MORDOĞAN WIND POWER PROJECT, TURKEY

Document Prepared By FutureCamp Turkey

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1. PROJECT DETAILS

1.1 Summary Description of the Project

The project of **Egenda Ege Enerji Üretim A.Ş.** (hereafter referred to as "**Egenda**"), **Mordoğan Wind Power Project** (hereafter referred to as the "Project" or "**Mordoğan WPP**"), involves installation and operation of **15 MWe** wind power plant. In the early stages of the project, installed capacity is determined as 13.8 MWe. However after the license is granted new researches was done at the project site and project owner decided to change the capcity of the project to 15 MWe. Also equipment agreement of the project is 15 MWe. Actaul installed capacity of the Project will be 15 Mwe.

An **estimated electricity generation of 45,588[1] MWh per year** by the efficient utilization of the available wind energy by project activity will replace the grid electricity, which is constituted of different fuel sources, mainly fossil fuels. The electricity produced by project activity will result in a **total emission reduction of 26,593 tonnes of CO_2e per year**. Moreover, project activity will contribute further dissemination of wind energy and extension of national power generation. It is expected that the generation of electricity will start as of February 2015 and will have an operational life of 25 years.

The project will help Turkey to stimulate and commercialise the use of grid connected renewable energy technologies and markets. Furthermore, the project will demonstrate the viability of grid connected wind farms which can support improved energy security, improved air quality, alternative sustainable energy futures, improved local livelihoods and sustainable renewable energy industry development. The specific goals of the project are to:

- reduce greenhouse gas emissions in Turkey compared to the business-as-usual scenario;
- help to stimulate the growth of the wind power industry in Turkey;
- create local employment during the construction and the operation phase of the wind farm;
- reduce other pollutants resulting from power generation industry in Turkey, compared to a business-as-usual scenario;
- help to reduce Turkeys increasing energy deficit;
- and differentiate the electricity generation mix and reduce import dependency.

As the project developer, **Egenda** believes that efficient utilization of all kinds of natural resources with a harmony coupled with responsible environmental considerations is vital for sustainable development of Turkey and the World. This has been a guiding factor for the shareholders towards the concept of designation and installation of a wind power project. Other than the objective of climate change mitigation through significant reduction in greenhouse gas (GHG) emissions, the project has been carried out to provide social and economic contribution to the region in a sustainable way. The benefits that will be gained by the realization of the project compared to the business-as-usual scenario can be summarized under four main indicators:

Environmental
The project activities will replace the grid electricity, which is constituted of different fuel sources causing greenhouse gas emissions. By replacing in the consumption of these fuels, it contributes to conservation of water, soil, flora and faunas and transfers these natural resources and also the additional supply of these primary energy sources to the future generations. In the absence of the project activity, an equivalent amount of electricity would have been generated from the power plants connected to the grid, majority of which are based on fossil fuels. Thus, the project is replacing the greenhouse gas emissions (CO_2, CH_4) and other pollutants (SO_X, NO_X, particulate matters) occurring from extraction, processing, transportation and burning of fossil-fuels for power generation connected to the national grid.

[1] See, Barlovento Wind-Resourcce-Assessment, page 46, alternative 6

Economical
Firstly, the project will help to accelerate the growth of the wind power industry and stimulate the designation and production of renewable energy technologies in Turkey. Then, other entrepreneurs irrespective of sector will be encouraged to invest in wind power generations. It will also assist to reduce Turkey's increasing energy deficit and diversify the electricity generation mix while reducing import dependency, especially natural gas. Importantly, rural development will be maintained in the areas around the project site by providing infrastructural investments to these remote villages.

Social
Local employment will be enhanced by all project activities during construction and operation of wind farm. As a result, local poverty and unemployment will be partially eliminated by increased job opportunities and project business activities. Construction materials for the foundations, cables and other auxiliary equipment will preferentially be sourced locally. Moreover as contribution of the project to welfare of the region, the quality of the electricity consumed in the region will be increased by local electricity production, which also contributes decreasing of distribution losses.

Technological
Implementation of the proposed project will contribute to wider deployment of wind power technology in local and national level. It will demonstrate the viability of larger grid connected wind farms, which will support improved energy security, alternative sustainable energy, and also renewable energy industry development. This will also strengthen pillars of Turkish electricity supply based on ecologically sound technology.

1.2 Sectoral Scope and Project Type

The project applies CDM EB-approved methodologies and tools in their latest version. The CDM program is a VCS approved program.

The respective sectoral scope is scope 1: "Energy Industry – Renewable/Non-renewable Sources". Installed capacity of the project is 15 MWe, thus it falls into a small scale project activity.

The project is not a grouped project.

1.3 Project Proponent

The WPP is operated and owned by **Egenda Ege Enerji Üretim A.Ş. Egenda** is also VCS project proponent and for contact please refer to the directions given below.

Table 1*:* Project Contact Data – Egenda

Organization:	**Egenda Ege Enerji Üretim A.Ş.**
Street/P.O.Box:	1380 Sokak No:2/1
Building:	Alyans Apt. Alsancak
City:	İzmir
State/Region:	N/A
Postcode/ZIP:	35220
Country:	Turkey
Personal Contact:	Ayça Dumankaya
Direct FAX:	0090 232 465 32 86
Direct tel:	0090 232 463 98 11
Personal e-mail:	ayca.dumankaya@endaenerji.com.tr

1.4 Other Entities Involved in the Project

The project documentation at hand was defined by Egenda in cooperation with FutureCamp Turkiye (PD consultancy).

Table 2: Contact Data of PD Consultant

Organization:	**FutureCamp İklim ve Enerji Ltd.**
Street/P.O.Box:	Çetin Emeç Bulvarı
Building:	Beste Apartmanı 19/18 Çankaya
City:	Ankara
State/Region:	N/A
Postcode/ZIP:	06460
Country:	Turkey
Personal Contact:	Engin MERT
Direct FAX:	0090 312 480 88 10
Direct tel:	0090 312 481 21 42
Personal e-mail:	engin.mert@futurecamp.com.tr

1.5 Project Start Date

The anticipated project start date is 1st of February 2015.

1.6 Project Crediting Period

A two times renewable crediting period of 10 years 0 month shall apply. First verifiable emission reductions shall be achieved in February 2015. Thus the first crediting period shall last from 1st of February 2015 until 31st of January 2025.

1.7 Project Scale and Estimated GHG Emission Reductions or Removals

Project	x
Small project	

The project activity is not a debundled component of a larger project activity as explained below.

As per clause 12(c) of the Simplified Modalities and Procedures for small scale clean development mechanism project activities (decision 4/CMP.1, Annex II), “To use simplified modalities and procedures for small-scale CDM project activities, a proposed project activity shall: Not be a debundled component of a larger project activity, as determined through appendix C to this annex. ”

As per clause 2 of the Appendix C of the Simplified Modalities and Procedure for Small-Scale CDM project activities (consolidated in Guidelines on assessment of de-bundling for SSC project activities, Version 03.1, EB54, Annex 13), “A proposed small-scale project activity shall be deemed to be a debundled 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:

(a) With the same project participants;

(b) In the same project category and technology/measure; and

(c) Registered within the previous 2 years; and

(d) Whose project boundary is within 1 km of the project boundary of the proposed small- scale activity at the closest point."

Egenda is owned by **Enda Enerji Holding A.Ş.** Enda has other projects; however none of them is within the 1 km boundary of the proposed project activity[2]. Only coordinates of projects are located in İzmir is given below since the projects located in other than İzmir cannot be within the 1 km boundary. Projects located in İzmir are Alaçatı WPP, Germiyan WPP, Urla WPP and Yaylaköy WPP.

Table 3: Projects of Egenda in İzmir

Project Name	Latitude (N)	Longitude (E)
Yaylaköy WPP[3]	38º35'27''	26º26'51''
Mordoğan WPP	38º29'25''	26º34'51''
Urla WPP[4]	38° 19' 5"	26° 36' 34"
Germiyan WPP[5]	38° 18' 59"	26° 25' 47"
Alaçatı WPP[6]	38° 17' 38"	26° 20' 53"

The physical project boundary is not within 1 km of the project boundary of the project activity at the closest point. Thus, the project activity is not a debundled component of a large project activity

[2] See; http://www.egenda.com.tr/egenda.php?sayfa_id=601&kategori_id=601&lng=1
[3] See; Yaylaköy Bird Assesment Report; page 53, for unit conservation see; http://www.rcn.montana.edu/resources/tools/coordinates.aspx?nav=11&c=UTM&md=83&mdt=NAD83/WGS84&z=35&e=591938&n=4469295&h=N
[4] See; http://mer.markit.com/br-reg/public/project.jsp?project_id=103000000001572
[5] See; http://mer.markit.com/br-reg/public/project.jsp?project_id=103000000001573
[6] See; http://mer.markit.com/br-reg/public/project.jsp?project_id=103000000001574

Table 4 Emission reduction volume during first crediting period

Years	Estimated GHG emission reductions or removals (tCO_2e)
2015*	24,377
2016	26,593
2017	26,593
2018	26,593
2019	26,593
2020	26,593
2021	26,593
2022	26,593
2023	26,593
2024	26,593
2025**	2,216
Total estimated ERs	265,930
Total number of crediting years	10
Average annual ERs	26,593

*(from 1st of February 2015 to 31st of December 2015)
** (from 1st January 2025 to 31st January 2025)

1.8 Description of the Project Activity

According to the Equipment agreement, 5 wind turbines with unit capacity of 3000 kW were selected for the project. Enercon is decided as equipment provider due to the outstanding features of its product regarding safety factors, simple durable design for low maintenance and long life operation, high efficiency, and also for fine visual appearance. The key parameters about the technical design of the selected model Enercon E82 E3 are listed below in Table 5. Mordoğan WPP will be connected to 380 kV Karaburun GIS Havza TM's OG and then Karaburun will be connected to the 380 kV Çeşme Havza TM. Total line will 21 km[7]. Also single line diagram of the plant is given figure below.

Table 5: Technical specifications of turbines[8]

Specifications	
Rated Power (kW)	3000
Rotor Diameter (m)	82
Num. of Blades	3
Swept Area (m²)	5281
Cut-out wind speed (m/s)	28-34 m/s

[7] See; Connection agreement, page 10
[8] See; http://www.enercon.de/en-en/64.htm

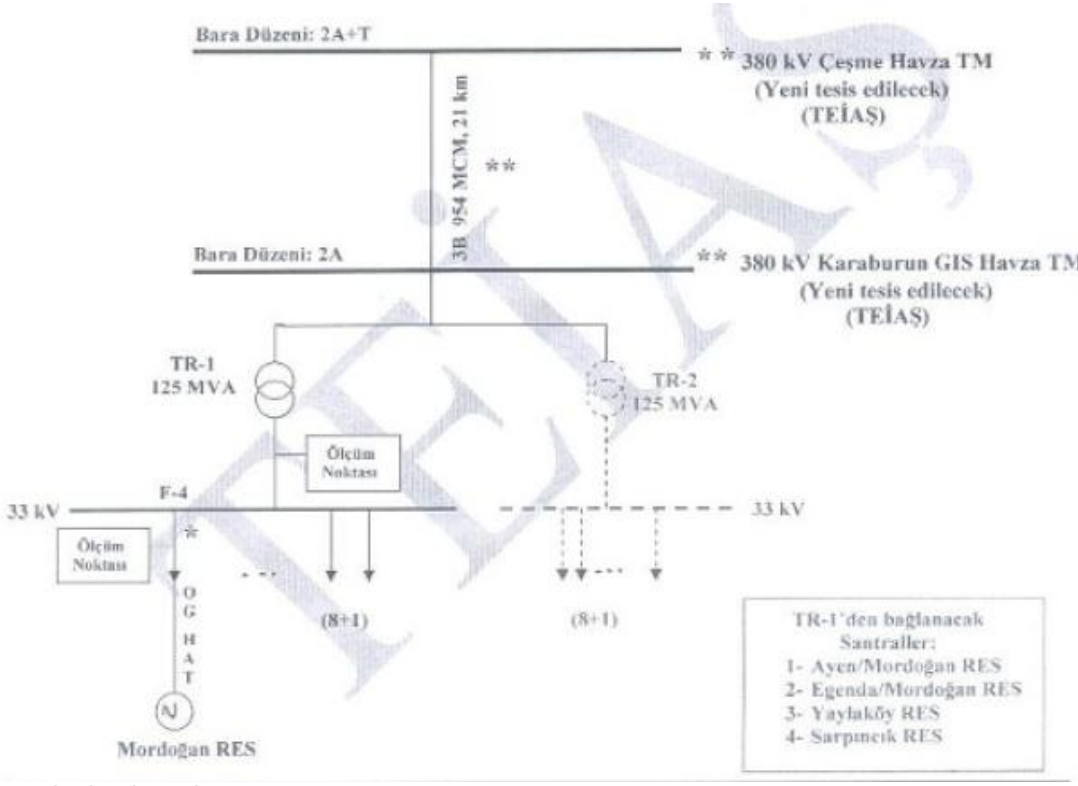


Figure 1: Single Line Diagram

The project activity will achieve emission reductions by avoiding CO_2 emissions from the business-as-usual scenario electricity generation produced by mainly fossil fuel-fired power plants within the Turkish national grid (Figure 2) Total emission reduction over the 10 year crediting period is expected to reach **26,593** tCO_2e with the assumed total net electricity generation of **45,588 MWh per year**.

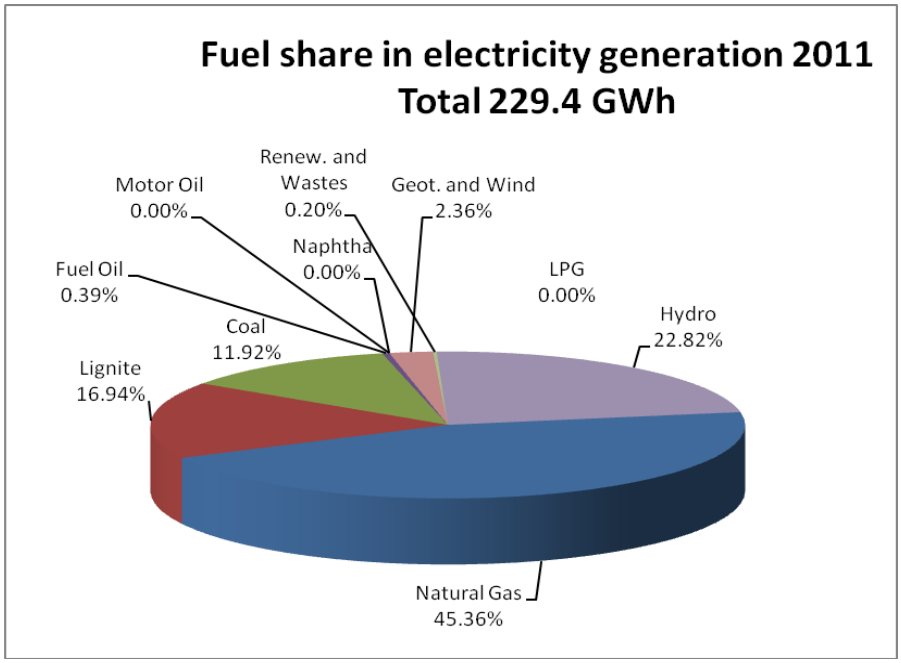


Figure 2: Share of Sources in Electricity Generation 2011[9]

Although Turkey has a very good wind resource, substantial space, a reasonably good electrical infrastructure and an approaching shortage of electricity; it uses negligible capacity (less than 2%) of its onshore potential, which is estimated as 53,000 MW by Ministry of Energy and Natural Resources (MENR).[10] Lack of attractive incentives and tax advantages, limited grid access and restricted turbine supply constitutes the major barriers in front of the wind energy.

Renewable energy law, enacted in 2005, which had amendments in end of 2010 regarding feed-in tariffs, stipulates a purchase obligation by the retail companies for 10 years with a purchase price 7.3 USDc/kWh (~7.3 $c/kWh) for the power plants put in operation by end of 2015[11]. This tariff is much below the average remuneration in the leading wind markets and does not constitute a sufficient incentive for investments in little experienced wind energy sector of Turkey. The revenues calculated according to these regulations are considered in the investment planning of the projects and do not lead to returns that let the project be profitable or attractive for capital investors and lenders.

These numbers and figures show the contribution of a wind power project like Mordoğan WPP to the development of environmental friendly electricity generation instead of above described Turkish mix of hydroelectric and fossil fuelled power plants, which are better known and financially more attractive from an investor's point of view. 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.

Mordoğan WPP, as a large wind power plant project, will serve as a perfect project to demonstrate long-term potential of wind energy as a means to efficiently reducing GHG emissions as well as to diversifying and increasing security of the local energy supply and contributing to a sustainable development. Wind driven turbines will rotate in generators and electricity generated here will be transferred to the grid for consumer without any greenhouse gas emissions. V-C-S certification shall help to realize this seminal

[9] See, Annual Development of Turkey's Gross Electricity Generation of Primary Energy Resources (1975-2011): http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2011/uretim%20tuketim(22-45)/35(75-11).xls

[10] See, Presentation of Zeynep Günaydın from MENR, http://www.senternovem.nl/mmfiles/MENR_tcm24-287950.pdf page 9

[11] See : http://www.epdk.org.tr/documents/elektrik/mevzuat/kanun/Elk_Kanun_Yek_Kanun.doc (List I in page 10)

technology by providing an adequate compensation for the lacking financial incentives in the Turkish renewable energy market.

Generation of emission reduction and by the way crediting period will start with the first day of documented electricity supply to the national grid. The first 10-year crediting period is expected to be from 1st of February 2015 to 31st of January 2025 after the completion of commissioning. Applying the approved methodology to the project (detailed in the Section B) annual average amount of **26,593** tCO_2e emission reductions is estimated to be achieved by producing **45,588 MWh/year electricity**. In each year the amount of VERs actually generated by the project will vary depending on the metered net electricity supplied to the grid, but totally **265,930 tCO_2e** emission reductions is expected over the period of 10 years.

1.9 Project Location

Location of the project is given below in the Map 1.

The wind power plant is planned to be built close to Mordoğan, Karaburun in the province of İzmir in Turkey. The project site is located about 18.9 km south east of Karaburun, İzmir. On the 5.6 km north of the project Aegean Sea, on the 2.4 east of the project Ovacık, on the 3.4 km east of the project Aegean Sea and on the 1.81 km south of the project Güzelbahçe Bay are located. The closest settlement to the project site is Kösedere which is about 4.9 km away to the north of the wind farm and Mordoğan which is about 7.3 km away to the north of the plant[12].

[12] See; Mordoğan Bird Assessment Report, page 8

Map 1: Location of Mordoğan Wind Power Plant Project

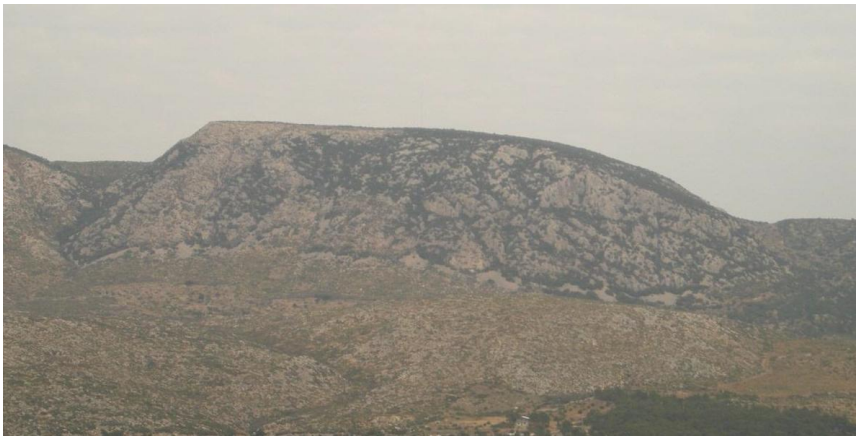
Table 6: Geographical coordinates of the wind turbines of the project activity[13]

Wind Turbine No.	Latitude (N)	Longitude (E)
1	38º29'25''	26º34'51''
2	38º29'24''	26º35'0''
3	38º29'24''	26º35'35''
4	38º29'21''	26º35'47''
5	38º29'31''	26º35'58''

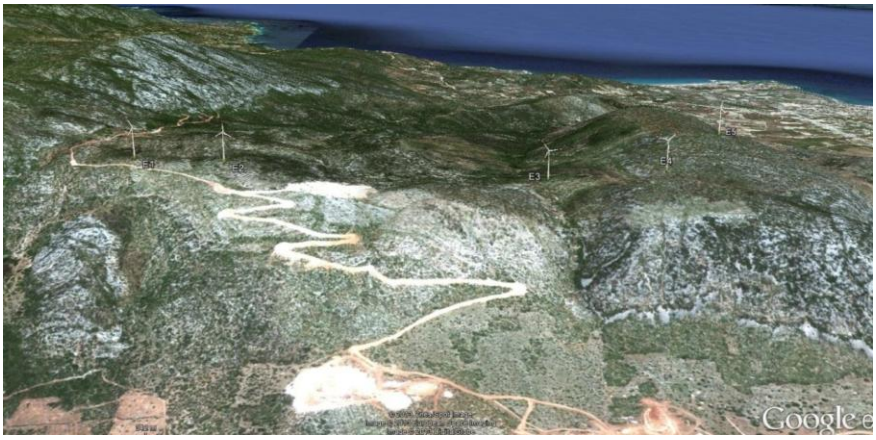
[13] See; Mordoğan Bird Assesment Report; page 53, for unit conservation see; http://www.rcn.montana.edu/resources/tools/coordinates.aspx?nav=11&c=UTM&md=83&mdt=NAD83/WGS84&z=35&e=591938&n=4469295&h=N

1.10 Conditions Prior to Project Initiation

Mordoğan WPP project site is located on west side of the Mordoğan. (see Map 1 above). The project area is on the top of the mountain. There is no agricultural area in the project area and the lands are owned by the state[14].
Project activity is not implemented for subsequent reduction of GHG. Project is a wind power plant implemented to generate electricity from renewable resources. Photos of the project area before and after the project implementation can be seen below;



Picture 1: Before the Project Implementation



Picture 2: After the Project Implementation (Simulation)

1.11 Compliance with Laws, Statutes and Other Regulatory Frameworks

The project is in line with all defined laws and regulations of Turkey. This is proven by the authorizations and operation permits obtained.

Laws as relevant to the project are (Law No. and Enactment Date):
(1) Electricity Market Law[15]
(2) Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy[16]
(3) Environment Law[17]

[14] See; Mordoğan WPP PIF, page: 13
[15] See: http://www.epdk.org.tr/documents/10157/351a7a0c-52a9-40d5-8e12-f8e61afe7247 (Enactment Date:2001)
[16] See: http://www.epdk.org.tr/documents/10157/4b360128-53aa-4174-8104-a6c10434ac9c (Enactment Date: 2005)

The renewable Energy generation license for Mordoğan WPP has been issued considering Electricity Law and Law in utilization of Renewable Energy Resources for the purpose of generating electricity energy. Environment Law is also satisfied in terms of sustainable development principles..

1.12 Ownership and Other Programs

1.12.1 Right of Use

Mordoğan WPP is a project by Egenda.

Respective documentation regarding the ownerships is given in Annex-2.

1.12.2 Emissions Trading Programs and Other Binding Limits

Not applicable: The project activity is neither included in an emissions trading program nor does it take place in a jurisdiction or sector in which binding limits are established on GHG emissions.

1.12.3 Participation under Other GHG Programs

The project does not participate/has not participated under any other GHG program.

1.12.4 Other Forms of Environmental Credit

The project has not created any form of other credit. Mordoğan WPP does not obtain any public funding.

1.12.5 Projects Rejected by Other GHG Programs

Mordoğan WPP has not applied for crediting under any other GHG program nor has it been rejected from any other GHG program.

1.13 Additional Information Relevant to the Project

Eligibility Criteria

Project is not classified as a grouped project.

Leakage Management

Not applicable. Leakage is not considered since project activity consists of installation of a new power plant.

Commercially Sensitive Information

Any commercially sensitive information that has been excluded from the public version of the VCS PD that will be displayed on the VCS Project Database shall be listed by the project proponent.

/FAD/ Financial analysis documentation

Further Information

Not applicable.

[17] See: http://www2.cevreorman.gov.tr/yasa/k/2872.doc (Enactment Date: 1983)

2. APPLICATION OF METHODOLOGY

2.1 Title and Reference of Methodology

The following CDM tools, guidelines and methodologies are used;

-The UNFCCC methodology AMS-I.D. “Grid connected renewable electricity generation” v.17.0.

-The UNFCCC methodology “Tool to calculate the emission factor for an electricity system”, v.03.0.0.

-“Guidelines on the Demonstration of Additionality of Small-Scale Project Activities”, v.9.0

2.2 Applicability of Methodology

In accordance with “Guidelines on the Demonstration of Additionality of Small-Scale Project Activities”, v.9.0, the project category is categorized as Type – I. D., Version 17, Sectoral Scope 1, “Grid connected renewable electricity generation”. Category I. D. is applicable to projects that use renewable energy technologies that supply electricity to the grid.

The applicability criteria of the above methodology in the context of the proposed CDM project are as follows:

Table 7: Applicability of Methodology

Technology /Measure as per AMS-I.D. (Version 17)	**Measure of the proposed CDM project activity**
This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: a) Supplying electricity to a national or a regional grid; or b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual agreement such as wheeling.	The proposed CDM project activity is a renewable power generation unit which uses wind as the source of energy. The proposed CDM project activity supplies electricity to the Turkish National Grid. Hence applicability condition is satisfied.
This methodology is applicable to project activities that (a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition ;(c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	The proposed CDM project activity is the installation of a new wind power plant at the project site where there was no wind power plant operating prior to the implementation of this project activity i.e. Greenfield plant. Hence applicability condition is satisfied.
Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: - The project activity is implemented in an existing reservoir with no change in the volume of reservoir; - The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m2; - The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m2.	The proposed CDM project activity is not a Hydro power plant. Hence this measure is not applicable.

If the new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The proposed CDM project activity does not involve any non-renewable component or co-fires fossil fuel. The proposed CDM project activity has only renewable energy (wind) component with the total installed capacity of 15 MW, which does not exceed the eligibility limit of 15 MW for the small-scale CDM projects. At any given point of time, the capacity of the said project activity shall not exceed 15 MW. Hence applicability condition is satisfied.
Combined heat and power (co-generation) systems are not eligible under this category.	No such system is present in the proposed CDM project activity.
In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	The proposed CDM project activity does not involve any addition to existing renewable energy generation unit and total installed capacity will remain at 15 MW throughout the entire crediting period.
In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.

Table 8: Applicability of Tool

This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side nergy efficiency projects).	As the project substitute grid electricity, the tool is applicable for the project activity.
Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, the conditions specified in "Appendix 2: Procedures related to off-grid power generation" should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	Only grid power plants are included
In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	the project electricity system is not located partially or totally in an Annex I country

2.3 Project Boundary

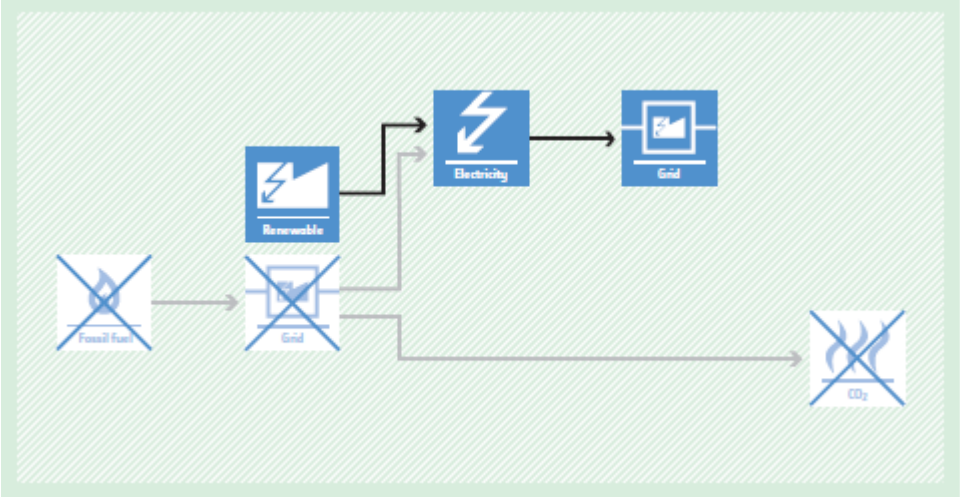


Figure 3: AMS I.D. project flow-diagram

Table 9: Overview of emission sources included or excluded from the project boundary

Source		Gas	Included?	Justification/Explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO2	Yes	Main Emission Source
		CH4	No	Minor emission source. Excluded for simplification
		N2O	No	Minor emission source. Excluded for simplification
Project Scenario	Emissions during construction and operation of the project activity	CO2	No	Minor emission source
		CH4	No	Minor emission source
		N2O	No	Minor emission source

2.4 Baseline Scenario

The baseline scenario is identified as "Electricity delivered to the grid by the project 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" defined in AMS I.D. v 17 via calculation of the combined margin calculation. For this the "Tool to calculate the emission factor for an electricity system" v.3 is applied.

Here for description and development of the baseline (Turkish grid emission factor) to the project activity, long-term electricity demand and supply projections for Turkey are assessed. The analysis shows that the share of fossil fuel-fired power capacity in Turkey and the related grid-emission factor are both expected to remain high.

Assessment of mid-term electricity demand and supply

Demand for electricity in Turkey is growing rapidly (annual average of 6.16% over past ten years).[18] The Turkish Electricity Transmission Company (TEİAŞ) as responsible institution for grid reliability has prepared an electricity demand projection for the next ten years period (2012-2021). This demand projection predicts a continuation of the trend of demand growth.[19]

Table 10: Low/High Demand Projection Scenarios - figures (TWh)

Scenarios	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
HighScenario	244.06	257.06	273.9	291.79	310.73	330.8	352.01	374.43	398.16	424.78
Low Scenario	244.026	262.01	281.85	303.14	325.92	350.3	376.35	404.16	433.9	467.26

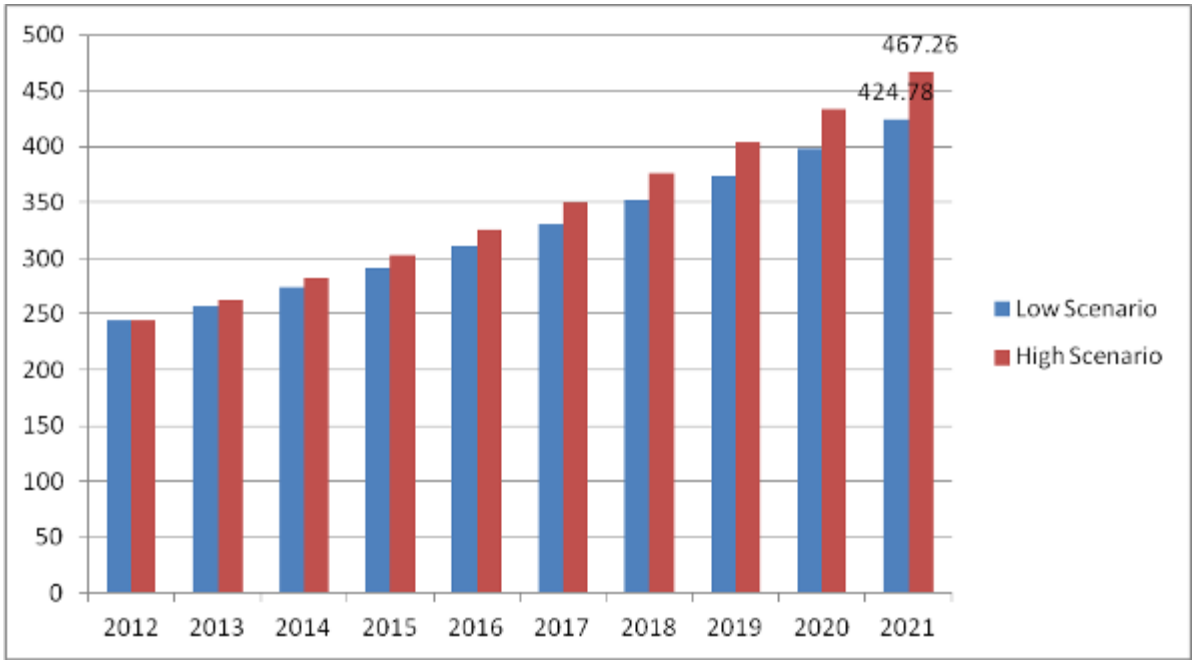


Figure 4: Low/High Demand Projection Scenarios - graphs (TWh)

[18] See, http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf (page 3, Table 1)
[19] See, http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf (page 24-25, Table 6 for High and Table 7 for Low Scenarios)

In this projection, electricity supply is also forecasted, taking into account all power plants, which are operational, under construction and newly licensed. Thus the projection of electricity generation is given (Table 11 below).

Table 11: Projection of Total Generation Capacity by Fuel Types[20]

YEARS	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	SHARE IN 2021 (%)
LIGNITE	52.683	52.861	53.185	57.261	61.236	61.333	61.333	61.333	61.333	61.333	*13.8%*
HARDCOAL	3.967	3.967	3.967	4.939	5.911	5.911	5.911	5.911	5.911	5.911	*1.3%*
IMPORTED COAL	26.821	26.780	26.281	30.790	37.901	39.626	39.673	39.673	39.673	26.821	*9%*
NATURAL GAS	150.688	152.777	158.748	169.522	175.072	175.154	176.011	175.785	176.011	176.011	*39.7%*
GEOTHERMAL	0.802	0.912	1.212	1.402	1.402	1.402	1.402	1.402	1.402	1.402	*0.3%*
FUEL OIL	9.224	9.224	9.224	9.224	9.224	9.224	9.224	9.224	9.224	9.224	*2.1%*
DIESEL	0.148	0.148	0.148	0.148	0.148	0.148	0.148	0.148	0.148	0.148	*0.0 %*
NUCLEER	0	0	0	0	0	0	0	4.200	12.600	21.000	*4.7%*
OTHER	1.408	1.408	1.408	1.408	1.408	1.408	1.408	1.408	1.408	1.408	*0.3%*
THERMAL TOTAL	245.739	248.076	254.172	274.693	292.301	294.205	295.108	299.083	307.708	316.108	*70.79%*
BIOGAS+WASTE	945	1.111	1.166	1.196	1.196	1.196	1.196	1.196	1.196	1.196	*0.3%*
HYDRO	65.463	72.934	79.651	90.522	104.443	112.708	115.779	116.558	116.558	116.558	*26.3%*
WIND	6.315	7.001	8.343	9.208	9.208	9.208	9.208	9.208	9.208	9.208	*2.1%*
TOTAL	**318462**	**329123**	**343333**	**375619**	**407148**	**417317**	**421292**	**426044**	**434670**	**443070**	***100.0%***

According to the 10-year projection it is clear that fossil fuels will remain the main sources for electricity generation (70.79 % in 2021). Natural gas will continue to dominate the market while total imported fuel will still be at 39.7 %. Hydro will account for 26.3% of the mix whereas all non-hydro renewable combined (geothermal/biogas/waste/wind) will only account for 2.3% of all electricity generation. This projection is consistent with continuing fossil fuel dependent characteristics of Turkish electricity sector, which is illustrated in Figure 5 below. The share of fossil fuels in the mix has been continuously increasing since the 1970s, reaching 73.8% in 2011.

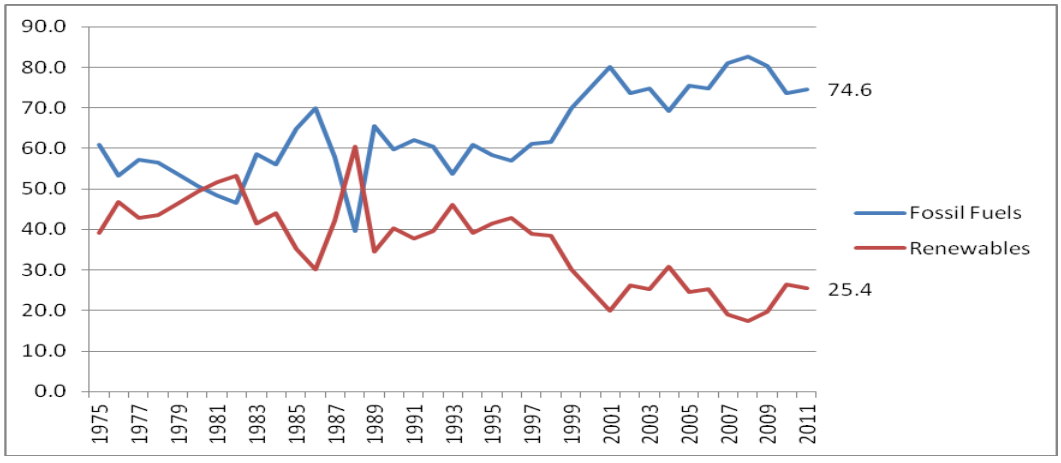


Figure 5: Fossil Fuels and Renewable in Turkish Electricity Mix (1975-2011)[21]

[20] See, http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf (page 51, Table 25)
[21] See, TEİAŞ, http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2011/uretim%20tuketim(22-45)/35(75-11).xls (Renewable generation is composing of 'renewable and waste', 'hydro' and 'geothermal and wind' data)

Conclusions on Baseline Development

The above given analysis of the baseline scenario (continuation of current situation) implies the following conclusions:

- **Conclusion-1:** Energy demand in Turkey has been increasing with significant rates since ten years, and it is expected to continue at least for next ten years.

- **Conclusion-2:** Even all operational plants, construction phase plants and licensed ones are taken into account lack of supply is projected after the year of 2017[22]. So, there is significant need for electricity generation investments to satisfy demand, which means electricity to be generated by the project activity would otherwise be generated by new power plants to avoid power shortage in coming years.

- **Conclusion-3:** Fossil fuels will hold the dominance in generation mix for at least midterm period (till the end of 2021) with 74.6% share. Hydro included renewables will remain low with 25.4% share and non-hydro energy contribution will stay negligible with only 2.6% of total share by the end of that period. This also shows that most of new capacity additions will be fossil fuel fired power plants.

The combination of aforementioned trends indicates that if Mordoğan WPP would not be built, power from a new grid-connected thermal plant would be the most likely scenario.

2.5 Additionality

Attachment A to appendix B"[23] document of "indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories", project participants are required to provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

a) Investment barrier
b) Technological barrier
c) Barrier due to prevailing practice
d) Other barriers

Investment barrier (option a) in accordance with Attachment A to Appendix B (Version 09) Non-binding best practice examples to demonstrate additionality for SSC project activities as per Annex 34[24] (EB 35). The investment analysis is discussed below:. The investment analysis is discussed below:

Regarding documentation for proof of the early consideration of VER incomes, please refer to Table 15.

Investment Analysis

The investment analysis for this project activity has done as per the Methodological Tool –"Tool for the demonstration and assessment of additionality"[25], (Version- 7).

As per this tool, it is to be determined that the project activity is not:

a) The most economically or financially attractive; or

[22] See, http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf (page 99, Table 48)
[23] See, http://cdm.unfccc.int/Reference/Guidclarif/meth/methSSC_guid05.pdf
[24] See, http://cdm.unfccc.int/EB/035/eb35_repan34.pdf
[25] See, http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf

b) Economically or financially feasible, without the revenue from the sale of emission reductions.

By applying sub-steps:

Sub-step 2a: Determine appropriate analysis method:

- Option I: Simple cost analysis
- Option II: Investment comparison analysis
- Option III: Benchmark analysis

The simple cost analysis is not applicable for the proposed project because the project activity will have revenue (from electricity sales) other than VER related income. The investment comparison analysis is also not applicable for the proposed project because the baseline scenario, providing the same annual electricity output by the Turkish National Grid, is not an investment project.

To conclude, the benchmark analysis will be used to identify whether the financial indicators (Project IRR in this case) of the proposed project is better than relevant benchmark value.

Sub-step 2b: Option III. Apply Benchmark analysis

While applying the Benchmark Analysis, Option III, the Equity IRR is selected as the financial indicator for the demonstration of the additionality of the project as permitted in the additionality tool.

Benchmark rate is calculated in line with "Tool for the demonstration and assessment of additionality" which suggests to use the government bond rates, increased by a suitable risk premium. The government bonds are used for determining the Benchmark because there is no pre-determined value for IRR or any other financial indicator for wind power projects in Turkey at the investment decision date of the project.

According to the Tool, benchmark can be derived from '*Estimates of the cost of financing and* ***required return on capital*** *(e.g. commercial lending rates and guarantees required for the country and the type of project activity concerned),* ***based on bankers views*** *and private equity investors/funds*'. As a banker view, according to Worldbank loan appraisal document[26], threshold equity IRR for wind power investments (i.e. required returns of equity for wind power plant investors) in Turkey is 15%.

Sub-step 2c: Calculation and comparison of the IRR

The IRR is calculated on the basis of expected cash flows (investment, operating costs and revenues from electricity sale), as used in the financial analysis for the feasibility assessment of the project. The parameters and values used for the IRR calculation are available to DOE during validation. A short overview on financial inputs is given in Table 12.

[26] Worldbank - Project Appraisal Document on a IBRD Loan and a Proposed Loan from Clean Technology Fund to TSKB and TKB with the Guarantee of Turkey, May 2009 (http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2009/05/11/000333037_20090511030724/Rendered/PDF/468080PAD0P112101Official0Use0Only1.pdf page 80, paragraph 29 and page 81, Table 11.5. In order to access to the file, copy and paste the complete link to the web browser.)

Table 12: Financial Inputs

Installed Power	15[27]	MWe
Annual Electricity Generation	45.588[28]	GWh
Total Project Cost	26,053,600[29]	USD
Operational Duration	25	years
Income Tax Rate	20%	%
Electricity Selling Price	73[30]	$/MWh
Annual Operating Cost	1,134,866[31]	USD
EUR/USD Exchange Rate	1.29	€/USD
USD/TL Exchange Rate	1.82	USD/TL

Operational life time of the Mordoğan WPP is determined by using the 'Tool to determine the remaining lifetime of equipment"[32].

In the tool it is stated that;

Project participants may use one of the following options to determine the remaining lifetime of the equipment:

(a) Use manufacturerís information on the technical lifetime of equipment and compare to the date of first commissioning;
(b) Obtain an expert evaluation;
(c) Use default values.

For the project option (c) is used. So in the tool it is said that default lifetime for the on-shore wind turbines is 25 years
.

The resulting equity IRR after Tax for Base Case Scenario (73 $/MWh) 25 operational years is stated in below Table 13.

Table 13: Equity IRR value (after tax) for project activity

Period	IRR
25 operational years	8.79 %

As resulting IRR for the project activity are clearly below the 15% benchmark, the project activity is unlikely to be economically attractive.

With figures taken from the Generation License, Plant Load Factor (PLF) is calculated as follows;

[27] See, Equipment Contract
[28] See, Barlovento Wind-Resourcce-Assessment, page 46, alternative 6
[29] See; See; Total Project cost figure is taken from Financial Report and Equipment agreement of the Mordoğan WPP
[30] See, www.epdk.gov.tr/documents/10157/4b360128-53aa-4174-8104-a6c10434ac9c, page 9 Table I
[31] See; Estimation of maintenance cost is taken from http://www.wind-energy-the-facts.org/en/part-3-economics-of-wind-power/chapter-1-cost-of-on-land-wind-power/operation-and-maintenance-costs-of-wind-generated-power.html plus estimation of personal costs and annual system usage fee.
[32] See, http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf

PLF= Annual Gen. / Installed Cap. * (working hours)

=45,588/15*8760

=0.35

Sub-step 2d: Sensitivity analysis

While the main parameter determining the income of the project is the electricity sales price, a variation of the accordant value shall demonstrate the reliability of the IRR calculation. For electricity price (EP), 73 $/MWh, which is the maximum of feed-in-tariff, is used as base case to be conservative.

For Sensitivity Analysis, power price, the investment amount, annual energy yield amount, construction cost and operating cost parameters are varied with +/- 10%. The worst, base and best-case results for each parameter variation are given in Table 14 below.

.

Table 14: IRR results according to different parameters (after tax)

Parameter	**Power Price**			**Investment Cost**			**Operating Cost**		
Variance	-10%	0%	10%	-10%	0	10%	-10%	0	10%
IRR	5.57%	8.79%	11.95%	13.26%	8.79%	6.26%	5.57%	8.79%	11.95%
Parameter	Energy Yield								
Variance	-10%	0%	10%						
IRR	10.88%	8.79%	6.43%						

The sensitivity analysis confirms that the proposed project activity is not likely to be economically attractive without the revenues from VERs as even the maximum IRR result for best-case scenario (13.26%) is considerably below the 15% benchmark.

The investment and sensitivity analysis shows that the VER revenues will improve the financial indicators of the project and make the project more attractive for investors and funding institutions. Considering that figures above are based on highest governmental guarantee price rather than average price, optimistic estimations for yearly generation and that those figures do not reflect the risk for investment, role of carbon income is a most significant number to enable the project to proceed and favourable investment and funding decision taken.

Based on the analysis and information above, it is concluded that project is not the most attractive option considering alternative investment opportunities. Therefore project is considered as additional to the baseline scenario.

Prior Consideration of VER

Table 15: Implementation Schedule

Date	Activity Name
29-05-2008	Issuance of the License
09-08-2011	Board Decision
28-12-2011	Signature with FutureCamp Türkiye for VER Development
15.05.2013	Equipment Agreement (Investment Decision Date)
01-02-2014	Start of first Construction Activities (Expected)

According to Turkish regulations, to get necessary permits for further project implementation, granting generation license from Authority is required. Hence, issuance of license cannot be considered as 'Project Start Date' but a prerequisite to proceed for further project development activities. Date of

equipment agreement with Enercon (Table 15) shall be set as the investment decision date according to decision of EB41[33].

Above Implementation Schedule clearly shows that before starting to the project activity, 'Egenda' started to analysis of revenue from VER credit sale, decided to get consultancy for VER development which can be seen from Board Decision of Egenda. (09.08.2011).

2.6 Methodology Deviations

Not Applicable.

[33] See: http://cdm.unfccc.int/EB/041/eb41rep.pdf (paragraph 67)

3. QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

3.1 Baseline Emissions

Calculation of the Combined Margin (CM)

Stepwise approach of 'Tool to calculate the emission factor for an electricity system' version 03.0.0[34] is used to determine the combined margin (emission coefficient) as described below:

Step 1: Identify the relevant electric systems;

There are 21 regional distribution regions in Turkey but no regional transmission system is defined. In Article 20 of License Regulation it is stated that '*TEİAŞ shall be in charge of all transmission activities to be performed over the existing transmission facilities and those to be constructed as well as the activities pertaining to the operation of* ***national transmission system*** *via the National Load Dispatch Centre and the regional load dispatch centres connected to this centre and the operation of Market Financial Reconciliation Centre*[35]'. As it can be understood from this phrase, only one transmission system which is national transmission system is defined and only TEİAŞ is in charge of all transmission system related activities. Moreover, a communication with representative of TEİAŞ which indicates that: "There are not significant transmission constraints in the national grid system which is preventing dispatch of already connected power plants" is submitted to the DOE. Therefore, the national grid is used as electric power system for project activity. The national grid of Turkey is connected to the electricity systems of neighbouring countries. Complying with the rules of the tool, the emission factor for imports from neighbouring countries is considered 0 (zero) tCO_2/MWh for determining the OM.

There is no information about interconnected transmission capacity investments, as TEİAŞ, who operates the grid, also didn't take into account imports-exports for electricity capacity projections.[36] Because of that, for BM calculation transmission capacity is not considered.

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)

According to Tool project participants may choose between the following two options to calculate the operating margin and build margin emission factor:

Option I: Only grid power plants are included in the calculation.

Option II: Both grid power plants and off-grid power plants are included

For this project, **Option I** is chosen.

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

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods,:

(a) Simple OM; or

(b) Simple adjusted OM; or

(c) Dispatch data analysis OM; or

(d) Average OM.

[34] See: http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v3.0.0.pdf
[35] See: http://www.ongurergan.av.tr/en-EN/mevzuat/Electric%20Market%20Licensing%20Regulation.doc (page 21)
[36] See: http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf

The Simple Operating Margin (OM) emission factor (EFgrid, OM, y) is calculated as the generation weighted average CO2 emissions per unit net electricity generation (tCO2/MWh) of all the generating plants serving the system, excluding low-cost/must-run power plants. As electricity generation from solar and low cost biomass facilities is insignificant and there are no nuclear plants in Turkey, the only low cost /must run plants considered are hydroelectric, wind and geothermal facilities.

The Turkish electricity mix does not comprise nuclear energy. Also there is no obvious indication that coal is used as must run resources. Therefore, the only low cost resources in Turkey, which are considered as must-run, are Hydro, Renewables and Waste, Geothermal and Wind (according to statistics of TEİAŞ).

Table 16: Share of Low Cost Resource (LCR) Production 2006-2010 (Production in GWh)[37]

	2007	2008	2009	2010	2011
Gross production	191,558.1	198,418.0	194,812.9	211,207.7	229,395.1
TOTAL LCR Production	36,575.6	34,498.6	38,229.6	55,837.6	58,226.0
Hydro	35,850.8	33,269.8	35,958.4	51,795.5	52,338.6
Renewables and Waste	213.7	219.9	340.1	457.5	469.2
Geothermal and Wind	511.1	1,008.9	1,931.1	3,584.6	5,418.2
Share of LCRs	*19.09%*	*17.39%*	*19.62%*	*26.44%*	*25.38%*
Average of last five years	**21.58%**				

As average share of low cost resources for the last five years is far below 50% (21.58%), the Simple OM method is applicable to calculate the operating margin emission factor ($EF_{grid,OM,y}$)

For the Simple OM method, the emissions factor can be calculated using either of the two following data vintages:

- Ex-ante option: A 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation, or
- Ex-post option: The year, in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

The ex-ante option is selected for Simple OM method, with the most recent data for the baseline calculation stemming from the years 2009 to 2011.

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. The calculation of the simple OM emission factor can be based on:

- net electricity generation and corresponding CO_2 emission factor of each power unit (Option A), or
- 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).

Option B is chosen to calculate the Simple OM, as there is no power plant specific data available. Renewable power generation is considered as low-cost power source and amount of electricity supplied to the grid by these sources is known.

Where 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, and

[37] See: http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2011/uretim%20tuketim(22-45)/35(75-11).xls

based on the fuel type(s) and total fuel consumption of the project electricity system, as per formula in the tool:

$$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} x NCV_{i,y} x EF_{CO2,i,y}}{EG_y} \quad \textbf{(1)}$$

Where:

$EF_{grid,OMsimple,y}$	=	Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)
$FC_{i,y}$	=	Amount of fossil fuel type i consumed in the project electricity system in year y (mass or volume unit)
$NCV_{i,y}$	=	Net calorific value (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 (MWh)
i	=	All fossil fuel types combusted in power sources in the project electricity system in year y
y	=	three most recent years for which data is available at the time of submission of the PDD to the DOE for validation

For the calculation of the OM the consumption amount and heating values of the fuels for each sources used for the years 2009, 2010 and 2011, is taken from the TEİAŞ annual statistics, which holds data on annual fuel consumption by fuel types as well as electricity generation amounts by sources and electricity imports. All the data needed for the calculation, including the emission factors and net calorific values (NCVs), are provided in part B of this Annex. Total CO_2 emission due to electricity generation in Turkey for the years of 2009, 2010 and 2011 are given in Table 17.

Table 17: CO_2 emissions from electricity production 2009-2011 ($ktCO_2$)[38]

	2009	2010	2011
CO2-Emmissions	97,863	98,478	109,963

Table 18 below presents the gross electricity production data by all the relevant energy sources. Low-cost/must run resources like hydro, wind, geothermal and biomass do not emit fossil CO_2 and thus are not taken into account in calculations.

Table 18: Gross electricity production by fossil energy sources 2009-2011[39] (GWh)

Energy Source	2009	2010	2011
Natural Gas	96,094.7	98,143.7	104,047.6
Lignite	39,089.5	35,942.1	38,870.4
Coal	16,595.6	19,104.3	27,347.5
Fuel Oil	4,439.8	2,143.8	900.5
Motor Oil	345.8	4.3	3.1
Naphtha	17.6	31.9	0.0
LPG	0.4	0.0	0.0
Total fossil fuels	**156,583.4**	**155,370.1**	**171,169.1**

[38] For detail calculation see section PART A of Annex 1 below.
[39] http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2011/uretim%20tuketim(22-45)/35(75-11).xls

Table 18 shows gross data, but EG_y in the above described formula means electricity delivered to the grid, i.e. net generation. Therefore following Table 19 shall help to derive net data by calculating the net/gross proportion on the basis of overall gross and net production numbers.

Table 19: Net/gross electricity production 2009-2011 (GWh)[40]

	2009	2010	2011
Gross Production	194,812.90	211,207.70	229,395.10
Net Production	186,619.30	203,046.10	217,557.70
Relation	**95.79%**	**96.14%**	**94.84%**

Multiplying these overall gross/net relation percentages with the fossil fuels generation amount does in fact mean an approximation. However this is a conservative approximation as the consumption of plant auxiliaries of fossil power plants is higher than for the plants that are not included in the baseline calculation. In the end this would lead to a lower net electricity generation and therefore to a higher OM emission factor and higher emission reductions.
Table 20 shows the resulting net data for fossil fuel generation and adds electricity imports.

Table 20: Electricity supplied to the grid, relevant for OM (GWh)

	2009	2010	2011
Net El. Prod. by fossil fuels	156,768.3	149,997.7	149,366.2
Electricity Import	789.4	812.0	1,143.8
Electricity supplied to grid by relevant sources	**157,557.7**	**150,809.7**	**150,510.0**

Electricity import is added to the domestic supply in order to fulfil the Baseline Methodology requirements. Imports from connected electricity systems located in other countries are weighted with an emission factor of 0 (zero) tCO_2/MWh.

The last step is to calculate $EF_{grid,OMsimple,y}$:

Table 21: Calculation of Weighted EFgrid,OMsimple,y (ktCO2/GWh)

	2008	2009	2010
CO_2-Emmissions ($ktCO_2$)	97,863	98,478	109,963
Net Electricity Supplied to Grid by relevant sources (GWh)	150,809.7	150,510.0	166,892.1
$EF_{grid,OMsimple,y}$ ($ktCO_2/GWh$)	0.6489	0.6543	0.6589
3-year Generation Weighted Average $EF_{grid,OMsimple,y}$ ($ktCO_2/GWh$)	0.6542		

Step 5: Calculate the build margin (BM) emission factor

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

Option 2: For the first crediting period, the build margin emission factor shall be updated annually,

[40] For Net Production See, http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2011/uretim%20tuketim(22-45)/33(84-11).xls

ex post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated *ex ante*, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.
Again, the project proponents can chose between two options according to the calculation tool: calculate the BM ex-ante based on the latest available data or update the BM each year ex post. Option 1, the ex-ante approach, is again chosen.

The sample group of power units *m* used to calculate the build margin should be determined as per the following procedure, consistent with the data vintage selected above. The last plant of the sample group is built in 2009 and until the end of the 2011 which is the latest year for official statistics published for plants put in operation. VER plants are excluded from sample group. While identifying the sample group dismantled, revised, retrofits are not included. Only new capacity additions (power plants / units) are taken into account. All power plants in operation by 2011 are given in Annex 3.

Total electricity generation in 2011 is **229,395.1** GWh and 20% of this generation is **45,879.02** ($AEG_{SET->20\%}$) GWh. Total electricity generation of last five power plants in operation is 826.5 GWh ($AEG_{SET-5-units}$) which is lower than 20% total generation in 2011. Since $AEG_{SET->2\%0}$ is bigger than $AEG_{SET-5-units}$, $SET_{>20\%}$ is chosen as SET_{sample}. Also in the sample group there is no power plant started supply electricity to grid more than 10 years ago, steps d, e and f are ignored.

Sample group for BM emission factor is given below table. The derivation of the values presented in Table 22 is contained in a separate excel file which is available for validation.

Table 22: Sample group generation for BM emission factor calculation (GWh)

Energy Source	2009	2010	Sample Group Total Generation (GWh)
Natural Gas	12,705.5	12,484.3	**25,189.7**
Lignite	0.0	0.0	**0.0**
Coal	9,080.0	4,320.0	**13,400.0**
Fuel Oil	0.0	701.2	**701.2**
Hydro	3,336.8	3,730.4	**7,067.2**
Renewables	0.0	150.0	**150.0**
TOTAL	**25,122.3**	**21,385.8**	**46,508.09**

The build margin emissions factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units *m* during the most recent year *y* for which power generation data is available, calculated as per formula in the tool:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} x EF_{EL,m,y}}{\sum_m EG_{m,y}} \quad \textbf{(2)}$$

Where:

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

y = Most recent historical year for which power generation data is available

Because of only fuel types and electricity generation data are available for the sample group, *Option B2* of Simple OM method is used to calculate emission factor. The formula of the tool is below:

$$EF_{EL,m,y} = \frac{EF_{CO2,m,i,y} x 3.6}{\eta_{m,y}} \quad \textbf{(3)}$$

Where:

$EF_{EL,m,y}$ = CO_2 emission factor of power unit m in year y (tCO_2/MWh)
$EF_{CO2,m,i,y}$ = Average CO_2 emission factor of fuel type i used in power unit m in year y (tCO_2/GJ)
$\eta_{m,y}$ = Average net energy conversion efficiency of power unit m in year y (%)
y = Three most recent years for which data is available at the time of submission of the PDD to the DOE for validation

BM emission factor calculation and resulted BM factor is given in the Table 23. For BM factor calculation, since no official emission factors for different fuel types are available, lower confidence default values of IPCC Guidelines are applied. Explanation of emission factor selection for each energy sources and references are given in section 3.3 of the PDD.

Table 23: BM emission factor calculation as per tool equations 13/3

Energy Source	Sample Group Total Generation (GWh)	Effective CO_2 emission factor (tCO_2/TJ)	Average Efficiency ($\eta_{m,y}$)	CO_2 Emission ($ktCO_2$)
Natural Gas	25,189.7	54.3	60%	8,206.8
Lignite	0.0	90.9	50%	0.0
Coal	13,400.0	89.5	50%	8,635.0
Fuel Oil	701.2	72.6	46%	398.4
Hydro	7,067.2	0.0	0.00%	0.0
Renewables	150.0	0.0	0.00%	0.0
Total	**46,508.09**			**17,240.1**
$EF_{grid,BM,y}$ (tCO_2/MWh)	**0.3707**			

Step 6: Calculate the combined margin emission factor

The calculation of the combined margin (CM) emission factor (*EFgrid,CM,y*) is based on one of the following methods:
(a) Weighted average CM; or
(b) Simplified CM.

The combined margin emission factor is calculated by using weighted average CM as per tool formula below:

$$EF_{grid,CM,y} = EF_{grid,OM,y} * w_{OM} + EF_{grid,BM,y} * w_{BM} \quad \textbf{(5)}$$

Where:

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

w_{OM} = Weighting of operating margin emissions factor (%)
w_{BM} = Weighting of build margin emissions factor (%)

According to the Tool for wind power generation project activities: w_{OM} = 0.75 and w_{BM} = 0.25. Then:

$EF_{grid,CM,y}$ = 0.6531 tCO2/MWh * 0.75 + 0.3707 tCO2/MWh * 0.25

= 0.5833 tCO2/MWh

As per AMS I.D. baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. This is calculated as per formula 1:

$BE_y = (EG_{BL,y}) \times EF_{CO2,\ grid,y}$ **(1)**

Where:
BE_y = Baseline emissions in year *y* (tCO_2/yr).

$EG_{BL,y}$ = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y* (MWh)

$EF_{grid,CM,y}$ = CO_2 emission factor of the grid in year y (tCO_2/MWh)

$BE_y = EG_{facility,y} * EF_{CO2,\ grid,y}$ = 45,588 MWh/year * 0.5833 tCO_2/MWh
= **26,593 tCO_2/year**

3.2 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 tCO2/year

3.3 Leakage

No leakage is applicable under this methodology.

3.4 Summary of GHG Emission Reductions and Removals

Emission reductions are calculated as follows:

$ER_y = BE_y - PE_y - LE_y$ **(10)**

Where:
ER_y = Emission reductions in year y (t CO_2/yr).
BE_y = Baseline emissions in year y (t CO_2/yr).
PE_y = Project emissions in year y (t CO_2/yr).
LE_y = Leakage emissions in year y (t CO_2/yr).

Table 24 : Net Emission Reductions

Years	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
2015*	24,377	0	0	24,377
2016	26,593	0	0	26,593
2017	26,593	0	0	26,593
2018	26,593	0	0	26,593
2019	26,593	0	0	26,593
2020	26,593	0	0	26,593
2021	26,593	0	0	26,593
2022	26,593	0	0	26,593
2023	26,593	0	0	26,593
2024	26,593	0	0	26,593
2025**	2,216	0	0	2,216
Total	265,930	0	0	265,930

*Starts from 1st of February 2015
** Ends at 31st of January 2025

4. MONITORING

4.1 Data and Parameters Available at Validation

Data Unit / Parameter:	**Gross electricity generation**
Data unit:	MWh
Description:	Gross Electricity supplied to the grid by relevant sources (2009-2011)
Source of data:	Turkish Electricity Transmission Company (TEİAŞ), Annual Development of Turkey's Gross Electricity Generation of Primary Energy Resources (1975-2011) TEİAŞ http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2011/uretim%20tuketim(22-45)/35(75-11).xls
Value applied:	See Table 18.
Justification of choice of data or description of measurement methods and procedures applied:	Data used for emission reduction calculation
Any comment:	TEİAŞ is the national electricity transmission company, which makes available the official data of all power plants in Turkey.

Data Unit / Parameter:	**$EF_{grid, CM, y}$**
Data unit:	tCO_2/MWh
Description:	Combined margin CO_2 emission factor for the project electricity system in year 2011
Source of data:	As per "Tool to calculate the emission factor for an electricity system"
Value applied:	0.5833 tCO_2/MWh
Justification of choice of data or description of measurement methods and procedures applied:	As per "Tool to calculate the emission factor for an electricity system" Calculated from data provided by the TEIAS for Turkish Power Sector; Operating Margin = 0.6542 KgCO2e/KWh Build Margin = 0.3707 KgCO2e/KWh Combined Margin = 0.5833 KgCO2/KWh
Any comment:	Emission Factor is fixed at ex-ante calculation.

Data Unit / Parameter:	**Eg_y**
Data unit:	MWh
Description:	Net electricity generated by project electricity system in year 2009, 2010 and 2011
Source of data:	Turkish Electricity Transmission Company (TEIAS), Annual Development of Electricity Generation- Consumption and Losses in Turkey (1984-2011) TEIAS, see http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2011/uretim%20tuketim(22-45)/33(84-11).xls
Value applied:	See Table 19 and Table 20

Justification of choice of data or description of measurement methods and procedures applied:	This data is used to find relation between the gross and net electricity delivered to the grid by fossil fuel fired power plants. (See Table 19). Import and Export data is used to identify total net electricity fed into the grid in the years of 2009, 2010 and 2011 (See Table 20). TEİAŞ is the national electricity transmission company, which makes available the official data of all power plants in Turkey.
Any comment:	

Data Unit / Parameter:	**$EF_{CO2,i,y}$**
Data unit:	tCO_2/GJ
Description:	CO_2 emission factor of fuel type i used in power unit m in year 2011
Source of data:	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the IPCC Guidelines on National GHG Inventories. See http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf
Value applied:	See Table 23 and See Table 27
Justification of choice of data or description of measurement methods and procedures applied:	No plant specific and national emission factor data is available in Turkey. So, IPCC default data is used. For Fuel Oil Power Plants: 'Gas/Diesel Oil' data is used for conservativeness. For Coal Power Plants: In the 205th page of official document given in the link below, it is stated that Çolakoğlu and İçdaş utilizes 'Taşkömürü' (Hardcoal). And at the Table-2 in page 157 of the same document, Taşkömürü is dived in two groups: Bituminous and Antharcite. Since Sub-Bituminous Coal is under Brown Coal in the same table and since Other Bituminous Coal has lower EF than Anthracite in 1.4 of IPCC Guidelines, EF for 'Other Bituminous Coal' is used. See: http://www.dpt.gov.tr/DocObjects/Icerik/4225/Enerji_Hammaddeleri_(Linyit_Taskömuru-Jeotermal)
Any comment:	**EF_i**

Data Unit / Parameter:	**Sample Group for BM emission factor**
Data unit:	Name of the plants, MW capacities, fuel types, annual electricity generations and dates of commissioning.
Description:	Most recent power plants which compromise 20% of total generation
Source of data:	Annual Development Of Fuels Consumed In Thermal Power Plants In Turkey By The Electric Utilities, TEIAS: http://www.epdk.org.tr/yayin_rapor/elektrik/yayin/uretimKapasiteProjeksiyonu.pdf http://www.epdk.org.tr/yayin_rapor/elektrik/yayin/uretimKapasiteProjeksiyonu2008_2017.pdf http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2009.pdf http://www.teias.gov.tr/projeksiyon/KAPASITE%20PROJEKSIYONU%202010.pdf http://www.epdk.org.tr/documents/10157/8edb1470-7667-4ce1-8ce5-21d1ce4e4761 http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf
Value applied:	Table 29
Justification of choice of data or description of measurement	TEIAS is the national electricity transmission company, which makes available the official data of all power plants in Turkey. The latest data available during PDD

methods and procedures applied:	preparation was for 2011.
Any comment:	

Data Unit / Parameter:	$\eta_{i,y}$
Data unit:	-
Description:	Average energy conversion efficiency of power unit m in year y
Source of data:	Annex I the "Tool to calculate the emission factor for an electricity system"
Value applied:	Table 23
Justification of choice of data or description of measurement methods and procedures applied:	For efficiency rates of Coal and Lignite Power Plants See Annex-1 of the Tool (highest rate is applied to be conservative) For Natural Gas and Oil plants efficiencies, default value given in the tool is applied: http://cdm.unfccc.int/methodologies/Tools/EB35_repan12_Tool_grid_emission.pdf
Any comment:	

Data Unit / Parameter:	$HV_{i,y}$
Data unit:	Mass or volume unit
Description:	Heating Values of fuels consumed for electricity generation in the years of2009, 2010 and 2011
Source of data:	Heating Values Of Fuels Consumed In Thermal Power Plants In Turkey By The Electric Utilities, TEİAŞ. See: http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2011/yak%C4%B1t46-49/49.xls
Value applied:	See Table 25
Justification of choice of data or description of measurement methods and procedures applied:	There is no national NVC data in Turkey. However, TEİAŞ announces Heating values of fuels. This data is used to calculate annual NCVs for each fuel type TEİAŞ is the national electricity transmission company, which makes available the official data of all power plants in Turkey.
Any comment:	

Data Unit / Parameter:	$FC_{i,y}$
Data unit:	Mass or volume unit
Description:	Amount of fuel type i consumed by relevant power plants in Turkey in the years of 2009, 2010 and 2011
Source of data:	Annual Development of Fuels Consumed In Thermal Power Plants In Turkey By The Electric Utilities, TEİAŞ. See: http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2011/yak%C4%B1t46-49/47.xls
Value applied:	See Table 26
Justification of choice of data or description of measurement	TEİAŞ is the national electricity transmission company, which makes available the official data of all power plants in Turkey.

methods and procedures applied:	
Any comment:	

Data Unit / Parameter:	$NCV_{i,y}$
Data unit:	TJ/kton, TJ/million m^3
Description:	Net calorific value (energy content) of fuel type i in years of 2009, 2010 and 2011
Source of data:	Calculated by using HVi,y to FCi,y as Net Calorific Values of fuel types are not directly available in Turkey. Calculation of NCVs from national HVi,y and FCi,y data, Table 18 and Table 19, is preferred to default IPCC data as these are more reliable.
Value applied:	See Table 27
Justification of choice of data or description of measurement methods and procedures applied:	TEİAŞ is the national electricity transmission company, which makes available the official data of power plants in Turkey.
Any comment:	

4.2 Data and Parameters Monitored

Data Unit / Parameter:	$EG_{facility,y}$
Data unit:	MWh/yr
Description:	Quantity of net electricity generation supplied to the grid in year y
Source of data:	The data from the Electricity Meters are the basis for the settlement notification of PMUM. Data are gathered electronically from the meters by TEIAS and stored in secured website of PMUM, which is accessible to project developer with a private password. For monitoring, the monthly settlement notification of PMUM shall be used as source of data.
Description of measurement methods and procedures to be applied:	• Two electricity meters will be placed (one main and one reserve) at the substation. These meters are sealed by TEIAS and intervention by project proponent is not possible. The fact that two meters are installed in a redundant manner keeps the uncertainty level of the only parameter for baseline calculation low. High data quality of this parameter is not only in the interest of the emission reduction monitoring, but paramount for the business relation between the plant operator and the electricity buyers. • Monthly settlement notifications of PMUM (Piyasa Mali Uzlaştırma Merkezi) consist hourly electricity production and withdrawn from the grid. • Since the meters are reading electricity supplied to the system and withdrawn from the system separately, the net electricity amount supplied to the grid will be calculated by electricity supplied minus electricity

	withdrawn which will be taken from monthly settlement notifications. The above described measurement method follows Article 81 of the official regulation "Electricity Market Balancing And Settlement Regulation"[41]
Frequency of monitoring/recording:	Continuous monitoring and at least monthly recording
Value applied:	-
Monitoring equipment:	Meters are in compliance with the communiqué for Metering Devices to be used in Electricity Market. They have an accuracy class 0.5s.
QA/QC procedures to be applied:	According to the Article 2 of the Communiqué of Meters in Electricity Sector[42]: '*The meters to be used in the electricity market shall be compliant with the standards of Turkish Standards Institute or IEC and have obtained* ***"Type and System Approval" certificate from the Ministry of Trade and Industry.'*** Therefore, Ministry of Trade and Industry (Ministry) is responsible from control and calibration of the meters. Also according to Article 11 of this Communiqué, meters shall be in class of 0.5s, which means error interval for measuring is in +-0.5% range which is well acceptable according to rules. Paragraph b) of the Article 9 of the 'Regulation of Metering and Testing of Metering Systems'[43] (Regulation) of Ministry states that: ' *b) Periodic tests of meters of electricity, water, coal gas, natural gas and current and voltage transformers are done* ***every 10 years****.'* Therefore periodic calibration of the meters will be done every 10 years. Also according to Article 67 (page 20) of this regulation, the calibration shall be done in calibration stations which have been tested and approved by Ministry of Trade and Industry. Article 10 d) of Communiqué requires the meters shall be three phase four wire and Article 64 of Regulation clearly states how calibration shall be performed for this kind of meters. As above mentioned, the data acquisition and management and quality assurance procedures that are anyway in place, no additional procedures have to be established for the monitoring plan. In addition to that the quantity of net electricity delivered to the grid will be cross checked with the meter reading records (OSF forms) provided to the company by TEIAS and internal reports provided to the head of the company by the plant manager.

[41] See, http://www.epdk.gov.tr/documents/elektrik/mevzuat/yonetmelik/elektrik/dengeleme_uzlastirma/DUYson.doc page 55
[42] See, http://www.epdk.gov.tr/documents/elektrik/mevzuat/teblig/elektrik/sayaclar_hakkinda/Elk_Tblg_Sayaclar.doc
[43] See, http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.6381&MevzuatIliski=0&sourceXmlSearch=

Calculation method:	The net electricity will be calculated by: a) Subtracting self consumption value from gross generation value for each month to find the net electricity supplied to the grid. b) Adding up all monthly net electricity values to calculate the total net electricity supplied to the grid during the monitoring period. c) Multiplying the total net electricity value with the CM emission factor.
Any comment:	Estimated amount of the yearly electricity generation is 45,588 MWh.

4.3 Description of the Monitoring Plan

As described above, the relevant data that has to be monitored is the electricity supplied to the grid (EG_y) per year.

$EG_{facility,y}$:
These data are subject to the accounting quality systems of both parties to the power purchase agreement, TEIAS and **Egenda**. With this, no additional structures or processes have to be implemented to insure the availability of necessary data for monitoring.

The plant manager is responsible for communication with TEIAS and undertaking the corrective action in line with the TEIAS procedures and rules if it falls under the authority of the plant manager. However, this might need the involvement of TEIAS as well as the project owners are not allowed to make changes or fixes on the meters. Thus, in case of a non-conformity, the plant manager will report it instantly to TEIAS. Also plant manager is responsible for collecting and archiving monthly PMUM screenshots electronically.

At the end of one monitoring period, which is planned to generally last one year, the data from the monthly meter reading records by PMUM (Market Financial Settlement Centre) will be added up to the yearly net electricity generation and multiplied with the combined margin emission factor with the help of an excel spreadsheet that also contains the combined margin calculation. Thus, the complete baseline approach is always transparent and traceable.

Technicians in Mordoğan WPP daily reads meters and keeps record for electricity generation amount and reports to management. These records can be used for monitoring in case of any problem will arise in meters.

For the operating stage the responsibilities and management structure has to be defined. Names, jobs and structure will be presented with the first monitoring report.

Currently the following information on staff and responsibilities at Mordoğan WPPs can be given:

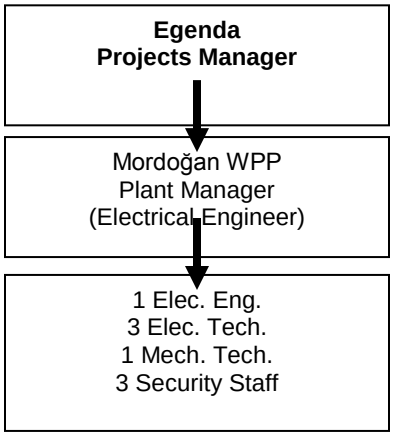


Figure 6: Organisation chart

All data monitored under the monitoring plan will be kept in electronic form and hard copy for 2 years after the end of the crediting period. Egenda's Project Manager Mrs. Ayça Karaduman is the authority and responsibility of overall project management.

The GHG information system at Mordoğan WPP is in line with VCS standards. It includes definition and description of

- monitored parameters (see especially 4.2);
- how this data is obtained, recorded and compiled (see especially 4.1 and 4.2);
- how it is analysed and used for quantifying and reporting GHG emissions (see especially sections 4 and 4.2 above).
- The combined margin calculation that is relevant for definition of the baseline scenario is described and analysed in Step 3("Baseline information").

5. ENVIRONMENTAL IMPACT

Mordoğan WPP has been exempted from the preparation of a Environmental Impact Assessment by the Ministry of Environment and Forest as it has been classified a "C" project with minimal social and environmental impact. The certificate is attached in Annex 2.

Although there was no significant environmental impacts determined, the summary of the impacts outlined in the Preliminary Environmental Impact Assessment.

Air Quality; Necessary precautions will be taken in order to minimize the dust formed during construction.

Water quality; the project has no negative impact on the water quality and quantity.

Biodiversity; In Turkey there are 35 Nature Preservation Area and 37 National Parks. The project is not located in any of these. Furthermore in Turkey there are 58 registered Monument of Nature and 16 registered Nature Park. None of these Monuments of Nature and Nature Parks is located in the project area.

Environmental benefits

The project helps Turkey to stimulate and commercialize the use of grid connected renewable energy technologies and markets. The specific environmental benefits are:

- Reduction of GHG emissions as attributable to conventional energy production in BAU scenario;
- Creation of local employment during construction and operation of WPP;
- Reduction of other pollutants from power generation in Turkey as compared to BAU.

6. STAKEHOLDER COMMENTS

According to the regulation declared by the Ministry of Environment and Forestry and published on the Official Gazette (dated 17th July 2008, numbered 26939), projects which have EIA is not required certificate are not obligated to hold Stakeholder Meetings. Therefore, a stakeholder meeting has not been planned.[44] Since it is not obligated by law, there is no ongoing communications between project owner and the local stakeholders.

[44] See; http://www.resmigazete.gov.tr/main.aspx?home=http://www.resmigazete.gov.tr/eskiler/2008/07/20080717.htm&main=http://www.resmigazete.gov.tr/eskiler/2008/07/20080717.htm also see the EIA process described in the website of the Environmental Ministry; http://www.csb.gov.tr/gm/ced/index.php?Sayfa=sayfaicerik&IcId=673#CED_Sureci_Akim_Semasi

ANNEX 1: Baseline Information

Calculation of Total CO_2 from OM Power Plants:

Table 25: $HV_{i,y}$ (Heating Values for Fossil Fuels for Electricity Generation (TCal)

Energy Sources	2009	2010	2011
Hard Coal+Imported Coal	35,130	39,546	57,567
Lignite	97,652	96,551	107,210
Fuel Oil	15,160	8,569	5,280
Diesel Oil	1,830	209	155
Lpg	1	0	0
Naphta	84	105	0
Natural Gas	186,266	194,487	202,064

Table 26: $FC_{i,y}$ (Fuel Consumptions for Fossil Fuels for Electricity Generation (million m^3 for Natural Gas and ton for others)

Energy Sources	2009	2010	2011
Hard Coal+Imported Coal	6,621,177	7,419,703	10,574,434
Lignite	63,620,518	56,689,392	61,507,310
Fuel Oil	1,594,321	891,782	531,608
Diesel Oil	180,857	20,354	15,047
LPG	111	0	0
Naphta	8,077	13,140	0
Natural Gas	20,978,040	21,783,414	22,804,587

1	**Tcal**	**=**	**4.1868**	**TJ**

Table 27: $NCV_{i,y}$ (Average Net Calorific Values for Fossil Fuels for Electricity Generation (TJ/million m^3 for Natural Gas and TJ/kton for others) and EF_i (Emission Factor of Fossil Fuels)

Energy Sources	NCVi 2009 (TJ/Gg)	NCVi 2010 (TJ/Gg)	NCVi 2011 (TJ/Gg)	EFCO2, I (kg/TJ)
Hard Coal+Imported Coal	22.21	22.32	22.79	*89.50*
Lignite	6.43	7.13	7.30	*90.90*
Fuel Oil	39.81	40.23	41.58	*72.60*
Diesel Oil	42.37	42.99	43.13	*72.60*
LPG	0.00	0.00	0.00	*61.60*
Naphta	43.54	33.46	0.00	*69.30*
Natural Gas	37.17	37.38	37.10	*54.30*

Table 28: CO_2 Emission by each Fossil Fuels Types ($ktCO_2e$)

Energy Sources	2009	2010	2011
Hard Coal+Imported Coal	13,164	14,819	21,571
Lignite	37,164	36,745	40,802
Fuel Oil	4,608	2,605	1,605
Diesel Oil	556	64	47
Lpg	0	0	0
Naphta	24	30	0
Natural Gas	42,346	44,215	45,938
TOTAL	**97,863**	**98,478**	**109,963**

Identification of Sample Group

Table 29: Sample Group PPs for BM Emission Factor Calculation

No	Information to clearly identify the Plant (Name of the Plant)	Date of Commisioning	Capacity in MW	Fuel Type	Annual Generation (GWh)
1	EKOTEN TEKSTİL GR-I	16.02.2006	1,9	N. Gas	14
2	ERAK GİYİM GR-I	22.02.2006	1,4	N. Gas	10,0
3	ALARKO ALTEK GR-III	23.02.2006	21,9	Steam	173,0
4	AYDIN ÖRME GR-I	25.02.2006	7,5	N. Gas	60,0
5	NUH ENERJİ-2 GR-II	02.03.2006	26,1	Steam	180,1
6	MARMARA ELEKTRİK (Çorlu) GR-I	13.04.2006	8,7	N. Gas	63,0
7	MARMARA PAMUK(Çorlu) GR-I	13.04.2006	8,7	N. Gas	63,0
8	ENTEK (Köseköy) GR-IV	14.04.2006	47,6	N. Gas	378,2
9	ELSE TEKSTİL (Çorlu) GRI-II	15.04.2006	3,2	N. Gas	25,0
10	BARES IX GRUP	20.04.2006	13,5	Wind	0,0
11	SÖNMEZ ELEKTRİK (Çorlu) GRI-II	03.05.2006	17,5	N. Gas	126,0
12	DENİZLİ ÇİMENTO (Revision)	04.05.2006	0,4	N.Gas	0,0
13	MENDERES ELEKTRİK GR-I	10.05.2006	8,0	Geothermal	56,0
14	KASTAMONU ENTEGRE (Balıkesir) GR-I	24.05.2006	7,5	N. Gas	54,0
15	ÇIRAĞAN SARAYI (Energy Ministry Omitted)	24.05.2006	-1,4	N.Gas	0,0
16	BARES X. ve XX. GRUPLAR	26.05.2006	16,5	Wind	0,0
17	BOZ ENERJİ GR-I	09.06.2006	8,7	N. Gas	70,0
18	ADANA ATIK SU ARITMA TESİSİ	09.06.2006	0,8	Biogas	6,0
19	AMYLUM NİŞASTA (ADANA)	09.06.2006	-6,2	Fuel Oil	0,0
20	AMYLUM NİŞASTA (ADANA)	09.06.2006	14,3	N. Gas	34,0
21	ŞIKMAKAS (Çorlu) GR-I	22.06.2006	1,6	N. Gas	13,0
22	ELBİSTAN B GR-III	23.06.2006	360,0	Lignite	2.340,0
23	ANTALYA ENERJİ GR I-II-III-IV	29.06.2006	34,9	N. Gas	245,0
24	HAYAT TEM. VE SAĞLIK GR I-II	30.06.2006	15,0	N. Gas	108,0
25	EKOLOJİK EN. (Kemerburgaz) GR-I	31.07.2006	1,0	Waste Heat	6,0
26	EROĞLU GİYİM (Çorlu) GR-I	01.08.2006	1,2	N. Gas	9,0
27	CAM İŞ ELEKTRİK (Mersin) GR-I	13.09.2006	126,1	N. Gas	1.008,0
28	ELBİSTAN B GR-II	17.09.2006	360,0	Lignite	2.340,0
29	YILDIZ ENT. AĞAÇ (Kocaeli) GR-I	21.09.2006	6,2	N. Gas	40,0
30	ÇERKEZKÖY ENERJİ GR-I	06.10.2006	49,2	N. Gas	390,0
31	ENTEK (Köseköy) GR-V	03.11.2006	37,0	N. Gas	293,9
32	ITC-KA EN. MAMAK TOP.M. GR I-II-III	03.11.2006	4,2	Waste Heat	0,0
33	ELBİSTAN B GR-IV	13.11.2006	360,0	Lignite	2.340,0
34	MARE MANASTIR RÜZGAR (X GRUP)	08.12.2006	8,0	Wind	0,0
35	ÇIRAĞAN SARAYI GR-I	01.12.2006	1,3	N. Gas	11,0
36	ERTÜRK ELEKTRİK Tepe RES GR-I	22.12.2006	0,9	Wind	2,0
37	AKMAYA (Lüleburgaz) GR-I	23.12.2006	6,9	N. Gas	50,0
38	BURGAZ (Lüleburgaz) GR-I	23.12.2006	6,9	N. Gas	54,0
39	VAN-2	2006	-24,7		0,0
40	KARACAÖREN-II	20.02.2006	-0,8	Hydro (with Dam)	0,0
41	SEYHAN I-II	20.02.2006	0,3	Hydro (with Dam)	0,0
42	ŞANLIURFA GR I-II	01.03.2006	51,8	Hydro (Run of River)	124,0
43	BEREKET ENERJİ GÖKYAR HES 3 Grup	05.05.2006	11,6	Hydro (Run of River)	43,3

44	MOLU EN. Zamantı Bahçelik GR I-II	31.05.2006	4,2	Hydro (Run of River)	16,7
45	SU ENERJİ (Balıkesir) GR I-II	27.06.2006	4,6	Hydro (Run of River)	20,7
46	BEREKET EN. (Mentaş Reg) GR I-II	31.07.2006	26,6	Hydro (Run of River)	108,7
47	EKİN (Başaran Hes) (Nazilli)	11.08.2006	0,6	Hydro (Run of River)	4,5
48	ERE (Sugözü rg. Kızıldüz hes) GR I-II	08.09.2006	15,4	Hydro (Run of River)	31,6
49	ERE (AKSU REG. Ve ŞAHMALLAR HES) GR I-II	16.11.2006	14,0	Hydro (Run of River)	26,7
50	TEKTUĞ (Kalealtı) GR I-II	30.11.2006	15,0	Hydro (Run of River)	
51	BEREKET EN. (Mentaş Reg) GR III	13.12.2006	13,3	Hydro (Run of River)	54,4
52	HABAŞ (ALİAĞA-ADDITION)	02.05.2007	9,1	N. Gas	35,3
53	BOSEN	2007	-123,5	N. Gas	0,0
54	MODERN ENERJİ	2007	5,2	N. Gas	38,0
55	ARENKO	2007	0,7	N. Gas	0,0
56	ALTINMARKA GIDA	2007	0,1	N. Gas	0,0
57	TEKBOY ENERJİ	2007	0,1	N. Gas	0,0
58	VELSAN AKRİLİK	2007	0,1	N. Gas	0,0
59	AKBAŞLAR	2007	-0,1	N. Gas	0,0
60	ORS RULMAN	2007	-0,3	N. Gas	0,0
61	Acıbadem Sağlık Hiz.ve Tic.A.Ş(Kadıköy Hast.)(İstanbul/Kadıköy)	19.06.2007	0,5	N. Gas	4,0
62	Acıbadem Sağlık Hiz.ve Tic.A.Ş(Kozyatağı Hast.)(İstanbul/Kadıköy)	23.10.2007	0,6	N. Gas	5,0
63	Acıbadem Sağlık Hiz.ve Tic.A.Ş(Nilüfer/BURSA)	28.08.2007	1,3	N. Gas	11,0
64	AKATEKS Tekstil Sanayi ve Ticaret A.Ş.	30.07.2007	1,8	N. Gas	14,0
65	FLOKSER TEKSTİL SAN.AŞ.(Çatalça/istanbul)(SüetserTesisi)	03.12.2007	2,1	N. Gas	17,0
66	FLOKSER TEKSTİL SAN.AŞ.(Çatalça/istanbul)(Poliser Tesisi)	03.12.2007	2,1	N. Gas	17,0
67	FRİTOLAY GIDA SAN.VE TİC. AŞ.	23.01.2007	0,5	N. Gas	4,0
68	KIVANÇ TEKSTİL SAN.ve TİC.A.Ş.	20.03.2007	3,9	N. Gas	33,0
69	KİL-SAN KİL SAN.VE TİC. A.Ş	19.02.2007	3,2	N. Gas	25,0
70	SÜPERBOY BOYA SAN.ve Tic.Ltd.Şti.(Büyükçekmece/İstanbul)	05.12.2007	1,0	N. Gas	8,0
71	SWİSS OTEL(Anadolu Japan Turizm A.Ş (İstanbul)	01.08.2007	1,6	N. Gas	11,0
72	TAV Esenboğa Yatırım Yapım ve İşetme AŞ./ANKARA	19.09.2007	3,9	N. Gas	33,0
73	STARWOOD	02.10.2007	-17,3	N. Gas	0,0
74	NUH ENERJİ-2(Nuh Çim.)	30.12.2007	73,0	N. Gas	0,0
75	KAREN	2007	-24,3	Fuel Oil	0,0
76	AKTEKS	2007	0,8	Fuel Oil	0,0
77	TÜPRAŞ İZMİT RAFİNERİ	2007	-0,9	Fuel Oil	0,0
78	AKBAŞLAR	2007	-3,8	Fuel Oil	0,0
79	UŞAK ŞEKER (NURİ ŞEKER)	2007	1,7	Lignite	0,0
80	BOR ŞEKER	2007	-0,6	Lignite	0,0
81	SUSURLUK ŞEKER	2007	-0,6	Lignite	0,0

82	AFYON ŞEKER	2007	-0,8	Motoroil	0,0
83	AĞRI ŞEKER	2007	-1,0	Motoroil	0,0
84	ALPULLU ŞEKER	2007	-0,9	Motoroil	0,0
85	BURDUR ŞEKER	2007	-0,8	Motoroil	0,0
86	ÇARŞAMBA ŞEKER	2007	-0,8	Motoroil	0,0
87	ÇORUM ŞEKER	2007	-0,8	Motoroil	0,0
88	ELAZIĞ ŞEKER	2007	-0,5	Motoroil	0,0
89	ELBİSTAN ŞEKER	2007	-0,8	Motoroil	0,0
90	ERCİŞ ŞEKER	2007	-0,8	Motoroil	0,0
91	EREĞLİ ŞEKER	2007	-0,8	Motoroil	0,0
92	KASTAMONU ŞEKER	2007	-0,2	Motoroil	0,0
93	KÜTAHYA ŞEKER (BAHA ESAD TEKAND)	2007	-0,7	Motoroil	0,0
94	MALATYA ŞEKER	2007	-0,5	Motoroil	0,0
95	BOĞAZLIYAN ŞEKER	2007	16,4	Liqued Fuel + N.Gas	0,0
96	KARTONSAN	2007	5,0	Liqued Fuel + N.Gas	40,0
97	ESKİŞEHİR END.ENERJİ	2007	3,5	Liqued Fuel + N.Gas	26,8
98	ESKİŞEHİR ŞEKER (KAZIM TAŞKENT)	2007	2,9	Liqued Fuel + N.Gas	0,0
99	İGSAŞ	2007	2,2	Liqued Fuel + N.Gas	15,2
100	DESA	2007	0,7	Liqued Fuel + N.Gas	0,0
101	DENTAŞ	2007	0,3	Liqued Fuel + N.Gas	0,0
102	SÜPER FİLMCİLİK	2007	0,1	Liqued Fuel + N.Gas	0,0
103	ATAER ENERJİ	2007	0,1	Liqued Fuel + N.Gas	0,0
104	BİL ENERJİ	2007	0,1	Liqued Fuel + N.Gas	0,0
105	EDİP İPLİK	2007	-0,1	Liqued Fuel + N.Gas	0,0
106	EGE BİRLEŞİK ENERJİ	2007	-0,3	Liqued Fuel + N.Gas	0,0
107	İSKO	2007	-1,8	Liqued Fuel + N.Gas	0,0
108	ITC-KA Enerji Üretim Aş.(Mamak)(Addition)	22.05.2007	1,4	Waste Heat	0,0
109	BİS Enerji Üretim AŞ.(Bursa)(Addition)	30.05.2007	43,0	N. Gas	354,8
110	Aliağa Çakmaktepe Enerji A.Ş.(Aliağa/İZMİR)	13.09.2007	34,8	N. Gas	278,0
111	BİS Enerji Üretim AŞ.(Bursa)(Revision)	11.09.2007	28,3	N. Gas	0,0
112	BİS Enerji Üretim AŞ.(Bursa)(Addition)	30.08.2007	48,0	N. Gas	396,1
113	BOSEN ENERJİ ELEKTRİK AŞ.	18.01.2007	142,8	N. Gas	1.071,0
114	Mamara Elektrik Üretim A.Ş.	25.09.2007	-8,7	N.Gas	0,0
115	NUH ENERJİ-2 (Nuh Çim.)	30.12.2007	-73,0	N.Gas	0,0
116	SAYENERJİ ELEKTRİK ÜRETİM AŞ. (Kayseri/OSB)	03.07.2007	5,9	N. Gas	47,0
117	T ENERJİ ÜRETİM AŞ.(İSTANBUL)	04.04.2007	1,6	N. Gas	13,0
118	ZORLU EN.Kayseri (1 GT Addition)	17.01.2007	7,2	N. Gas	55,0
119	SİİRT	2007	25,6	Fuel Oil	190,0
120	Mardin Kızıltepe	2007	34,1	Fuel Oil	250,0

121	KAREN	2007	24,3	Fuel Oil	180,0
122	İDİL 2 (PS3 A- 2)	2007	24,4	Fuel Oil	180,0
123	İSKUR TEKSTİL (SÜLEYMANLI HYDRO)	30.12.2007	-4,6	Hydro (run of river)	0,0
124	BORÇKA HES	27.02.2007	300,6	Hydro (With Dam)	1.039,0
125	TEKTUĞ(Keban River)	08.05.2007	5,0	Hydro (run of river)	32,0
126	YPM Ener.Yat.AŞ.(Altıntepe Hydro)(Sivas/Suşehir)	06.06.2007	4,0	Hydro (run of river)	18,0
127	YPM Ener.Yat.AŞ.(Beypınar Hydro)(Sivas/Suşehir)	06.06.2007	3,6	Hydro (run of river)	18,0
128	YPM Ener.Yat.AŞ.(Konak Hydro)(Sivas/Suşehir)	19.07.2007	4,0	Hydro (run of river)	19,0
129	KURTEKS Tekstil A.Ş./Kahramanmaraş(KARASU HES-Andırın)	28.11.2007	2,4	Hydro (run of river)	19,0
130	İSKUR TEKSTİL (SÜLEYMANLI HES)	30.12.2007	4,6	Hydro (run of river)	18,0
131	ÖZGÜR ELK.AŞ.(K.MARAŞ)(Tahta)	03.05.2007	6,3	Hydro (run of river)	27,0
132	ÖZGÜR ELK.AŞ.(K.MARAŞ)(Tahta)(Addition)	24.05.2007	6,3	Hydro (run of river)	27,0
133	ANEMON EN.ELEK.ÜRETİM.AŞ.	21.02.2007	8,0	Wind	0,0
134	ANEMON EN.ELEK.ÜRETİM.AŞ. (Addition)	16.08.2007	15,2	Wind	0,0
135	ANEMON EN.ELEK.ÜRETİM.AŞ. (Addition)	21.11.2007	7,2	Wind	0,0
136	BURGAZ RES (Doğal Enerji Üretim A.Ş.)	14.08.2007	4,0	Wind	0,0
137	BURGAZ RES (Doğal Enerji Üretim A.Ş.)	30.12.2007	10,9	Wind	0,0
138	DENİZ ELEK. ÜRETİM Ltd.Şti. (Karakurt)	27.05.2007	10,8	Wind	0,0
139	MARE MANASTIR RÜZGAR ENERJİ (Addition)	25.01.2007	11,2	Wind	0,0
140	MARE MANASTIR RÜZGAR ENERJİ (Addition)	12.04.2007	20,0	Wind	0,0
141	AKKÖY ENERJİ (AKKÖY I HES)	2008	101,9	Hydro (with Dam)	408,0
142	ALP ELEKTRİK (TINAZTEPE) ANTALYA	2008	7,7	Hydro (run of river)	29,0
143	CANSU ELEKTRİK (MURGUL/ARTVİN)	2008	9,2	Hydro (run of river)	47,0
144	ÇALDERE ELEKT. (ÇALDERE HES) Dalaman - MUĞLA	2008	8,7	Hydro (run of river)	0,0
145	DAREN HES ELKT. (SEYRANTEPE BARAJI VE HES)	2008	49,7	Hydro (With Dam)	182,0
146	DEĞİRMENÜSTÜ EN. (KAHRAMANMARAŞ)	2008	25,7	Hydro (With Dam)	69,0
147	GÖZEDE HES (TEMSA ELEKTRİK) BURSA	2008	2,4	Hydro (run of river)	10,0
148	H.G.M ENERJİ (KEKLİCEK HES) (Yeşilyurt)	2008	8,7	Hydro (run of river)	18,0
149	HAMZALI HES (TURKON MNG ELEKTRİK)	2008	16,7	Hydro (run of river)	0,0
150	HİDRO KNT. (YUKARI MANAHOZ REG. VE HES)	2008	22,4	Hydro (run of river)	79,0
151	İÇ-EN ELK. (ÇALKIŞLA REGÜLATÖRÜ VE HES)	2008	7,7	Hydro (run of river)	18,0
152	KALEN ENERJİ (KALEN II REGÜLAT. VE HES)	2008	15,7	Hydro (run of river)	50,0
153	MARAŞ ENERJİ (FIRNIS REGÜLATÖRÜ VE HES)	2008	7,2	Hydro (run of river)	0,0
154	SARMAŞIK I HES (FETAŞ FETHİYE ENERJİ)	2008	21,0	Hydro (run of river)	96,0
155	SARMAŞIK II HES (FETAŞ FETHİYE ENERJİ)	2008	21,6	Hydro (run of river)	108,0
156	TORUL	2008	105,6	Hydro (With Dam)	322,0
157	YEŞİL ENERJİ ELEKTRİK (TAYFUN HES)	2008	0,8	Hydro (run of river)	5,0
158	ZORLU ENERJİ (MERCAN) (Revision)	2008	1,3	Hydro (run of river)	0,0
159	MB ŞEKER NİŞASTA SAN.A.Ş. (Sultanhanı)	2008	8,8	Natural Gas	60,0
160	AKSA ENERJİ (Antalya)	2008	183,8	Natural Gas	1.290,0
161	AKSA ENERJİ (Manisa)	2008	52,4	Natural Gas	370,0
162	ANTALYA ENERJİ (Addition)	2008	17,5	Natural Gas	122,3
163	ATAÇ İNŞAAT SAN. A.S.B. (ANTALYA)	2008	5,4	Natural Gas	37,0
164	BAHÇIVAN GIDA (LÜLEBURGAZ)	2008	1,2	Natural Gas	8,0
165	CAN ENERJİ (Çorlu - Tekirdağ) (Addition)	2008	52,4	Natural Gas	304,2

166	FOUR SEASONS OTEL (ATİK PASHA TUR. A.Ş.)	2008	1,2	Natural Gas	7,0
167	FRİTOLAY GIDA SAN.VE TİC. AŞ. (Addition)	2008	0,1	Natural Gas	4,0
168	ITC-KA Enerji Üretim Aş.(Mamak)(Addition)	2008	14,1	Waste	0,0
169	KARKEY (SİLOPİ-5) (154 kV) (Addition)	2008	14,8	Fuel Oil	103,2
170	MELİKE TEKSTİL (GAZİANTEP)	2008	1,6	Natural Gas	11,0
171	MİSİS APRE TEKSTİL BOYA EN. SAN.	2008	2,0	Natural Gas	14,0
172	MODERN ENERJİ (LÜLEBURGAZ)	2008	13,4	Natural Gas	94,1
173	ORTADOĞU ENERJİ (ODA YERİ) (Eyüp/İST.)	2008	2,8	Waste	0,0
174	POLAT TURZ. (POLAT RENAISSANCE İST. OT.)	2008	1,6	Natural Gas	11,0
175	SARAYKÖY JEOTERMAL (Denizli)	2008	6,9	Geothermal	50,0
176	YILDIZ SUNTA (Uzunçiftlik - Köseköy) (Revision)	2008	22,6	Natural Gas	0,0
177	SÖNMEZ Elektrik (Addition)	2008	8,7	Natural Gas	67,3
178	BAKİ ELEKTRİK ŞAMLI RÜZGAR	2008	21,0	Wind	0,0
179	DATÇA RES (Datça)	2008	8,1	Wind	0,0
180	ERTÜRK ELEKTRİK Çatalca RES	2008	60,0	Wind	0,0
181	İNNORES ELK YUNTDAĞ RÜZG. (Aliağa)	2008	42,5	Wind	0,0
182	LODOS RES (Taşoluk) (G.O.P./İSTANBUL)	2008	24,0	Wind	0,0
183	SAYALAR RÜZGAR (Doğal Enerji)	2008	30,6	Wind	0,0
184	SEBENOBA (DENİZLİ ELK.) (Samandağ - HATAY)	2008	31,2	Wind	0
185	TÜPRAŞ RAFİNERİ(Aliağa/İzmir)	2009	24,7	Natural Gas	170
186	ITC-KA ENERJİ MAMAK KATI ATIK TOP.MERK.	2009	2,826	RENEW.+WASTES	0
187	ERDEMİR(Ereğli-Zonguldak)	2009	36,1	Natural Gas	217,95
188	ARENKO ELEKTRİK ÜRETİM A.Ş. (Denizli)	2009	12	Natural Gas	84
189	ORTADOĞU ENERJİ (ODA YERİ) (Addition)	2009	4,245	Landfill Gas	0
190	TAV İSTANBUL TERMİNAL İŞLETME. A.Ş.	2009	6,52	Natural Gas	54,56
191	AKSA AKRİLİK KİMYA SN. A.Ş. (YALOVA)	2009	70	Natural Gas	539
192	KASAR DUAL TEKSTİL SAN. A.Ş. (Çorlu)	2009	5,67	Natural Gas	38
193	SÖNMEZ ELEKTRİK(Uşak) (Addition)	2009	8,73	Natural Gas	67,29
194	GÜRMAT ELEKT. (GÜRMAT JEOTERMAL)	2009	47,4	Geothermal	313
195	DELTA ENERJİ ÜRETİM VE TİC.A.Ş.	2009	60	Natural Gas	467
196	KEN KİPAŞ ELKT. ÜR.(KAREN) (K.Maraş)	2009	17,46	Natural Gas	73,36
197	TESKO KİPA KİTLE PAZ. TİC. VE GIDA A.Ş.	2009	2,33	Natural Gas	18
198	NUH ÇİMENTO SAN. TİC. A.Ş.(Nuh Çim.) (Addition)	2009	46,95	Natural Gas	328,65
199	SİLOPİ ELEKTRİK ÜRETİM A.Ş.	2009	135,000	Asphaltit	945,00
200	MAURİ MAYA SAN. A.Ş.	2009	2,000	Natural Gas	16,52
201	AKSA ENERJİ (Antalya) (Addition)	2009	300,000	Natural Gas	2310,00
202	ANTALYA ENERJİ (Addition)	2009	41,820	Natural Gas	302,24
203	MARMARA PAMUKLU MENS. SN.TİC.A.Ş.	2009	34,920	Natural Gas	271,68
204	AKSA ENERJİ (Antalya) (Addition)	2009	300,000	Natural Gas	2310,00
205	ORTADOĞU ENERJİ (KÖMÜRCÜODA)	2009	5,804	Biogas	0,00
206	ZORLU ENERJİ (B.Karıştıran) (Addition)	2009	49,530	Natural Gas	395,21
207	ITC-KA ENERJİ (SİNCAN)	2009	2,832	Landfill Gas	0,00
208	İÇDAŞ ÇELİK (Addition)	2009	135,000	Imported coal	961,67
209	GLOBAL ENERJİ (PELİTLİK)	2009	8,553	Natural Gas	65,31
210	RASA ENERJİ (VAN)	2009	78,570	Natural Gas	500,00
211	ORTADOĞU ENERJİ (ODA YERİ) (Addition)	2009	5,660	Landfill Gas	0,00
212	DELTA ENERJİ ÜRETİM VE TİC.A.Ş. (Addition)	2009	13,000	Natural Gas	101,18

213	İÇDAŞ ÇELİK (Addition)	2009	135,000	Imported coal	961,67
214	DALSAN ALÇI SAN. VE TİC. A.Ş.	2009	1,165	Natural Gas	9,00
215	AK GIDA SAN. VE TİC. A.Ş. (Pamukova)	2009	7,500	Natural Gas	61,00
216	CAM İŞ ELEKTRİK (Mersin) (Addition)	2009	126,100	Natural Gas	1008,00
217	SELKASAN KAĞIT PAKETLEME MALZ. İM.	2009	9,900	Natural Gas	73,00
218	TAV İSTANBUL TERMİNAL İŞLETME. A.Ş.	2009	3,260	Natural Gas	27,28
219	DESA ENERJİ ELEKTRİK ÜRETİM A.Ş.	2009	9,800	Natural Gas	70,00
220	FALEZ ELEKTRİK ÜRETİMİ A.Ş.	2009	11,748	Natural Gas	88,00
221	AKSA ENERJİ (MANİSA) (Addition)	2009	62,900	Natural Gas	498,07
222	SİLOPİ ELEKTRİK ÜRETİM A.Ş.(ESENBOĞA)	2009	44,784	Fuel Oil	315,00
223	TAŞOVA YENİDEREKÖY HES (HAMEKA A.Ş.)	2009	1,980	Hydro (run of river)	10,00
224	TEKTUĞ (Erkenek)	2009	6,000	Hydro (run of river)	24,00
225	BAĞIŞLI REG. VE HES (CEYKAR ELEKT.)	2009	9,857	Hydro (run of river)	32,96
226	DEĞİRMENÜSTÜ EN. (KAHRAMANMARAŞ)	2009	12,850	Hydro (run of river)	35,28
227	BAĞIŞLI REG. VE HES (CEYKAR ELEKT.)	2009	19,714	Hydro (run of river)	66,04
228	TOCAK I HES (YURT ENERJİ ÜRETİM SN.)	2009	4,760	Hydro (run of river)	13,00
229	BEYOBASI EN. ÜR. A.Ş. (SIRMA HES)	2009	5,880	Hydro (run of river)	23,00
230	ÖZYAKUT ELEK. ÜR.A.Ş. (GÜNEŞLİ HES)	2009	1,800	Hydro (run of river)	8,00
231	LAMAS III - IV HES (TGT ENERJİ ÜRETİM)	2009	35,674	Hydro (run of river)	150,00
232	YPM SEVİNDİK HES (Suşehri/SİVAS)	2009	5,714	Hydro (run of river)	36,00
233	YPM GÖLOVA HES (Suşehri/SİVAS)	2009	1,050	Hydro (run of river)	0,00
234	BEREKET ENERJİ (KOYULHİSAR HES)	2009	42,000	Hydro (run of river)	329,00
235	KALEN ENERJİ (KALEN I - II HES)	2009	15,650	Hydro (run of river)	52,17
236	CİNDERE HES (Denizli)	2009	19,146	Hydro (With Dam)	58,00
237	ŞİRİKÇİOĞLU EL.(KOZAK BENDİ VE HES)	2009	4,400	Hydro (run of river)	15,00
238	AKUA ENERJİ (KAYALIK REG. VE HES)	2009	5,800	Hydro (run of river)	39,00
239	KAYEN ALFA ENERJİ (KALETEPE HES)	2009	10,200	Hydro (run of river)	37,00
240	OBRUK HES	2009	212,400	Hydro (With Dam)	473,00
241	ANADOLU ELEKTRİK (ÇAKIRLAR HES)	2009	16,158	Hydro (run of river)	60,00
242	ÖZTAY ENERJİ (GÜNAYŞE REG.VE HES)	2009	8,300	Hydro (run of river)	0,00
243	AKÇAY HES ELEKTRİK ÜR. (AKÇAY HES)	2009	28,780	Hydro (run of river)	95,00
244	ELESTAŞ ELEKTRİK (YAYLABEL HES)	2009	5,100	Hydro (run of river)	20,00
245	FİLYOS ENERJİ (YALNIZCA REG. VE HES)	2009	14,430	Hydro (run of river)	0,00
246	ERVA ENERJİ (KABACA REG. VE HES)	2009	4,240	Hydro (run of river)	16,50
247	ELESTAŞ ELEKTRİK (YAZI HES)	2009	1,109	Hydro (run of river)	6,00
248	YAPISAN (KARICA REG. ve DARICA I HES)	2009	48,500	Hydro (run of river)	0,00
249	ERVA ENERJİ (KABACA REG. VE HES)	2009	4,240	Hydro (run of river)	16,50
250	TÜM ENERJİ (PINAR REG. VE HES)	2009	30,090	Hydro (run of river)	138,00
251	TEKTUĞ (Erkenek) (Additon)	2009	6,514	Hydro (run of river)	26,00
252	REŞADİYE 3 HES (TURKON MNG ELEKT.)	2009	22,300	Hydro (run of river)	0,00
253	SARITEPE HES (GENEL DİNAMİK SİS.EL.)	2009	2,450	Hydro (run of river)	10,00
254	UZUNÇAYIR HES (Tunceli)	2009	27,330	Hydro (With Dam)	105,00
255	YEŞİLBAŞ ENERJİ (YEŞİLBAŞ HES)	2009	14,000	Hydro (run of river)	56,00
256	SARITEPE HES (GENEL DİNAMİK SİS.EL.)	2009	2,450	Hydro (run of river)	10,00
257	ÖZGÜR ELEKTRİK (AZMAK II REG.VE HES)	2009	24,407	Hydro (run of river)	0,00
258	BAKİ ELEKTRİK ŞAMLI RÜZGAR	2009	36,000	Wind	0,00
259	DATÇA RES (Datça)	2009	8,900	Wind	0,00
260	AYEN ENERJİ A.Ş. AKBÜK RÜZGAR	2009	16,800	Wind	0,00
261	AYEN ENERJİ A.Ş. AKBÜK RÜZGAR (Addition)	2009	14,700	Wind	0,00
262	DATÇA RES (Datça) (Addition)	2009	11,800	Wind	0,00
263	ALİZE ENERJİ (ÇAMSEKİ RES)	2009	20,800	Wind	0,00
264	ALİZE ENERJİ (KELTEPE RES)	2009	18,900	Wind	0,00

265	ROTOR ELEKTRİK (OSMANİYE RES)	2009	17,500	Wind	0,00
266	ÜTOPYA ELEKTRİK (DÜZOVA RES)	2009	15,000	Wind	0,00
267	AK ENERJİ (AYYILDIZ RES)	2009	15,000	Wind	0,00
268	SOMA ENERJİ ÜRETİM (SOMA RES)	2009	18,000	Wind	0,00
269	SAYALAR RÜZGAR (Doğal Enerji)	2009	3,600	Wind	0,00
270	MAZI-3 RES ELEKT.ÜR. A.Ş. (MAZI-3 RES)	2009	12,500	Wind	0,00
271	BAKİ ELEKTRİK ŞAMLI RÜZGAR	2009	33,000	Wind	0,00
272	ROTOR ELEKTRİK (OSMANİYE RES)	2009	17,500	Wind	0,00
273	MAZI-3 RES ELEKT.ÜR. A.Ş. (MAZI-3 RES)	2009	10,000	Wind	0,00
274	BORASKO ENERJİ (BANDIRMA RES)	2009	24,000	Wind	0,00
275	BELEN ELEKTRİK BELEN RÜZGAR-HATAY	2009	15,000	Wind	0,00
276	BORASKO ENERJİ (BANDIRMA RES)	2009	21,000	Wind	0,00
277	ALİZE ENERJİ (SARIKAYA RES) (Şarköy)	2009	28,800	Wind	0,00
278	BELEN ELEKTRİK BELEN RÜZGAR-HATAY	2009	15,000	Wind	0,00
279	SOMA ENERJİ ÜRETİM (SOMA RES)(Addition)	2009	16,200	Wind	0,00
280	ROTOR ELEKTRİK (OSMANİYE RES)	2009	22,500	Wind	0,00
281	SOMA ENERJİ ÜRETİM (SOMA RES)(Addition)	2009	10,800	Wind	0,00
282	KORES KOCADAĞ RES (Urla/İZMİR)	2009	15,000	Wind	0,00
283	Eti Soda	2010	24,000	Lignite	144,00
284	Can Tekstil	2010	7,832	Natural Gas	86,75
285	ALTINMARKA GIDA	2010	4,600	Natural Gas	33,00
286	Gaziantep Landfill	2010	1,131	Biogas	0,00
287	Akbaşlar (Addition)	2010	1,540	Natural Gas	12,08
288	ORTADOĞU ENERJİ (ODA YERİ) (Eyüp/İST.)	2010	4,245	Landfill Gas	0,00
289	GLOBAL ENERJİ (PELİTLİK)	2010	3,544	Natural Gas	27,06
290	Konya Şeker	2010	6,000	Lignite	40,00
291	FLOKSER TEKSTİL SAN.AŞ.(Çatalça/istanbul)(SüetserTesisi)	2010	-2,100	Natural Gas	0,00
292	RASA ENERJİ (VAN)	2010	26,190	Natural Gas	166,60
293	Aksa Enerji (Antalya)	2010	25,000	Natural Gas	175,46
294	Yıldız Entegre Ağaç (kocaeli)	2010	12,368	Natural Gas	80,10
295	ITC-KA ENERJİ (SİNCAN)	2010	1,416	Landfill Gas	0,00
296	ATAER ENERJİ	2010	49,000	Liqued Fuel + N.Gas	278,00
297	Cengiz Enerji	2010	101,950	Natural Gas	802,00
298	Simko (Kartal)	2010	-2,054	Natural Gas	0,00
299	Uğur Enerji	2010	48,200	Natural Gas	406,00
300	Söktaş	2010	-4,500	Nafta	0,00
301	Aksa Enerji (Antalya)	2010	25,000	Natural Gas	175,46
302	ALTEK ALARKO Elektrik Santralleri	2010	60,100	Natural Gas	420,00
303	Eren Enerji	2010	160,000	Imported coal	1068,00
304	Flokser Tekstil (Çerkezköy/Tekirdağ)	2010	5,172	Natural Gas	42,00
305	RB Karesi İthalat İhracat Tekstil	2010	8,600	Natural Gas	65,00
306	Cengiz Enerji	2010	101,950	Natural Gas	802,00
307	Keskinoğlu Tavukçuluk ve Dam. İşl.	2010	3,495	Natural Gas	25,00
308	Binatom Elektrik Üretim A.Ş.	2010	2,000	Natural Gas	13,00
309	CAN ENERJİ (Çorlu - Tekirdağ)	2010	29,100	Natural Gas	203,00
310	Kurtoğlu Bakır Kurşun San.A.Ş.	2010	1,585	Natural Gas	12,00
311	Sönmez Enerji Üretim (Uşak)	2010	32,242	Natural Gas	272,55
312	ITC-KA Adana Biyokütle Sant.	2010	9,900	Biomass	0,00
313	Kırka Boraks	2010	10,000	Liqued Fuel + N.Gas	65,00

314	Enerji-SA (Bandırma)	2010	930,800	Natural Gas	7540,00
315	Uğur Enerji (Addition)	2010	12,000	Natural Gas	100,00
316	Eren Enerji (Addition)	2010	600,000	Imported coal	4006,00
317	Eren Enerji (Addition)	2010	600,000	Imported coal	4006,00
318	MARMARA PAMUKLU MENS. SN.TİC.A.Ş. (Addition)	2010	26,190	Natural Gas	203,76
319	Aliağa Çakmaktepe Enerji A.Ş.(Aliağa/İZMİR) (Addition)	2010	69,840	Natural Gas	556,00
320	FRİTOLAY GIDA SAN.VE TİC. AŞ. (Addition)	2010	0,330	Biogas	2,40
321	Sönmez Enerji Üretim (Uşak) (Addition)	2010	2,564	Natural Gas	19,77
322	Ak-Enerji (Uşak OSB)	2010	-15,240	Liqued Fuel + N.Gas	0,00
323	Ak-Enerji (DG+N) (Deba-Denizli)	2010	-15,600	Liqued Fuel + N.Gas	0,00
324	Polyplex Europa Polyester Film	2010	7,808	Natural Gas	61,00
325	ALTEK ALARKO Elektrik Santralleri	2010	21,890	Natural Gas	151,36
326	Aksa Enerji (Demirtaş/Bursa)	2010	-1,140	Natural Gas	0,00
327	RASA ENERJİ (VAN) (Addition)	2010	10,124	Natural Gas	64,41
328	SİLOPİ ELEKTRİK ÜRETİM A.Ş.(ESENBOĞA)	2010	-44,784	Fuel Oil	0,00
329	International Hospital Istanbul	2010	0,770	Natural Gas	6,00
330	Tuzla Jeotermal	2010	7,500	Geothermal	0,00
331	Menderes Jeotermal Dora-2	2010	9,500	Geothermal	0,00
332	Selimoğlu Reg. Ve Hes	2010	8,000	Hydro (run of river)	0,00
333	Kulp IV HES	2010	12,298	Hydro (run of river)	46,00
334	Cindere HES (Denizli) (Addition)	2010	9,065	Hydro (With Dam)	28,29
335	Bayburt Hes	2010	14,631	Hydro (run of river)	51,00
336	UZUNÇAYIR HES (Tunceli) (Addition)	2010	27,330	Hydro (With Dam)	105,00
337	Alakır Hes.	2010	2,060	Hydro (run of river)	6,00
338	Peta Müh. En. (Mursal II Hes.)	2010	4,500	Hydro (run of river)	19,00
339	Asa Enerji (Kale Reg. Ve Hes.)	2010	9,570	Hydro (run of river)	0,00
340	Hetaş Hacısalihoğlu (Yıldızlı Hes)	2010	1,200	Hydro (run of river)	5,00
341	Doğubay Elektrik (Sarımehmet Hes)	2010	3,100	Hydro (run of river)	10,00
342	Nuryol Enerji (Defne Reg. Ve hes.)	2010	7,230	Hydro (run of river)	22,00
343	ÖZGÜR ELEKTRİK (AZMAK I REG.VE HES)	2010	5,913	Hydro (run of river)	0,00
344	Birim Hidr. Üretim A.Ş. (Erfelek Hes)	2010	3,225	Hydro (run of river)	19,00
345	Beytek El. Ür. A.Ş. (Çataloluk Hes.)	2010	9,540	Hydro (run of river)	0,00
346	Nisan E. Mekanik En. (Başak Reg. Hes.)	2010	6,850	Hydro (run of river)	22,00
347	UZUNÇAYIR HES (Tunceli) (Addition)	2010	27,330	Hydro (With Dam)	105,00
348	Fırtına Elektrik Üretim A.Ş. (Sümer Hes)	2010	21,600	Hydro (run of river)	70,00
349	KAR-EN Karadeniz El. A.Ş. Aralık Hes	2010	12,410	Hydro (run of river)	0,00
350	Birim Hidr. Üretim A.Ş. (Erfelek Hes)	2010	3,225	Hydro (run of river)	19,00
351	Karadeniz El. Üret. (Uzundere-1 Hes)	2010	62,200	Hydro (run of river)	165,00
352	Akım Enerji (Cevizli Reg. Ve Hes.)	2010	91,400	Hydro (run of river)	330,00
353	Çakıt Hes. (Çakıt Enerji)	2010	20,180	Hydro (run of river)	0,00
354	Ceyhan Hes. (Oşkan Hes.) (Enova En.)	2010	23,889	Hydro (run of river)	98,00
355	Erenler Reg. Ve Hes. (BME Bir. Müt. En.)	2010	45,000	Hydro (run of river)	85,00
356	Paşa Reg. Ve Hes (Özgür Elektrik)	2010	8,680	Hydro (run of river)	0,00
357	Güzelçay-I-II Hes (İlk Elektrik Enerji)	2010	8,100	Hydro (run of river)	0,00
358	Kale Reg. Ve Hes (Kale Enerji Ür.)	2010	34,140	Hydro (run of river)	116,00
359	Erikli-Akocak Reg. Ve Hes	2010	82,500	Hydro (run of river)	0,00
360	Çamlıkaya Reg. Ve Hes	2010	5,648	Hydro (run of river)	19,00
361	Dinar Hes. (Elda Elekrik Üretim)	2010	4,440	Hydro (run of river)	15,00
362	Damlapınar Hes. (Cenay Elektrik Üretim)	2010	16,424	Hydro (run of river)	0,00

363	Dim Hes (Diler Elektrik Üretim)	2010	38,250	Hydro (run of river)	123,00
364	ÖZGÜR ELEKTRİK (AZMAK I REG.VE HES)	2010	5,913	Hydro (run of river)	0,00
365	Kirpilik Reg. Ve Hes (Özgür Elektrik)	2010	6,240	Hydro (run of river)	22,00
366	Yavuz Reg. Ve Hes (Masat Enerji)	2010	22,500	Hydro (run of river)	83,00
367	Kayabükü Reg. Ve Hes (Elite Elektrik)	2010	14,580	Hydro (run of river)	0,00
368	Gök Reg. Ve Hes (Gök Enerji El. San.)	2010	10,008	Hydro (run of river)	43,00
369	Bulam Reg. Ve Hes (MEM Enerji ELK.)	2010	7,030	Hydro (run of river)	0,00
370	Karşıyaka HES (Akua Enerji Üret.)	2010	1,592	Hydro (run of river)	8,00
371	Ceyhan Hes. (Berkman Hes) (Enova En.)	2010	25,200	Hydro (run of river)	103,00
372	Güdül I Reg. Ve HES (Yaşam Enerji)	2010	2,360	Hydro (run of river)	14,00
373	Tektuğ Elektrik (Andırın Hes)	2010	40,500	Hydro (run of river)	106,00
374	Selen Elektrik (Kepezkaya Hes)	2010	28,000	Hydro (run of river)	0,00
375	REŞADİYE 2 HES (TURKON MNG ELEKT.)	2010	26,140	Hydro (run of river)	0,00
376	Kozan Hes (Ser-Er Enerji)	2010	4,000	Hydro (run of river)	9,00
377	Kahraman Reg. Ve Hes (Katırcıoğlu)	2010	1,420	Hydro (run of river)	6,00
378	Narinkale Reg. Ve Hes (EBD Enerji)	2010	3,100	Hydro (run of river)	10,00
379	Erenköy Reg. Ve Hes (Türkerler)	2010	21,456	Hydro (run of river)	87,00
380	Kahta I HES (Erdemyıldız Elektrik Üretim)	2010	7,120	Hydro (run of river)	35,00
381	Azmak II Reg. Ve Hes	2010	-18,066	Hydro (run of river)	0,00
382	Ulubat Kuvvet Tüneli ve Hes	2010	97,000	Hydro (With Dam)	372,00
383	REŞADİYE 1 HES (TURKON MNG ELEKT.)	2010	15,680	Hydro (run of river)	0,00
384	Egemen 1 HES (Enersis Elektrik)	2010	19,900	Hydro (run of river)	0,00
385	Sabunsuyu II HES (Ang Enerji Elk.)	2010	7,350	Hydro (run of river)	21,00
386	Burç Bendi ve Hes (Akkur Enerji)	2010	27,330	Hydro (run of river)	113,00
387	Murgul Bakır (Ç.kaya) (Addition)	2010	19,600	Hydro (run of river)	40,50
388	Güzelçay II Hes (İlk Elektrik Enerji) (Addition)	2010	4,960	Hydro (run of river)	0,00
389	REŞADİYE 1 HES (TURKON MNG ELEKT.)	2010	15,680	Hydro (run of river)	0,00
390	Egemen 1 HES (Enersis Elektrik)	2010	8,820	Hydro (run of river)	0,00
391	Yedigöze HES (Yedigöze Elektrik)	2010	155,330	Hydro (With Dam)	474,00
392	Umut III Reg. Ve HES (Nisan Elek.)	2010	12,000	Hydro (run of river)	26,00
393	FEKE 2 Barajı ve HES (Nisan Elek.)	2010	69,340	Hydro (With Dam)	223,00
394	Egemen 1B HES (Enersis Elektrik)	2010	11,100	Hydro (run of river)	0,00
395	Kalkandere Reg. Ve Yokuşlu HES.	2010	14,540	Hydro (run of river)	63,00
396	ROTOR ELEKTRİK (OSMANİYE RES)	2010	55,000	Wind	0,00
397	Asmakinsan (Bandırma 3 RES)	2010	24,000	Wind	0,00
398	Soma Enerji Üretim (Soma Res)	2010	34,200	Wind	0,00
399	Deniz Elektrik (Sebenoba Res)	2010	10,000	Wind	0,00
400	Akdeniz Elektrik (Mersin Res)	2010	33,000	Wind	0,00
401	Boreas Enerji (Boreas I Enez Res)	2010	15,000	Wind	0,00
402	Bergama Res En. Ür. A.Ş. Aliağa Res	2010	90,000	Wind	0,00
403	Bakras En. Elek. Ür. A.Ş. Şenbük Res	2010	15,000	Wind	0,00
404	ALİZE ENERJİ (KELTEPE RES)	2010	1,800	Wind	0,00
405	ROTOR ELEKTRİK (Gökçedağ Res)	2010	22,500	Wind	0,00
406	MAZI-3 RES ELEKT.ÜR. A.Ş. (MAZI-3 RES)	2010	7,500	Wind	0,00
407	BORASKO ENERJİ (BANDIRMA RES)	2010	12,000	Wind	0,00
408	Ziyaret Res (Ziyaret Res Elektirk)	2010	35,000	Wind	0,00
409	Soma Res (Bilgin Rüzgar San. En. Ür.)	2010	90,000	Wind	0,00
410	Belen ELEKTRİK BELEN Res (Addition)	2010	6,000	Wind	0,00
411	ÜtOPYA ELEKTRİK (DÜZOVA RES) (Addition)	2010	15,000	Wind	0,00
412	Kuyucak Res (Alize Enerji Ür.)	2010	25,600	Wind	0,00
413	Sares Res (Garet Enerji Üretim)	2010	15,000	Wind	0,00
414	Turguttepe Res (Sabaş Elektrik Ür.)	2010	22,000	Wind	0,00

415	AKIM ENERJİ BAŞPINAR (SÜPER FİLM)	2011	25,320	Natural Gas	177,00
416	AKSA AKRİLİK (İTHAL KÖM.+D.G)	2011	25,000	Natural Gas	189,08
417	AKSA ENERJİ (Antalya)	2011	600,000	Natural Gas	3600,00
418	ALİAĞA ÇAKMAKTEPE ENERJİ (İlave)	2011	139,680	Natural Gas	1051,60
419	BEKİRLİ TES (İÇDAŞ ELEKTRİK EN.)	2011	600,000	Imported coal	4320,00
420	BOLU BELEDİYESİ ÇÖP TOP. TES. BİYOGAZ	2011	1,100	Landfill Gas	0,00
421	BOSEN ENERJİ ELEKTRİK ÜRETİM AŞ.	2011	93,000	Natural Gas	698,49
422	CENGİZ ÇİFT YAKITLI K.Ç.E.S.	2011	131,335	Natural Gas	985,00
423	CENGİZ ENERJİ SAN.VE TİC.A.Ş.	2011	35,000	Natural Gas	281,29
424	CEV ENERJİ ÜRETİM(GAZİANTEP ÇÖP BİOGAZ)	2011	5,700	Landfill Gas	0,00
425	FRAPORT IC İÇTAŞ ANTALYA HAVALİMANI	2011	8,000	Natural Gas	64,00
426	GLOBAL ENERJİ (PELİTLİK)	2011	4,000	Natural Gas	29,91
427	GORDİON AVM (REDEVCO ÜÇ EMLAK)	2011	2,000	Natural Gas	15,00
428	GOREN-1 (GAZİANTEP ORGANİZE SAN.)	2011	48,650	Natural Gas	277,00
429	GÜLLE ENERJİ(Çorlu) (İlave)	2011	3,900	Natural Gas	17,97
430	HASIRCI TEKSTİL TİC. VE SAN. LTD. ŞTİ.	2011	2,000	Natural Gas	15,00
431	HG ENERJİ ELEKTRİK ÜRET. SAN.TİC. A.Ş.	2011	52,380	Natural Gas	366,00
432	ISPARTA MENSUCAT (Isparta)	2011	4,300	Natural Gas	33,00
433	ITC ADANA ENERJİ ÜRETİM (İlave)	2011	1,415	Landfill Gas	0,00
434	ITC-KA EN. (ASLIM BİYOKÜTLE) KONYA	2011	5,660	Landfill Gas	0,00
435	ITC-KA ENERJİ (SİNCAN) (İlave)	2011	1,416	Landfill Gas	0,00
436	ITC-KA ENERJİ MAMAK KATI ATIK TOP.	2011	2,826	Landfill Gas	0,00
437	İSTANBUL SABİHA GÖKÇEN UL.AR. HAV.	2011	4,000	Natural Gas	32,00
438	KARKEY (SİLOPİ 1)	2011	100,440	Fuel Oil	701,15
439	KAYSERİ KATI ATIK DEPONİ SAHASI	2011	1,600	Landfill Gas	0,00
440	KNAUF İNŞ. VE YAPI ELEMANLARI SN.	2011	1,600	Natural Gas	12,00
441	LOKMAN HEKİM ENGÜRÜ SAĞ.(SİNCAN)	2011	0,500	Natural Gas	4,00
442	MARDİN-KIZILTEPE (AKSA ENERJİ)	2011	32,100	Natural Gas	225,00
443	NUH ENERJİ EL. ÜRT.A.Ş. (ENERJİ SANT.-2)	2011	119,980	Natural Gas	900,00
444	ODAŞ DOĞALGAZ KÇS (ODAŞ ELEKTRİK)	2011	54,960	Natural Gas	415,00
445	POLYPLEX EUROPA POLYESTER FİLM	2011	3,904	Natural Gas	30,70
446	SAMSUN TEKKEKÖY EN. SAN. (AKSA EN.)	2011	131,335	Natural Gas	980,00
447	SAMUR HALI A.Ş.	2011	4,300	Natural Gas	33,00
448	SARAY HALI A.Ş.	2011	4,300	Natural Gas	33,00
449	TEKİRDAĞ-ÇORLU TEKS.TES.(NİL ÖRME)	2011	2,677	Natural Gas	21,00
450	TİRENDA TİRE ENERJİ ÜRETİM A.Ş.	2011	58,380	Natural Gas	410,00
451	YENİ UŞAK ENERJİ ELEKTRİK SANTRALI	2011	8,730	Natural Gas	65,00
452	ZORLU ENERJİ (B.Karıştıran)	2011	7,200	Natural Gas	54,07
453	ŞANLIURFA OSB (RASA ENERJİ ÜR. A.Ş.)	2011	116,760	Natural Gas	800,00
454	AYDIN/GERMENCİK JEOTERMAL	2011	20,000	Geothermal	150,00
455	ÇEŞMEBAŞI REG. VE HES (GİMAK EN.)	2011	8,200	Hydro (run of river)	39,00
456	ÇUKURÇAYI HES (AYDEMİR ELEKTRİK ÜR.)	2011	1,800	Hydro (run of river)	8,00
457	DARCA HES (BÜKOR ELEKTRİK ÜRETİM)	2011	8,900	Hydro (run of river)	0,00
458	DERME (KAYSERİ VE CİVARI ENERJİ)	2011	4,500	Hydro (run of river)	14,00
459	DURU 2 REG. VE HES (DURUCASU ELEK.)	2011	4,500	Hydro (run of river)	22,00
460	ERENKÖY REG. VE HES (NEHİR ENERJİ)	2011	21,500	Hydro (run of river)	87,00
461	ERKENEK (KAYSERİ VE CİVARI ENERJİ)	2011	0,320	Hydro (run of river)	0,00
462	EŞEN-1 HES (GÖLTAŞ ENERJİ ELEKTRİK)	2011	60,000	Hydro (run of river)	240,00
463	GİRLEVİK (BOYDAK ENERJİ)	2011	3,040	Hydro (run of river)	21,00
464	GÖKMEN REG. VE HES (SU-GÜCÜ ELEKT.)	2011	2,869	Hydro (run of river)	13,00
465	HACININOĞLU HES (ENERJİ-SA ENERJİ)	2011	142,300	Hydro (run of river)	360,00

466	HAKKARİ (Otluca) (NAS ENERJİ A.Ş.)	2011	1,300	Hydro (run of river)	6,00
467	HASANLAR	2011	9,400	Hydro (run of river)	39,00
468	HASANLAR HES (DÜZCE ENERJİ BİRLİĞİ)	2011	4,700	Hydro (run of river)	0,00
469	İNCİRLİ REG. VE HES (LASKAR ENERJİ)	2011	25,200	Hydro (run of river)	126,00
470	KALKANDERE REG. VE YOKUŞLU HES	2011	23,360	Hydro (run of river)	0,00
471	KARASU 4-2 HES (İDEAL ENERJİ ÜRETİMİ)	2011	10,400	Hydro (run of river)	0,00
472	KARASU 4-3 HES (İDEAL ENERJİ ÜRETİMİ)	2011	4,600	Hydro (run of river)	0,00
473	KARASU 5 HES (İDEAL ENERJİ ÜRETİMİ)	2011	4,100	Hydro (run of river)	0,00
474	KARASU I HES (İDEAL ENERJİ ÜRETİMİ)	2011	3,800	Hydro (run of river)	0,00
475	KARASU II HES (İDEAL ENERJİ ÜRETİMİ)	2011	3,100	Hydro (run of river)	13,00
476	KAZANKAYA REG. VE İNCESU HES (AKSA)	2011	15,000	Hydro (run of river)	48,00
477	KESME REG. VE HES (KIVANÇ ENERJİ)	2011	4,600	Hydro (run of river)	16,00
478	KIRAN HES (ARSAN ENERJİ A.Ş.)	2011	9,700	Hydro (run of river)	0,00
479	KORUKÖY HES (AKAR ENERJİ SAN. TİC.)	2011	3,000	Hydro (run of river)	22,00
480	KOVADA-I (BATIÇİM ENERJİ ELEKTRİK)	2011	51,200	Hydro (run of river)	36,20
481	KOVADA-II (BATIÇİM ENERJİ ELEKTRİK)	2011	8,250	Hydro (run of river)	4,10
482	KOZDERE HES (ADO MADENCİLİK ELKT.)	2011	3,100	Hydro (run of river)	0,00
483	KÖYOBASI HES (ŞİRİKOĞLU ELEKTRİK)	2011	1,100	Hydro (run of river)	5,00
484	KULP I HES (YILDIZLAR ENERJİ ELK.ÜR.)	2011	22,920	Hydro (run of river)	78,00
485	KUMKÖY HES (AES-IC İÇTAŞ ENERJİ)	2011	17,490	Hydro (run of river)	98,00
486	AKSU REG. VE HES (KALEN ENERJİ)	2011	5,200	Hydro (run of river)	16,00
487	ALKUMRU BARAJI VE HES (LİMAK HİD.)	2011	261,270	Hydro (run of river)	828,00
488	AYRANCILAR HES (MURADİYE ELEKTRİK)	2011	32,100	Hydro (run of river)	0,00
489	BALKONDU I HES (BTA ELEKTRİK ENERJİ)	2011	9,200	Hydro (run of river)	33,00
490	BAYRAMHACILI BARAJI VE HES	2011	47,000	Hydro (run of river)	175,00
491	BERDAN	2011	10,200	Hydro (run of river)	47,20
492	BOĞUNTU HES (BEYOBASI ENERJİ)	2011	3,800	Hydro (run of river)	17,00
493	CEVHER I-II REG. VE HES (ÖZCEVHER EN.)	2011	16,400	Hydro (run of river)	0,00
494	ÇAKIRMAN REG. VE HES (YUSAKA EN.)	2011	6,980	Hydro (run of river)	22,00
495	ÇAMLIKAYA REG.VE HES (ÇAMLIKAYA EN)	2011	2,824	Hydro (run of river)	0,80
496	ÇANAKÇI HES (CAN ENERJİ ENTEGRE)	2011	9,300	Hydro (run of river)	39,00
497	MENGE BARAJI VE HES (ENERJİSA ENERJİ)	2011	44,700	Hydro (run of river)	0,00
498	MOLU ENERJİ (Zamantı-Bahçelik HES)	2011	4,200	Hydro (run of river)	30,00
499	MURATLI REG. VE HES (ARMAHES EL.)	2011	26,700	Hydro (run of river)	94,00
500	NARİNKALE REG. VE HES (EBD ENERJİ)	2011	30,400	Hydro (run of river)	108,00
501	OTLUCA I HES (BEYOBASI ENERJİ ÜR.)	2011	37,500	Hydro (run of river)	0,00
502	OTLUCA II HES (BEYOBASI ENERJİ ÜR.)	2011	6,360	Hydro (run of river)	0,00
503	ÖREN REG. VE HES (ÇELİKLER ELEKTRİK)	2011	6,600	Hydro (run of river)	16,00
504	POYRAZ HES (YEŞİL ENERJİ ELEKTRİK)	2011	2,660	Hydro (run of river)	10,00
505	SARAÇBENDİ HES (ÇAMLICA ELEKTRİK)	2011	25,500	Hydro (run of river)	0,00
506	SARIKAVAK HES (ESER ENERJİ YAT. AŞ.)	2011	8,100	Hydro (run of river)	0,00
507	SAYAN HES (KAREL ELEKTRİK ÜRETİM)	2011	14,900	Hydro (run of river)	0,00
508	SEFAKÖY HES (PURE ENERJİ ÜRETİM AŞ.)	2011	33,100	Hydro (run of river)	0,00
509	DAREN HES ELEKTRİK (SEYRANTEPE)	2011	49,700	Hydro (run of river)	181,13
510	SIZIR (KAYSERİ VE CİVARI EL. T.A.Ş)	2011	5,800	Hydro (run of river)	46,00
511	SÖĞÜTLÜKAYA (POSOF III) HES	2011	6,100	Hydro (run of river)	31,00
512	TEFEN HES (AKSU MADENCİLİK SAN.)	2011	33,000	Hydro (run of river)	141,00
513	TUZTAŞI HES (GÜRÜZ ELEKTRİK ÜR.)	2011	1,600	Hydro (run of river)	10,00
514	ÜZÜMLÜ HES (AKGÜN ENERJİ ÜRETİM)	2011	11,400	Hydro (run of river)	41,00
515	YAMAÇ HES (YAMAÇ ENERJİ ÜRETİM A.Ş.)	2011	5,500	Hydro (run of river)	0,00
516	YAPISAN (KARICA REG. ve DARICA I HES)	2011	13,320	Hydro (run of river)	0,00
517	YAPRAK II HES (NİSAN ELEKTROMEK.)	2011	10,800	Hydro (run of river)	32,00

518	YAŞIL HES (YAŞIL ENERJİ ELEKTRİK)	2011	3,800	Hydro (run of river)	15,00
519	YEDİGÖL REG. VE HES (YEDİGÖL HİDR.)	2011	21,900	Hydro (run of river)	77,00
520	YEDİGÖZE HES (YEDİGÖZE ELEK.) (İlave)	2011	155,330	Hydro (run of river)	425,00
521	SARES RES (GARET ENERJİ ÜRETİM)	2011	7,500	Wind	0,00
522	SEYİTALİ RES (DORUK ENERJİ ELEKTRİK)	2011	30,000	Wind	0,00
523	SOMA RES (SOMA ENERJİ) (İlave)	2011	36,900	Wind	0,00
524	SUSURLUK RES (ALANTEK ENERJİ ÜRET.)	2011	45,000	Wind	0,00
525	ŞAH RES (GALATA WİND ENERJİ LTD. ŞTİ)	2011	93,000	Wind	0,00
526	TURGUTTEPE RES (SABAŞ ELEKTRİK)	2011	2,000	Wind	0,00
527	ZİYARET RES (ZİYARET RES ELEKTRİK)	2011	22,500	Wind	0,00
528	AKRES (AKHİSAR RÜZGAR EN. ELEKT.)	2011	43,800	Wind	0,00
529	AYVACIK RES (AYRES AYVACIK RÜZG.)	2011	5,000	Wind	0,00
530	BAKİ ELEKTRİK ŞAMLI RÜZGAR (İlave)	2011	24,000	Wind	0,00
531	ÇANAKKALE RES (ENERJİ-SA ENERJİ)	2011	29,200	Wind	0,00
532	ÇATALTEPE RES (ALİZE ENERJİ ELEKTRİK)	2011	16,000	Wind	0,00
533	İNNORES ELEKTRİK YUNTDAĞ RÜZGAR	2011	10,000	Wind	0,00
534	KİLLİK RES (PEM ENERJİ A.Ş.)	2011	40,000	Wind	0,00

ANNEX 2: Generation Licence And Eia is Not Required Certificate Of Mordoğan WPP

T.C.
ENERJİ PİYASASI DÜZENLEME KURUMU

E P D K

ÜRETİM LİSANSI

Bu Lisans kapsamındaki üretim tesisi Yenilenebilir Enerji Kaynağı kullanmaktadır.

Lisans No : EÜ/1622-8/1181

Tarih : 29/05/2008

Bu Lisans; **Egenda Ege Enerji Üretim Anonim Şirketi**'ne, İzmir ili, Karaburun ilçesinde, rüzgar enerjisine dayalı Mordoğan RES projesi kapsamında, 29/05/2008 tarihinden itibaren 49 yıl süreyle üretim faaliyeti göstermek üzere 4628 sayılı Elektrik Piyasası Kanunu ve ilgili mevzuat uyarınca Enerji Piyasası Düzenleme Kurulu'nun 29/05/2008 tarihli ve 1622-8 sayılı Kararı ile verilmiştir.

Hasan KÖKTAŞ
Başkan

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

Picture 3: Generation License of Mordoğan WPP issued by Energy Market Regulatory Authority (EMRA) dated 29.05.2008, for 49 years duration.

English version of the Generation License:

T.C.
Energy Market Regulatory Authority

Generation License
The power plant covered under this license utilizes renewable energy resources

License No:EU/1622-8/1181
Date: 29/05/2008

In accordance with Electricity Market Law and its related legislation and decision of Energy Market Regulator Authority dated 29/05/2008 and no 4628; this license is granted to Egenda Ege Enerji Üretim Anonim Şirketi for period of 49 years in purpose generation activity for power plant based on wind energy in İzmir district.

T.C.
İZMİR VALİLİĞİ
İL ÇEVRE VE ORMAN MÜDÜRLÜĞÜ

Karar Tarihi : 18/5./2009
Karar No : 667

ÇED GEREKLİ DEĞİLDİR BELGESİ

17 Temmuz 2008 tarih ve 26939 sayılı Resmi Gazete'de yayımlanarak yürürlüğe giren Çevresel Etki Değerlendirmesi Yönetmeliği'nin Ek- II listesinde yer **" 13,8 MW kapasiteli Mordoğan Rüzgar Enerjisi Santralı"** projesi ile ilgili olarak inceleme değerlendirme yapılmış ve Proje Tanıtım Dosyasında çevresel etkilere karşı alınması öngörülen önlemler yeterli görülmüştür. Ayrıca ÇED Raporu hazırlanmasına gerek bulunmadığı tespit edilmiş olup, söz konusu projeye ÇED yönetmeliğinin 17. maddesi gereğince; Valiliğimizce projesi hakkında ***"Çevresel Etki Değerlendirmesi Gerekli Değildir Kararı"*** verilmiştir.

Mustafa AYDIN
Vali a.
Vali Yardımcısı

Proje Sahibi : Egenda Ege Enerji Üretim A.Ş
Projenin Yeri : İzmir İli , Karaburun İlçesi Mordoğan Yellicebelen Dağı Kayadibi Tepe, Dağüstü Tepe, Yenicepınar Tepe Mevkiinde haritanın Urla-L17-a1 pa (12 adet 1000 kW ve 2 adet 800 kW'lık Türbin)

Picture 4: "EIA not Required Certificate" of Mordoğan WPP issued by Directorate of Forest and Environment of İzmir province Governorship dated 18.05.2009

English version of the EIA not Requierd Certificate:

T.C.

İzmir GOVERNORSHIP

DIRECTORATE of FOREST and ENVIRONMENT

Decision Date: 18.05.2009
Decision No:667

According to the 17th article of the Environmental Impact Assessment Regulation which is published 26939th Official Gazette at 17.07.2008 decided that ''Environmental Impact Assessment is not Required'' for Mordoğan WPP.

Project owner: Egenda Ege Enerji Üretim A.Ş.
Project area: İzmir