CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)
Version 03 - in effect as of: 22 December 2006

CONTENTS

Annexes

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
03	22 December 2006	• The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.

SECTION A. General description of small-scale project activity

A.1 Title of the small-scale project activity:

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Burgaz Wind Farm Project – Turkey
Version number of the document: 04
Date: 11th of February 2009

A.2. Description of the small-scale project activity:

>>
Summary:
Burgaz Wind Farm Project (hereafter referred to as the proposed project) involves the development of 14,9 MW onshore wind farm in the region of Çanakkale Province, Gallipoli District in Turkey[1]. The generated electricity will be delivered to the Turkish national grid. The Project involves the installation of 18 turbines and the development of a high voltage transmission line between the proposed project area and the national grid. An estimated 52 GWh/year[2] will be produced by the project activity and delivered to the national grid. The annual emission reductions are estimated as 33,532 tCO_2-eq/year.

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

- Reduction of the greenhouse gas emissions in Turkey by replacing electricity otherwise generated by the Turkish gird, which has a large share of fossil fuel power generation.
- Contribution to the development of the wind energy sector in Turkey[3].
- Creation of local employment both during the construction and operational phase. At the moment the unemployment level in Turkey is 11,6% [4]. The project will mainly have an impact on the local area.
- Contribution to local and regional economy since the cables, transformer, masts, blades, construction equipments and subcontractors are procured locally.
- Technology and know-how transfer as the employees are trained by both Demirer Holding and German wind turbine manufacturer ENERCON on maintenance, safety and operational issues.
- Contribution to the reduction of pollutants such as sulphur dioxide, nitrogen oxides and particles resulting from the electricity generation using fossil fuels in Turkey.
- Reduction of Turkish dependency on electricity imports.

Results from the sustainable development matrix:
According to the requirements of the Gold Standard, the project activity must be assessed against a matrix of sustainable development indicators. The contribution of the proposed project activity to sustainable development of

[1] Reference: Energy Market Regulatory Authority official website http://www.epdk.gov.tr/lisans/elektrik/lisansdatabase/verilenuretim.asp

[2] Reference: Technical feasibility study available for DOE

[3] The proposed Project is among the first 5 wind farm projects invested by the private sector in Turkey.

[4] Reference: Turkish Statistical Institute www.tuik.gov.tr [Labor Force Statistic / February 2008]

the country is based on the local/global environmental sustainability, social sustainability & development and economic & technological development. The matrix is presented in Table 1.

The indicators have been discussed with stakeholders affected by the project.

Table 1: Sustainable Development Indicators Matrix for the Gold Standard

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

* Added to the monitoring plan

The indicators are described in more detail below.

Explanation of the indicators:

1 Water quality (0): There are no process originated waste water formations in the project neither in the construction nor in its operational phase. There will be a minor amount of wastewater in the construction phase of the project. The water usage in this phase will be mainly due to usage of the personnel and the water used to make concrete. The water used for the concrete will stay in the material and hence will not produce any wastewater. Home based waste water will be discharged to the tight cesspool cavities that will be constructed based on “Regulation on diggings that will be done where it is not possible to construct a sewage course”. When the cesspool is full the municipality will suck it with sewage pumps and discharge it to nearest sewage system on systematic basis and on a

predefined fare. Considering the very small amount of wastewater caused by the personnel and taking into account that respective rules and regulations are taken into account this indicator scores (0).

2 Air Quality (+1): As the proposed project replaces the fossil fuel electricity generation dominating the national grid, it reduces the emissions other than GHG such as NOx and SOx[5]. Considering the high installed capacity of the national grid this has a minor improvement to the air quality and this sustainable indicator scores a "+1".

3 Other pollutants (+1): As the proposed project replaces the fossil fuel electricity generation dominating the national grid, it also reduces the emissions of odours. Considering the high installed capacity of the national grid this has a minor improvement to the air quality and this sustainable indicator scores a "+1".

4 Soil condition (0): There will be no considerable difference regarding the soil characteristics between the baseline scenario and project activity. A geotechnical evaluation report was prepared by the Yildiz Technical University, Civil Engineering Department on October 2006[6]. The geological features, land profiles and landslide potentials were thoroughly investigated in this report. Accordingly one turbine was eliminated from the project design and necessary precautions are taken for all construction activities. In line with this report drainage channels were established near the turbine foundations where there was risk of erosion. This sustainable indicator scores "0".

5 Biodiversity (0): No major change regarding biodiversity is expected because of implementing the Burgaz Wind Farm. Deforestation was made in about 20% of the project area and around 30-35 trees were cut for road preparation. Project participant, has paid compensation fee that is enough to cover whole project area and the roads to the Regional Directorate of Forestry of Canakkale[7], although only 20% of the area was deforested. Moreover the vice-chancellor of the Canakkale Onsekiz Mart University, Prof. Dr. Osman Demircan, has been consulted on the affects of the project to biodiversity. A written statement, that the project has no harmful effect to biodiversity[8] has been provided from Mr. Demircan. This sustainable indicator scores "0".

6 Employment (job quality) (+2): The first year of the project operational phase, technical and security staff will be trained by Demirer Holding, regarding security issues and by Enercon GmbH regarding technical issues on turbine technology and maintenance. The training includes technical, environment and security knowledge and operational and maintenance instructions. Also training will be given by TEIAS for the staff, which will be responsible for the switchgear station. As generally the labourer's technical capacity is low in the region, where the economy is mostly dependent on agriculture, therefore this sustainable indicator scores a "+2".

7 Livelihood of the poor (+1): The constructed roads connecting the village to the farms of the residents and the bridge built by Demirer Holding is expected to contribute to both economic and infrastructural development of the region. Therefore this indicator scores a "+1".

8 Access to energy services (electricity) (0): There will be no change or minor change in the number of connections of local households to the grid due to the project activity. This indicator scores a "0".

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[5] The actual emissions of NOx and SOx related with electricity generation can be found on-line in the official web site of the Turkish Statistical Institution: http://www.tuik.gov.tr/yillik/yillik.pdf

[6] Original document are available to the DOE.

[7] Official proceedings are available to the DOE.

[8] Original letter is available to the DOE.

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

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

11 Balance of payments (sustainability) (0): Net foreign currency savings will also be very difficult to proof and monitor, therefore this indicator scores a zero as well.

12 Technological self reliance (+1): Enercon GmbH, which is a wind turbine manufacturer and supplier of the wind turbines for Burgaz Project and will train the staff regarding technical issues. This sustainable indicator scores a "+1".

To meet the requirements of the Gold Standard, each of the components of the sustainability matrix, must have a positive sub-total score, the total score must be positive, and none of the indicators should score –2. As the project scores +8, this project satisfies all three requirements to meet the Gold Standard.

Those indicators that are either crucial for an overall positive impact on sustainable development or particularly sensitive to changes in the framework conditions are marked with asterisk and will be monitored.

A.3. Project participants:

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Name of Party involved (*) ((host) indicates a host Party)	**Private and/or public entity(ies) project participants (*) (as applicable)**	**Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)**
Turkey (host country)	• Demirer Enerji Üretim San. ve Tic. A.•. (private company) • Polat Enerji San. ve Tic. A.•. (private company)	No

Demirer Enerji Üretim A.•. and Polat Enerji San. ve Tic. A.•. are both 50% shareholder of Do•al Enerji Elektrik Üretim A.•.[9] the operating company of the project activity.

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

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

A.4. Technical description of the small-scale project activity:

A.4.1. Location of the small-scale project activity:

[9] Reference: Generation License available for DOE

A.4.1.1. Host Party(ies):

>>
Turkey

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

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Marmara Region / Çanakkale Province / Gallipoli District

A.4.1.3. City/Town/Community etc:

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The Burgaz Wind Farm Project is located in Çanakkale Province, Burgaz-Munip Çiftli•i Station, near Cevizli Village which has a total of 50 households and has approximately 220 residents. The Çanakkale region is known for its historical value and is a touristic attraction. The economy of Cevizli Village is mostly dependent on agriculture.

A.4.1.4. Details of physical location, including information allowing the unique identification of this small-scale project activity :

Figure 1: General map of Turkey and identification of the project area

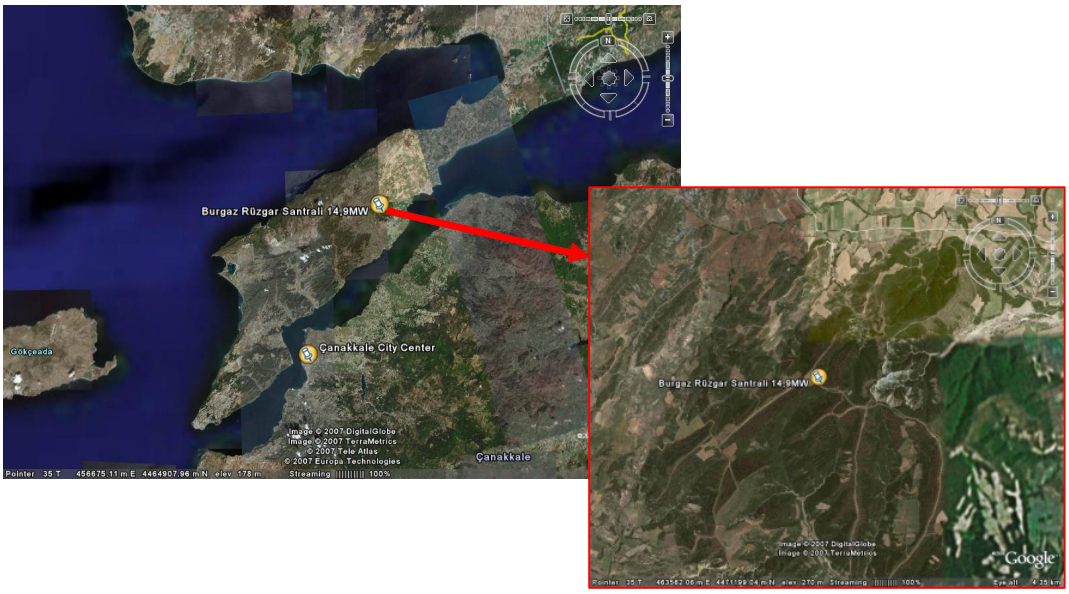

Figure 2:.Map of Gallipoli District and the project location

The coordinates of the wind turbines are included in additional supportive document Appendix1[10]

A.4.2. Type and category(ies) and technology/measure of the small-scale project activity:

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As per the latest available Gold Standard Manual for VER projects Appendix A the project falls into the category A.1. – Renewable Energy.

The Project involves the installation of 18 turbines and the development of a high voltage transmission line between the proposed project area and the national grid. An estimated 52 GWh/year[11] will be produced by the project activity and delivered to the national grid

Wind Farm

The Project participants have chosen for the turbines the sophisticated direct drive[12] turbines manufactured by ENERCON GmbH. The turbines are relatively more expensive compared to the common turbines, however they are of higher quality which is expressed in higher reliability and less noise, besides the turbines are grid friendly. In total 18 turbines will be installed, 13 units of ENERCON E48 and 5 units of ENERCON E44. The technical description of turbines is presented in more detail in table 2 below.

[10] Additional supportive documents are available for DOE.

[11] Reference: Technical feasibility study available for DOE

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

Table 2: Technical details of ENERCON wind turbines

Model of turbine	Rated power [kW]	Number of blades	Rotor diameter [m]	Rotor swept area [m^2]	Hub height [m]
E48	800	3	48	1,810	65
E44	900	3	44	1,521	55

The turbines will be manufactured in Germany and transported to the project site. The other critical components of the wind farm such as blades, masts, cables etc. will be manufactured and supplied by local/national manufacturers.

Grid connection
The proposed project activity also involves the development of a connection to the national grid. The grid connection consists of 2 km overhead transmission line developed by the project owner. The Project will be connected to the 154 kV HV transmission line from the connection point, Kumlulimanı-Gelibolu transformer station.

A.4.3 Estimated amount of emission reductions over the chosen crediting period:

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Years	Annual estimation of emission reductions in tonnes of tCO_2-eq
2007	13.972
2008	33.532
2009	33.532
2010	33.532
2011	33.532
2012	33.532
2013	33.532
2014	19.560
Total emission reductions (tonnes of CO_2-eq)	234.721
Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tonnes of CO_2-eq)	33.532

A.4.4. Public funding of the small-scale project activity:

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The project does not obtain public funding. The project investment has been financed by 20% equity and 80% loan from a commercial private bank[13].

[13] Financial structure of the proposed project activity is available for DOE.

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a large scale project activity:

As highlighted in Appendix C of the Simplified Modalities and Procedures for Small-Scale CDM project activities, a proposed small-scale project activity shall be deemed to be a de-bundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- With the same project participants;
- In the same project category and technology/measure;
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

These conditions have also been assumed for the VER project, where for CDM can be read 'VER'. On the basis of the above and the assumption, the project cannot be considered a de-bundled component of a larger project.

SECTION B. Application of a baseline and monitoring methodology

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

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Applied approved baseline and monitoring methodology:

- Approved consolidated baseline and monitoring methodology AMS-I.D "Approved Small Scale Methodology for Grid Connected Renewable Electricity Generation", version 13, EB 36

Used tools:

- "Tool for the demonstration and assessment of additionality" version 05, EB39.
- "Tool to calculate the emission factor for an electricity system" version 01, EB35.

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

B.2 Justification of the choice of the project category:

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Methodology AMS-I.D "Approved Small Scale Methodology for Grid Connected Renewable Electricity Generation", version 13" is applicable to the proposed project activity because it fulfils the required criteria:

- The project consists of a wind power electricity capacity addition and is a grid-connected electricity generation project.
- The installed capacity of the proposed project activity is 14,9MW, hence below the 15 MW limit for a small scale project activity.

B.3. Description of the project boundary:

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According to methodology AMS-I.D "'Approved Small Scale Methodology for Grid Connected Renewable Electricity Generation", version 13", the project boundary encompasses the physical, geographical site of the renewable generation source. The project boundary includes the Project site and all power plants connected physically to the Turkish National Grid. The emission sources are the emissions associated with the electricity that is displaced from the grid. These are calculated as the electricity supplied to the grid multiplied by an emission factor for the grid.

B.4. Description of baseline and its development:

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As per AMS I.D. "Approved Small Scale Methodology for Grid Connected Renewable Electricity Generation", version 13" the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient calculated in a transparent and conservative manner as a combined margin, consisting of the combination of operating margin and build margin according to procedures prescribed in the "Tool to calculate the emission factor for an electricity system" version 01.

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 small-scale CDM project activity:

As required in the Gold Standard Voluntary Emission Reductions Manuel for Project Developers, the project additionality is demonstrated through use of the Tool for the demonstration and assessment of additionality (version 05).

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

Realistic and credible alternatives to the project activity that can be a part of the baseline scenario are defined through the following steps:

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

The alternatives to the proposed project activity are listed in table 3 below.

Table 3: Alternatives to the project activity

Alternative A	Proposed project developed without the VER revenues
Alternative B	Same amount of electricity produced by other facilities not under the control of project participant (No action from the investors)

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

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 Step 1a above are in compliance with applicable laws and regulations.

Step 2. Investment analysis
This step has not been applied.

Step 3. Barrier analysis

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

Implementation of the project without VER revenues (alternative A defined under sub-step 1a) faces barriers that prevent the implementation of this alternative.

The following barriers prevent the implementation of the proposed project activity if it was not developed as a VER project. An overview of the barriers is presented in Table 4. Each barrier is described in more details in the section below.

Table 4: Identified barriers for development of the project activity.

Type of barrier		Identified barrier	Internal/External barrier
Investment	Barriers related to access to finance.	Low project IRR (Internal Rate of Return) and ADSCR (Average Debt Service Coverage Ratio).	INT
		High level of financing and long pay back period	INT
		Country risk	EXT
	Barriers related to the project design	Development of grid connection	EXT
		Direct drive turbines	INT
Technical		No Turkish manufacturers of wind turbines	EXT
Prevailing practice		Wind capacity constitutes a low share of the total generation capacity	EXT
Other		Bureaucratic and legislative	EXT
		Time restrictions	EXT

The most important barrier that prevent the development of Burgaz Wind Farm Project is that the project having a low IRR and ADSCR (Average Dept Service Coverage Ratio).

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

- *Low project IRR and ADSCR*: The Internal Rate of Return (IRR) and (Annual Debt Service Cover Ratio) ADSCR of the project without the income from VERs was too low to secure project financing. The additional income from VERs has increased the IRR and the ADSCR of the project significantly, which

positively influenced the decision of the bank to issue the loan[14]. The impact of the registration as a VER project is given by comparison of the project IRR with and without VER revenues in table 5 below.

The main assumptions for the IRR calculations are as followed:

- Electricity price: 4.5 €cent/kWh
- VER price: 5 €/tCO_2e
- Electricity production: 52,106 MWh/year (net generation)
- Total investment cost: 19.5 M€
- Equity / Loan rate: 20/80 %

Table 5: IRR comparison[15]

Project IRR	10 Years	20 years
Without VERs	n.a.	0.07 %
With VERs	n.a.	1.15 %

Turkey has adopted "Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy" on 10 May 2005[16]. At the time of issuance of the bank loan the law in force guaranteed the purchase of electricity generated from renewable resources, at 7 years fixed price (the average wholesales price determined by Electricity Market Regulatory Authority) based on Turkish currency. The average wholesales price of 4,5 €cent/kWh was used for the financial feasibilities submitted to the bank. It can be concluded from the financial feasibility study that the incentive scheme in Turkey is not sufficient to secure the proposed project financially. The impact of the VER revenues has positively increased the IRR values and strengthened the dept coverage ratio.

- *High level of financing and long pay back period*: Wind farms require a high level of financing and have long pay back periods compared to other investment options, which increases the financial risks associated with the project activity.

- *Country risk*: In the international markets the risk for investments in Turkey is considered high. After an economic crisis in 2001, Turkish economy has seen a positive development. However investments in Turkey are still considered as relatively high risk investments. In early-to-mid 2006 the raise of interest rate in major industrial countries has strongly affected the Turkish economy, the currency depreciated significantly, long-terms interest rates rose and inflation accelerated. Together with the high current account deficit, a still high public debt ratio, a large stock of rapid foreign investments and non-supportive

[14] Written statement of the creditor bank stating loans were considered with VER credits taken into account. Available to DOE.

[15] Financial feasibility of Burgaz Wind Farm Project submitted to the creditor bank, available for the DOE

[16] With the enactment of "Law on Energy Efficiency", where a reference was made to Article 6 of "Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy", the purchase guarantee was revised as a guaranteed period of 10 years and a guaranteed purchase price of 5€cent/kWh was introduced (02/05/2007).

political environment Turkey is vulnerable to a sudden stop in capital inflows[17]. It can be concluded that the economical and political situation has an adverse impact on the international perception of Turkey as investment country and, this is an important barrier to the Project.

Other financial barriers identified for the project are:

- *Development of grid connection*: The proposed project activity is connected to the national grid by the construction of 2 km, 154 kV High Voltage overhead transmission line. The investment costs are approximately 300,000 €/km. This investment will be fully covered by Demirer Holding, later this grid connection will be transferred to TEIA•[18] (Turkish Electricity Transmission Company). However the compensation of the costs will be done through the internal price tariffs of TEIA• (and not based on actual costs nor up to date prices), which results to a loss on behalf of the project owner.

- *Direct drive turbines*: The project involves the installation of direct drive variable speed turbines supplied by ENERCON. These are more expensive compared to the common turbines, however they are of higher quality which is expressed in higher reliability, more grid friendly and have a lower noise level.[19].

Technical Barriers

- *No Turkish manufacturers of wind turbines*: Currently, there are no manufactures of wind turbines in Turkey. Therefore the project participants have to import wind turbines from abroad. For the proposed project the turbines are imported from Germany. This transfer of technology results in higher operational risk and higher investments costs. Furthermore the import of new technology requires the training of personnel for the construction, operation and maintenance of the wind farm.

Barriers due to prevailing practice

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

Table 6: The energy demand and increase rates between years 1997-2006[20]

[17] Reference: IMF Fifth Review – Turkey 2007, http://www.imf.org/external/pubs/ft/scr/2007/cr07161.pdf ; OECD Economic Survey of Turkey 2006, http://www.oecd.org/dataoecd/50/53/37529636.pdf

[18] TEIAŞ is the state owned monopolized company responsible for the whole transmission system of Turkey http://www.teias.gov.tr

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

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

Year	Energy Demand [GWh]	% of increase
1997	105,517	11.3
1998	114,023	8.1
1999	118,485	3.9
2000	128,276	8.3
2001	126,871	-1.1[21]
2002	132,553	4.5
2003	141,151	6.5
2004	150,018	6.3
2005	160,794	7.2
2006	174,230	8.3

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

Table 7 Projection of installed generation capacity of Turkey[22]

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

Note: the actual realised installed wind capacity in 2008 is 333 MW (please see Table 8 below), while in the projection this was estimated as 1,113 MW.

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

Table 8: Breakdown of installed capacity of the Turkish grid[23]

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

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

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

Primary Energy Source	2006 [MW]	% of installed capacity 2006
Lignite	8,210.8	20.2
Hard + Imported Coal	1,986.0	4.9
Natural Gas	11,462.2	28.3
Fuel Oil	2,123.2	5.2
Diesel Oil	251.9	0.6
LPG	0	0
Naphtha	21.4	0.1
Solid + Liquid	471.0	0.2
Natural Gas + Liquid	2,852.4	7.0
Hydro	13,062.7	32.2
Geothermal + Wind	***81.9***[24]	***0.2***
TOTAL	40,564.8	100

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

Other Barriers

- *Bureaucratic and legislative*: The first wind measurements for the Burgaz Wind Farm Project were performed by Demirer Holding in late 1996. However the project was only able to start construction in 2007. This delay can be explained by the bureaucratic and legislative barriers the project faced:

    1. *Change in the structure of the Turkish energy market*: On 03 March 2001 the "Turkish Electricity Market Law[25]" was enacted and the structure of the electricity market changed from a monopolised market model, to a liberalised market model. In the monopolised model private companies' could participate through BOT (Built Operate and Transfer; see section 4.a. for further information on BOT projects) projects, this involved low risks since the projects where after construction transferred to the state. The conjuncture and legal basis before 2001 (the enactment of Electricity Market Law) allowed wind farm project to have a 20 year purchase guarantee with a fixed price[26]. The current participation of private companies to the market is relatively weak in terms of financial attractiveness of wind projects compared to pre 2001 condition. In addition, the private companies, especially those who invest in new technologies such as wind energy, encounter delays due to the immature structure of the new electricity market.
    2. *Uncertainties in the market*: The legal basis of renewable energy generation, including wind energy, is laid down in the "Law on Utilization of Renewable Energy Resources for the Purpose of

[24] The figure of geothermal and wind divers from the sum given in Table 9 due to frequency of updating internal information within TAIS.

[25] Reference: Official website of Energy Market Regulatory Authority
http://www.epdk.gov.tr/mevzuat/kanun/elektrik/elektrik.html

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

Generating Electricity Energy" enacted on 18 May 2005[27]. This law provides a guaranteed electricity price over a period of time. The enactment of this law reduced the uncertainty in payback which obstructed the private sector to invest in wind energy projects and reduced the high risk perception for wind energy projects from creditors' point of view.

- *Political demeanor of the government*: In addition to the energy projection presented above, temporary article 2 of the newly enacted "Law on Installation, Operation and Sales of Energy of Nuclear Power Plants[28]" (enacted on 09 November 2007) constitutes a subsidy scheme for coal fired power plants with a capacity over 1000 MW.

  It can be concluded that the political tendency is to cover the increasing energy demand by installation of thermal power plants rather then increasing share of wind energy and other renewables.

- *Time restrictions*: As a result of Electricity Market License Regulation[29], Demirer Holding had to start the construction of Burgaz Wind Farm Project in 2007 or else it would loose their electricity production license. The Electricity Market License Regulation states that in case there is a delay that exceeds half of the period between the facility completion date and the license grant date the generation license may be cancelled. Article 16 of the Electricity Market Regulation states that "licenses based on renewable and domestic resources is evident that the facility completion date cannot be met even the half of the completion period is considered, the license may be cancelled by a Board decision." Therefore the Burgaz Project was obliged to finalize the construction of the project before 11 November 2007[30]. This obligation forced Demirer Holding to start with the construction of the project without securing the financial revenues of the project such as VER credits, and increased the risk of the project.

Sub-step 3 b. 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, which is not under the control of the project participant, is not hindered by the identified barriers.

Step 4. Common practice analysis

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

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

[27] Reference: Official website of Energy Market Regulatory Authority
http://www.epdk.gov.tr/mevzuat/diger/yenilenebilir/reseng.doc

[28] Reference: Official website of Energy Market Regulatory Authority / http://www.epdk.gov.tr/mevzuat/diger/nukleer/5710.htm

[29] Reference: Electricity Market License Regulation, Article 16 /
http://www.epdk.gov.tr/mevzuat/yonetmelik/elektrik/lisans/lyson.doc

[30] Reference: Burgaz Wind Farm Project Generation License / Available to DOE.

The current 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 333 MW, which constitutes a small share of the total installed capacity of Turkey.

Table 9: Most recent wind farms installed in Turkey[31]

Location	Company	Installed Capacity (MW)	Developed as	Year
•zmir – Çe•me	Alize A.•.	1.5	BOT	1998
•zmir – Çe•me	Güçbirli•i A.•.	7.2	BOT	1998
Çanakkale – Bozcaada	Bores A.•.	10.2	BOT	2000
Istanbul – Hadımkoy	Sunjüt A.•.	1.2	BOT	2003
Balıkesir – Bandırma	Bares A.•.	30	VER	I-2006
Istanbul – Silivri	Ertürk A.•.	0.85	BO	II-2006
•zmir – Çe•me	Mare A.•.	39.2	VER	I-2007
Manisa – Akhisar	Deniz A.•.	10.8	VER	I-2007
Çanekkale – Intepe	Anemon A.•.	30.4	VER	I-2007
Çanakkale-Gelibolu	Do•al A.•.	14.9	VER	II-2007
Hatay Samanda•	Deniz A.•.	30	VER	I-2008
Manisa Sayalar	Do•al A.•.	30.6	VER	I-2008
•zmir-Alia•a	•nnores A.•.	42.5	VER	I-2008
•stanbul-Gaziosmanpa•a	Lodos A.•.	24	VER	I-2008
•stanbul-Çatalca	Ertürk	60	VER	I-2008
TOTAL		**333.35**[32]		

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

Many of the projects seen in table 9 are either developed as BOT projects, which had been developed before the liberalization of the electricity market in 2001 or as VER projects.

BOT was an initiated by the Turkish Government in order to decrease the external debt of the National Treasury. In these kinds of projects the debt is on the investor company. On the other side the Government issues various financial incentives for these projects. Therefore BOT projects have a low risk profile. The various advantages preceded by the Government for BOT projects such as:

- Exemption from customs
- Discount on investment
- Exemption from and postponement of VAT

[31] Reference: Energy Market Regulatory Authority, ofiicial web site
http://www.epdk.gov.tr/lisans/elektrik/yek/ruzgarprojeleriningelisimi.xls

[32] The total installed capacity value also includes the installed capacity of Burgaz Wind Farm Project (Doğal A.Ş.)

Apart from these advantages the investment company who has undertaken a BOT project signed a Guarantee Agreement with the National Treasury. This agreement assures the sales of the electricity produced by the project. That is if the designated public entity could not buy the electricity produced by the project, the National Treasury shall pay and buy the produced amount.

It should also be noted that BOT projects are not private investments. By definition they actually are government projects developed a private company and operated by a public entity at a later stage.

Sub-step 4b. Discuss any similar options that are occurring:
As demonstrated under table 9 the most recent wind farms that have been developed by private investment have been realized as VER projects.

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

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

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The emission reductions resulting from the proposed project are calculated according to AMS I D "Approved Small Scale Methodology for Grid Connected Renewable Electricity Generation", version 13.

According to this methodology the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO2e/kWh) calculated in a transparent and conservative manner.

The emission factor is calculated according to "Tool for calculation of emission factor for electricity systems" version 1 as follows:

Step 1. Identification of the relevant electrical 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. Selection of an operating margin (OM) method

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) can only be used if low-cost/must run resources constitute less than 50% of total grid generation, where low-cost/must run resources include hydro, geothermal, wind, low-cost biomass, nuclear and solar generation. The share of the installed capacity of renewable energy sources excluding hydro power is 0.1% of the total electricity generation and is therefore not taken into consideration (see table 15). There is no indication that coal is used as a must-run and no nuclear energy plants are located in Turkey. That leaves hydro power as the only relevant low-cost must run source for electricity. The electricity generation from hydro power is 25.1% of the total electricity generation (see table 15). Therefore the requirements for the use of the Simple OM calculations (option a) are satisfied.

Table 10: Breakdown by sources of the electricity generation from the Turkish grid 2006[33]

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

Since the Simple OM calculation (option a) is selected, the emission factor is calculated by the generation-weighted average emissions per electricity unit (tCO_2/GWh) and averaged over the past three years of all generating sources serving the system, not including low-operating cost and must-run power plants.

The tool gives two options for the calculation of $EF_{grid, OM,y}$;

- Ex-ante option: A 3-year generation–weighted average, based on the most recent data available at the time of submission of the VER-PDD to the DOE for validation, without the requirement to monitor and recalculate the emissions factor during the crediting period, or
- Ex post option: The year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during the monitoring.

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

For this proposed project the ex-ante approach is selected. Data for calculating the three year average is obtained from the period 2004 – 2006 which are the most recent data available at the time of preparation of the PDD[34].

Step 3. Calculating the operating margin emission factor according to the selected method.
The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost / must run power plants / units. It may be calculated:

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

As the fuel consumption and the average efficiency data for each power plant / unit is not available Option C is used for simple OM calculation[35].

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

$$EF_{grid,OM,y} \frac{\sum FC_{i,y} \times NCV_{i,y} \times EF_{CO_2,i,y}}{EG_y} \quad \textbf{(3)}$$

Where:

$EF_{grid, OM, y}$	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)
$EF_{CO2, I,}$	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 (MWh)

Step 4. Identifying the cohort of the power units to be included in the build margin.
The sample group of power units' m used to calculate the build margin consists of either;

(a) The set of five power units that have been built most recently, or
(b) The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently[36].

[34] The index "y" in the equations refers to the years 2004-2006 to calculate the emission factor *ex-ante*.

[35] There are no nuclear power plants in Turkey and the share of the renewable energy is very small

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

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

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

Step 5. Calculation of the build margin emission factor.

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

$$EF_{grid,BMsimple,y} = \frac{\sum EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}} \quad \textbf{(4)}$$

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)

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 B2 has been selected for the calculation of the CO_2 emission factor of each power unit m ($EF_{EL,m,y}$) as follows:

$$EF_{EL,my} = \frac{EF_{CO_2,m,i,y} \times 3.6}{\eta_{m,y}} \quad \textbf{(5)}$$

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)
$n_{m,y}$	Average net energy conversion efficiency of power unit m in year y (%)

Step 6. Calculation of the combined margin emission factor.

The combined margin emissions factor is calculated as follows:

$$EF_{grid,CM} = EF_{grid,OM} \cdot w_{OM} + EF_{grid,BM} \cdot w_{BM} \quad \textbf{(6)}$$

Where:

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

w_{BM} Weight of the build margin emission factor

The weighs for the operating margin and build margin emission factors are by default 0.75 and 0.25 respectively.

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

(Copy this table for each data and parameter)

Data / Parameter:	**ID.1 / EG_{gross}**
Data unit:	GWh
Description:	Gross electricity production by fossil fuel power sources (2004-2006)
Source of data used:	TEIAS (Turkish Electricity Transmission Company) The distribution of gross electricity generation by primary energy resources and the electricity utilities in Turkey (2004, 2005, 2006). http://www.teias.gov.tr/istat2004/42.xls http://www.teias.gov.tr/istatistik2005/43.xls http://www.teias.gov.tr/ist2006/40.xls
Value applied:	Table 17; 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"[37] TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Any comment:	

Data / Parameter:	**ID.2 / FC_i**
Data unit:	m^3 / tons (m^3 for gaseous fuels)
Description:	Amount of fossil fuel consumed in the project electricity system by generation sources (2004-2006)
Source of data used:	TEIAS (Turkish Electricity Transmission Company) Fuels consumed in thermal power plants in Turkey by the electric utilities (2004-2005, 2006) http://www.teias.gov.tr/ist2006/42.xls for 2004 and 2005 data http://www.teias.gov.tr/ist2006/43.xls for 2006 data
Value applied:	Table 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:	

[37] Reference: http://rega.basbakanlik.gov.tr/Eskiler/2005/11/20051118-1.htm

Data / Parameter:	ID.3 / Electricity Imports
Data unit:	GWh
Description:	Electricity transfers from connected electricity systems to the project electricity system by years (2004-2006)
Source of data used:	TEIAS (Turkish Electrical Transmission Company) Monthly distribution of imported electrical energy by years (2004, 2005, 2006) http://www.teias.gov.tr/ist2006/47.xls
Value applied:	Table 19
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to "Turkish Statistics Law and Official Statistics Program" TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Any comment:	

Data / Parameter:	ID.4 / NCV
Data unit:	TJ/Gg
Description:	Net calorific value (energy content) of fossil fuel type
Source of data used:	TEIAS (Turkish Electricity Transmission Company) Heating values of fuels consumed in thermal plants in Turkey by the electricity utilities (2004-2005, 2006) http://www.teias.gov.tr/ist2006/44.xls for 2004 and 2005 data http://www.teias.gov.tr/ist2006/45.xls for 2006 data
Value applied:	Table 16
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:	In order to convert the data source units to the required units; 1cal is considered to be 4.187[38] joules and the density of natural gas is considered to be 0.695kg/m^3[39].

[38] Reference: International Energy Agency (IEA) Statistics, Natural Gas Information / p.xxv, Abbreviations and conversion factors

[39] Reference: International Energy Agency (IEA) Statistics, Natural Gas Information / p.xxvi, Abbreviations and conversion factors

Data / Parameter:	**ID.5 / EF_{co2}**
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 16; Table 20
Justification of the choice of data or description of measurement methods and procedures actually applied :	There is no information on the fuel specific default emission factor in Turkey, hence, IPCC values has been used as referred in the "Tool to calculate the emission factor for an electricity system (version 1)".
Any comment:	

Data / Parameter:	**ID.6 / η**
Data unit:	%
Description:	Plant specific generation efficiency for type of fuel
Source of data used:	"Environmental Map" published by Environmental Inventory Head Department under Ministry of Environment and Forestry / http://www.cedgm.gov.tr/dosya/cevreatlasi/atlasin_metni.pdf or http://www.cedgm.gov.tr/dosya/cevreatlasi.htm (p.197 table X.3.1; Thermal Plants and Environment)
Value applied:	Table 20
Justification of the choice of data or description of measurement methods and procedures actually applied :	The average values of thermal plants in Turkey are taken from the report "Environmental Map" published by the Ministry of Environment and Forestry.
Any comment:	

Data / Parameter:	ID.7 / Capacity additions
Data unit:	Name of the plant; Installed capacity (MW); Fuel type; Generation (GWh); Comissionary date
Description:	Capacity additions to the grid that comprises 20% of the total generation (2003-2006)
Source of data used:	TEIAS (Turkish Electricity Transmission Company) Generation units put into operation in 2004; 2005; 2006 http://www.teias.gov.tr/istatistik/7.xls for 2003 http://www.teias.gov.tr/istat2004/7.xls for 2004 http://www.teias.gov.tr/istatistik2005/7.xls for 2005 http://www.teias.gov.tr/projeksiyon/ekler.htm for 2006 (see Annex II (Ek II) in the web page)
Value applied:	Annex 3; Table 21
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.8 / EF_{CM}
Data unit:	tCO_2e/MWh
Description:	Combined Margin emission factor
Source of data used:	Official data
Value applied:	0.645
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated *ex-ante* according to the "Tool to calculate emission factor for an electricity system" version 01, EB35 Annex 12.
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

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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 TE•AS, which is the official source of related data. The fuel consumption values for relevant years are given in Table 11 below.

Table 11: Fuel consumption of generation sources connected to the grid (2004-2006)[40]

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

Turkey specific net calorific values ($NCV_{i,y}$) 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 Table 12 below.

Table 12: NCV and emission factor of fossil fuel type[41]

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

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

Table 13: Gross electricity production by fossil fuel power sources 2004-2006[42]

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

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

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

[41] For further information please see section B.6.2.

[42] For further information please see section B.6.2.

Table 14 Relation between net and gross electricity generation 2002-2004[43]

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

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

Table 15: Net electricity production by fossil fuel power plants and electricity imports 2004-2006[44]

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

Based on the above values the $EF_{grid,OM}$ calculated through equation (3) is **652 tCO_2-eq/GWh.**

Calculation of Build Margin Emission Factor ($EF_{grid,BM}$):
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 16 below.

[43] For further information please see section B.6.2.

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

Table 16: Emission factor of the power units[45]

	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	46%	425
Lignite	90,900	33%	1001
Coal	94,600	34%	1014
Fuel Oil	72,600	33%	788
Hydro	n.a.	n.a.	0
Wind	n.a.	n.a.	0

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 $EF_{CO2,m,l,y}$ has been used.

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

Table 17: Electricity generated by the power units included in the build margin calculation[46].

$EG_{m,y}$ [GWh]					
	2003	**2004**	**2005**	**2006**	**TOTAL**
Natural Gas		8,834.2	7,068.5	3,283.5	19,186
Lignite			4,420.0	7,020.0	11,440
Coal		337.5	1,125.0		1,463
Fuel Oil		793.3	99.1		892
Hydro	347.8	241.8	1,028.8	478.1	2,096
Renewables			87.4	100.0	187
TOTAL					35,265

The $EF_{grid,BM}$ which is calculated through equation (4) is **618 tCO_2-eq/GWh.**

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

The $EF_{grid,CM}$ which is calculated through equation (6) is **644 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 is taken as 0 tCO_2/year

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

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

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

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

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Year	Estimation of project activity emissions (tonnes CO_2-eq)	Estimation of baseline emissions (tonnes CO_2-eq)	Estimation of leakage (tonnes CO_2-eq)	Estimation of overall emission reductions (tonnes CO_2-eq))
2007	0	13.972	0	13.972
2008	0	33.532	0	33.532
2009	0	33.532	0	33.532
2010	0	33.532	0	33.532
2011	0	33.532	0	33.532
2012	0	33.532	0	33.532
2013	0	33.532	0	33.532
2014	0	19.560	0	19.560
Total	**0**	**234.721**	**0**	**234.721**

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

B.7.1 Data and parameters monitored:

(Copy this table for each data and parameter)

Data / Parameter:	**ID.8 / EG_y**
Data unit:	kWh
Description:	Net electricity supplied by the Project to the grid
Source of data to be used:	Measured by ammeters.
Value of data	52,106,000 kWh/year
Description of measurement methods and procedures to be applied:	Measured to determine the emission reductions from electricity generation, as avoided emission of electricity generation by power stations feeding the grid. The ammeter will be controlled and maintained by the grid owner
QA/QC procedures to be applied:	The ammeter will be subject to a regular maintenance and testing regime by the grid owner to ensure accuracy.
Any comment:	Data will be used for billing and therefore checked by project owner and power company. Data will be archived electronically during the crediting period and two years after.

Data / Parameter:	**SDI.1 / Employment (job quality)**
Description:	Trainings are an important issue to improve the job quality of employees.
Description of measurement methods	Respective staff is trained regarding health and safety issues and first aid. There is also technical training regarding the operation of the equipment. The trainees receive a

and procedures to be applied:	certificate after these trainings. Therefore the training given to the respective staff will be monitored by the certificates that they will obtain following their education.
Proof:	Respective certificates are available to the DOE.
Frequency:	Annually.
QA/QC procedures to be applied:	The trainees receive a certificate after these trainings.
Any comment:	

Data / Parameter:	**SDI.2 / Employment (quantity)**
Description:	The project activity will create a substantial number of jobs in the project area.
Description of measurement methods and procedures to be applied:	The personnel employed will be registered in the Social Security Institution (SSK). The number of the personnel will be monitored by the domicile and Social Security Institution documents. Domicile documents will prove how many people had been employed in the region. Apart from the documents the registration of an employee to the Social Security Institution may be monitored by the web portal of SSK by simply entering the ID number of the respective employee.
Proof:	Domicile and social security records or via the web portal of SSK.
Frequency:	Annually.
QA/QC procedures to be applied:	
Any comment:	

B.7.2 Description of the monitoring plan:

>>

The amount of electricity generated by the project and fed into the national grid and the amount of electricity consumption to fulfil the project requirements from the grid will be monitored continuously. The amount of the generated electricity fed into the grid will be monitored continuously. From this value the imported electricity from the grid to fulfil the project requirements will be deducted. The payback of the project depends on the net electricity delivered to the grid. Therefore the meters are accurate, reliable and continuously measuring the net electricity exported to the national grid and can be considered as representative.

Details of metering, metering equipments, meter readings, calibration and maintenance details are given below:

Metering: The delivered electricity is being metered at 154 kV high voltage side of the step up transformer (154/24 kV) installed at the project site. The meters measure the net electricity delivered to the grid, which is the data used in emission reduction calculations. The losses before this point will be on the account of the project owner.

Meter readings: Officials from TEIA• (Turkish Electricity Transmission Company) will perform data readings under the surveillance of responsible staff from Demirer Holding for both the primary and secondary devices on a periodic basis. A meter reading report is prepared by TEIA• and delivered to Demirer for each month.

Quality control and quality assurance: The collected data will be kept by both Demirer Holding and TEIA• during the crediting period and stored at least two years after the last issuance of VER credits for the Burgaz wind farm project activity in the concerning crediting period. The measuring device's specifications are in accordance with the measurement communiqué of Turkey (Turkish Standards and International Electro technical Commission standards[47]).

As the meters are sealed by TE•A•, Demirer Holding cannot intervene with the devices by themselves. TE•A• performs a regular maintenance on a regular basis. TEIA• is the main responsible for calibration and maintenance of the devices. TEIA• performs the necessary maintenance and calibration. Since the electricity generation data is used for the billing and accounting between TEIA• and Demirer Holding the data is of high quality.

The Plant Manager is responsible for the plant as well as the monitoring issues on behalf of Demirer Holding on sight.

Training: Demirer Holding together with TEIA• will provide training to designated employees to ensure accuracy and completeness of data recorded. TEIA• has an Education and Occupational Safety Department particularly designated to give in depth training to the employees of TEIA• who are responsible for reading, calibration and maintenance of the metering devices.[48]

According to "Gold Standard" the parameter that score (+2) in the sustainability matrix should be monitored. In line with this requirement the parameters mentioned in section B.7.1 will be monitored.

[47] http://www.epdk.gov.tr/mevzuat/teblig/elektrik/sayac/sayacson.doc

[48] The Educational Policy of TEIAS can be found at:
http://www.teias.gov.tr/egitim/EGITIM_PLANI2008/EGITIM_POLITIKASI_ILKE_VE_PRENSIPLERI.htm

Specific training programmes offered by TEIAS can be found at:
http://www.teias.gov.tr/egitim/EGITIM_PROGRAMLARIMIZ/EGITIM_PROGRAMLARIMIZIN_ISIMLERI.htm

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

>>
Date of completing the final draft of this baseline section:
24th of July 2007
Name of person/entity determining the baseline:
The baseline has been prepared by Ecofys Netherlands BV in consultation with Demirer Holding.

Company name: Ecofys Netherlands BV
Visiting Address: Kanaalweg 16-G
3526 KL Utrecht
The Netherlands
Contact Person: Mr. Ömer Akyürek
Telephone number: +90 212 3256780
Fax number: +90 212 2823480
e-mail: o.akyurek@ecofys.com

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

>>
14th of May 2007

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

>>
Life time of the project: 30 years[49]

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

C.2.1. Renewable crediting period

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

>>
25th of July 2007

[49] Reference: Generation License. Available to DOE.

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. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

>>
No Environmental Impact Assessment (EIA) has been performed for the proposed VER project activity, as executing an EIA for a project of this kind is not legally obliged in Turkey[50].

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:

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

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

2. The Sustainable Indicator Matrix, as can be found in section A.2 of this PDD, has a total score of +8 and does not contain any negative scores. According to the 'Gold Standard Voluntary Emission Reductions (VERs) Manual for Project Developers', indicators scoring -1 must be subject to the EIA pre-screen checklist to determine the necessity of an EIA. Since no indicator has a negative score it is not necessary to perform an EIA.

3. The outcomes of the First Round Consultation did not result in any negative comments on significant impacts of the proposed project on the environment. In order to ensure adequate consideration of all

[50] Reference: Official document of Exemption for Environmental Impact Analyse for Burgaz Project. Available for DOE.

relevant impacts, stakeholders have been asked to address the impacts and their significance based on the Social Impacts Checklist of the 'Gold Standard Voluntary Emission Reductions (VERs) Manual for Project Developers'. Detailed information regarding the First Round Consultation Process can be found under section E, Stakeholders' comments.

SECTION E. Stakeholders' comments

>>

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

>>

As required by the Gold Standard a first round consultation and second round consultation has to be undertaken by the project owners in order to involve stakeholders participation to the project for a retroactive registration. The first round consultation was organised in the Çanakkale Province, where the project is located. For the MSC, the identified stakeholders have received a questionnaire, which they were asked to fill in and return. Furthermore they received the ISC report and a draft PDD.

First Round Consultation:

The initial stakeholder consultation was organised in Çanakkale Province on 10th of April 2007. Demirer Holding invited national, regional and local level stakeholders including local NGO's and the International NGO's Greenpeace Turkey and WWF Turkey and REC Turkey (Gold Standard supporters) by an e-mail sent on 23rd of March 2007. Besides the e-mail an advertisement was placed in "Olay" and "Bo•az" (daily local / regional newspaper) on 30th and 31st of March 2007. The stakeholder meeting was held in the building of the Public Works and Settlement Provincial Directorate in the city centre, with participation of 21 stakeholders. Among them were NGO's (Yerel Gündem 21, •lim Yayma Cemiyeti), Universities (University of Çanakkale), Chamber of Engineers, press (Kalem, Olay, Bo•az and Anatolia News Agency) and locals. Mr. Ahmet Araçman (project coordinator of Burgaz Wind Farm) and Mrs. Ça•la Balcı (commercial coordinator asst. of Demirer Holding) as the representatives of Demirer Holding and Ömer Akyürek (Consultant) as representative of OneCarbon.

Demirer Holding has made an oral presentation on the project followed by an speech from Prof. Dr. Osman Demircan (Çanakkale University) on reasons and effects of climate change. A brief written project description was handed out during the meeting. The questions, concerns, comments and requests related with the project were received and replied in a transparent way. Mr. Muammer Topcu, the head man of Kızılcaören Village, was present during the meeting as the independent representative of the local stakeholders.

Although the first round consultation was publicly announced and invitations were sent to the stakeholders via mail, some stakeholders were not able to attend the meeting. For those who were not able to attend the meeting, a questionnaire was sent along with the non-technical project summary on 16 April 2007 via mail. During the First Round Consultation meeting it was concluded that no negative effects regarding environmental and social aspects of the project were expected.

Second Round Consultation:

The second round consultation period has started on 14th of December 2007 by sending the First Round Consultation report, the questionnaire and the draft PDD to stakeholders. They were invited to ask questions or send

questions regarding Burgaz Wind Farm Project. Besides sending the related documents to the stakeholders via mail, the PDD is open for comments on the website of TüV-Rheinland.

The documents that were sent to the stakeholders are:

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

List of stakeholders invited to the First Round Consultation meeting and approached for the Second Round Consultation:

National Level

Name / Surname	***Organization / Position***
Tacidar Seyhan	Congressman for Adana Province (member of Industry, Commerce, Energy, Natural Resource, Information and Technology Commission / Grand National Assembly of Turkey)
Mustafa Kemal Büyükmıhçı	General Directorate of EIE (General Directorate of Electrical Power Resources Survey and Development Administration / Ministry of Energy and Natural Resources)

Regional Level

Name / Surname	***Organization / Position***
Necmettin Köksal	Director of Canakkale Province Special Provincial Administration
Uğur Yüksel	Director of Canakkale Province Provincial Public Works

Local Level

Name / Surname	***Organization / Position***
Ülgür Gökhan	Mayor of Canakkale Province
Ekrem Özçelik	Department Manager of Canakkale Province Cadastral Property
Muammer Topçu	Headman of Kızılcaören Village

NGO

Name / Surname	***Organization / Position***
İsmail Tümay	Association of Local Agenda 21
Saim Yavuz	Chairman of CABISAK (Canakkale Province Science, Arts and Culture Activities)

GS Supporters

Name / Surname	*Organization / Position*
Filiz Demirkaya	WWF Turkey
Hilal Atıcı	Greenpeace Turkey
Yunus Arıkan[51]	REC Turkey

E.2. Summary of the comments received:

>>

First Round Consultation:

The general outcome of the first round consultation meeting was positive. The stakeholders stated that they are in favour of the project and underlined the significant contribution of the project to regions sustainable image and stressed the importance of renewable and clean energy. One of the topics that the organisers of the Stakeholders Consultation brought to the attention of the stakeholders was the noise effect of the wind turbines. The stakeholders have no negative concern on the noise effect from the project.

Essentially, the negative environmental impact of wind farms is very low and the main negative impact handled during operation phase is the noise coming from the tribunes. However, the tribunes to be used in this Project produce relatively low mechanical noise due to the fact that they have a gearless system (Enercon direct drive). The turbines meet all the European noise insulation standards to meet the required noise level. The noise level at 185 m from the tribunes is below 45dB. This figure declines to the value of 37dB at a distance of 400 m, which is the bedroom standard in European Countries.

During the First Round Consultation process, no negative comments have been received regarding the Burgaz Wind Farm Project.

Second Round Consultation:

Second Round Consultation period has started on 14th of December 2007 and stakeholders are invited to ask questions or send questions regarding Burgaz Wind Farm Project. No comments have been received so far[52].

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

>>

Although no negative comments have been received during the stakeholders' process, Demirer Holding is aware of the importance of the project for the region and wants to further contribute to the social and sustainable development of the region. As an outcome of the close communication and relation with people in Cevizli Village, which is the closest residential area to the project site, Demirer had decided to implement several measures and provide beneficial contributions to the region. These measures and contributions are;

Employment: During construction and operational period, the project has created employment opportunities for the local community. For operation of the wind farm Demirer Holding has employed for every available work local employees. The list of employees is presented in table 17 below.

[51] Mr. Yunus Arıkan was not included as a stakeholder during ISC, but included in the Second Round Consultation process.

[52] This section will be updated accordingly if any comments are received within 60 days of Second Round Consultation process starting from 14th of December 2007.

Table. 17 List of employees for operation of Burgaz Wind Farm Project

Name	Position	Resident in
İlker İlhan	Electrical Engineer / Plant Manager	Gelibolu
Yakup Bozdağ	Technician	Gelibolu
Turgay Kurt	Technician	Gelibolu
Ersel Solmaz	Technician	Gelibolu
Erkan Tutay	Technician	Gelibolu
Serkan Zebek	Security	Cevizli Village
Volkan Şenoğul	Security	Cevizli Village
İsmail Gürşen	Security	Cevizli Village
Hasan Solak	Security	Gelibolu
Gürsu Köksal	Maintenance	Gelibolu

Other benefits provided by Demirer Holding:

- Concrete Bridge: There was a bridge (connecting the village to the main road) over a stream in the Cevizli village, however the weak bridge could not support any heavy vehicles. This hindered any kind of construction, maintenance or supply transport for the village. Demirer holding has built a concrete bridge over the stream that can support any kind of vehicle (including the tractors used by the villagers) in the village.
- New Roads: Demirer holding has constructed approximately 5 km[53] road, which the villagers could also benefit to access their farms with tractors.
- Cemetery wall: Demirer Holding has constructed a retaining wall for the cemetery of the village.
- Wedding hall: The maintenance of the wedding hall (repairing of the roof, walls) has been carried out by Demirer Holding.
- Public toilet: A new public toilet has been constructed in the village.
- Mosque: The maintenance of the mosque has been carried out by Demirer Holding.

[53] 2,660m from Cevizli Village and 3,140m inside the project area.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Demirer Enerji Üretim San. Ve Tic. A.Ş
Street/P.O.Box:	Mazhar Osman Sok. 9/1 Feneryolu - Kadıköy
Building:	Güneş apt.
City:	Istanbul
State/Region:	
Postfix/ZIP:	
Country:	Turkey
Telephone:	+90 216 38609 95
FAX:	+90 216 336 42 23
E-Mail:	cagla@demirerholding.com
URL:	
Represented by:	
Title:	
Salutation:	Mrs.
Last Name:	Eriş
Middle Name:	Balcı
First Name:	Çağla
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	cagla@demirerholding.com

Organization:	Polat Enerji San. Ve Tic. A.Ş
Street/P.O.Box:	Büyükdere cad. No:87/6 Mecidiyeköy
M	Polat İşhanı
City:	Istanbul
State/Region:	
Postfix/ZIP:	
Country:	Turkey
Telephone:	+90 212 212 02 00
FAX:	
E-Mail:	zeki.eris@polatholding.com
URL:	
Represented by:	
Title:	
Salutation:	Mr.
Last Name:	Zeki
Middle Name:	Aybar

First Name:	Eriş
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	zeki.eris@polatholding.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The project does not obtain public funding.

Annex 3

BASELINE INFORMATION

List of Capacity additions for 2003-2006

EKOTEN TEKSTİL GR-I	1,9	*N.GAS*	14,0	16.02.2006
ERAK GİYİM GR-I	1,4	*N.GAS*	10,0	22.02.2006
ALARKO ALTEK GR-III	21,9	*N.GAS*	112,6	23.02.2006
AYDIN ÖRME GR-I	7,5	*N.GAS*	60,0	25.02.2006
NUH ENERJİ-2 GR II	26,1	*N.GAS*	180,0	02.03.2006
MARMARA ELEKTRİK (Çorlu) GR I	8,7	*N.GAS*	63,0	13.04.2006
MARMARA PAMUK (Çorlu) GR I	8,7	*N.GAS*	63,0	13.04.2006
ENTEK (Köseköy) GR IV	47,6	*N.GAS*	306,0	14.04.2006
ELSE TEKSTİL (Çorlu) GR I - II	3,2	*N.GAS*	25,0	15.04.2006
SÖNMEZ ELEKTRİK (Çorlu) GR I - II	17,5	*N.GAS*	126,0	03.05.2006
DENİZLİ ÇİMENTO(DÜZELTME)	0,4	*N.GAS*	0,0	04.05.2006
KASTAMONU ENTEGRE (Balıkesir) GR I	7,5	*N.GAS*	54,0	24.05.2006
BOZ ENERJİ GR I	8,7	*N.GAS*	70,0	09.06.2006
AMYLUM NİŞASTA (ADANA)	14,3	*N.GAS*	34,0	09.06.2006
ŞIK MAKAS (Çorlu) GR I	1,6	*N.GAS*	13,0	22.06.2006
ANTALYA ENERJİ GR I - II - III - IV	34,9	*N.GAS*	245,0	29.06.2006
HAYAT TEM. VE SAĞLIK GR I - II	15,0	*N.GAS*	108,0	30.06.2006
EROĞLU GİYİM (Çorlu) GR I	1,2	*N.GAS*	9,0	01.08.2006
CAM İŞ ELEKTRİK (Mersin) GR I	126,1	*N.GAS*	1.008,0	13.09.2006
YILDIZ ENT. AĞAÇ (Kocaeli) GR I	6,2	*N.GAS*	40,0	21.09.2006
ÇERKEZKÖY ENERJİ GR I	49,2	*N.GAS*	390,0	06.10.2006
ENTEK (Köseköy) GR V	37,0	*N.GAS*	237,9	03.11.2006
ÇIRAĞAN SARAYI GR I	1,3	*N.GAS*	11,0	01.12.2006
AKMAYA (Lüleburgaz) GR I	6,9	*N.GAS*	50,0	23.12.2006

BURGAZ (Lüleburgaz) GR I	6,9	*N.GAS*	54,0	23.12.2006
	461,7		**3.283,5**	
ELBİSTAN B GR III	360,0	Lignite	2.340,0	23.06.2006
ELBİSTAN B GR II	360,0	Lignite	2.340,0	17.09.2006
ELBİSTAN B GR IV	360,0	Lignite	2.340,0	13.11.2006
	1.080,0		**7.020,0**	
ŞANLIURFA GR I-II	51,8	*RUN OF RIVER*	124,0	01.03.2006
BEREKET ENERJİ GÖKYAR HES 3 Grup	11,6	*RUN OF RIVER*	43,3	05.05.2006
MOLU EN. Zamantı Bahçelik GR I - II	4,2	*RUN OF RIVER*	16,7	31.05.2006
SU ENERJİ (Balıkesir) GR I - II	4,6	*RUN OF RIVER*	20,7	27.06.2006
BEREKET EN.(Mentaş Reg) GR I - II	26,6	*RUN OF RIVER*	108,7	31.07.2006
EKİN (Başaran Hes) (Nazilli)	0,6	*RUN OF RIVER*	0,0	11.08.2006
ERE(Sugözü rg. Kızıldüz hes) GR I - II	15,4	*RUN OF RIVER*	31,6	08.09.2006
ERE(AKSU REG.ve ŞAHMALLAR HES) GR I-II	14,0	*RUN OF RIVER*	26,7	16.11.2006
TEKTUĞ(Kalealtı) GR I - II	15,0	*RUN OF RIVER*	52,0	30.11.2006
BEREKET EN.(Mentaş Reg) GR III	13,3	*RUN OF RIVER*	54,4	13.12.2006
SEYHAN I-II	0,3	*DAM*	0,0	20.02.2006
	157,5		**478,1**	
BARES IX GRUP	0,0	*Wind*	0,0	20.04.2006
BARES X. ve XX. GRUPLAR	0,0	*Wind*	0,0	26.05.2006
MARE MANASTIR RÜZGAR (X GRUP)	0,0	*Wind*	0,0	08.12.2006
ERTÜRK ELEKTRİK Tepe RES GR I	0,9	*Wind*	2,0	22.12.2006
MENDERES ELEKTRİK GR I	8,0	*Geothermal*	56,0	10.05.2006
ADANA ATIK SU ARITMA TESİSİ	0,8	*Biogaz*	6,0	09.06.2006
EKOLOJİK EN. (Kemerburgaz) GR I	1,0	*LFG*	6,0	31.07.2006
ITC-KA EN. MAMAK TOP.M. GR I-II-III	4,2	*LFG*	30,0	03.11.2006
	14,8		**100,0**	
2006 TOTAL	**1.714,0**		**10.881,6**	

AKBAŞLAR GR-II(İZOLE)	8,8	*N.GAS*	73,0	2005
AKÇA ENERJİ GR-III	8,7	*N.GAS*	65,4	2005
AYKA TEKSTİL GR-I	5,5	*N.GAS*	40,0	2005
BAYDEMİRLER GR IV-V-VI	6,2	*N.GAS*	51,4	2005
BOSEN GR-III	50,0	*N.GAS*	350,0	2005
ÇUMRA ŞEKER	16,0	*N.GAS*	40,0	2005
EVYAP GR I-II	5,1	*N.GAS*	30,0	2005
GRANİSER GRANİT GR-I	5,5	*N.GAS*	42,0	2005
HABAŞ ALİAĞA GR III	47,7	*N.GAS*	381,6	2005
HABAŞ ALİAĞA GR IV	47,7	*N.GAS*	381,6	2005
HABAŞ ALİAĞA GR-V	24,6	*N.GAS*	196,8	2005
HAYAT KAĞIT GR-I	7,5	*N.GAS*	56,0	2005
KORUMA KLOR GR I-II-III	9,6	*N.GAS*	77,0	2005
KÜÇÜKÇALIK TEKSTİL GR I-II-III-IV	8,0	*N.GAS*	64,0	2005
MERCEDES BENZ TURK GR I-II-III-IV	8,3	*N.GAS*	68,0	2005
MODERN ENERJİ GR-III	8,4	*N.GAS*	62,9	2005
MOSB GR I-II-III-IV-V-VI-VII	84,8	*N.GAS*	434,0	2005
ORS RULMAN	12,4	*N.GAS*	99,4	2005
PAK GIDA(Kemalpaşa) GR-I	5,7	*N.GAS*	45,0	2005
TEZCAN GALVANİZ GR I-II	3,7	*N.GAS*	29,0	2005
YONGAPAN(KAST.ENTG) GR-II	5,2	*N.GAS*	32,7	2005
ZEYNEP GİYİM SAN. GR-I	1,2	*N.GAS*	9,0	2005
AK ENERJİ(K.paşa) GR- III	40,0	*N.GAS*	256,9	2005
AK ENERJİ(K.paşa) GR I-II	87,2	*N.GAS*	560,1	2005
ALTEK ALARKO GR I-II	60,1	*N.GAS*	420,0	2005
BİS ENERJİ GR VII	43,7	*N.GAS*	360,8	2005
CAN ENERJİ GR-I	3,9	*N.GAS*	28,0	2005
ÇEBİ ENERJİ BT	21,0	*N.GAS*	164,9	2005
ÇEBİ ENERJİ GT	43,4	*N.GAS*	340,1	2005
ENTEK ELK.A.Ş.KOÇ ÜNİ.GR I-II	2,3	*N.GAS*	19,0	2005
KAREGE GR IV-V	18,1	*N.GAS*	141,9	2005

METEM ENERJİ(Hacışıramat) GR I-II	7,8	*N.GAS*	58,0	2005
METEM ENERJİ(Peliklik) GR I-II-III	11,7	*N.GAS*	89,0	2005
NOREN ENERJİ GR-I	8,7	*N.GAS*	70,0	2005
NUH ENERJİ-2 GR I	47,0	*N.GAS*	319,7	2005
ZORLU ENERJİ KAYSERİ GR-I-II-III	149,9	*N.GAS*	1.144,1	2005
ZORLU ENERJİ KAYSERİ GR-IV	38,6	*N.GAS*	294,9	2005
ZORLU ENERJİ YALOVA GR I-II	15,9	*N.GAS*	122,0	2005
MODERN ENERJİ GR-II	6,7	*N.GAS*	50,4	2005
	986,7		**7.068,5**	
ÇAN GR I	160,0	Lignite	1.040,0	2005
ÇAN GR II	160,0	Lignite	1.040,0	2005
ELBİSTAN-B GR I	360,0	Lignite	2.340,0	2005
	680,0		**4.420,0**	
İÇDAŞ ÇELİK GR-I	135,0	*COAL*	1.080,0	2005
KAHRAMANMARAŞ KAĞIT GR-I	6,0	*COAL*	45,0	2005
	141,0		**1.125,0**	
KARKEY(SİLOPİ-4) GR-IV	6,2	FUEL-OİL	47,2	2005
KARKEY(SİLOPİ-4) GR-V	6,8	FUEL-OİL	51,9	2005
	12,9		**99,1**	
TEKTUĞ(Kargılık) GR I-II	23,9	*RUN OF RIVER*	83,0	2005
İÇTAŞ ENERJİ(Yukarı Mercan) GR I-II	14,2	*RUN OF RIVER*	44,0	2005
MURATLI GR I-II	115,0	*DAM*	444,0	2005
BEREKET EN.(DALAMAN) GR XIII-XIV-XV	7,5	*RUN OF RIVER*	35,8	2005
YAMULA GRUP I-II	100,0	*DAM*	422,0	2005
	260,6		**1.028,8**	
SUNJÜT(RES) GR I-II	1,2	*WIND*	2,4	2005
ETİ MAD.(BAN.ASİT)GR-I	11,5	Renewable	85,0	2005
	12,7		**87,4**	
2005 TOTAL	**2.093,9**		**13.828,8**	
ECZACIBAŞI BAXTER HAS.ÜRÜN.	1,0	*N.GAS*	5,8	2004

ÇIRAĞAN SARAYI İŞL.	1,4	*N.GAS*	11,0	2004
BAHARİYE MENSUCAT (İzole)	1,0	*N.GAS*	7,0	2004
ANKARA D.G.(BAYMİNA) GR-I-II-III	798,0	*N.GAS*	6.500,0	2004
ENTEK GR-IV	31,1	*N.GAS*	255,7	2004
ATATEKS 2 GM	5,6	*N.GAS*	45,0	2004
TANRIVERDİ 4 GM	4,7	*N.GAS*	38,7	2004
TEKBOY TEKSTİL 1 GM	2,2	*N.GAS*	16,0	2004
KOMBASSAN KAĞIT GIDA VE TEKS	5,5	*N.GAS*	38,1	2004
AYEN OSTİM ENERJİ ÜRETİM	31,1	*N.GAS*	264,1	2004
BİS ENERJİ 2 GT	73,0	*N.GAS*	602,7	2004
ŞAHİNLER ENERJİ 1 GM	3,2	*N.GAS*	22,2	2004
BESLER GR-2, BT (5,2+7,5)	12,7	*N.GAS*	97,7	2004
ÇELİK ENERJİ ÜR.ŞTİ. 2 GM	2,4	*N.GAS*	18,6	2004
KOMBASSAN KAĞ. MATBAA GIDA	5,5	*N.GAS*	35,7	2004
AYEN OSTİM ENERJİ ÜRETİM(BT)	9,9	*N.GAS*	84,0	2004
HABAŞ ALİAĞA GRUP I-II	89,2	*N.GAS*	713,9	2004
STANDART PROFİL 3 GM	6,7	*N.GAS*	49,2	2004
ALTINMARKA GIDA GR I-II-III	3,6	*N.GAS*	28,8	2004
	1.088,0		**8.834,2**	
ÇOLAKOĞLU(KAPASİTE ARTIRIMI)	45,0	*COAL*	337,5	2004
	45,0		**337,5**	
TÜPRAŞ BATMAN GR V	1,5	FUEL-OİL	4,1	2004
GÜL ENERJİ GR-II	12,5	FUEL-OİL	96,5	2004
ENERJİ-SA ADANA 1 BT	49,8	FUEL-OİL	322,9	2004
KARKEY-II 3+3 DGM	54,3	FUEL-OİL	369,7	2004
	118,1		**793,3**	
ERE(BİR KAPILI HES) GRUP-I	48,5	*RUN OF RIVER*	170,6	2004
ELTA ELK(DODURGA) GR-I-II-III-IV	4,1	*RUN OF RIVER*	12,3	2004
İSKUR TEKSTİL(SÜLEYMANLI) GR I-II	4,6	*RUN OF RIVER*	17,9	2004
BEREKET EN.(Feslek Hes) Gr-1-2	9,5	*RUN OF RIVER*	41,0	2004
	66,7		**241,8**	
2004 TOTAL	**1.317,8**		**10.206,7**	

MERCAN GR I-II-III	19,1	*RUN OF RIVER*	78,0	2003
KÜRTÜN GR II	42,5	*DAM*	99,0	2003
BATMAN GR II-IV	70,0	*DAM*	170,8	2003
	131,6		**347,8**	
2003 TOTAL	**131,6**		**347,8**	

Annex 4

MONITORING INFORMATION