Kardeş" on 10th of August, 2007. This is the local newspaper, which is easily accessible especially for local stakeholders and also has its internet edition[41].

In total 20 people participated in the ISC, this included the local stakeholders directly affected by the Project, representatives of NGOs and national, regional and local authorities. In addition, Mr. Ahmet Araçman (Datça Project Coordinator), Mrs. Çağla Balcı Eriş (Commercial Coordinator Assistant) as the representatives of Demirer Holding and Mr. Ömer Akyürek (Consultant) in representation of OneCarbon Company also attended the ISC meeting.

The ISC was organized to introduce and to explain all aspects of the proposed project. The discussions were held in Turkish, the local language. Each participant to the ISC received non-technical summary of the project[42] written in transparent and comprehensible manner. The document included description of the project, the idea of carbon credits and importance of sustainable development. The public consultation checklist (Appendix E of Gold Standard Manual) was also translated and handed out to all present stakeholders.

After oral presentation made by Demirer Holding's representatives the stakeholders were asked to comment on the project. The questions, concerns, comments and requests related to the Project were received and replied in a transparent and explicit manner. All comments and questions raised during ISC are presented in section E.2.

[41] Full information in ISC report available to the DOE.

[42] Document available to the DOE.

On 24th of October, 2007, two days after the ISC meeting, the stakeholders were informed about the results of the ISC by announcement[43] in local newspaper "Kardeş".

Main Stakeholder Consultation
The MSC consultation period started on 5th of March, 2008 by sending the ISC report, the questionnaire and the draft PDD to stakeholders. Stakeholders were invited to comment regarding Alize Wind Farm Project.

The documents that were sent to the stakeholders are:

- The draft version of the Project Design Document
- A non-technical summary of the Project
- The report on the outcomes of the ISC (ISC report)
- A questionnaire comprising all the questions in Gold Standard Voluntary Emission Reductions (VERs) Manual for Project Developers – Annex E.

The MSC ended on 5th of May, 2008.

E.2. Summary of the comments received:

During the ISC meeting and MSC process it was concluded that the project was not expected to result in negative environmental effects or social aspects.

Initial Stakeholder Consultation
The outcome of the ISC meeting was that the Project has no negative impact, but can be considered as having a positive impact.

The environmental and social aspects of the proposed project have been discussed during the stakeholders' consultation meeting with the local stakeholders.
The main issues brought up by the stakeholders regarding the proposed project can be summarized as followed:

1. *The employment opportunity to be created by the project activity*.
   It was discussed during the meeting that the project participants are well aware of their social corporate responsibilities and prefers to procure employment from the local city centres and villages, which are near to the project area. They assured that both for construction and operational phases new employees will be contracted.

2. T*he contribution to the local and national economy.*
   The project participants explained that most of the equipment, such as blades, masts, cables, transformers are provided locally, which has a contribution to local economy and to development of local industries.

Main Stakeholders Consultation:
During the whole Main Stakeholders Consultation period no comments were received from the stakeholders.

[43] Available to the DOE.

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

No negative comments were received from the stakeholders and therefore no action was needed from project participants. However, Demirer Holding is evaluating opportunities and possible actions to broaden the project's sustainable contribution to the region.

Although there were no comments in the MSC period Demirer Holding had been doing studies before and after the MSC period to find out possible ways to contribute to sustainable development.

Accordingly Demirer Holding has made donations one computer and one printer to the village headman office of the Kiraz village. Additionally Demirer Holding has donated 5,000,000 YTL to Kiraz village as the project roads will cross the dwellings of the village (see annex III of the MSC report)

In order to further contribute to sustainable development of the region Demirer Holding has undertaken the rehabilitation of Reşadiye Primary School. Mehmet Güngör, the principal of the Reşadiye Primary School communicated his thanks for this undertaking with an official letter he sent to Demirer Holding.

The details and the proofs of the donations for sustainable development can be found in the MSC Report.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Demirer Enerji Üretim San. Ve Tic. A.Ş.
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Telephone:	+90 216 38609 95
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E-Mail:	cagla@demirerholding.com
URL:	
Represented by:	
Title:	
Salutation:	Mrs.
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Middle Name:	Balcı
First Name:	Çağla
Department:	
Mobile:	
Direct FAX:	
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Personal E-Mail:	cagla@demirerholding.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The project does not obtain public funding.

Annex 3

BASELINE INFORMATION

Plant Name	Installed Capacity [MW]	Fuel Type	Generation Capacity [GWh]	Comissionary Date
2006				
EKOTEN TEKSTİL GR-I	1.9	*N.GAS*	14.0	2006-02-16
ERAK GİYİM GR-I	1.4	*N.GAS*	10.0	2006-02-22
ALARKO ALTEK GR-III	21.9	*N.GAS*	112.6	2006-02-23
AYDIN ÖRME GR-I	7.5	*N.GAS*	60.0	2006-02-25
NUH ENERJİ-2 GR II	26.1	*N.GAS*	180.0	2006-03-02
MARMARA ELEKTRİK (Çorlu) GR I	8.7	*N.GAS*	63.0	2006-04-13
MARMARA PAMUK (Çorlu) GR I	8.7	*N.GAS*	63.0	2006-04-13
ENTEK (Köseköy) GR IV	47.6	*N.GAS*	306.0	2006-04-14
ELSE TEKSTİL (Çorlu) GR I - II	3.2	*N.GAS*	25.0	2006-04-15
SÖNMEZ ELEKTRİK (Çorlu) GR I - II	17.5	*N.GAS*	126.0	2006-05-03
DENİZLİ ÇİMENTO(DÜZELTME)	0.4	*N.GAS*	0.0	2006-05-04
KASTAMONU ENTEGRE (Balıkesir) GR I	7.5	*N.GAS*	54.0	2006-05-24
BOZ ENERJİ GR I	8.7	*N.GAS*	70.0	2006-06-09
AMYLUM NİŞASTA (ADANA)	14.3	*N.GAS*	34.0	2006-06-09
ŞIK MAKAS (Çorlu) GR I	1.6	*N.GAS*	13.0	2006-06-22
ANTALYA ENERJİ GR I - II - III - IV	34.9	*N.GAS*	245.0	2006-06-29
HAYAT TEM. VE SAĞLIK GR I - II	15.0	*N.GAS*	108.0	2006-06-30
EROĞLU GİYİM (Çorlu) GR I	1.2	*N.GAS*	9.0	2006-08-01
CAM İŞ ELEKTRİK (Mersin) GR I	126.1	*N.GAS*	1 008.0	2006-09-13
YILDIZ ENT. AĞAÇ (Kocaeli) GR I	6.2	*N.GAS*	40.0	2006-09-21
ÇERKEZKÖY ENERJİ GR I	49.2	*N.GAS*	390.0	2006-10-06
ENTEK (Köseköy) GR V	37.0	*N.GAS*	237.9	2006-11-03
ÇIRAĞAN SARAYI GR I	1.3	*N.GAS*	11.0	2006-12-01
AKMAYA (Lüleburgaz) GR I	6.9	*N.GAS*	50.0	2006-12-23
BURGAZ (Lüleburgaz) GR I	6.9	*N.GAS*	54.0	2006-12-23
	461.7		**3 283.5**	
ELBİSTAN B GR III	360.0	Lignite	2 340.0	2006-06-23
ELBİSTAN B GR II	360.0	Lignite	2 340.0	2006-09-17
ELBİSTAN B GR IV	360.0	Lignite	2 340.0	2006-11-13
	1 080.0		**7 020.0**	
ŞANLIURFA GR I-II	51.8	*RUN OF RIVER*	124.0	2006-03-01
BEREKET ENERJİ GÖKYAR HES 3 Grup	11.6	*RUN OF RIVER*	43.3	2006-05-05
MOLU EN. Zamantı Bahçelik GR I - II	4.2	*RUN OF RIVER*	16.7	2006-05-31
SU ENERJİ (Balıkesir) GR I - II	4.6	*RUN OF RIVER*	20.7	2006-06-27
BEREKET EN.(Mentaş Reg) GR I - II	26.6	*RUN OF*	108.7	2006-07-31

		RIVER		
EKİN (Başaran Hes) (Nazilli)	0.6	*RUN OF RIVER*	0.0	2006-08-11
ERE(Sugözü rg. Kızıldüz hes) GR I - II	15.4	*RUN OF RIVER*	31.6	2006-09-08
ERE(AKSU REG.ve ŞAHMALLAR HES) GR I-II	14.0	*RUN OF RIVER*	26.7	2006-11-16
TEKTUĞ(Kalealtı) GR I - II	15.0	*RUN OF RIVER*	52.0	2006-11-30
BEREKET EN.(Mentaş Reg) GR III	13.3	*RUN OF RIVER*	54.4	2006-12-13
SEYHAN I-II	0.3	*DAM*	0.0	2006-02-20
	157.5		**478.1**	
BARES IX GRUP	0.0	*Wind*	0.0	2006-04-20
BARES X. ve XX. GRUPLAR	0.0	*Wind*	0.0	2006-05-26
MARE MANASTIR RÜZGAR (X GRUP)	0.0	*Wind*	0.0	2006-12-08
ERTÜRK ELEKTRİK Tepe RES GR I	0.9	*Wind*	2.0	2006-12-22
MENDERES ELEKTRİK GR I	8.0	*Geothermal*	56.0	2006-05-10
ADANA ATIK SU ARITMA TESİSİ	0.8	*Biogaz*	6.0	2006-06-09
EKOLOJİK EN. (Kemerburgaz) GR I	1.0	*LFG*	6.0	2006-07-31
ITC-KA EN. MAMAK TOP.M. GR I-II-III	4.2	*LFG*	30.0	2006-11-03
	14.8		**100.0**	
2006 TOTAL	**1 714.0**		**10 881.6**	

2005

AKBAŞLAR GR-II(İZOLE)	8.8	*N.GAS*	73.0	2005
AKÇA ENERJİ GR-III	8.7	*N.GAS*	65.4	2005
AYKA TEKSTİL GR-I	5.5	*N.GAS*	40.0	2005
BAYDEMİRLER GR IV-V-VI	6.2	*N.GAS*	51.4	2005
BOSEN GR-III	50.0	*N.GAS*	350.0	2005
ÇUMRA ŞEKER	16.0	*N.GAS*	40.0	2005
EVYAP GR I-II	5.1	*N.GAS*	30.0	2005
GRANİSER GRANİT GR-I	5.5	*N.GAS*	42.0	2005
HABAŞ ALİAĞA GR III	47.7	*N.GAS*	381.6	2005
HABAŞ ALİAĞA GR IV	47.7	*N.GAS*	381.6	2005
HABAŞ ALİAĞA GR-V	24.6	*N.GAS*	196.8	2005
HABAŞ ALİAĞA (DÜZELTME)	6.2	*N.GAS*	49.3	2005
HAYAT KAĞIT GR-I	7.5	*N.GAS*	56.0	2005
KORUMA KLOR GR I-II-III	9.6	*N.GAS*	77.0	2005
KÜÇÜKÇALIK TEKSTİL GR I-II-III-IV	8.0	*N.GAS*	64.0	2005
MERCEDES BENZ TURK GR I-II-III-IV	8.3	*N.GAS*	68.0	2005
MODERN ENERJİ GR-III	8.4	*N.GAS*	62.9	2005
MOSB GR I-II-III-IV-V-VI-VII	84.8	*N.GAS*	434.0	2005
ORS RULMAN	12.4	*N.GAS*	99.4	2005
PAK GIDA(Kemalpaşa) GR-I	5.7	*N.GAS*	45.0	2005
TEZCAN GALVANİZ GR I-II	3.7	*N.GAS*	29.0	2005
YONGAPAN(KAST.ENTG) GR-II	5.2	*N.GAS*	32.7	2005
ZEYNEP GİYİM SAN. GR-I	1.2	*N.GAS*	9.0	2005
AK ENERJİ(K.paşa) GR- III	40.0	*N.GAS*	256.9	2005

AK ENERJİ(K.paşa) GR I-II	87.2	*N.GAS*	560.1	2005
ALTEK ALARKO GR I-II	60.1	*N.GAS*	420.0	2005
BİS ENERJİ GR VII	43.7	*N.GAS*	360.8	2005
CAN ENERJİ GR-I	3.9	*N.GAS*	28.0	2005
ÇEBİ ENERJİ BT	21.0	*N.GAS*	164.9	2005
ÇEBİ ENERJİ GT	43.4	*N.GAS*	340.1	2005
ENTEK ELK.A.Ş.KOÇ ÜNİ.GR I-II	2.3	*N.GAS*	19.0	2005
KAREGE GR IV-V	18.1	*N.GAS*	141.9	2005
METEM ENERJİ(Hacışıramat) GR I-II	7.8	*N.GAS*	58.0	2005
METEM ENERJİ(Peliklik) GR I-II-III	11.7	*N.GAS*	89.0	2005
NOREN ENERJİ GR-I	8.7	*N.GAS*	70.0	2005
NUH ENERJİ-2 GR I	47.0	*N.GAS*	319.7	2005
ZORLU ENERJİ KAYSERİ GR-I-II-III	149.9	*N.GAS*	1 144.1	2005
ZORLU ENERJİ KAYSERİ GR-IV	38.6	*N.GAS*	294.9	2005
ZORLU ENERJİ YALOVA GR I-II	15.9	*N.GAS*	122.0	2005
MODERN ENERJİ GR-II	6.7	*N.GAS*	50.4	2005
	992.8		**7 117.8**	
ÇAN GR I	160.0	Lignite	1 040.0	2005
ÇAN GR II	160.0	Lignite	1 040.0	2005
ELBİSTAN-B GR I	360.0	Lignite	2 340.0	2005
OTOP DÜZELTME	0.1	Lignite	0.0	2005
	680.1		**4 420.0**	
İÇDAŞ ÇELİK GR-I	135.0	*COAL*	1 080.0	2005
KAHRAMANMARAŞ KAĞIT GR-I	6.0	*COAL*	45.0	2005
	141.0		**1 125.0**	
OTOP DÜZELTME	0.6	FUEL-OİL	1.8	2005
KARKEY(SİLOPİ-4) GR-IV	6.2	FUEL-OİL	47.2	2005
KARKEY(SİLOPİ-4) GR-V	6.8	FUEL-OİL	51.9	2005
	13.5		**100.9**	
TEKTUĞ(Kargılık) GR I-II	23.9	*RUN OF RIVER*	83.0	2005
İÇTAŞ ENERJİ(Yukarı Mercan) GR I-II	14.2	*RUN OF RIVER*	44.0	2005
MURATLI GR I-II	115.0	*DAM*	444.0	2005
BEREKET EN.(DALAMAN) GR XIII-XIV-XV	7.5	*RUN OF RIVER*	35.8	2005
YAMULA GRUP I-II	100.0	*DAM*	422.0	2005
	260.6		**1 028.8**	
SUNJÜT(RES) GR I-II	1.2	*WIND*	2.4	2005
ETİ MAD.(BAN.ASİT)GR-I	11.5	Renewable	85.0	2005
	12.7		**87.4**	
2005 TOTAL	**2 100.7**		**13 879.9**	

2004

ECZACIBAŞI BAXTER HAS.ÜRÜN.	1.0	*N.GAS*	5.8	2004
ÇIRAĞAN SARAYI İŞL.	1.4	*N.GAS*	11.0	2004
BAHARİYE MENSUCAT (İzole)	1.0	*N.GAS*	7.0	2004
ANKARA D.G.(BAYMİNA) GR-I-II-III	798.0	*N.GAS*	6 500.0	2004

ENTEK GR-IV	31.1	*N.GAS*	255.7	2004
ATATEKS 2 GM	5.6	*N.GAS*	45.0	2004
TANRIVERDİ 4 GM	4.7	*N.GAS*	38.7	2004
TEKBOY TEKSTİL 1 GM	2.2	*N.GAS*	16.0	2004
KOMBASSAN KAĞIT GIDA VE TEKS	5.5	*N.GAS*	38.1	2004
AYEN OSTİM ENERJİ ÜRETİM	31.1	*N.GAS*	264.1	2004
BİS ENERJİ 2 GT	73.0	*N.GAS*	602.7	2004
ŞAHİNLER ENERJİ 1 GM	3.2	*N.GAS*	22.2	2004
BESLER GR-2. BT (5.2+7.5)	12.7	*N.GAS*	97.7	2004
ÇELİK ENERJİ ÜR.ŞTİ. 2 GM	2.4	*N.GAS*	18.6	2004
OTOPRODÜKTÖR(DÜZELTME)	6.4	*N.GAS*	43.2	2004
KOMBASSAN KAĞ. MATBAA GIDA	5.5	*N.GAS*	35.7	2004
AYEN OSTİM ENERJİ ÜRETİM(BT)	9.9	*N.GAS*	84.0	2004
HABAŞ ALİAĞA GRUP I-II	89.2	*N.GAS*	713.9	2004
STANDART PROFİL 3 GM	6.7	*N.GAS*	49.2	2004
ALTINMARKA GIDA GR I-II-III	3.6	*N.GAS*	28.8	2004
	1 094.4		**8 877.4**	
ÇOLAKOĞLU(KAPASİTE ARTIRIMI)	45.0	*COAL*	337.5	2004
	45.0		**337.5**	
TÜPRAŞ BATMAN GR V	1.5	FUEL-OİL	4.1	2004
GÜL ENERJİ GR-II	12.5	FUEL-OİL	96.5	2004
ENERJİ-SA ADANA 1 BT	49.8	FUEL-OİL	322.9	2004
KARKEY-II 3+3 DGM	54.3	FUEL-OİL	369.7	2004
	118.1		**793.3**	
ERE(BİR KAPILI HES) GRUP-I	48.5	*RUN OF RIVER*	170.6	2004
ELTA ELK(DODURGA) GR-I-II-III-IV	4.1	*RUN OF RIVER*	12.3	2004
İSKUR TEKSTİL(SÜLEYMANLI) GR I-II	4.6	*RUN OF RIVER*	17.9	2004
BEREKET EN.(Feslek Hes) Gr-1-2	9.5	*RUN OF RIVER*	41.0	2004
	66.7		**241.8**	
2004 TOTAL	**1 324.2**		**10 249.9**	

2003

Yİ DÜZELTME-*REVISED*	83.1	*N.GAS*	692.3	2003-12-31
	83.1		**692.3**	
2003 TOTAL	**83.1**		**692.3**	

Annex 4

MONITORING INFORMATION

Data / Parameter:	SDI.1 / Water Quality
Data unit:	-
Description:	Water quality – disposal of waste water
Source of data to be used:	Documents proving the disposal of waste water
Value of data	N/A
Description of measurement methods and procedures to be applied:	During verification, documents proving the disposal of the waste water will be gathered.
QA/QC procedures to be applied:	
Any comment:	

Data / Parameter:	SDI.4 / Soil Condition
Data unit:	-
Description:	Soil Condition – excavation wastes
Source of data to be used:	Visiual inspection
Value of data	N/A
Description of measurement methods and procedures to be applied:	During first verification, the site will be visually inspected with regards to the excavation wastes.
QA/QC procedures to be applied:	
Any comment:	

Data / Parameter:	SDI.6 / Employment (quality)
Data unit:	-
Description:	Job quality - number of employees trained with issued certificates
Source of data to be used:	Certificates issued by Demirer and ENERCON
Value of data	N/A
Description of measurement methods and procedures to be applied:	At the end of the first year of operation issued certificates will be gathered.
QA/QC procedures to be applied:	
Any comment:	

Data / Parameter:	SDI.10 / Employment (number)
Data unit:	-
Description:	Number of employment created
Source of data to be used:	Monthly salary payment sheets
Value of data	N/A
Description of measurement methods and procedures to be applied:	The number of jobs created can be derived from the number of monthly salary payment sheets.
QA/QC procedures to be applied:	Salary payment sheets will be stored electronically by Demirer.
Any comment:	

Annex 5

ADDITIONAL REQUIREMENTS FOR THE GOLD STANDARD

In this annex the required additional information for registration under the Gold Standard carbon credit label is presented. Only the paragraphs from the PDD where additional requirements for the Gold Standard are mentioned (as stated in the GS-CDM-PDD format) are presented below.

Title: **Keltepe Wind Farm Project – Turkey**
Version number of the document: 03
Date: 16.09.2008

GS.1 Description of the project activity:

In order for the project to be eligible for the Gold Standard the project activity must be assessed against a matrix of sustainable development indicators, which is presented below.

Table GS.1 – Sustainable Development Assessment Matrix

Component Indicators	Score –2 to +2
Local/regional/global environment	
1. Water quality*	0
2. Air quality (emissions other than GHG)	+1
3. Other pollutants (Total Suspended Particles, odours)	+1
4. Soil condition (quality and quantity)*	0
5. Biodiversity	0
Sub total	+2
Social sustainability and development	
6. Employment (job quality) *	+2
7. Livelihood of the poor	0
8. Access to energy services (electricity)	0
9. Human and institutional capacity	0
Sub total	+2
Economic and technological development	
10. Employment (numbers) *	+2
11. Balance of payments (sustainability)	0
12. Technological self reliance	+1
Sub total	+3
TOTAL	+7

Explanation of the indicators:

1 Water quality (0): During operation of the project activity, the domestic waste from the employees will be collected in a sealed septic tank and will be collected periodically and will be discharged to a place location shown by the Municipality. The project is under the regulation of "Management of municipal waste water"[44]. Moreover since the project activity is not located near to water, nor will have influence on ground water systems this indicator scores a "0".

2 Air Quality (+1): As the proposed project replaces the fossil fuel electricity generation dominating the national grid, it reduces the emissions other than GHG such as NOx and SOx. Considering the high installed capacity of the national grid this has a minor improvement to the air quality and this sustainable indicator scores a "+1".

3 Other pollutants (+1): As the proposed project replaces the fossil fuel electricity generation dominating the national grid, it also reduces the emissions of odours. Furthermore the use of most recent turbine technology secures a minimum level of noise. The project activity use gearless Enercon turbines[45], which substantially reduces the noise emissions even further. Hence it can be concluded that there will be no permanent negative impact due from the project activity. Moreover there had not been any negative comments on the stakeholder consultation process[46]. Taking into account the above arguments on noise levels and considering the high installed capacity of the national grid this has a minor improvement to the air quality and this sustainable indicator scores a "+1".

4 Soil condition (0): The excavation work will be during the construction period will be carried out according to the "Regulation on the control of solid wastes from excavation soil, construction and wreckage". Excavation wastes that will be generated during the land preparation and construction will be stored temporarily on the site and will be used for the road constructions to minimise the needed construction material. Considering the small amount of excavation work during the construction and taking into account that respective rules and regulations are taken into account this indicator scores (0).

5 Biodiversity (0): With regards to effects of wind turbines on bird migration, according to National Wind Coordination Committee large avian mortality event at wind farms are unlikely[47]. This fact is supported by the report Turkish Union of Mechanical Engineers where it is stated that birds are not affected by small and mid scale wind farms[48]. Taking into account the above arguments no negative impact on biodiversity is expected due from the project activity. No change regarding biodiversity is expected because of implementing the Keltepe Wind Farm. This sustainable indicator scores (0).

6 Employment (job quality) (+2): The first year of the project operational phase, technical and security staff will be trained by Demirer Holding regarding security issues and by

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[44] Reference: www.cevreorman.gov.tr/yasa/y/26047.doc

[45] http://www.enercon.de/en/e44.htm

[46] See the ISC and MSC reports.

[47] Erickson, P.W. et al., *Avian Collisions with Wind Turbines: A Summary of Existing Studies and Comparisons of Avian Collision Mortality in the United States, 2001,* Resource document of National Wind Coordinating Collaborative (NWCC) from official web page of NWCC: http://www.nationalwind.org/publications/wildlife/avian_collisions.pdf see page 15 retrieved: 11/02/2009

[48] Ünver C., *Rüzgar Enerjisi ve EIE'nin Çalışmaları (Wind Power and the undertakings of General Directorate of Electrical Power Resources Survey and Development Administration)* presented at Panel on Turkish Energy Politics, 1996. Available online at official web page of Chamber of Mechanical Engineers (TMMOB): http://arsiv.mmo.org.tr/pdf/000007F8.pdf see page 192, retrieved: 11/02/2009

ENERCON GmbH regarding technical issues on turbine technology and maintenance. The training includes technical, environment and security knowledge and operational and maintenance instructions. Also training will be given by TEIAS for the staff, which will be responsible for the switchgear station. As generally the labourer's technical capacity is low in the region, where the economy is mostly dependent on agriculture[49], this sustainable indicator scores a "+2".

7 Livelihood of the poor (0): Although the project is expected to lead to both economic and infrastructural development of the region this would be very difficult to monitor. This indicator scores a "0".

8 Access to energy services (electricity) (0): The number of connections of local households to the grid will not increase due to the project activity. Wind power can provide voltage control and active power (frequency) control. Wind power plants can also reduce transmission and distribution losses when applied as embedded generation. Furthermore wind power plants affect voltage levels and power flows. In the networks. These effects can be beneficial to the system, especially when wind power plants are located near load centres, and certainly at low penetration levels[50]. However the positive impact of the project activity to the local and regional energy system is almost impossible to determine therefore this sustainable indicator scores (0).

9 Human and institutional capacity (0): No changes are expected regarding human and institutional capacity in the region.

10 Employment (numbers) (+2): The project will create local and regional employment both during the construction phase and operational phase. For the operational phase approximately 5 people are planed to be employed. Considering the unemployment rate of Turkey, and the low employment opportunities that the region offers, this sustainable indicator scores a "+2".

11 Balance of payments (sustainability) (0): Although the proposed project will have a positive impact on the net currency savings due from reducing dependency on energy import, the magnitude of this impact will be limited taking into account the share of the proposed project within the total electricity generation in Turkey. Furthermore it would be very difficult to provide a quantitative figure. Therefore this indicator scores a zero as well.

12 Technological self reliance (+1): ENERCON GmbH, which is a wind turbine manufacturer and supplier of the wind turbines for Keltepe Wind Farm Project and will train the staff regarding technical issues. The blades of the turbines are manufactured locally by Enercon Aero Rüzgar Endüstrisi A.Ş.[51] a joint venture of Demirer A.Ş. and Enercon GmbH located in the Aegean free trade zone and hence contribute the technological self reliance of the country. This sustainable indicator scores a "+1".

To meet the requirements of the Gold Standard, each of the components of the sustainability matrix, must have a positive sub-total score, the total score must be positive, and none of the indicators should score -2. As the project scores +7, this project satisfies all three requirements to meet the Gold Standard.

[49] Reference: Provincial Environmental Status Report 2007, *Governorship of Balikesir, Provincial Directorate of Environment and Forestry* Retrieved from: *www.cedgm.gov.tr/icd_raporlari/balikesiricd2007.pdf* see pg.262

[50] Reference: Wind Enrgy The Facts web page (Impacts of Wind Power on Power Systems) http://www.wind-energythe-facts.org/en/part-2-grid-integration/chapter-2-wind-power-variability-and-impacts-on-power-systems/mainimpacts-of-wind-power-on-power-systems.html

[51] See invoices from Aero Rüzgar Endüstrisi A.Ş. also see the official web page of Aero: http://www.demirer.com.tr/aero/aero.html

Those indicators that are either crucial for an overall positive impact on SD or particularly sensitive to changes in the framework conditions are marked with asterisk and included in the Annex 4 of the PDD.

GS.1.1 Category(ies) of project activity:

According to the latest Gold Standard VER Manual for Project Developers[52], the Project falls into the category A.1. – Renewable Energy. Therefore, the proposed project is eligible for the Gold Standard.

GS.1.2 Technology to be employed by the project activity:

The project involves the installation of 23 wind turbines connected to the Turkish grid. The proposed project would not be implemented without technology and knowledge transfer.

Technology transfer
The proposed project will use turbines delivered by a German company – ENERCON GmbH.

Knowledge transfer
ENERCON GmbH will provide training to Demirer Holding and contracted employees in terms of operation and maintenance of the wind farm. TEIAS will provide training to responsible employees regarding monitoring issues.

Taking the above into account, it can be concluded that the project relies on North to South and on an urban to a rural area technology and knowledge transfer.

GS.1.3 Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed CDM 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:

Public Announcement Check
The proposed project, in its current design, has not been publicly announced to be developed without support of the CDM and no payment has been made prior to the implementation of the project. Therefore, the project is eligible for the Gold Standard.

Additionality Tool Check
To demonstrate additionality the project applies "Tool for the demonstration and assessment of additionality" (version 04)[53]. See section B.5 of the PDD.

Conservative Approach Check of the Baseline Scenario
The project applies approved UNFCCC methodology, which is consistent with "Gold Standard Manual for Project Developers" in the context of conservative approach. The methodology is listed below:

- Approved consolidated baseline methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 07)[54].

[52] Reference: http://www.cdmgoldstandard.org/uploads/file/GS-VER_Proj_Dev_manual_final%20.pdf

[53] Rerefence: http://cdm.unfccc.int/EB/036/eb36_repan13.pdf

GS.1.4 Public funding of the project activity:

The project does not use Official Development Assistance (ODA) or any other public funding.

GS.2 Documentation on the analysis of the environmental impacts, including transboundary impacts:

No Environmental Impact Assessment (EIA) has been executed for the proposed project activity, due to the following reasons:

- EIA is not required for this type of projects in terms of Tyrkish law regulations
- None of the SD indicators scored "-1", as presented in table GS-1
- No significant negative environmental or social impacts were raised by stakeholders during stakeholders consultation process

G.3. Brief description how comments by local stakeholders have been invited and compiled:

In accordance with Gold Standard rules, Initial Stakeholders Consultation (ISC) and Main Stakeholders Consultation (MSC) have to be carried out to inform relevant stakeholders and receive comments to the proposed project. Summary of the ISC and MSC is presented below. Full reports are available for the DOE.

Initial Stakeholder Consultation

The ISC was organised on 22nd of October 2007 in Susurluk Municipality, which is located in the vicinity of the Project site. The stakeholders have been identified according to the Gold Standard rules, which include the following stakeholders:

- National, Regional and Local Policy Makers
- Local People directly impacted by the project
- Local NGO's
- Local and national NGO's that endorse the Gold Standard

The complete list of all stakeholders invited to participate in ISC is presented in supportive documentation available to the DOE.

For the purpose of invitation of all relevant stakeholders to the ISC the project participants chose e-mail, phone and local newspaper as a sufficient media. The invitation e-mails were sent by Demirer Holding on 10th of October, 2007. One stakeholder was invited via phone call. Moreover, the announcement and invitation to the meeting was made in a newspaper named as "Kardeş" on 10th of August, 2007. This is the local newspaper, which is easily accessible especially for local stakeholders and also has its internet edition[55].

In total 20 people participated in the ISC, this included the local stakeholders directly affected by the Project, representatives of NGOs and national, regional and local authorities. In addition, Mr. Ahmet Araçman (Datça Project Coordinator), Mrs. Çağla Balcı Eriş (Commercial Coordinator Assistant) as

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

[55] Full information in ISC report available to the DOE.

the representatives of Demirer Holding and Mr. Ömer Akyürek (Consultant) in representation of OneCarbon Company also attended the ISC meeting.

The ISC was organized to introduce and to explain all aspects of the proposed project. The discussions were held in Turkish, the local language. Each participant to the ISC received non-technical summary of the project[56] written in transparent and comprehensible manner. The document included description of the project, the idea of carbon credits and importance of sustainable development. The public consultation checklist (Appendix E of Gold Standard Manual) was also translated and handed out to all present stakeholders.

After oral presentation made by Demirer Holding's representatives the stakeholders were asked to comment on the project. The questions, concerns, comments and requests related to the Project were received and replied in a transparent and explicit manner. All comments and questions raised during ISC are presented in section E.2.

On 24th of October, 2007, two days after the ISC meeting, the stakeholders were informed about the results of the ISC by announcement[57] in local newspaper "Kardeş".

The environmental and social aspects of the proposed project have been discussed during the stakeholders' consultation meeting with the local stakeholders.
The main issues brought up by the stakeholders regarding the proposed project can be summarized as followed:

3. *The employment opportunity to be created by the project activity.*
   It was discussed during the meeting that the project participants are well aware of their social corporate responsibilities and prefers to procure employment from the local city centres and villages, which are near to the project area. They assured that both for construction and operational phases new employees will be contracted.

4. T*he contribution to the local and national economy.*
   The project participants explained that most of the equipment, such as blades, masts, cables, transformers are provided locally, which has a contribution to local economy and to development of local industries.

Main Stakeholder Consultation
The MSC consultation period started on 5th of March, 2008 by sending the ISC report, the questionnaire and the draft PDD to stakeholders. Stakeholders were invited to comment regarding Alize Wind Farm Project.

The documents that were sent to the stakeholders are:

- The draft version of the Project Design Document
- A non-technical summary of the Project
- The report on the outcomes of the ISC (ISC report)
- A questionnaire comprising all the questions in Gold Standard Voluntary Emission Reductions (VERs) Manual for Project Developers – Annex E.

[56] Document available to the DOE.

[57] Available to the DOE.

The MSC ended on 5th of May, 2008. No negative comments were received from the stakeholders and therefore no action was needed from project participants.

Gold Standard monitoring plan

For more information please refer to section B7 and Annex 4.