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

CONTENTS

SECTION A. General Description of project activity

A.1. Title of the project activity:

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Balıkesir Susurluk 45 MW Wind Farm Project – Turkey
Version number of the document: 04
Date: 05/05//2011

A.2. Description of the project activity:

>>

Summary:

Turkey mainly depends on fossil fuel to meet her energy demand. In 2008, over 82% of total electricity is generated by fossil fuel source that is the main responsible for GHG emissions in Turkey. As a country with a rapid growing economy, Turkey's demand for electricity has been continuously growing during the past decade and expected to grow following decades. Increasing energy demand will be covered by fossil fuel sources according to National Projections (up to 2018) of Energy Ministry, while the share of total renewables are projected less than 2% during the same period.

The objective of proposed Gold Standard VER project activity is to generate renewable electricity from wind energy and feed it into power grid, consequently displace the fossil sourced electricity with renewable one in Turkish national grid.

The Susurluk Wind Farm Project (hereafter referred to as the Project) will be developed and operated by Alentek Enerji AS, affiliate of İltek İletişim Teknolojileri AS

İltek İletisim Teknolojileri AS is active on hydro energy projects. Their first hydro project recently commissioned. They have also 3 more hydro energy projects that are under early construction stage and acquired 5 wind energy licenses. Although Iltek Iletisim has experience on developing hydro energy projects, Alentek Enerji AS Susurluk project will ever be their first wind farm project. Iltek iletisim is Affiliate Company of EKSİM Holding AS. www.eksim.com.tr

The project was planned and acquired license to develop 45 MW onshore wind farm located in the Balıkesir province, Susurluk District in Turkey. According to first issue of the production license, 112,227 MWh/year[1] of electricity generated by 60 pieces of 750 kW wind turbines will be delivered to the Turkish national grid. However, they have applied EMRA (EPDK)for a license alteration to change turbine sizes two times; at first time the turbines sizes changed to 22 pieces 2 MW and 1 piece 1 MW and at the second time, turbine sizes changed to 18 pieces of 2,5 MW wind turbines. Although the installed capacity remains the same (45 MW), according to Geonet Umweltconsulting GmbH report, the annual electricity generation rises up to 121,939 MWh/year[2] because of the high energy yield of 2,5 MW turbines comparing to 750 kW ones
As a summary, the project involves the installation of 18 turbines (18 * 2, 5 MW) with 121,939MWh electricity generation yearly and the development of a 29,326 m. transmission line between the proposed project area and the national grid.

The annual emission reductions are estimated as 74,016.97tCO2-eq/year. The baseline scenario has been defined as the generation of the same amount of electricity by the national grid which is dominated by thermal power plants. The main emission source of electricity generation in fossil fuel fired power plants that are connected to National Grid is CO2 as in baseline scenario. Compared to that baseline scenario, the project will have positive influences on sustainable development in the region and in Turkey.

[2]According to Geonet Umweltconsulting GmbH report (available to DOE), page 25

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 fossil fuel power generation.
- Contribution to the development of the wind energy sector in Turkey.
- Contribution to local and regional economy since the cables, transformer, masts, blades and construction equipment's and subcontractors are procured locally.
- Contribution to the reduction of pollutants such as sulphur dioxide, nitrogen oxides and particles resulting from the electricity generation from fossil fuels in Turkey.
- Reduction of Turkish dependency on the electricity imports.
- Supporting local economy while construction stage, since all foods and consumables are being supplied locally, local employment opportunity at the plant. There are already 7 people from Susurluk region has been hired for the construction stage.[3]
- Contribution of social development since roads are enlarged, X ray room are recovered by lead at Kepsut state hospital, fixed drink water pipeline for nearby village.[4]

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)**
	Alentek Enerji A.Ş. (private company) with share percentages of its partners;	No

İltek İletisim A.Ş. is the main shareholder of Susurluk Rüzgar Enerji Santrali Alentek Enerji AS the operating company of the project activity. The shareholders and their shares of Alentek Enerji AŞ can be found below table;

İSMAİL FAHREDDİN TİVNİKLİ	1,00
ABDULLAH TİVNİKLİ	1,00
ŞEYHMUS ÖZMEN	10,00
MUSTAFA ÇETİN	0,01
İLTEK İLETİŞİM TEKNOLOJİLERİ A.Ş.	87,99

Ecofys Turkey has developed the baseline study and monitoring methodology for this project.

[3]All related documents are available to DOE

[4]All related documents are available to DOE

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party (ies):

Turkey ratified the Kyoto Protocol, but did not sign Kyoto Protocol and do not have emission reduction target. Therefore, Turkey is only present in voluntary markets.

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

Marmara Region / Balıkesir Province / Susurluk District

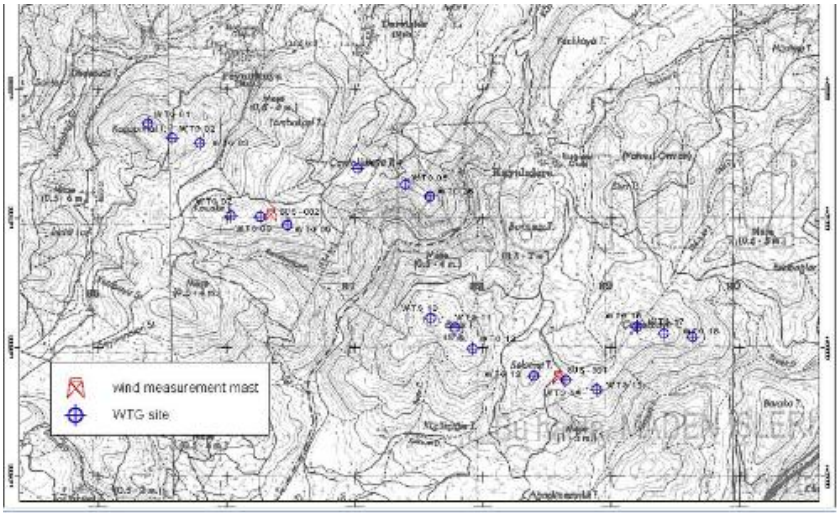
A.4.1.3. City/Town/Community etc.:

The Susurluk Wind Farm Project is located in Balıkesir Province, near Ömerköy and Demirkapı Villages.

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

The project will be implemented in Susurluk district which is 30 km north of "Balıkesir" province. Location of the project activity is shown at below maps;

Figure 1Map Susurluk District



SUSURLUK WIND TURBİNE (18 x 2,5 MW)COORDINATES

Turbine No	6 degree UTM Coordinates (ED50)				Rotor Hun Heights	Turbine Power	Rotor Diameter	Turbine Class
	X	Y	Grid Area Sign	Letter	m	MW	m	
T1	585396	4407734	35	S	80	2,5	100	IIIA
T2	585581	4407620	35	S	80	2,5	100	IIIA
T3	585776	4407618	35	S	80	2,5	100	IIIA
T4	587012	4407398	35	S	80	2,5	100	IIIA
T5	587414	4407261	35	S	80	2,5	100	IIIA
T6	587596	4407171	35	S	80	2,5	100	IIIA
T7	586043	4407017	35	S	80	2,5	100	IIIA
T8	586271	4407013	35	S	80	2,5	100	IIIA
T9	586479	4406949	35	S	80	2,5	100	IIIA
T10	587602	4406225	35	S	80	2,5	90	Ib
T11	587786	4406150	35	S	80	2,5	90	Ib
T12	587929	4405990	35	S	80	2,5	90	Ib
T13	588389	4405776	35	S	80	2,5	100	IIIA
T14	588687	4405753	35	S	80	2,5	100	IIIA
T15	588897	4405675	35	S	80	2,5	100	IIIA
T16	589212	4406158	35	S	80	2,5	100	IIIA
T17	589419	4406105	35	S	80	2,5	100	IIIA
T18	589632	4406106	35	S	80	2,5	100	IIIA

Table 1: Wind Turbine Coordinates

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

According to the latest Gold Standard Requirements III.d.2, the Project falls into the category: Renewable Energy.

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

The total installed capacity will be 45 MW with an establishment of a grid connection. The generated electricity will be delivered to the Turkish national grid. The project activity involves the installation of 18 turbines and the establishment of a 29,326 m. transmission line between the proposed project area and the national grid. The Project is expected to generate 121,939,000 kWh/year of electricity with transgression probability of 75of the wind park.[5]
3 pieces Nordex N90 and 15 pieces Nordex N100 Wind Turbines will be erected in Susurluk Wind Farm. Turbines will be transported from Europe 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.

Brief technical description of Nordex Wind Turbines

Nordex's third generation of the 2.5 MW series, the Gamma Generation, combines the latest research and development with technical know-how and experience from a decade of operation to meet today's market requirements. The Gamma Generation sets new standards for yield, availability, ease of service, quality, delivery and installation time and grid compliance.

[5]According to Geonet Umweltconsulting GmbH report (available to DOE), page 25.

The rotor consists of three rotor blades made of high-quality glass fiber-reinforced polyester, a hub, slewing rings and drives for adjusting the rotor blades. A pitch system is used to control and optimize output. The variable-speed rotor enhances the aerodynamic effects and reduces the wind load on the system. If necessary, each rotor blade can be locked in any position by means of an innovative locking system to facilitate servicing.
The drive train consists of the rotor shaft, the gearbox, an elastic coupling and the generator.
The nacelle is equipped with a two-stage planetary gearbox with a spur gear stage. The gearbox is fitted with a cooling circuit with variable cooling output. The gearbox bearing and tooth engagement are kept continuously lubricated with oil.
The generator is a double-fed asynchronous machine. Nordex has been using this type of generator with variable-speed turbines successfully for many years. The main advantage is that only 25 – 30% of the energy produced needs to be fed into the electricity grid via a frequency converter. The deployment of this generator/frequency converter system thus cuts the total cost of the wind power system.
The gearbox, generator and converter of the turbine each have independent active cooling systems. The cooling system for the generator and frequency converter is based on a cooling water circuit, while the gearbox is cooled by an oil-based system. This ensures optimum operating conditions in all types of weather. A separate cooling system room at the rear of the nacelle facilitates access to the cooling units and ensures optimum performance of the individual systems.
The three redundant and independently controlled rotor blades can be set at full right angles to the rotation direction for aerodynamic braking. In addition, the hydraulic disc brake provides additional support in the event of an emergency stop.
The nacelle consists of the cast machine frame, a welded generator frame, a steel structure for the crane system and for supporting the nacelle housing and the nacelle housing itself, which is made of glass fiber-reinforced plastic. Ergonomically designed, it is spacious and thus very service-friendly.
The wind direction is continuously monitored by two redundant wind direction sensors on the nacelle. If the permissible deviation is exceeded, the nacelle yaw is actively adjusted by means of up to 4 geared motors.
The tubular steel tower is designed and certified as a modular tower. The requirements of EN 50308 in particular have been taken into account in the design of the tower interiors (access ladder, platforms, safety equipment). The transformer can be installed either inside or outside the tower.

Control and grid connection

The wind turbine has two anemometers. One anemometer is used for controlling the turbine, the second for monitoring the first. All operational data can be monitored and checked on a control screen located in the switch cabinet or via an external laptop. The data and signals are transmitted via ISDN for remote monitoring. At the click of the mouse, the operator can download all key data for the turbine from the Internet. The necessary communications software and hardware is supplied by Nordex.

Lightning protection
Lightning and overvoltage protection of the entire wind turbine is based on the lightning protection concept and is in accordance with DIN EN 62305.

Technical lifetime
Manufacturer's information for the technical lifetime of the equipment is 20 years.[6]

Environment and noise friendly due to;

- The absence of rotatic hydraulic system.
- The enclosed grease and oil collecting pans.
- The hydraulics with all lines in the area of the oil pan meaning that no oil can be polluted the environment.

[6] http://windturbine.co.kr/tt/board/images/Nordex 2500kw spec.pdf

- Helical gearing of all gearwheels reduces the noise level within gearbox.
- The vibrations in the generator are either not transmitted or are damped.

Technical description of Nordex N100 and N90 wind turbines those are being implemented by the proposed GS VER project activity is summarized in detail in Table 2 below:

Technical Specification of Nordex N100 and N90

Specifications	**Nordex N100/2500**	**Nordex N90/2500**
Rated Power (kW)	2,500	2,500
Rotor Diameter (m)	100	90
Hub Height (m)	80	80
Num. of Blades	3	3
Swept Area (m²)	7,854	6,362
Rotational Speed (rpm)	9.6-14.9	9,6-14.9
Cut-out wind speed (m/s)	20	25
Power Regulation	Individual blade pitch	Individual blade pitch
Generator	Double-fed asynchronous with partial frequency converter - 50 or60 Hz - 660 V	Double-fed asynchronous with partial frequency converter - 50 or 60 Hz - 660 V
Braking Systems	Single pitch - Individual pitching blades - Disc brake	Single pitch - Individual pitching blades - Disc brake
Yaw bearing	Ball bearing	Ball Bearing
Yaw drive	continuously monitored by two redundant wind direction sensors on the nacelle	continuously monitored by two redundant wind direction sensors on the nacelle

Table 2 Technical specifications of turbine models

The project activity will reduce CO2 emissions from the baseline scenario electricity generation that is produced by mainly fossil fuel-fired power plants within the Turkish national grid according to ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (version 12)

Due to the fast growing economy of Turkey, electricity demand increases around 7% in average, each year. (Table 3) It can be seen below, that on the long term the share of wind will not change and remain insignificant within the long-term projections for energy supply, according to the TEIAS projection between 2009 – 2018 studies. (Table 4)

Currently the increase in energy demand is met by development of local thermal resources first. This fact is underlined in the TEIAS projections for 2009-2018.

Year	Energy Demand [GWh]	% of increase
2003	141,151	6,5
2004	150,018	6,3
2005	160,794	7,2
2006	174,637	8,6
2007	190,000	8,8
2008	198,085	4,2

Table 1the energy demand and increase rates between years 2003-2008[7]

Energy Source	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Thermal (MW total)	27989	27835	29051	32179	34232	34232	34232	34232	34232	34232
Biogas and Waste	41	52	60	60	60	60	60	60	60	60
Hydro (MW total)	14886	16381	18058	19877	19877	19877	19877	21077	21077	21077
Wind + Other renewables (MW total)	570	743	1012	1012	1012	1012	1012	1012	1012	1012
% wind + other renewables contribution to total installed capacity	1,3%	1,7%	2,1%	1,9%	1,8%	1,8%	1,8%	1,8%	1,8%	1,8%
MW TOTAL	**43485**	**45011**	**48182**	**53128**	**55182**	**55182**	**55182**	**56382**	**56382**	**56382**

Table 2 Breakdown Total installed capacity by Fuel resources in Turkey[8]
Note: From the two projection scenarios that TEIAS offers in the report Scenario 1, which is more optimistic about share of renewables is chosen.

When calculating emission factor for Turkey in line with "Tool to calculate the emission factor for an electricity system V02", Default efficiency factors for power plants has been conservatively taken account from Annex 1 of the UNFCCC methodology, although the average emission reduction factor of many plants is much lower according to "Environmental Map" published by Environmental Inventory Head Department under Ministry of Environment and Forestry.

These numbers and figures proves the contribution of a wind farm project like Susurluk to the development of environmental friendly electricity generation instead of above described Turkish mix of hydroelectric and fossil fuelled power plants which are projected majority 98% of total energy generation in 2018 by the Ministry of Energy and Natural Resources. The emission reductions would not occur in the absence of the proposed project activity because of various real and perceived risks that impede the provision of financing.

Susurluk Wind Farm Project will show as a perfect project to demonstrate long-term potential of wind energy , efficient technology to reduce GHG emissions as well as to diversifying and increasing security of the local

[7] Reference: Derived from Turkish Electricity Transmission Company Projection report 2007 (p.4 table1) / http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2009.pdf

[8] Reference: Turkish Electricity Transmission Company, Turkish Electrical Energy 10 Year Projection of Generation Capacity (2007-2016) (p.31 table 21)/ http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2009.pdf

energy supply and contributing to a sustainable development. The Gold Standard certification shall help to realize this technology by providing an adequate compensation for the accessing to finance opportunities for project participant and lacking financial incentives in the Turkish renewable energy market.

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

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Years	Annual estimation of emission reductions In tones of tCO_2-eq
2011	37,008,48
2012	74,016.97
2013	74,016.97
2014	74,016.97
2015	74,016.97
2016	74,016.97
2017	74,016.97
2018	37,008.48
Total emission reductions (tons of CO_2-eq)	518,118.79
Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tons of CO_2-eq)	74,016.97

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 12.

"Tool for the demonstration and assessment of additionality" version 05.2

"Tool to calculate the emission factor for an electricity system" version 02

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

The above methodologies referred under section B.1 are applicable to this project activity as:

- The project consists of installation of wind power plant 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 methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 12 the only emission sources are the emissions associated with the electricity that is displaced from the grid.

	Source	Gas	Included?	Justification/Explanation
Baseline	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.
Project activity	Project emission	CO_2	No	As per ACM0002 (version 11) there are no expected project emission related to the generation of electricity by wind turbines
		CH_4	No	
		N_2O	No	

Table 5 Sources and gases included in the project boundary

According to methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 12, the spatial extent of the project boundary includes the project site and all power plants connected physically to the Turkish National Grid.

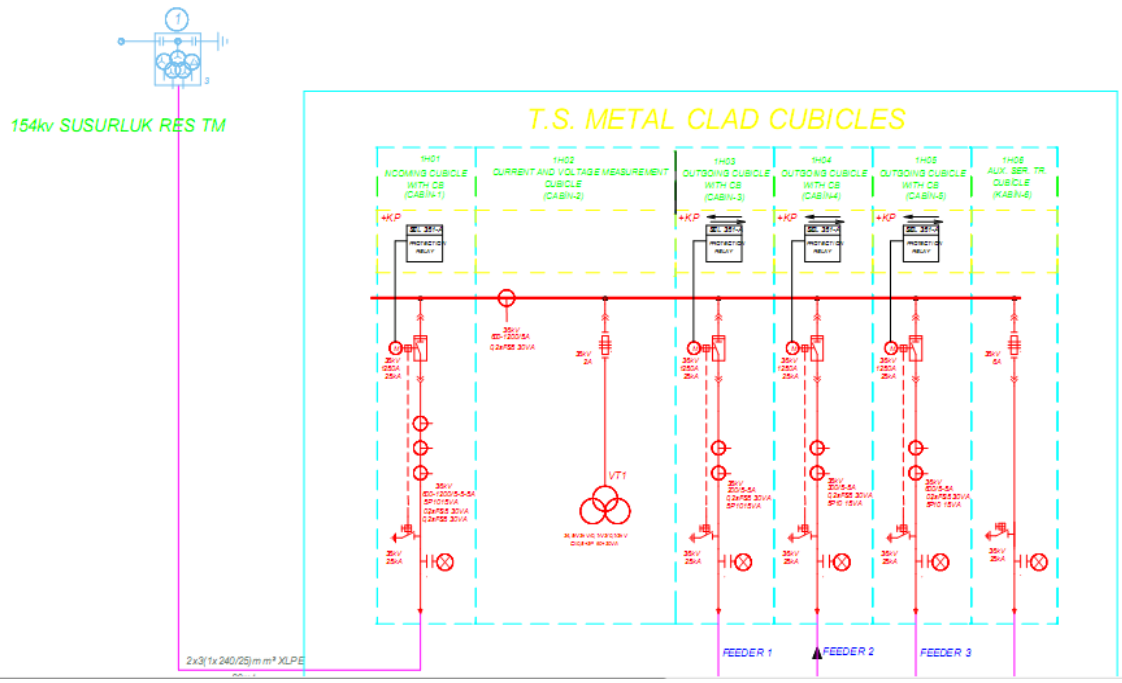

Table 6: electricity will be generated by three groups (feeders) of wind turbine and connected to Turkish electricity grid through 154 kV main transformers.
(121,939 kWh with 82.658.8 tCO2 emission reduction annually)

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

According to methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 12), 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 version 02".

Since Turkey is developing country, the demand for electricity is growing fast in parallel with the growing economy. The electricity consumption of Turkey almost folds double in every 10 years, as it shown below Table7 .The annual demand rose an average of 7% between 2003 and 2008 ,Table 2. According to TEIAS projection up to 2018, electricity consumption will continue to rise in Turkey. [9]

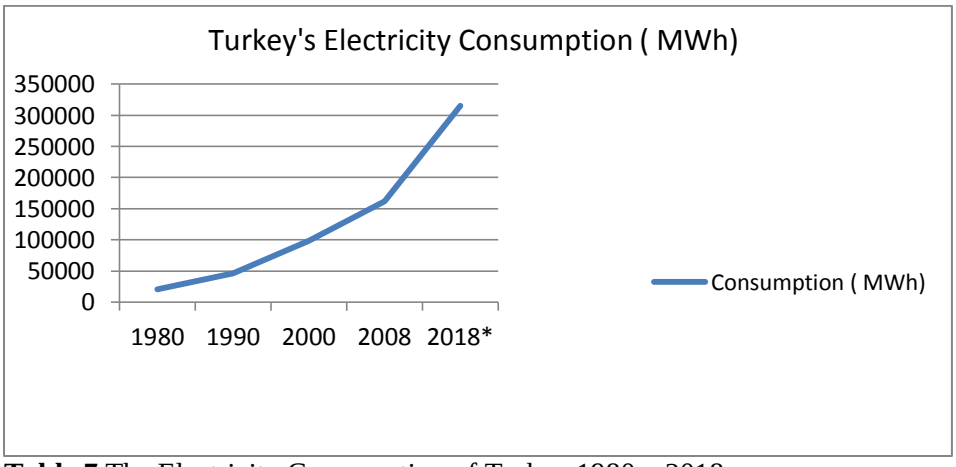

Table 7 The Electricity Consumption of Turkey 1980 – 2018

[9] http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2009.pdf

When investigating the development of Turkey's gross electricity generation by % share of energy sources (1980 – 2018), it could be seen that Turkish electricity mostly depends on fossil fuel sources (thermal), while the hydraulic share had significant 48% share in 1980, but lowered to 16.8% by 2008[10]. However, the share of Hydraulic electricity projected to rise to 23% by the year 2018[11]. This additional hydro capacity mostly expected from the small type or run of river type Hydraulic Power Plant without dam applications. Nevertheless, the shares of other renewables including Wind energy remains almost constant during the same period up to 2018. It is clear from those tables that at least for 10 years fossil fuels will be the main resource for electricity generation with 75.5% share in 2018.

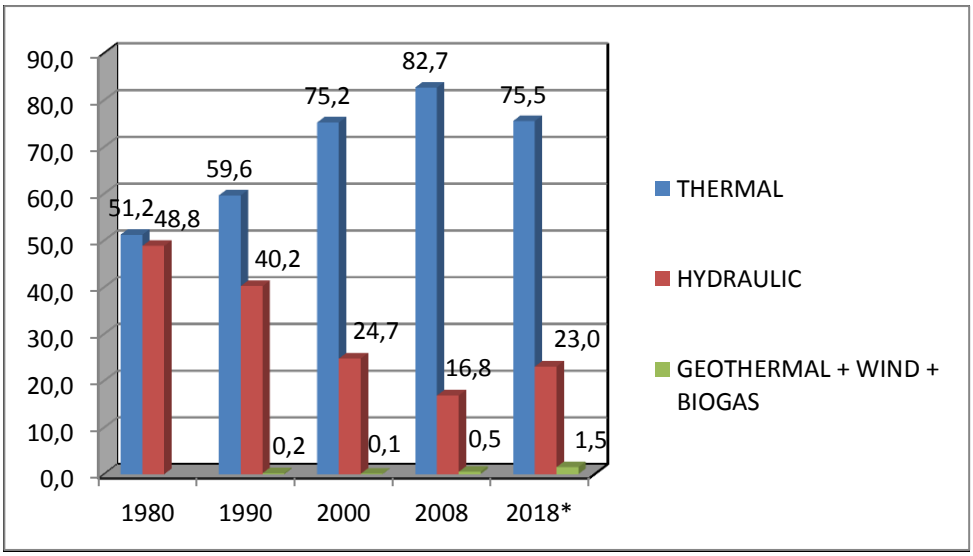

Table 8 Gross electricity generation of Turkey by share of energy sources (%)

Above analysis for the baseline scenario (continuation of current situation) can be concluded that:
Energy demand in Turkey has been increasing with significant rates since ten years, and it is expected to continue at least for ten years. Since Turkey is developing country, there is significant need for electricity generation investments to satisfy demand. Fossil fuels will be the main energy source over 75% shares. The share of other renewables (other than hydraulic) will remain very low with 1, 5% share while the contribution of wind electricity will stay only 1.2% of total share.

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 Toolkit, the project additionality is demonstrated through use of the Tool for the demonstration and assessment of additionality (version 05.2). The project is new project activity.

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

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

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

[10] http://www.teias.gov.tr/istatistik2008/33.xls

[11] http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2009.pdf

Alternative A	The proposed project activity undertaken without being registered as a VER project activity.
Alternative B	Continuation of the current situation (no project activity or other alternatives undertaken)
Alternative C	Other realistic and credible (thermal or hydraulic) alternative scenario(s) to the proposed GS VER project

First alternative, which is the implementation of the project without VER income is facing problem on accessing finance and other barriers as discussed in barrier analysis section below. The Second alternative (Scenario 2) is the baseline scenario and implementation of the proposed project as a VER activity would be additional to this scenario. Last alternative, the project activity is power generation activity without any greenhouse gas emission harnessing the energy of the wind. Being a private entity, Eksim Holding doesn't have to invest power investments even proposed project activity. Also, in the proposed project area there is no hydro or other sources available for electricity generation, other project activities delivering same electricity is *not* realistic for project participant.

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

Investment analysis has been prepared to show the project activity is not the most economically or financially attractive for Alentek AS.

Sub-step 2a.

The *Tool for the Demonstration and Assessment of Additionality',* version 05.3 lists three possible analysis methods:
- Option I: Simple cost analysis;
- Option II: Investment comparison analysis;
- Option III: Benchmark analysis.

Since the project generates financial benefits (by selling electricity) other than carbon credit related income, Option I cannot be used.
Option II is applicable to projects where alternatives should be similar investment projects in terms of generation capacity. Since the baseline for the project is generation of the electricity by the grid, no similar investment project exists.
Option III has been chosen for the demonstration of additionality of the project.

Sub, step 2b Option III Apply Benchmark Analysis

The Internal Rate of Return (IRR) is one of the most widely accepted financial indicators for project evaluation. According to the "Guidance on the assessment of Investment Analysis" # 12"required/expected returns on equity are appropriate benchmarks for an ***equity IRR***; therefore this benchmark will be used.
.

The additionality tool states that benchmarks should be derived from (among others) government bond rates, increased by a suitable risk premium to reflect project characteristics[12]

In our case, cost of equity will be calculated using Capital Asset Pricing Model (CAPM), a standard tool in finance. The market reward-to-risk ratio is effectively the market risk premium and solving for E (Ri), we obtain the Capital Asset Pricing Model (CAPM)[13] as below formula;

$$E(R_i) = R_f + \beta_i(E(R_m) - R_f)$$

Where:

- $E(R_i)$ is the cost of equity
- R_f is the risk-free rate of interest such as interest arising from government bonds
- β_i (the *beta*) is the sensitivity of the expected excess asset returns to the expected excess market returns, or also $\beta_i = \frac{\mathrm{Cov}(R_i, R_m)}{\mathrm{Var}(R_m)}$,
- $E(R_m)$ is the expected return of the market
- $E(R_m) - R_f$ Is sometimes known as the *market premium* or *risk premium* (the difference between the expected market rate of return and the risk-free rate of return).

R_f is the risk-free rate of interest, Eurobond

From state bank (Ziraat Bankası) website[14], Eurobond was chosen for the date when the turbine purchase agreement signed (18.08.2010) which is the project activity start date. Since the investment of the project is primarily made in Euros, the currency of Eurobond was also chosen in Euro with the longest available due date Eurobond choice.

Eurobond Code	Due Date	Currency	Rate %
XS0503454166	18.05.2020	EUR	4,79

β_i the *beta*

The Beta represents the sensibility of the expected excess returns to the expected excess market returns. Since Our project is renewable energy project and it there is no publicly available source to derive Beta, It can be concluded that Beta value is equal to “one”, which represents that expected excess returns will move with the entire market returns for Turkey.

$E(R_m) - R_f$ the *market premium* or *risk premium*

As in study of “Stern School of Business”, Average Risk Premium of Turkey is 9.29%, calculated on the basis of the credit rating Ba3 given to Turkey by Moody’s.[15]

As a result,the cost of equitycan be found from below formula;

$$E(R_i) = R_f + \beta_i(E(R_m) - R_f)$$

[12]Tool for the demonstration and assessment of additionality, version 5.2, page 6

[13] See http://en.wikipedia.org/wiki/Capital_asset_pricing_model

[14]http://www.ziraat.com.tr/tr/bankamiz/faiz-ve-ucretler/aspx/eurobond.aspx

[15]www.**stern**.**nyu**.edu/~adamodar/pc/archives/ctryprem01.xls

E(Ri) = 4,79% + 1*(9,29%) = 14,08%

Hence, the appropriate benchmark rate for the proposed project activity is 14, 08%

Sub-step 2c. Calculation and comparison of financial indicators:

The detailed financial analysis is provided in the annex electronic spreadsheet "Susurluk Aylık Çalışma Ecofys.xls" where a full description of all the variables and assumptions are available.

Assumptions	**Units**	**Value**
Size of the project	MW	45
Annual electricity production	MWh	121,939
Total Investment	Euro	53.783.640
Debt Share	%	67,6%
Debt payback period	year	2+10
Electricity income	Euro per MWh	55
Annual VER volume	tone CO2	74,016.97
Project lifetime	Year	20
VER income	Euro per tone	8

According to "Tool to determine the remaining lifetime of equipment" (EB 50 Annex 15), manufacturer's information for the technical lifetime of the equipment may be used. In our case, manufacturer company Nordex states that their wind turbines' technical lifetime is 20 years.[16]In parallel with technical lifetime, operational lifetime of the project was taken as 20 years on IRR calculation.

The "Guidelines on the Assessment of investment analysis (version 3.1)" (EB51 Annex 58) was thoroughly observed in the elaboration of the financial analysis whose results are reported below.

Result: After applying the assumptions enumerated above and others described in the financial analysis spreadsheet, the Equity IRR is 5, 4%. Comparison of the Equity IRR and the Benchmark rate: According to the Tool for the demonstration and assessment of additionality, Sub-step 2c, sub item 10. (b): *"The financial benchmark, if Option III (benchmark analysis) is used. If the CDM project activity has a less favorable indicator (e.g. lower IRR) than the benchmark, then the CDM project activity cannot be considered as financially attractive".* Thus, without the VER revenues, the proposed VER project is not financially feasible, that is, the Project IRR of 5, 4% is much lower than the benchmark rate value of 14, 08%.With VERs revenue of 8 Euro/tone, the project IRR 8, 1% makes the project financially more attractive and the investment decision possible.

Equity IRR of 5, 4% < Benchmark rate of 14, 08 %

Sub-step 2.d Sensitivity Analysis

The sensitivity analysis is used to show whether the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions. For the project, four parameters that constitute more than 20% of either total project costs or total project revenues are selected as variables to control the financial attractiveness. The variables include:

[16]http://windturbine.co.kr/tt/board/images/Nordex 2500kw spec.pdf page 3

1.) Total investment cost
2.) Operational cost
3.) Electricity price
4.) Electricity generation

Sensitivity analysis variables change by -10% and +10%;

	-10%	-5%	0%	5%	10%
Total Investment Cost	8, 5%	6, 7%	5, 4%	4, 3%	3, 5%
Operational Cost	6, 2%	5, 8%	5, 4%	5, 0%	4, 8%
Electricity Price	2, 2%	3, 9%	5, 4%	7, 1%	8, 8%
Electricity Generation	2, 2%	3, 9%	5, 4%	7, 1%	8, 8%

To exceed the benchmark value of 14, 08%, it is impossible to reduce total investment cost by 19 % due to turbine purchase contract has already been signed.
Even there will be no operational costs, it is impossible to exceed the benchmark value of 14, 08%, hence the most of the costs are already fixed (maintenance, teias cost, land fee, etc.)
It is unlikely to rise over 26% of either electricity price or electricity generation to exceed the benchmark value, since the project will generate 121.939 MWh by 75%of probability and higher probability values are not acceptable for both investors and finance organizations. According to the newly legislated renewable energy law[17], guaranteed electricity price for wind electricity is 7, 3 USD cent. Although investment is progressed in Euro currency, electricity income will be in USD. The volatility of exchange rates occur financial risk for the project. USD/Euro currency rate is 1, 4013 based on TCMB[18] website dated on 07.03.2011. The guaranteed price for wind electricity has even be lowered from 5, 5 Euro cents to (7, 3 USD cents = 5, 21 Euro Cents) due to the volatility of exchange rates. Furthermore, the wind electricity is not suitable to be sold in spot market according to "balancing and settlement regulation"[19]. The electricity generation depends on wind condition and the plant cannot generate electricity for the hours with high price level at spot market. The spot prices are not used in wind project economic analysis by financiers, due the uncertainties of spot price and electricity generation of wind farm.

Outcome of Step 2:

The sensitivity analysis shows that without VER revenue, IRR of the project is difficult to reach the benchmark, which supports the conclusion, that the proposed project is unlikely to be financially attractive. Based on the above information, the project is considered as additional to the baseline scenario and eligible for VERs.

Step 3. Barrier analysis

Step 3 barrier analysis is also used for the assessment of additionality.
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 realization of this alternative. An overview of the barriers is presented in Table 9Each barrier is described in more details in the section below.

Type of barrier	**Identified barrier**	**Internal/External**

[17] http://www.ttgv.org.tr/content/docs/yek-8.1.2011.pdf

[18] http://tcmb.gov.tr/

[19] http://www.epdk.org.tr/web/elektrik-piyasasi-dairesi/26

Investment	Barriers related to access to finance.	INT

Table 9 Identified barriers for development of the project activity.

Investment Barriers / Barriers related to access to finance

Alentek considered the opportunity to develop the project using the income from VERs. Alentek board has taken the decision that income from VERs was needed for the development of the project. Despite the decision to develop the project as VER project, the project participants had difficulties to secure a loan for development of the project. During the negotiations with creditor banks, additional revenue from Carbon Credits are discussed to affect positively the creditworthiness of the project. This is described in the table below;

Date of Event	**Description of event**
24 July 2008	EMRA issues production license for the project.
27 April 2009	Exemption from EIA received form Balıkesir Province Directorate of Environment and Forestry
12 October 2009	Decision of Alentek Board to make use of VER credits[20]
16 November 2009	Alentek signs contract with Ecofys Turkey to develop VER credits
19 February 2010	Alentek signs conditional agreement with a firm for the purchase of turbines. According to the contract Alentek pays 10% upfront fee on the condition that the supplier of the turbines finds a creditor within 8 weeks. The special clause states that Alentek has right to terminate the contract after 8 weeks if no creditor is found and get 10% payment back, or prolong it for 8 more weeks. Full purchase of the turbines will be done only if the contracted firm finds a creditor bank.[21]
16 April 2010	Contracted firm fails to find a creditor bank. Alentek decides to prolong an additional 8 weeks to the contracted firm to find a creditor.
03 May 2010	The land permit was granted to Alentek by Susurluk Forestry Regional Directorate.[22] Even there is no certainty if the project will actually be implemented, minor pre-project activities started.
11 June 2010	At the end of additional 8 weeks if the contracted firm finds a creditor full purchase of the turbines will be finalized. If the contracted firms still did not find a creditor Alentek has right to terminate the contract and get the 10% back and find another supplier.
11 June 2010	As an alternative option if contracted firm fails to find credit, Alentek starts negotiations with other suppliers and creditor banks. The prospect of generating tradable Voluntary Emission Reduction VERs and expected revenues from carbon credits have been negotiated with creditor banks.
06 August 2010	Contracted firm fails to find creditor bank one more time .Alentek

[20]Board Decision available to the DOE.

[21]Contract available to the DOE.

[22]Available to DOE

	terminated the contract and continued negotiations with other suppliers and creditor banks.
16 August 2010	Expected revenues from carbon credits have been negotiated and taken account by creditor bank during credit evaluation period. The creditor bank statement to Alentek regarding the VERs income shows that Bank has taken account of carbon credits while approving the credits.[23]
18.August.2010	Alentek signs wind turbine purchase agreement with Nordex. This date is also project activity start date.
19 August 2010	Alentek reached financial closure with Aklease.[24]

Table 10 Description of Event

[23] Available to DOE

[24] Available to DOE

AKLease

16/08/2010

Dear Sirs,

Referring to Susurluk Wind Farm Project & Greenhouse Gas (GHG) Emission Reductions Project ("the project" by Alentek Enerji AS,

We would like to inform that;

Alentek Enerji AS and its mother(main) company İltek İletisim Teknolojileri AS is a trustworthy and a reliable company of our company . The prospect of generating tradeable Verified Emission Reduction Credits (VERs) and the expected revenues from carbon credits have been negotiated with themselves during credits evaluations.

Wind farm projects need a high level of financing and long repayment periods. Both aspects make the project difficult to realize in Turkey due to the perception of the country risk in the international markets. We therefore, welcome and support the initiative of Alentek Enerji As and İltek İletişim Teknolojileri AS to use the concept of GHG emission reductions to realize the expected revenues from carbon credits and hope to affect positively the creditworthiness of the project

Alentek Enerji AS and İltek İletisim Teknolojileri AS intend to generate additional returns through an emission reduction project that leads to tradeable carbon certificates. On the other hand, we take care about the aspects for such projects to make a sound and rational decisions.

This information has been given upon request of our customer neither engage us on our part, nor constitutes any form of commitment and obligation.

Best regards,

AK FİNANSAL KİRALAMA A.Ş.

Bekir YILDIZ
Assistant General Manager

Murat ÖZTÜRK
Operation Manager

An important reason why the project had difficulties on securing financing is that the project will be realized in Turkey which is internationally considered a relatively high risky country for investment and finance. This results in higher interest rates and required shorter payback terms compared to other countries. After an economic crisis in 2001, the 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[25]. It can be concluded that the economic and political situation has an adverse impact on the international perception of Turkey as investment country posing a barrier to the Project.

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:

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 363, 7 MW (2008), where the total installed capacity equals 41, 817, 2 MW. The project boundary is National Electricity Grid of Turkey. The Geographical and physical boundaries of the Turkish grid and location of the wind power plants are well identified.

Most recent wind farms in Turkey together with their installed capacities can be seen in Table 12.

Wind Farm in Operation in Turkey		
Location	**Company**	**Installed Power (MW)**
İzmir-Çeşme	Alize Enerji Elektrik Üretim A.Ş.	1,50
Çanakkale-İntepe	Anemon Enerji Elektrik Üretim A.Ş.	30,40
Manisa-Akhisar	Deniz Elektrik Üretim Ltd. Şti.	10,80
Çanakkale-Gelibolu	Doğal Enerji Elektrik Üretim A.Ş.	14,90
Manisa-Sayalar	Doğal Enerji Elektrik Üretim A.Ş.	34,20
İstanbul-Çatalca	Ertürk Elektrik Üretim A.Ş.	60,00
İzmir-Aliağa	İnnores Elektrik Üretim A.Ş.	42,50
İstanbul-Gaziosmanpşa	Lodos Elektrik Üretim A.Ş.	24,00
İzmir-Çeşme	Mare Manastır Rüz En.San. ve Tic. A.Ş.	39,20
İstanbul-Hadımköy	Sunjüt Sun'i Jüt San. ve Tic. A.Ş	1,20
Wind Farm in Operation in Turkey	**Wind Farm in Operation in Turkey**	**Wind Farm in Operation in Turkey**
Balıkesir-Bandırma	Yapısan Elektrik Üretim A.Ş.	30,00
Balıkesir-Şamlı	Baki Elektrik Üretim Ltd. Şti.	90,00

25 Reference: IMF Fifth Review – Turkey 2007, http://www.imf.org/external/pubs/ft/scr/2007/cr07161.pdf ; OECD Economic Survey of Turkey 2008, http://www.oecd.org/dataoecd/50/53/37529636.pdf

Muğla-Datça	Dares Datça Rüz San ve Tic A.Ş.	29,60
Hatay-Samandağ	Deniz Elektrik Üretim Ltd. Şti.	30,00
Aydın-Didim	Ayen Enerji A.Ş.	31,50
Çanakkale-Ezine	Alize Enerji Elektrik Üretim A.Ş.	20,80
Balıkesir-Susurluk	Alize Enerji Elektrik Üretim A.Ş.	18,90
Osmaniye-Bahçe	Rotor Elektrik Üretim A.Ş.	95,00
İzmir-Bergama	Ütopya Elektrik Üretim San ve Tic A.Ş.	15,00
İzmir-Çeşme	Mazı-3 Rüz En Santrali Elk Üretim A.Ş.	22,50
Balıkesir-Bandırma	Akenerji Elektrik Üretim A.Ş.	15,00
Balıkesir-Bandırma	Borasco Enerji Kimya San ve Tic A.Ş.	45,00
Manisa-Soma	Soma Enerji Elektrik Üretim A.Ş.	49,50
Hatay-Belen	Belen Elektrik Üretim A.Ş.	30,00
Tekirdağ-Şarköy	Alize Enerji Elektrik Üretim A.Ş.	28,80
İzmir-Urla	Kores Kocadağ Rüz En Santralı ÜrtA.Ş.	15,00
Balıkesir-Bandırma	As Makinsan Elk Ürt San. ve Tic. A.Ş.	24,00
Mersin-Mut	Akdeniz Elektrik Üretim A.Ş.	33,00
Edirne-Enez	Boreas Enerji Üretim Sistemleri A.Ş.	15,00
İzmir-Bergama, Aliağa	Bergama RES Enerji Üretim A.Ş.	52,50
Hatay-Belen	Bakras Enerji Elekt Üretim ve Tic. A.Ş.	15,00
İzmir-Çeşme	Ares Alaçatı Rüz En. San. ve Tic. A.Ş.	7,20
Çanakkale-Bozcaada	Bores Bozcaada Rüz San ve Tic. A.Ş.	10,20
İstanbul-Silivri	Ertürk AŞ	0,85

Table 12 Most recent wind farms installed in Turkey[26]

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

All wind energy projects in Turkey applied or registered VERs credits except few applications which are not comparable with the project as described at the below.

Only projects that were not developed by VERs are:

1. Alize A.Ş. 1.50 MW WPP at İzmir-Çeşme
2. Güçbirliği A.Ş. 7.20 MW WPP at İzmir-Çeşme
3. Bores A.Ş. 10.20 MW WPP at Çanakkale-Bozcaada
4. Sunjüt A.Ş. 1.20 MW WPP at İstanbul-Hadımköy
5. Ertürk A.Ş. 0.85 MW at İstanbul-Silivri

Güçbirliği A.Ş. and Bores A.Ş. are BOT project and are not comparable to the Project,

Alize A.Ş. and Sunjüt A.Ş. is auto-producers and hence is not comparable to the Project,

Only private company that does not use VERs is Ertürk AŞ. However due to very low installed capacity this project poses much lower investment risks and hence is not comparable to the Project

Conclusion

[26] http://www.epdk.gov.tr/lisans/elektrik/yek/ruzgarprojeleriningelisimi.xls

With the additional expected income from GS VERs, accessing to finance will be easier and this barrier can be overcome. As this is the first wind farm project of Alentek, VER credits will also support to mitigate the project development risks of the plant. (As an additional income to cover the learning costs, etc.)

The political environment in Turkey is in favor of utilization of thermal electric plants fuelled by domestic coal resources. It is said that this is because of a need to cover the rapidly increasing energy demand. Moreover, use of Nuclear energy is subsidized by newly enacted law. Currently, the wind farms constitute only 0.1% of the generation capacity. According to TEIAS projection, this share will increase to 1,2 % of total generation capacity in 2018.The additional revenues from GS VERs will support the project participants to overcome the above mentioned barriers for realizing the plant. As a conclusion, with the support of VERs credits, clean electricity generation capacity will be implemented instead of additional fossil fuel fired thermal generation capacity.

Based on the above statement, it can be concluded that the project activity (as a large scale project) 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:

The emission reductions resulting from the proposed project are calculated according to ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources" version 12.*

According to the referred methodology the emission reductions are calculated as follows:

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

Where:

ER_y : Emission reductions in year y (tCO_2e/yr)
BE_y : Baseline emissions in year y (tCO_2e/yr)
PE_y : Project emissions in year y (tCO_2/yr)

The baseline emissions include only CO_2 emissions from the electricity generation in fossil fuel fired power plants that are displaced due to the project activity, calculated as follows:

$$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y} \quad (2)$$

Where:

BE_y : Baseline emissions in year y (tCO_2e/yr)
$EG_{PJ, y}$: Quantity of net electricity generation that is produced and fed into the grid as a result of the VER activity (MWh)
$EF_{grid, CM, and\ y}$: Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the *"Tool to calculate the emission factor for an electricity system" version 2*

The emission factor is calculated according to "Tool for calculation of emission factor for electricity systems" version 2. This tool provides the following six steps to calculate combined margin emission factor:

Step 1. Identify the relevant electric power system.
Step 2. Choose whether to include off-grid power plants in the project electricity system (optional).
Step 3. Select a method to determine the operating margin (OM)

Step 4. Calculate the operating margin emission factor according to the selected method.
Step 5. Identify the group of power units to be included in the build margin (BM).
Step 6. Calculate the build margin emission factor.
Step 7. Calculate the combined margin (CM) emissions factor.

Step 1.Identify the relevant electric power system

According to the "Tool to calculate the emission factor for an electricity system", 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.Choose whether to include off-grid power plants in the project electricity system

Since off grid application is not significant and there is no data available on off grid plants in Turkey, option 1 is selected.
Only grid power is included in the calculation.

Step 3.Select a method to determine the operating margin (OM)

According to the "Tool to calculate the emission factor for an electricity system", 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) could 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 therefore is not taken into consideration (see Table13). 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 16.8% of the total electricity generation (see Table13). Therefore the requirements for the use of the Simple OM calculations (option a) are satisfied.

Power plants by fuel type	2008 Generation	
	Generation (GWh)	Share (%)
Natural Gas	98.685,3	49,7
Coal	57.715,6	29.1
Hydro power	33.269,8	16,8
Fuel Oil	7.208,6	3,6
Diesel	266,3	0,1
Naphta	43,6	0
Renew. Waste	219,9	0,1
Geothermal	162,4	0,1
Wind	846,5	0,4
Total	**198.418,0**	**100**

Table 13Breakdown by sources of the electricity generation from the Turkish grid 2008[27]

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 $EF_{grid, OM, y}$;

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

II. 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 2006 – 2008 which are the most recent data available at the time of preparation of the PDD.

Step 4.Calculate the operating margin emission factor according to the selected method.

The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost / must run power plants / units. It may be calculated:

(a) Based on the net electricity generation and a CO2 emission factor of each power unit (option A); or
(b) Based on 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 B)

As the fuel consumption and the average efficiency data for each power plant / unit is not available Option B is used for simple OM calculation[28].

As Option B 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:

27 Reference: TEIAS (Turkish Electricity Transmission Company) / "The distribution of gross electricity generation by primary energy resources and the electricity utilities in Turkey 2008" http://www.teias.gov.tr/istatistik2008/41.xls

28 There are no nuclear power plants in Turkey and the share of the renewable energy is very small.

$$EF_{grid,OMsimple,y} = \frac{\sum_i \left(FC_{i,y} \cdot NCV_{i,y} \cdot EF_{CO2,i,y}\right)}{EG_y} \quad (3)$$

Where:

$EF_{grid, OMsimple, y}$	Simple operating margin CO_2 emission factor in year y (tCO_2/GWh)
$FC_{i, y}$	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 the system, not including low-cost / must run power plants / units, in year y (GWh)
i	All fossil fuel types combusted in power sources in the project electricity system in year *y*
y	The relevant year as per the data vintage chosen in Step 3

Step 5.Identify the group of power units to be included in the build margin (BM).

The sample group of power units' m is 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[29].

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.

Option 1 is chosen to calculate the build margin emission factor ex ante based on the recent information available on units already built for the sample group m at the time of VER PDD submission to the DOE for validation, and update respectively renewals for the crediting period of 2 and 3 as indicated in step 5 of *"Tool to calculate the emission factor for an electricity system" version 2*

Step 6.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:

$$EF_{grid,BM,,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \quad (4)$$

Where:

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

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

As per the "Tool to calculate the emission factor for an electricity system", 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 A2 has been selected for the calculation of the CO_2 emission factor of each power unit m ($EF_{EL,m,y}$) as follows:

$$EF_{EL,m,y} = \frac{EF_{CO2,m,I,y} \cdot 3,6}{\eta_{m,y}} \qquad (5)$$

Where:

$EF_{EL,m,y}$	CO_2 emission factor of the power unit m in year y (tCO_2/GWh)
$EF_{CO2,m,I,y}$	Average CO_2 emission factor of fuel type I used in power unit m in year y (tCO_2/GJ)
$\eta_{m,y}$	Average net energy conversion efficiency of power unit m in year y (ratio)
m	All power units serving the grid in year *y* except low-cost/must-run power Units
y	The relevant year as per the data vintage chosen in Step 3

Step 7. Calculate the combined margin (CM) emissions factor.
The combined margin emissions factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,CM,y} \times w_{BM} \qquad (6)$$

Where:

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

Wind and solar power generation project activities: wOM = 0.75 and wBM = 0.25 (owing to their intermittent and non-dispatch able nature) for the first crediting period and for subsequent crediting period.

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 (2006-2008)
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 (2006, 2007, 2008). http://www.teias.gov.tr/istatistik2008/37(06-08).xls
Value applied:	Table 16; Table 17
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to "Turkish Statistics Law and Official Statistics Program"[30] 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 (2006, 2007, 2008) http://www.teias.gov.tr/istatistik2008/44.xls
Value applied:	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" 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.3 / Electricity Imports**
Data unit:	GWh
Description:	Electricity transfers from connected electricity systems to the project electricity system by years (2006-2008)
Source of data used:	TEIAS (Turkish Electrical Transmission Company) Monthly distribution of imported electrical energy by years (2006, 2007, 2008) http://www.teias.gov.tr/istatistik2008/30(84-08).xls
Value applied:	Table 18
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 Reference: http://rega.basbakanlik.gov.tr/Eskiler/2005/11/20051118-1.htm

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 (2006, 2007, 2008) http://www.teias.gov.tr/istatistik2008/46.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.5 / EF_{C02}**
Data unit:	kg/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 15; Table 19
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:	Default efficiency Factors for Power Plants
Source of data used:	UNFCCC EB 50 Annex 14 Methodological Tool (Version 2) "Tool to calculate the emission factor for an electricity system" Annex 1, pg. 25 http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.pdf
Value applied:	Table 19
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default efficiency Factors for Power Plants are taken from the report "UNFCCC EB 50 Annex 14 Version 2"
Any comment:	

Data / Parameter:	ID.7 / Capacity additions
Data unit:	Name of the plant; Installed capacity (MW); Fuel type; Generation (GWh); Commission date
Description:	Capacity additions to the grid that comprises 20% of the total generation (2004-2008)
Source of data used:	TEIAS (Turkish Electricity Transmission Company) Generation units put into operation in 2004; 2005; 2006; 2007; 2008 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/KAPASITE%20PROJEKSIYONU%202007.pdffor 2006 http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2008.pdf for 2007 http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2009.pdf for 2008.
Value applied:	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:	

B.6.3 Ex-ante calculation of emission reductions:

>>

Calculation of Simple Operation Margin Emission Factor ($EF_{grid, OM, y}$):

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 Table14.

$FC_{i, y}$ 1000m^3 or tons (m^3 is used for gaseous fuels)				
	2006	**2007**	**2008**	**Total**
Natural Gas	17.034.548	20.457.793	21.607.635	**59.099.976**
Lignite	50.583.810	61.223.821	66.374.120	**178.181.751**
Coal	5.617.863	6.029.143	6.270.008	**17.917.014**
Fuel Oil	1,746,403	2,250,686	2.173.371	**6.170.460**
Diesel	61.501	50.233	131,206	**242,940**
Naphtha	13.453	11.441	10,606	**35.500**

Table 14 Fuel consumption of generation sources connected to the grid (2006-2008)[31]

Turkey specific net calorific values ($NCV_{i, y}$) for fossil fuel types are used, however, for emission factor of fossil fuel types ($EF_{CO2, I, y}$) ,data from IPCC guidelines for national greenhouse gas inventory has been used.

The NCV and emission factors are presented in Table15.

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

	NCV_i (TJ/Gg)			$EF_{CO2,I}$ (kg/TJ)
	2006	2007	2008	
Natural Gas	37,0	36,8	36,6	54,300
Lignite	6,9	6,9	6,8	90,900
Coal	22,0	22,3	22,2	94,600
Fuel Oil	40,2	39,9	39,9	75,500
Diesel	42,7	43,1	42,4	72,600
Naphtha	43,9	43,2	44,6	69,300

Table 15NCV and emission factor of fossil fuel type[32]

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). Table16shows the gross electricity production for 2006-2008 produced by fossil fuel power sources.

$EG_{gross,y}$ GWh				
	2006	**2007**	**2008**	**Total**
Natural Gas	80.691,2	95.024,8	98.685,3	**274.401,3**
Lignite	32.432,9	38.294,7	41.858,1	**112.585,7**
Coal	14.216,6	15.136,2	15.857,5	**45.210,3**
Fuel Oil	4.232,4	6.469,6	7.208,6	**17910,6**
Diesel	57,7	13,3	266,3	**337,3**
Naphtha	50,2	43,9	43,6	**137,7**

Table 16Gross electricity production by fossil fuel power sources 2006-2008[33]

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 below.

	2006	**2007**	**2008**
Gross generation [GWh]	176.300	191.558	198.418
Net generation [GWh]	169.543	183.340	189.762
Relation	96,2%	95,7%	95,6%
Average correction factor	95,8%		

Table 17Relation between net and gross electricity generation 2006-2008[34]

The net electricity delivered to the grid by the fossil fuel plants ($EG_{net,y}$) is calculated in table below. 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.

32 For further information please see section B.6.2.

33 For further information please see section B.6.2.

34 For further information please see section B.6.2.

		2006 (GWh)	2007 (GWh)	2008 (GWh)	Total
Net electricity production $EG_{net,y}$ [GWh]	**Natural Gas**	80.691,2	95.024,8	98.685,3	**274.401,3**
	Lignite	32.432,9	38.294,7	41.858,1	**112.585,7**
	Coal	14.216,6	15.136,2	15.857,5	**45.210,3**
	Fuel Oil	4,232,4	6,496,9	7,208,6	**17,910,6**
	Diesel	57,7	13,3	266,3	**337,3**
	Naphtha	50,2	43,9	43,6	**137,7**
Electricity imports [GWh]		573,2	864,3	789,4	**2.226,9**
Electricity supplied to grid EG_y [GWh]		**126,759**	**149,379**	**157,868**	**434,007**

Table 18Net electricity production by fossil fuel power plants and electricity imports 2006-2008[35]

Based on the above values the $\mathbf{EF_{grid, OM ,y}}$ calculated through equation (3) is **656 $\mathbf{tCO_2}$-eq/GWh**.

Calculation of Build Margin Emission Factor ($EF_{grid,BM,y}$):
The average CO_2 emission factor of fuel types ($EF_{CO2,m}$) and the average net energy conversion efficiency of the power plants ($n_{m,y}$) used for the calculation of emission factor of the power units ($EF_{EL,m,y}$) through equation (5) are presented in Table 19 below.

	Average emission factor ($EF_{CO2,m}$)	Average conversion efficiency (n_m)	Emission factor of the power unit ($EF_{EL,m,y}$)
	tCO_2/GWh	%	tCO_2/GWh
Natural Gas	54,300	60%	326
Lignite	90,900	39%	839
Coal	94,600	39%	873
Fuel Oil	75,500	39,5%	688
Diesel	72,600	39,5%	662
Naphtha	69,300	39,5%	632
Hydro	n.a.	n.a.	0
Wind	n.a.	n.a.	0

Table 19: Emission Factor of the power units

For calculation of the built margin emission factor, 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.

The data regarding the electricity generated and delivered to the grid by power units ($EG_{m,y}$) are presented in Table 20 below.

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

$EG_{m,y}$ [GWh]						
	2004	**2005**	**2006**	**2007**	**2008**	**TOTAL**
Natural Gas	8.360,2	7.117,8	3.283,5	2.105,0	2.488	23,354
Lignite		4.420,0	7.020,0	0,0	0	11.440
Coal	337,5	1.125,0	0,0	0,0	0	1,463
Fuel Oil	369,7	100,9	0,0	800,0	0	1.271
Diesel	4,1					4.1
Naphtha	322,9					322.9
Hydro		1.028,8	478,1	1.217,0	1629	2.724
Renewables		87,4	100,0	0,0	72	187
TOTAL						40.766

Table 20Electricity generated by the power units included in the build margin calculation[36].

The **$EF_{grid,BM}$**, which is calculated through equation (4), is 459 **tCO_2-eq/GWh**.

Calculation of Combined Margin Emission Factor (*$EF_{grid,CM,y}$*):

The $EF_{grid, CM,y}$ which is calculated through equation (6) is **607 tCO_2-eq/GWh.**

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/year

Leakage

No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, and transport). These emissions sources are neglected.

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

>>

Year	**Estimation of project activity emissions (tons CO_2-eq)**	**Estimation of baseline emissions (tons CO_2-eq)**	**Estimation of leakage (tons CO_2-eq)**	**Estimation of overall emission reductions (tons CO_2-eq))**
2011	0	41,329.4	0	41,329.4
2012	0	74,016.97	0	74,016.97
2013	0	74,016.97	0	74,016.97
2014	0	74,016.97	0	74,016.97
2015	0	74,016.97	0	74,016.97
2016	0	74,016.97	0	74,016.97
2017	0	74,016.97	0	74,016.97
2018	0	74,016.97	0	74,016.97
Total	**0**	518,118.79	**0**	518,118.79

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

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

B.7.1 Data and parameters monitored:

Data / Parameter:	ID.8 / EG_y
Data unit:	MWh/year
Description:	Annual net 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	121,939121,939 MWh/year[37]
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. According to the first index protocol between Alentek and TEIAS[38], detailed technical specification regarding primary measuring device is as follows; Serial Nr: 00416275 Brand: Elster Type: A 1500 Production standard and class: 0,2 S Active, 2 Reactive Current: 5A Voltage: 3 x 57 /100 V. Constant value: 40000 Number of phase and wire: 3 phase, 4 wires Backup measuring device serial Nr is 00416274. Technical specification of backup device is same as the one of primary device.. According to article 52 of the official regulation "Electricity Market Balancing And Settlement Regulation"[39];"The meters included in the metering system configuration of the settlement aggregation entities registered on the names of the market participants shall be read monthly, within the first 4 (four) days of the month, by TEIAS and/or distribution licensees with participation of the market participant's representative and the meter reading values shall be submitted to MFSC. The MFSC shall monthly update the list of meters that need to be read as part of the settlement process to reflect new registrants and updates in existing registrations, and send them to TEIAS and the distribution licensees. The (a) energy withdrawn from the system in kWh, and (b) active energy supplied to the system in kWh for each settlement period of the related invoicing period shall be read from the registered meters." This procedure is sufficient and no extra Monitoring activity need to be

37Value according to study of Geonet Umweltconsulting.

[38] TEIAS First index report of measuring devices is available to DOE

[39]http://www.epdk.org.tr/english/regulations/electric/balancing/balancing.doc page 50

	implemented.
QA/QC procedures to be applied:	The metering devices will be calibrated and sealed by TEIAŞ. The Turkish Electricity Market Regulation Agency (EPDK) sets rules on the accuracy of electricity meters that are used by power plants feeding to the grid.[40] Maintenance and calibration of the metering devices will be made by TEIAS. 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.

B.7.2 Description of the monitoring plan:

All monitoring procedures and requirements of the Susurluk Wind Farm Project are in accordance with the methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 12).

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.

Metering: The amount of electricity generated by the project and delivered to the national grid will be monitored continuously by two metering devices; 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: Every last day of the month, officials from TEIAŞ (Turkish Electricity Transmission Company) will perform data readings. An invoice (receipt of sale) will be prepared by TEIAŞ and delivered to Alentek for each month.

All collected data will be archived electronically and kept at least for 2 years after the end of the last crediting period.

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: 08/10/2010

The baseline has been prepared by Ecofys Turkey

Company name:	Ecofys Turkey San. ve Tic. A.Ş.
Contact Person:	Haluk Sayar
Telephone number:	+90 2166680946
GSM number:	+90 533 2755797
E-mail:	h.sayar@ecofys.com.tr

Ecofys Turkey is not project participant listed in Annex 1

[40] http://www.gentransltd.com/dosyalar/tebligler/SAYAC%20TEBLIGI.pdf

SECTION C. Duration of the project activity / crediting period

C.1. Duration of the project activity:

>>

C.1.1. Starting date of the project activity:

The project activity begins in 18/08/2010 which is the date for "wind turbine purchase agreement"

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

20 years

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

C.2.1. Renewable crediting period

The project will use a renewable crediting period of 3 times 7 year

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

The first crediting period starts with commissioning of the wind farm, expected to be in 01/07/2011.

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 trans boundary impacts:

>>

Wind energy projects are exempt from EIA in Turkey[41]. Nevertheless the environmental impacts of the projects were analyzed in the Project Document prepared in 2009. This document includes analysis of impacts of noise, impacts on flora, fauna etc.

Detailed analysis is given in the sustainability matrix in GS Passport and LSC Report.

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:

>>

Local Stakeholder Consultation Meeting was held on 13/04/2010 in Ömerköy Village in line with Gold Standard Toolkit.
Stakeholders were identified after a brainstorming session with the project owner and the carbon consultant. Ministry of Environmental Ministry, local and national authorities, national and international NGO's were invited to the meeting. Stakeholders were invited through invitation letters sent by e-mail, phone, newspaper announcements, and public announcement and through village heads.
A sample e-mail invitations and the newspaper announcement can be found below.

[41] EIA exemption document available to the DOE.

kullanılmak üzere İstanbul Metro Tur. Sey. Tic. Ltd. Şti.'nin katkıları ile MAN marka otobüsü cüzi bir rakamla kiralayarak belediyemize kazandırdık. Susurluk'un ihtiyaçlarını belirlemek ve çözümler üretmek üzere Kent Konseyi'ni oluşturduk.

Belediyemiz itfaiye birimini acil durumlarda hareket kabiliyetinin daha kolay hale gelebilmesi ve zamanında müdahale edilebilmesi için belediye garajı mevkiine taşıdık. İlçemiz alt yapı, kanalizasyon ve yol yapım çalışmalarını büyük ölçüde tamamladık. Belediyemize ait olup, kira sözleşmeleri sona eren düğün salonları ve işletmeler yine belediyemiz tarafından işletilmeye başlandı. Önceki dönemde başlatmış olduğum, Susurluk Ayran Kültür Sanat Şenliklerini bu yılda düzenledik.

Desteklerini bizden esirgemeyen uyum içinde çalıştığımız meclis üyelerine, birim müdürlerine, memurundan işçisine tüm belediye çalışanlarına ve bize çalışma gücü veren Susurluklulara içten teşekkür ediyorum" dedi.

Başkan BOZOĞLU'nun konuşmasından sonra 2009 yılı faaliyet raporu Fen işleri Müdürü Sibel SARI tarafından okundu ve Başkan koltuğuna oturan meclis üyesi ruhi AKOĞLAN tarafından meclisin oyuna sunuldu ve rapor oybirliği ile kabul edildi.

taşıyorlar.

Çözüm Dershanesi'nin yeri için İstasyon Caddesinde eski Zağnos dershanesinin binasını kiralayan ERÖZ ve ATALAYA, 2010-2011 ders yılı başından önce, Susurluk'ta Çözüm Dershanesini faaliyete geçirebilmek için çalışmalarını sürdürdüklerini söylediler.

Şirketimiz Alentek Enerji A.Ş.'nin yapmayı planladığı Balıkesir İli, Susurluk İlçesi sınırlarında 45 MW kurulu güce sahip Susurluk Rüzgar Enerjisi Santralinin halka tanıtım toplantısı 13 Nisan 2010 saat 14.00'de Ömerköy köy kahvesinde yapılacaktır.

Projemizin "Gold Standard" sürüdürülebilirlik kriterlerine uygun olmasını hedeflemekteyiz. Toplantıda proje hakkında bilgi verilecek bunun dışında projenin yerel sürdürülebilirliğe katkıları ve "Gold Standard" sürdürülebilirlik kriterleri tartışılacaktır. Bu bağlamda toplantıya katılıp görüş ve önerilerilerinizi bildirmenizden mutluluk duyarız.

İletişim:Fahrettin Kerim Gökay Cad. No:34 Altunizade/Üsküdar/İSTANBUL
Gsm:0554 540 14 86 - Tel:0216 544 24

MİLLİYEÇİ HAREKET PARTİSİ SUSURLUK İLÇE BAŞKANLIĞINDAN

Partimizin kurucusu Genel Başkanı, hareketimizin lideri, ülkücülerin başbuğu, Türk milliyetçiliğinin önderi Alparslan TÜRKEŞ'in hakka yürüyüşünün on üçüncü yılında rahmetle anıyoruz.

Ne mutlu ki hep iftihar ettiği, üzerine titrediği milliyetçi-ülkücü kadrolar onun izinden yürümeye, devraldığı millet hizmetini büyük şuur ve inançla sürdürmeye kararlıdırlar.

Bu yolda Allah'ın izni ile hep birlikte kat'edecek ve ülkemizi güzel günlere kavuşturmanın şeref ve mutluluğu hep birlikte mutlaka yaşayacağız.

RUBU FUTBOL TAKIMI 1.ULUSLAR 'URNUVASINDA GÖZ DOLDURDU

nirspor'a 1-0, Karamürsel idmanyurduna 2-0 yenildi.
Akademisini 5-1, Kuşadası Galatasaray Futbol Okulu'nu da 2-0

TI ZÜMRÜT ÇİÇEK TAŞINDI

Uzun yıllardır, İstasyon Caddesinde (Belediye Altında) hizmet vermekte olan, Yılmaz ÇETİNKAYA'ya ait Zümrüt

2010

Non-technical summary was prepared and delivered to local people a few days before Stakeholder consultation meeting. This summary was also handed out during the meeting. The meeting was opened by Mr. Levent Göçmenöz from Alentek Enerji. He made a brief explanation about the global climate change and the importance of renewable energy sources. Later, he explained the project in a simple language. The presentation was about the general aspects of the project and its possible environmental impacts. In order to initiate a healthy discussion environment in the Local Stakeholder Consultation, representatives of the project made oral presentations the presenters also talked about the possible impacts of the project on sustainable development in an open and transparent way.

As a part of the presentation the stakeholders were asked for their comments. The Sustainable Development exercise was done by distributing questionnaires to the participants.
Local Stakeholder consultation meeting has been recorded on video. All comments have been noted and also requested from government agencies and invitees by letters sent by mail.
The meeting was closed by a general support from participants.

E.2. Summary of the comments received:

>>The comments received were mainly positive and supporting. Only few concerns were explained;

Stakeholder comment	**Was comment taken into account (Yes/ No)?**	**Explanation (Why? How?)**
Disturbance of noise level on local wild animal and livestock production	Yes	No such harm is monitored but further research will be done (see section D for details)

Employment opportunity for the local people	Yes	1 person is already hired for the implementation stage. Other employment opportunities will be created in the construction stage.
Stakeholder comment	**Was comment taken into account (Yes/ No)?**	**Explanation (Why? How?)**
Which wind map will be used during implementation of the project	Yes	Alentek Enerji has done 2 years of wind measurement
Maintenance cost and how it will be ensured	Yes	12 years of technical maintenance contract is signed with Spanish firm
Effect of soil drying because of the wind circulation caused by turbines	Yes	No such effect is observed (see section D for details)
Possible radioactive effect of turbines on human health like electric poles	Yes	No such effect is observed[42]
How to protect possible historical heritage while the construction stage of roads to wind turbines,	Yes	The project complies with the national laws and regulations regarding historical heritage. No cultural and historical or archaeological site was found[43] in the project site in line with "World Heritage Convention"[44].
Free electricity to be provided to the nearby villages.	Yes	Since the project is commercial, free electricity cannot be provided.

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

>Since the project received major support no major changes were done in the project design.

[42] See web site of Centre for Renewable Sources (Greek national entity for the promotion of renewable energy sources): http://www.cres.gr/kape/publications/papers/dimosieyseis/CRESTRANSWINDENVIRONMENT.doc

[43] Project documentation available to the DOE.

[44] http://whc.unesco.org/archive/convention-en.pdf

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Alentek Enerji A.Ş.
Street/P.O.Box:	Fahrettin Kerim Gökay Cad. No: 34
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

NO PUBLIC FUNDING WAS USED FOR FINANCING THE PROJECT ACTIVITIES.

Annex 3

BASELINE INFORMATION

Build Margin of plants that constitute 20% of the 198,418 GWh Electricity generations by the end of 2008 excluding VER projects and retrofits are listed below.

Plant Name	Installed Capacity MW	Fuel Type	Generation Capacity GWh
2008			
MB ŞEKER NİŞASTA SAN. A.Ş. (Sultanhanı)	8,8	*N.GAS*	60
AKSA ENERJİ (Antalya)	183,8	*N.GAS*	1290
AKSA ENERJİ (Manisa)	52,38	*N.GAS*	370
ATAÇ İNŞAAT SAN. A.S.B.(ANTALYA)	5,4	*N.GAS*	37
BAHÇIVAN GIDA (LÜLEBURGAZ)	1,165	*N.GAS*	8
FOUR SEASONS OTEL (ATİK PASHA TUR.A.Ş)	1,165	*N.GAS*	7
MELİKE TEKSTİL (GAZİANTEP)	1,584	*N.GAS*	11
MİSİS APRE TEKSTİL BOYA EN. SAN.	2	*N.GAS*	14
MODERN ENERJİ (LÜLEBURGAZ)	96,8	*N.GAS*	680
POLAT TURZ. (POLAT RENAISSANCE İST.OT.)	1,6	*N.GAS*	11
N.GAS TOTAL	**455,954**		**2488**
AKKÖY ENERJİ (AKKÖY I HES)	101,94	*Hydro*	408
ALP ELEKTRİK (TINAZTEPE) ANTALYA	7,689	*Hydro*	29
CANSU ELEKTRİK (Murgul/ARTVİN)	9,18	*Hydro*	47
ÇALDERE ELK.(ÇALDERE HES)Dalaman-MUĞLA	8,74	*Hydro*	35
DAREN HES ELKT. (SEYRANTEPE BARAJI VE HES)	49,7	*Hydro*	182
DEĞİRMENÜSTÜ EN. (KAHRAMANMARAŞ)	25,7	*Hydro*	69
GÖZEDE HES (TEMSA ELEKTRİK) BURSA	2,4	*Hydro*	10
H.G.M. ENERJİ (KEKLİCEK HES) (Yeşilyurt)	8,674	*Hydro*	18
HAMZALI HES (TURKON MNG ELEKTRİK)	16,7	*Hydro*	117
HİDRO KNT.(YUKARI MANAHOZ REG.VE HES)	22,4	*Hydro*	79
İÇ-EN ELK.(ÇALKIŞLA REGÜLATÖRÜ VE HES)	7,66	*Hydro*	18
KALEN ENERJİ (KALEN II REGÜLAT. VE HES)	15,65	*Hydro*	50

Plant Name	İnstalled Capacity MW	Fuel Type	Generation Capacity GWh
MARAŞ ENERJİ (FIRNIS REGÜLATÖRÜ VE HES)	7,22	*Hydro*	36
SARMAŞIK I HES (FETAŞ FETHİYE ENERJİ)	21,04	*Hydro*	96
SARMAŞIK II HES (FETAŞ FETHİYE ENERJİ)	21,58	*Hydro*	108
TORUL	105,6	*Hydro*	322
YEŞİL ENERJİ ELEKTRİK (TAYFUN HES)	0,82	*Hydro*	5
HYDRO TOTAL	**433,968**		**1629**
SARAYKÖY JEOTERMAL (Denizli)	6,85	*Geothermal*	50
ORTADOĞU ENERJİ (ODA YERİ) (Eyüp/İST.)	2,83	*Waste*	22
OTHER RENEWABLE TOTAL	**241,21**		**72**
2008 TOTAL	**1145,912**		**4189**
2007			
Acıbadem Sağlık Hiz.ve Tic.A.Ş(Kadıköy Hast.)(İstanbul/Kadıköy)	0,5	*N.GAS*	4
Acıbadem Sağlık Hiz.ve Tic.A.Ş(Kozyatağı Hast.)(İstanbul/Kadıköy)	0,6	*N.GAS*	5
Acıbadem Sağlık Hiz.ve Tic.A.Ş(Nilüfer/BURSA)	1,3	*N.GAS*	11
AKATEKS Tekstil Sanayi ve Ticaret A.Ş.	1,8	*N.GAS*	14
FLOKSER TEKSTİL SAN.AŞ.	2,1	*N.GAS*	17
FLOKSER TEKSTİL SAN.AŞ.(Çatalça/istanbul)(Süetser Tesisi)	2,1	*N.GAS*	17
FRİTOLAY GIDA SAN.VE TİC. AŞ.	0,5	*N.GAS*	4
KIVANÇ TEKSTİL SAN.ve TİC.A.Ş. 3,9	3,9	*N.GAS*	33
KİL-SAN KİL SAN.VE TİC. A.Ş	3,2	*N.GAS*	25
SÜPERBOY BOYA SAN.ve Tic.Ltd.Şti.(Büyükçekmece/İstanbul)	1	*N.GAS*	8
SWİSS OTEL(Anadolu Japan Turizm A.Ş (İstanbul)	1,6	*N.GAS*	11
TAV Esenboğa Yatırım Yapım ve İşetme AŞ./ANKARA	3,9	*N.GAS*	33
NUH ENERJİ-2(Nuh Çim.)	73	*N.GAS*	514
Aliağa Çakmaktepe Enerji A.Ş.(Aliağa/İZMİR)	34,8	*N.GAS*	278
BOSEN ENERJİ ELEKTRİK AŞ .	142,8	*N.GAS*	1071

Plant Name	İnstalled Capacity MW	Fuel Type	Generation Capacity GWh
T ENERJİ ÜRETİM AŞ.(İSTANBUL)	1,6	*N.GAS*	13
N.GAS TOTAL	**422,4**		**2105**
SİİRT	25,6	*Fuel Oil*	190
Mardin Kızıltepe	34,1	*Fuel Oil*	250
KAREN	24,3	*Fuel Oil*	180
İDİL 2 (PS3 A- 2)	24,4	*Fuel Oil*	180
F.OIL TOTAL	**110,9**		**800**
BORÇKA HES	300,6	*Hydro*	1039
TEKTUĞ(Keban Deresi)	5	*Hydro*	32
YPM Ener.Yat.AŞ.(Altıntepe Hidro.)(Sivas/Suşehir)	4	*Hydro*	18
YPM Ener.Yat.AŞ.(Beypınar Hidro.)(Sivas/Suşehir	3,6	*Hydro*	18
YPM Ener.Yat.AŞ.(Konak Hidro.)(Sivas/Suşehir)	4	*Hydro*	19
KURTEKS Tekstil A.Ş./Kahramanmaraş(KARASU HES-Andırın)	2,4	*Hydro*	19
İSKUR TEKSTİL (SÜLEYMANLI HES)	4,6	*Hydro*	18
ÖZGÜR ELK.AŞ.(K.MARAŞ)(Tahta)	12,5	*Hydro*	54
HYDRO TOTAL	**336,7**		**1217**
2007 TOTAL	**958,7**		**4122**
2006			
EKOTEN TEKSTİL GR-I	1,9	*N.GAS*	14,0
ERAK GİYİM GR-I	1,4	*N.GAS*	10,0
ALARKO ALTEK GR-III	21,9	*N.GAS*	112,6
AYDIN ÖRME GR-I	7,5	*N.GAS*	60,0
NUH ENERJİ-2 GR II	26,1	*N.GAS*	180,0
MARMARA ELEKTRİK (Çorlu) GR I	8,7	*N.GAS*	63,0
MARMARA PAMUK (Çorlu) GR I	8,7	*N.GAS*	63,0
ENTEK (Köseköy) GR IV	47,6	*N.GAS*	306,0
ELSE TEKSTİL (Çorlu) GR I - II	3,2	*N.GAS*	25,0
SÖNMEZ ELEKTRİK (Çorlu) GR I - II	17,5	*N.GAS*	126,0
KASTAMONU ENTEGRE (Balıkesir) GR I	7,5	*N.GAS*	54,0

Plant Name	Installed Capacity *MW*	Fuel Type	Generation Capacity *GWh*
BOZ ENERJİ GR I	8,7	*N.GAS*	70,0
AMYLUM NİŞASTA (ADANA)	14,3	*N.GAS*	34,0
ŞIK MAKAS (Çorlu) GR I	1,6	*N.GAS*	13,0
ANTALYA ENERJİ GR I - II - III - IV	34,9	*N.GAS*	245,0
HAYAT TEM. VE SAĞLIK GR I - II	15,0	*N.GAS*	108,0
EROĞLU GİYİM (Çorlu) GR I	1,2	*N.GAS*	9,0
CAM İŞ ELEKTRİK (Mersin) GR I	126,1	*N.GAS*	1.008,0
YILDIZ ENT. AĞAÇ (Kocaeli) GR I	6,2	*N.GAS*	40,0
ÇERKEZKÖY ENERJİ GR I	49,2	*N.GAS*	390,0
ENTEK (Köseköy) GR V	37,0	*N.GAS*	237,9
ÇIRAĞAN SARAYI GR I	1,3	*N.GAS*	11,0
AKMAYA (Lüleburgaz) GR I	6,9	*N.GAS*	50,0
BURGAZ (Lüleburgaz) GR I	6,9	*N.GAS*	54,0
	461,7		**3.283,5**
ELBİSTAN B GR III	360,0	Lignite	2.340,0
ELBİSTAN B GR II	360,0	Lignite	2.340,0
ELBİSTAN B GR IV	360,0	Lignite	2.340,0
	1.080,0		**7.020,0**
ŞANLIURFA GR I-II	51,8	*RUN OF RIVER*	124,0
BEREKET ENERJİ GÖKYAR HES 3 Grup	11,6	*RUN OF RIVER*	43,3
MOLU EN. Zamantı Bahçelik GR I - II	4,2	*RUN OF RIVER*	16,7
SU ENERJİ (Balıkesir) GR I - II	4,6	*RUN OF RIVER*	20,7
BEREKET EN.(Mentaş Reg) GR I - II	26,6	*RUN OF RIVER*	108,7
ERE(Sugözü rg. Kızıldüz hes) GR I - II	15,4	*RUN OF RIVER*	31,6
ERE(AKSU REG.ve ŞAHMALLAR HES) GR I-II	14,0	*RUN OF RIVER*	26,7
TEKTUĞ(Kalealtı) GR I - II	15,0	*RUN OF RIVER*	52,0
BEREKET EN.(Mentaş Reg) GR III	13,3	*RUN OF RIVER*	54,4
	157,5		**478,1**
ERTÜRK ELEKTRİK Tepe RES GR I	0,9	*Wind*	2,0
MENDERES ELEKTRİK GR I	8,0	*Geothermal*	56,0
ADANA ATIK SU ARITMA TESİSİ	0,8	*Biogaz*	6,0
EKOLOJİK EN. (Kemerburgaz) GR I	1,0	*LFG*	6,0
ITC-KA EN. MAMAK TOP.M. GR I-II-III	4,2	*LFG*	30,0
	Renewables (2006) Total	**14,8**	**100,0**
2006 TOTAL		**1.714,0**	**10.881,6**

2005			
Plant Name	İnstalled Capacity MW	Fuel Type	Generation Capacity GWh
AKBAŞLAR GR-II(İZOLE)	8,8	*N.GAS*	73,0
AKÇA ENERJİ GR-III	8,7	*N.GAS*	65,4
AYKA TEKSTİL GR-I	5,5	*N.GAS*	40,0
BAYDEMİRLER GR IV-V-VI	6,2	*N.GAS*	51,4
BOSEN GR-III	50,0	*N.GAS*	350,0
ÇUMRA ŞEKER	16,0	*N.GAS*	40,0
EVYAP GR I-II	5,1	*N.GAS*	30,0
GRANİSER GRANİT GR-I	5,5	*N.GAS*	42,0
HABAŞ ALİAĞA GR III	47,7	*N.GAS*	381,6
HABAŞ ALİAĞA GR IV	47,7	*N.GAS*	381,6
HABAŞ ALİAĞA GR-V	24,6	*N.GAS*	196,8
HABAŞ ALİAĞA (DÜZELTME)	6,2	*N.GAS*	49,3
HAYAT KAĞIT GR-I	7,5	*N.GAS*	56,0
KORUMA KLOR GR I-II-III	9,6	*N.GAS*	77,0
KÜÇÜKÇALIK TEKSTİL GR I-II-III-IV	8,0	*N.GAS*	64,0
MERCEDES BENZ TURK GR I-II-III-IV	8,3	*N.GAS*	68,0
MODERN ENERJİ GR-III	8,4	*N.GAS*	62,9
MOSB GR I-II-III-IV-V-VI-VII	84,8	*N.GAS*	434,0
ORS RULMAN	12,4	*N.GAS*	99,4
PAK GIDA(Kemalpaşa) GR-I	5,7	*N.GAS*	45,0
TEZCAN GALVANİZ GR I-II	3,7	*N.GAS*	29,0
YONGAPAN(KAST.ENTG) GR-II	5,2	*N.GAS*	32,7
ZEYNEP GİYİM SAN. GR-I	1,2	*N.GAS*	9,0
AK ENERJİ(K.paşa) GR- III	40,0	*N.GAS*	256,9
AK ENERJİ(K.paşa) GR I-II	87,2	*N.GAS*	560,1
ALTEK ALARKO GR I-II	60,1	*N.GAS*	420,0
BİS ENERJİ GR VII	43,7	*N.GAS*	360,8
CAN ENERJİ GR-I	3,9	*N.GAS*	28,0
ÇEBİ ENERJİ BT	21,0	*N.GAS*	164,9
ÇEBİ ENERJİ GT	43,4	*N.GAS*	340,1
ENTEK ELK.A.Ş.KOÇ ÜNİ.GR I-II	2,3	*N.GAS*	19,0
KAREGE GR IV-V	18,1	*N.GAS*	141,9
METEM ENERJİ(Hacışıramat) GR I-II	7,8	*N.GAS*	58,0
METEM ENERJİ(Peliklik) GR I-II-III	11,7	*N.GAS*	89,0
NOREN ENERJİ GR-I	8,7	*N.GAS*	70,0
NUH ENERJİ-2 GR I	47,0	*N.GAS*	319,7
ZORLU ENERJİ KAYSERİ GR-I-II-III	149,9	*N.GAS*	1.144,1
ZORLU ENERJİ KAYSERİ GR-IV	38,6	*N.GAS*	294,9
ZORLU ENERJİ YALOVA GR I-II	15,9	*N.GAS*	122,0
MODERN ENERJİ GR-II	6,7	*N.GAS*	50,4
	992,8		**7.117,8**
ÇAN GR I	160,0	Lignite	1.040,0
ÇAN GR II	160,0	Lignite	1.040,0
ELBİSTAN-B GR I	360,0	Lignite	2.340,0
	680,1		**4.420,0**
İÇDAŞ ÇELİK GR-I	135,0	*COAL*	1.080,0

Plant Name	Installed Capacity MW	Fuel Type	Generation Capacity GWh
	141,0		**1.125,0**
OTOP DÜZELTME	0,6	FUEL-OİL	1,8
KARKEY(SİLOPİ-4) GR-IV	6,2	FUEL-OİL	47,2
KARKEY(SİLOPİ-4) GR-V	6,8	FUEL-OİL	51,9
	13,5		**100,9**
TEKTUĞ(Kargılık) GR I-II	23,9	*RUN OF RIVER*	83,0
İÇTAŞ ENERJİ(Yukarı Mercan) GR I-II	14,2	*RUN OF RIVER*	44,0
MURATLI GR I-II	115,0	*DAM*	444,0
BEREKET EN.(DALAMAN) GR XIII-XIV-XV	7,5	*RUN OF RIVER*	35,8
YAMULA GRUP I-II	100,0	*DAM*	422,0
	260,6		**1.028,8**
SUNJÜT(RES) GR I-II	1,2	*WIND*	2,4
ETİ MAD.(BAN.ASİT)GR-I	11,5	Renewable	85,0
	12,7		**87,4**
2005 TOTAL	**2.100,7**		**13.879,9**
ECZACIBAŞI BAXTER HAS.ÜRÜN.	1,0	*N.GAS*	5,8
ÇIRAĞAN SARAYI İŞL.	1,4	*N.GAS*	1 ,0
BAHARİYE MENSUCAT (İzole)	1,0	*N.GAS*	7,0
ANKARA D.G.(BAYMİNA) GR-I-II-III	798,0	*N.GAS*	6.500,0
ENTEK GR-IV	31,1	*N.GAS*	255,7
BİS ENERJİ	73,0	*N.GAS*	602,7
HABAŞ ALİAĞA GRUP I-II	89,2	*N.GAS*	713,9
AYEN OSTİM	31,1	*N.GAS*	264,1
Natural Gas (2004) Total	**1.025,9**		**8.360,2**
ÇOLAKOĞLU (Capacity Generation)	45,0	*COAL*	337,5
Coal (2004) Total	**45,0**	**337,5**	
KARKEY-II 3+3 DGM	54,3	*FUEL OIL*	369,7
Fuerl Oil (2004) Total	**54,3**		369,7
ENERJİ-SA ADANA	49,8	*NAPHTA*	322,9
Naphta (2004) Total	**49,8**		**322,9**
TÜPRAŞ BATMAN	1,5	*DIESEL*	4,1
Diesel (2004) Total	**1,5**		**4,1**
2004 TOTAL	**1176,5**		**9394.4**

Annex 4

MONITORING INFORMATION

I. INFORMATION ABOUT MONITORING PLAN IS GIVEN IN SECTION B.7.2.