ALAÇATI WIND POWER PROJECT, TURKEY

Document Prepared By Lif Enerji Ltd. Şti.

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Table of Contents

1.1 Summary Description of the Project

The project of **Egenda Ege Enerji Üretim A.Ş.** (hereafter referred to as "**Egenda**"), **Alaçatı Wind Power Project** (hereafter referred to as the "Project" or "**Alaçatı WPP**"), involves installation and operation of 16 MW[1] wind power plant by Energy Market Regulatory Authority (EMRA) and this licence was issued in May 2008.

An **estimated electricity generation of 49,822 MWh[2] 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 29,062 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 June 2016 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

[1] See; Alaçatı Generation License
[2] See, Barlovento Wind-Resourcce-Assessment, page 49, alternative 2

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.

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 respective sectoral scope is scope 1: "Energy Industry – Renewable/Non-renewable Sources". Installed capacity of the project is 16 MWe, thus it falls into a large scale project activity.

The project is not a grouped project.

1.3 Project Proponent

Egenda Ege Enerji Üretim A.Ş. is the developer and owner of the Project.

Organization name	Egenda Ege Enerji Üretim A.Ş.
Contact person	Taylan Kabaş

Title	WPP Projects Manager
Address	1380 Sokak No:2/1 Alyans Apt. Alsancak İzmir Turkey
Telephone	0090 232 463 98 11
Email	taylan.kabas@endaenerji.com.tr

1.4 Other Entities Involved in the Project

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

Organization name	Lifenerji Ltd. Şti.
Role in the project	Carbon Consultant
Contact person	Engin Mert
Title	Carbon Management Manager
Address	Address: Çetin Emeç Bulvarı 19/18 Çankaya/Ankara
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Email	engin.mert@lifenerj.com

1.5 Project Start Date

The anticipated project start date is 1st of June 2016.

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 June 2016. Thus the first crediting period shall last from 1st of June 2016 until 31st of May 2026.

1.7 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	
Large project	x

Year	Estimated GHG emission reductions or removals (tCO_2e)
2016*	16,953
2017	29,062
2018	29,062
2019	29,062
2020	29,062
2021	29,062
2022	29,062
2023	29,062
2024	29,062
2025	29,062
2026**	12,109
Total estimated ERs	**290,620**
Total number of crediting years	**10**
Average annual ERs	**29,062**

*Start date; 01.06.2016
**End date; 31.05.2026

1.8 Description of the Project Activity

According to the Generation License, 8 wind turbines with unit capacity of 2000 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 are listed below in table.

Table 1: Technical specifications of EnerconTurbines

Specifications	
Rated Power (kW)	2000
Rotor Diameter (m)	82
Hub Height (m)	78
Num. of Blades	3

Operational life time of the Alaçatı WPP is determined by using the 'Tool to determine the remaining lifetime of equipment''[3]. In the tool it is stated that;

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

[3] See, http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf

(a) Use manufacturers 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

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

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

=49,911/16*8760

=0.36

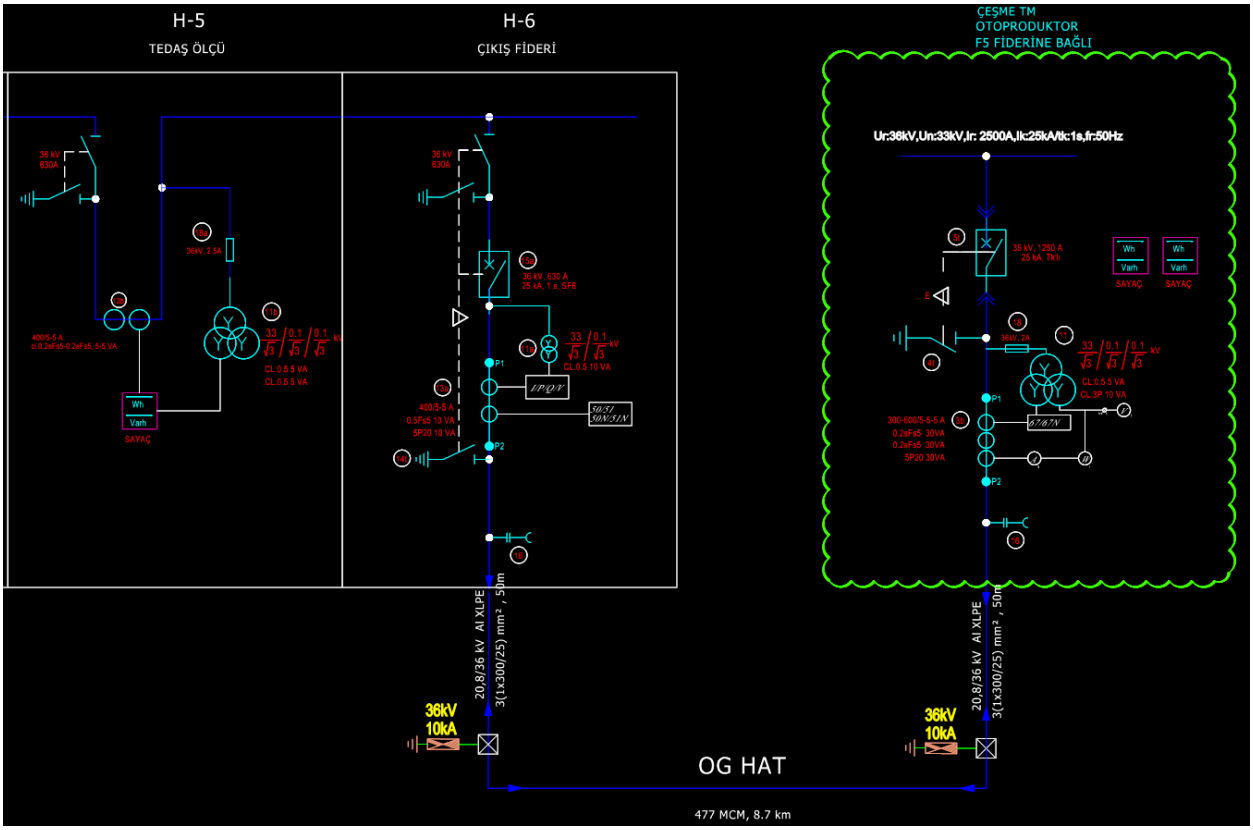


Figure 1: Single line diagram of Alaçatı WPP

The project activity will achieve emission reductions by avoiding CO2 emissions from the business-as-usual scenario electricity generation produced by mainly fossil fuel-fired power plants within the Turkish national grid. Total emission reduction over the 10 year crediting period is expected to reach 290,620 tCO2e with the assumed total net electricity generation of 49,822 MWh per year.

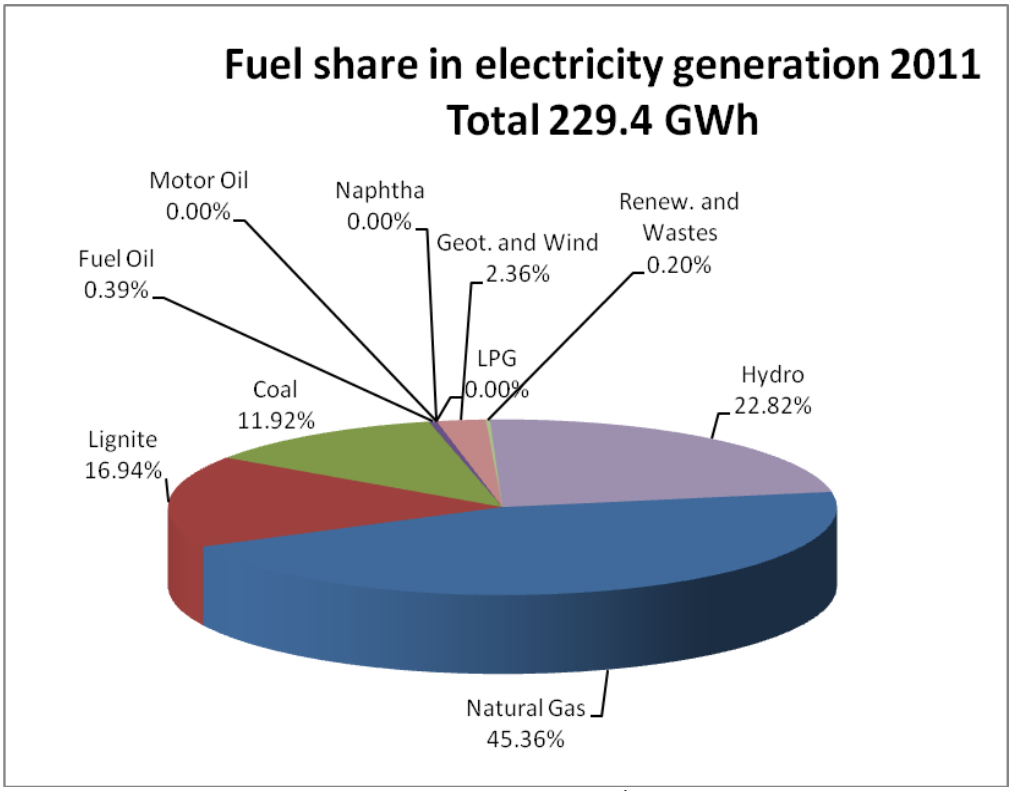


Figure 2: Share of Sources in Installed Capacity 2011[4]

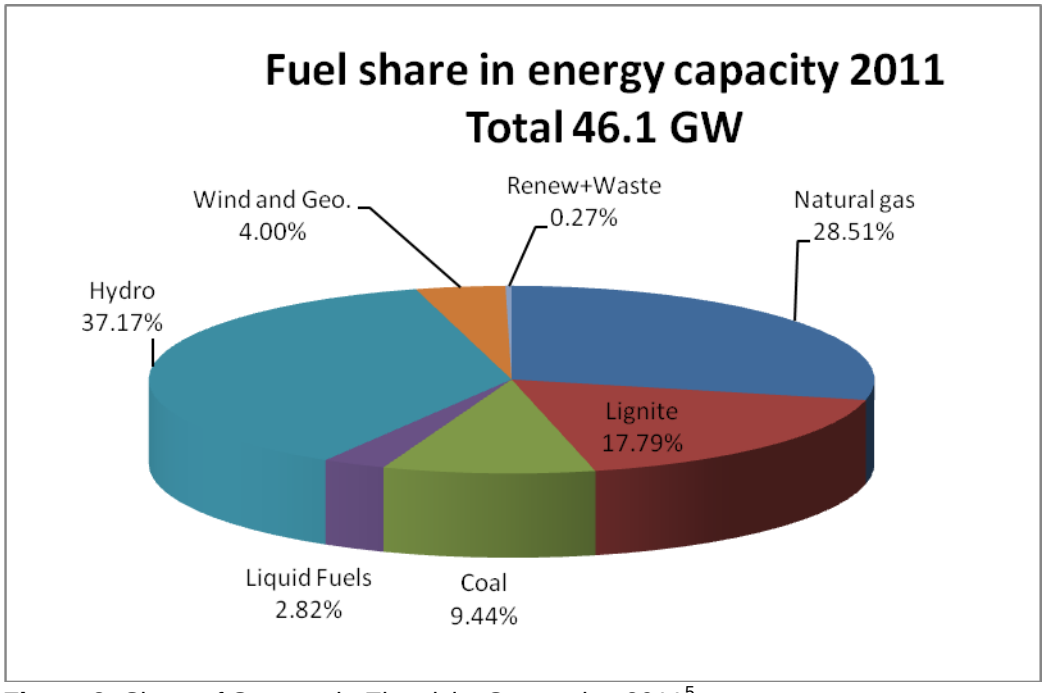


Figure 3: Share of Sources in Electricity Generation 2011[5]

[4] 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

[5] 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

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). 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 (~5.5 €c/kWh) for the power plants put in operation by end of 2015 [6]. 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 Alaçatı 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.

Alaçatı 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. The Gold Standard certification shall help to realize this seminal 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 June 2016 to 31st of May 2026 after the completion of commissioning. Applying the approved methodology to the project annual average amount of 29,062 tCO2e emission reductions is estimated to be achieved by producing 49,822 MWh/year electricity. In each year the amount of VCUs actually generated by the project will vary depending on the metered net electricity supplied to the grid, but totally 290,620 tCO2e emission reductions is expected over the period of 10 years

1.9 Project Location

The project site is located about 5.8 km south east of Çeşme. On the 2.4 km north of the project Aegean Sea, on the 2.8 east of the project Ovacık, on the 2 km east of the project Alaçatı and on the 1.1 km south of the project Çeşme-İzmir road are located. The closest settlement to the project site is Ilıca which is about 1.6 km away to the north of the wind farm and Reisdere Neighbourhood which is about 1.3 km away to the north of the plant[7].

[6] See : http://www.epdk.org.tr/documents/elektrik/mevzuat/kanun/Elk_Kanun_Yek_Kanun.doc (List I in page 10)
[7] See; Alaçatı Bird Assessment Report, page 8

Map 1: Location of Alaçatı Wind Power Plant Project

Table 2: Geographical coordinates of the wind turbines of the project activity[8]

Wind Turbine No.	Latitude (N)	Longitude (E)
1	38° 17' 38"	26° 20' 53"
2	38° 17' 27"	26° 20' 48"
3	38° 17' 15"	26° 20' 45"
4	38° 17' 2"	26° 20' 54"
5	38° 17' 2"	26° 20' 44"
6	38° 16' 50"	26° 20' 49"
7	38° 16' 37"	26° 20' 45"
8	38° 17' 18"	26° 20' 55"

[8] See; Alaçatı Bird Assessment Report, page 54

1.10 Conditions Prior to Project Initiation

As the project activity is a greenfield project, the conditions prior to the project initiation is the continuation of the current situation, i.e. the equivalent amount of energy would have been produced by other grid-connected units, which is explained under the Section 2.4 (Baseline Scenario).

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[9]

(2) Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy[10]

(3) Environment Law[11]

The renewable Energy generation license for Alaçatı 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

Alaçatı 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

N.A.

1.12.3 Other Forms of Environmental Credit

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

[9] See: http://www.epdk.org.tr/documents/10157/351a7a0c-52a9-40d5-8e12-f8e61afe7247 (Enactment Date:2001)

[10] See: http://www.epdk.org.tr/documents/10157/4b360128-53aa-4174-8104-a6c10434ac9c (Enactment Date: 2005)

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

1.12.4 Participation under Other GHG Programs

Project was seeking registration under the Gold Standard. Due to the carbon market conditions project owner would like to opt from GS and applied for VCS.

1.12.5 Projects Rejected by Other GHG Programs

Project has not been rejected from any other program.

1.13 Additional Information Relevant to the Project

Eligibility Criteria

Project is not classified as 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

N.a.

2 APPLICATION OF METHODOLOGY

2.1 Title and Reference of Methodology

For the determination of the baseline, the official methodology ACM0002 version 16.0.0, "Large-scale Consolidated baseline methodology for grid-connected electricity generation from renewable sources"[12], is applied, using conservative options and data as presented in the following section. This methodology refers to five Tools, which are:

1. Tool to calculate the emission factor for an electricity system (Version 04.0.0)[13];

2. Tool for the demonstration and assessment of additionality (Version 07.0.0)[14];

[12] ACM0002 Version 16: (https://cdm.unfccc.int/filestorage/0/X/6/0X6IERWMG92J7V3B8OTKFSL1QZH5PA/EB81_repan09_ACM0002_ver16.0_clean.pdf?t=Ykx8bmo1MG5nfDBt9CgQqHHHPLb9pKkRE10Z)

[13] See; http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf

[14] See; http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf

3. Combined tool to identify the baseline scenario and demonstrate additionality (Version 05.0.0)[15];

4. Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion (Version 02.0.0)[16].

5. Tool to determine the remaining lifetime of the equipment[17]

For baseline calculation the first tool, for additionality assessment the second tool is used. As third tool is the combination of the first and second tool, it is not used. Since no project emission or leakage calculation is required for wind power project fourth tool is not used, and finally to determine the remaining lifetime of the equipment fifth tool is used.

2.2 Applicability of Methodology

"Grid-connected renewable power generation project The choice of methodology ACM0002 version 16 is justified as the proposed project activity meets its applicability criteria:

Applicability Conditions in the ACM0002/Version16.0	Applicability to this project activity
This methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Install a Greenfield power plant; (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plants/units; (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s).	The project activity consists of installation of Greenfield power plant at a site where no renewable power plant was operated prior to the implementation of the project activity. Thus, it meets the said applicability condition.
The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit.	The project activity is the installation of 8 numbers of wind turbine generators (WTGs). Hence, meets this criterion.
In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the	The project activity does not involve capacity additions, retrofits, rehabilitations or replacements. Hence this criterion is not applicable to the project activity.

[15] See; http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v5.0.0.pdf
[16] See; http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf
[17] See; http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf

calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	
In case of hydro power plants, one of the following conditions shall apply: (a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or (b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (3), is greater than 4 W/m^2; or (c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than 4 W/m^2; or (d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m^2, all of the following conditions shall apply: (i) The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m2; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m2 shall be: a. Lower than or equal to 15 MW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project.	The project activity is not a hydro power plant. Hence this applicability criterion is not relevant to the project activity.
In the case of integrated hydro power projects, project proponent shall: (a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or (b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of	The project activity is not a hydro power plant. Hence this applicability criterion is not relevant to the project activity.

water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.	
The methodology is not applicable to: (a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; (b) Biomass fired power plants/units	Project activity does not involve: • Switching from fossil fuels to renewable energy sources at the site of the project activity. • Biomass fired plants. Hence this criterion is not applicable.
In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	The project is not a retrofit, rehabilitations, replacements or capacity addition; hence this applicability criterion is not relevant.
In addition, the applicability conditions included in the tools referred to above apply.	Applicability conditions of the applied tool are justified

From the above it is concluded that the project activity meets all the applicability conditions of the methodology ACM0002 version 16.0 "Grid connected electricity generation from renewable sources".

The project activity also meets the following applicability conditions of "Tool to calculate the emission factor for an electricity system".

SI No	Applicability condition	Applicability to this project activity
1	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, i.e. 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 energy efficiency projects).	The project activity substitutes grid electricity by supplying renewable power to grid. Hence this criterion is applicable.
2	In case of CDM projects the tool is not applicable if the project electricity system is	Project is not a CDM project.

	located partially or totally in an Annex I country.	

The project activity also meets the applicability conditions given in "Tool for the demonstration and assessment of additionality".

Other tools mentioned in the methodology are not applicable for this project activity. In addition to this, all approved Standardized baselines are not applicable for the project activity.

2.3 Project Boundary

As per the Approved Large Scale Consolidated Methodology ACM0002, the project boundary is "The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to." Correspondingly, in this project activity the project boundaries include the project site and all power plants attached to the Turkish National Grid.

The project uses wind energy to produce electricity. Kinetic power of the wind is converted to electrical energy, which then will be transferred to the grid. Back-up power generators in the wind farm will only be used when the wind farm is out of service and power cannot be supplied from grid. Hence, emissions due to usage of back-up power generation are expected to be very low and are taken to be zero complying with the Tool. The baseline and project activity related greenhouse gases which are considered in baseline calculation is given below.

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	CO_2		*Main emission source*
		CH_4		*Minor emission sources*:
		N_2O		*Minor emission source*
Project	Emissions during construction and operation of the project	CO_2		*As per ACM0002 project emissions are not considered for wind power project.*
		CH_4		*As per ACM0002 project emissions are not considered for wind power project.*

Source		Gas	Included?	Justification/Explanation
	activity	N_2O		*As per ACM0002 project emissions are not considered for wind power project.*

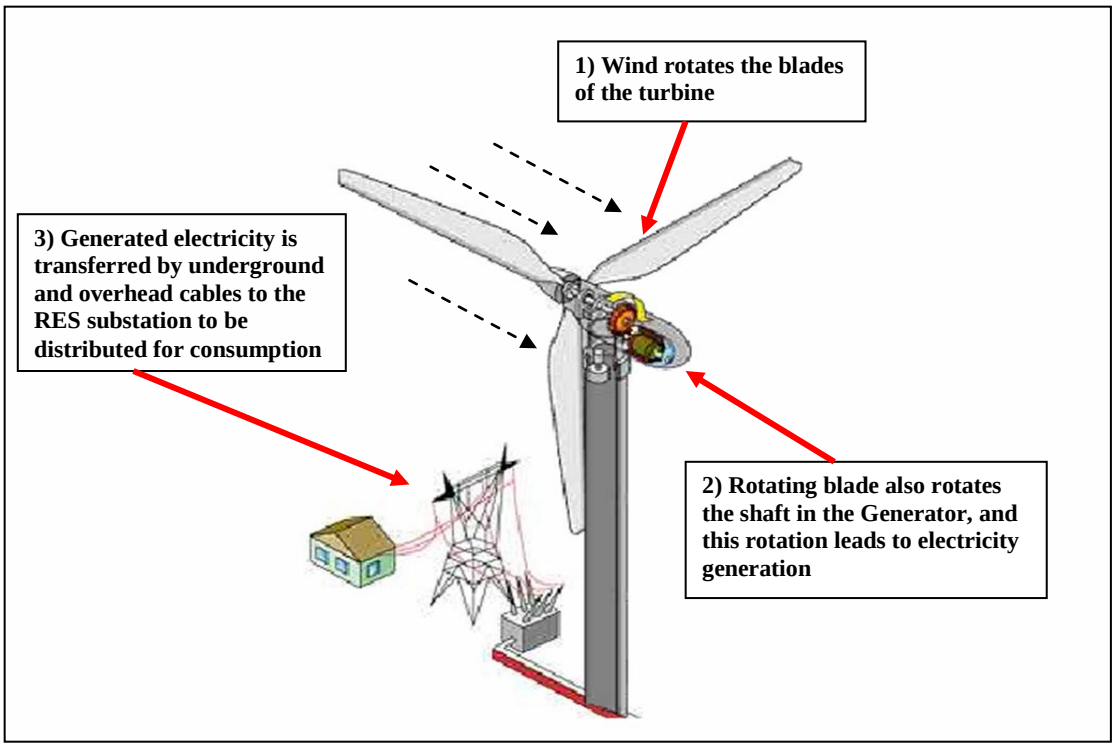


Figure 4: Operation diagram of the project

2.4 Baseline Scenario

The baseline scenario is identified according to the "Baseline Methodology Procedure" of ACM0002 ver.16 (page 10). The project activity is installation of a new grid-connected wind farm with 5 turbines and is not modification/retrofit of an existing grid-connected power plant. So, first identification of this procedure is selected for proposed project activity, which is described as:

"Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system"(v.4).

To describe the baseline and its development for the project activity, long-term electricity demand and supply projections for Turkey are assessed.

Demand for electricity in Turkey is growing rapidly with average 6.16%[18] for previous ten years. TEİAŞ, who is responsible from the grid reliability has prepared an electricity demand projection for next ten years period (2012-2021) for Turkey and announced on July 2012, given in **Table 3** and **Figure 5**, reflecting the continuation of current demand growth[19].

Table 3: Low and High Demand Projection Scenarios for Ten Years Period (TWh)

Scenarios	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
High Scenario	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

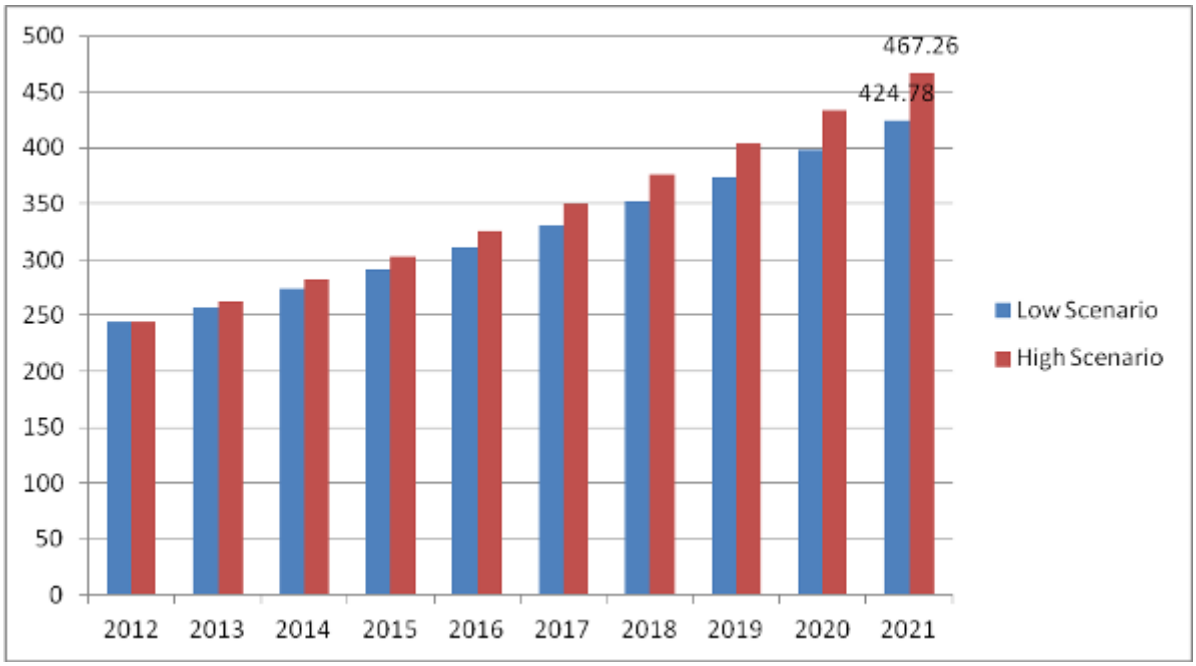


Figure 5: Electricity Demand Projections for Ten Years

In this projection, electricity supplies are also forecasted taking into account all power plants, which are operational, under construction and newly licensed. Generation projection based on project generation is given in:

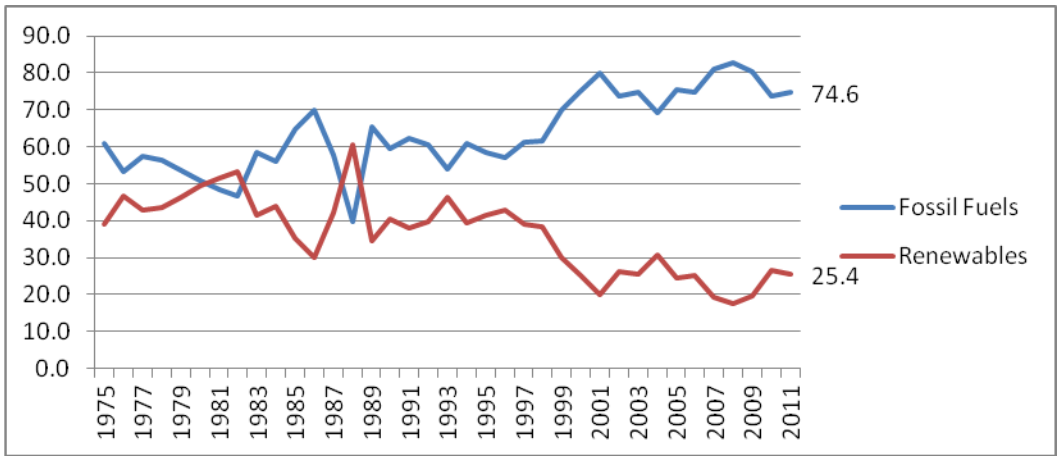
[18] See, http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf (page 3, Table 1)

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

Table 4: Projection of Total Generation Capacity by Fuel Types (TWh)[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 6**. The share of fossil fuels in the mix has been continuously increasing since the 1970s, reaching 73.8% in 2011.



[20] See, http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf (page 51, Table 25)

Figure 6: Fossil Fuels and Renewable in Turkish Electricity Mix (1975-2011)[21]

In the shed of above analysis for the baseline scenario (continuation of current situation) it can be concluded that:

- **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.

2.5 Additionality

For the explanation of how and why the project activity leads to emission reductions that are additional to what would have occurred in the absence of the project activity, the Baseline Methodology refers to the consolidated "Tool for the demonstration and assessment of additionality"[23] version 7.0.0 (Tool), which defines a step-wise approach to be applied to the proposed project.

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

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

To identify the realistic and credible alternative scenario(s) for project participants, scenarios in the Tool are assessed:

a) The proposed project activity undertaken without being registered as a VCS project activity

This alternative is realistic and credible as Egenda may undertake project activity if he sees no risk for project and/or if the project turns out to be financially attractive without VCU credit income. However, investments analyze shows that the project is not economically feasible without VCU credit income. Detail information is given in Step-3.

[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)
[22] See, http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf (page 99, Table 48)
[23] Version 6, http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf (page 4)

b) Other realistic and credible alternative scenario(s) to the proposed VCS project activity scenario that deliver electricity with comparable quality, properties and application areas, taking into account, where relevant, examples of scenarios identified in the underlying methodology;

The project activity is power generation activity without any greenhouse gas emission harnessing the energy of the wind. Being a private entity, Egenda doesn't have to invest power investments even proposed project activity. Also, since Egenda has licence only for wind power investment and since in the proposed project area there is no hydro or other sources for electricity generation, other project activities delivering same electricity in the same project area is not realistic for project participant.

c) Continuation of the current situation, i.e. Alaçatı WPP is not built

The decision in favour or against a project investment depends on the expected revenues and risks, like for every other private investment. Investment decisions other than Alaçatı WPP are independent from the question whether Alaçatı WPP is built or not. This alternative is also realistic and credible.

According to baseline scenario, there is a need for energy investment to satisfy increasing demand and if the Alaçatı WPP is not built, the same amount of energy will be supplied by other private investors to the grid. Forecasts shows that electricity supplied in the absence of Alaçatı WPP will be mainly based on fossil fuels as the projections for the year of 2021 forecasts 70.79% share for fossil fuels in the energy mix.

Therefore, two realistic and credible alternative scenarios are identified for the project activity:

a) The proposed project activity undertaken without being registered as a VCS project activity.

b) Continuation of the current situation, i.e. Alaçatı WPP is not built.

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

Both alternatives are (building or not building the project activity) in compliance with the following identified applicable mandatory laws and regulations:

(1) Electricity Market Law[24]

(2) Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy[25]

(3) Environment Law[26]

[24] See: http://www.epdk.gov.tr/documents/elektrik/mevzuat/kanun/Elk_Kanun_6446.doc (Enactment Date:2013)

[25] See: http://www.epdk.org.tr/documents/elektrik/mevzuat/kanun/Elk_Kanun_Yek_Kanun.doc (Enactment Date: 2005)

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

Table 5: Project Implementation Schedule

Date (DD/MM/YYYY)	Activity
29-05-2008	Issuance of the License
09-08-2011	Board Decision
28-12-2011	Signature with Carbon Consultant for VER Development
15-05-2013	Equipment Agreement (Investment Decision Date)
01-05-2015	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 (15-05-2013) shall be set as the investment decision date according to decision of EB41[27].

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).

In the following, the investment analysis is applied to clearly demonstrate that the project activity is unlikely to be financially/economically attractive without the revenue from the sale of VERs.

Outcome of Step 1.b: Alaçatı consisted with mandatory laws and regulations. Project implementation schedule shows us that Enda started to consideration of VER from the beginning of the project implementation and VER Revenue has decisive impact on decision of proceeding to the project.

Step 2. Investment analysis

"Guidelines on the assessment of investment analysis[28]" version 5 is taken into account when applying this step.

Sub-step 2a: Determine appropriate analysis method

Applied tool: **"Tool for the demonstration and assessment of additionality version 7.0.0"**

Three options can be applied for the investment analysis: the simple cost analysis, the investment comparison analysis and the benchmark analysis.

- Option I: Simple cost analysis

- Option II: Investment comparison analysis

- Option III: Benchmark analysis

[27] See: http://cdm.unfccc.int/EB/041/eb41rep.pdf (paragraph 67)
[28] http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf

"Determine whether to apply simple cost analysis, investment comparison analysis or benchmark analysis (Sub-step 2b). If the CDM project activity and the alternatives identified in Step 1 generate no financial or economic benefits other than CDM related income, then apply the simple cost analysis (Option I). Otherwise, use the investment comparison analysis (Option II) or the benchmark analysis (Option III)."

As the project generates income other than the VER benefits (revenues from the sale of electricity to the grid), Option I that is the Simple Cost Analysis cannot be applied in this case.

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 (Equity IRR in this case) of the proposed project is better than relevant benchmark value.

Sub-step 2b: Option III: 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 [29], benchmark 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

In the paragraph 12 of the 'Guidance on the Assessment of Investment Analysis'[30] version 5, it is stated that:

[29] 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.)

[30] See, http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf(page 3)

'Required/expected returns on equity are appropriate benchmarks for equity IRR'. Since, benchmark identified in the Sub-step 2b is required/expected returns on equity, equity IRR (after tax) of the project activity shall be calculated for comparison.

Item	Value	Units	Source
Installed Power	16	MWe	License of The project
Operational lifetime of the project	25	years	Tool
Net Generation to be sold	49,822	MWh	Barlovento Wind-Resourcce-Assessment, page 49, alternative 2
Electricity tariff	73	USD Per MWh	For feed-in-tariff [31]
Income Tax Rate	20%	-	Corporate Tax Rate[32]
Equity Share	25%	-	Calculated
Annual Operating Cost	1,241,906	USD	Financial Analysis Reports
Total Project Cost	32,849,800	USD	Equipment agreements and Financial Analysis Reports
EUR/USD Rate	1.29	-	Equipment Contract Date (Investment Decision Date TCMB rare (15/05/2013))

Operational life time of the Alaçatı WPP is determined by using the 'Tool to determine the remaining lifetime of equipment''[33]. In the tool it is said that default lifetime for the on-shore wind turbines is 25 years.

The equity IRR (after tax) of Alaçatı WPP 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. The resulting IRR for 25 years is stated in below table.

Table 6: Equity IRR value for project activity (after tax)

Period	IRR
25 years	6.31 %

It is evident that the project activity has a less lower IRR than the benchmark. Thus, the project activity cannot be considered as financially attractive.

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 Electricity price (EP) is varied with +/-10% from 73 $/MWh, which is the - feed-in-tariff value.

The investment, energy yield and operating cost parameters are varied with +/- 10%. The worst, base and best-case results for each parameter variation are given below, in

[31] See, http://www.epdk.gov.tr/documents/elektrik/mevzuat/kanun/Elk_Kanun_Yek_Kanun.doc , page 9 Table I
[32] See, http://www.gib.gov.tr/index.php?id=860
[33] See, http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf

Table 7. The sensitivity analysis confirms that the proposed project activity is unlikely to be economically attractive without the revenues from VERs as even the maximum IRR result for the best case scenario (9.98%) is below the benchmark, which is 15%.

Table 7: Equity IRR results according to different parameters

Parameter	**Electricity Price**			**Investment Cost**			**Energy Yield**			**Operating Cost**		
Variance	**-10%**	**0%**	**10%**	**-10%**	**0%**	**10%**	**-10%**	**0%**	**10%**	**-10%**	**0%**	**10%**
IRRs	2.74%	6.31%	9.90%	9.98%	6.31%	4.00%	2.74%	6.31%	9.90%	8.69%	6.31%	3.71%

Step 4: Common Practice Analysis

The section below provides the analysis as per step 4 of the "Tool for the demonstration and assessment of additionality", version 7.0.0 and according to the Guidelines on Common Practice version 02.0

Step 1. Calculate applicable capacity or output range as +/-50% of the total design capacity or output of the proposed project activity: The proposed project has a capacity of 16 MW consisting of 8 turbines with 2 MW capacity each. Per the guideline of +/-50%, the applicable output range for the project is **8 MW to 24 MW**.

Step 2: Identify similar projects (both CDM and non-CDM) which fulfil all of the following conditions:

(a) The projects are located in the applicable geographical area; (Turkey)

(b) The projects apply the same measure as the proposed project activity; (Renewable Energy Projects)

(c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity; (Wind Power Plants)

(d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant; (N.A.)

(e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1; (8 MW-24 MW)

(f) The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity; (N.A.)

Table 8: WPP's with the same output range

Reference[34]		Name of the WPP	Installed Power MW	Generation Capacity GWh	Fuel Type	VER Project ID	Financial Structure
Page 112	1	BORES (Bozcaada)	10.2	30	Wind		BOT
Page 123	2	ALİZE ENERJİ (ÇAMSEKİ)	20.8	82	Wind	GS ID: 103000000002517	Private
Page 123	3	ALİZE ENERJİ (KELTEPE)	20.7	73	Wind	GS ID: 103000000002479	Private
Page 123	4	AK ENERJİ AYYILDIZ (BANDIRMA)	15	51	Wind	GS634	Private
Page 123	5	ASMAKİNSAN (BANDIRMA-3 RES)	24	85	Wind	GS683	Private
Page 123	6	BAKRAS ELEK.ŞENBÜK RES	15	47	Wind	GS ID: 103000000002194	Private
Page 123	7	BOREAS EN.(ENEZ RES)	15	49	Wind	GS702	Private
Page 123	8	ÇATALTEPE (ALİZE EN.)	16	52	Wind	GS ID: 103000000002342	Private
Page 123	9	DOĞAL ENERJİ (BURGAZ)	14.9	48	Wind	GS439	Private
Page 123	10	DENİZLİ ELEKT. (Karakurt-Akhisar)	10.8	28	Wind	VCS66	Private
Page 123	11	KORES KOCADAĞ	15	56	Wind	GS601	Private
Page 123	12	LODOS RES (TAŞOLUK)KEMERBURGAZ	24	85	Wind	GS503	Private
Page 123	13	SARES (GARET ENER.)	22.5	91	Wind	GS ID: 103000000001967	Private
Page 123	14	TURGUTTEPE RES (SABAŞ ELEK.)	24	70	Wind	GS610	Private

Step 3: Within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number N_{all}.

Table 9: List of projects defines as N_{all}

Reference[35]		Name of the WPP	Installed Power MW	Generation Capacity GWh	Fuel Type	VER Project ID	Financial Structure

[34] See; http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf
[35] See; http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf

Page 112	1	BORES (Bozcaada)	10.2	30	Wind		BOT

N_{all} **= 1**

Step 4: within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number N_{diff}.

Table 10: List of projects defines as N_{diff}

Reference[36]		Name of the WPP	Installed Power MW	Generation Capacity GWh	Fuel Type	VER Project ID	Financial Structure
Page 112	1	BORES (Bozcaada)	10.2	30	Wind		BOT

N_{diff}**= 1**

Step 5: Calculate factor F=1-N_{diff}/N_{all} representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.

F = 1-N_{diff}/N_{all}

= 1 – (1/1)

Factor F is therefore **0**.

The proposed project activity is a "common practice" within a sector in the applicable geographical area if the factor F is greater than 0.2 and Nall-Ndiff is greater than 3. Since factor F is 0 and also N_{all}-N_{diff} is 0, the proposed **is not a common practice** as per the guidelines. The proposed project activity is therefore **additional** under common practice analysis. An Excel sheet is provided for the calculation.

2.6 Methodology Deviations

N.a.

[36] See; http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf

3 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

3.1 Baseline Emissions

Stepwise approach of „Tool to calculate the emission factor for an electricity system" version 04.0.0 [37] is used to find this 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:

"TEIAS 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 Center and the regional load dispatch centers connected to this center and the operation of Market Financial Reconciliation Center[38]".

As it can be understood from this phrase, only one transmission system, which is national transmission system is defined and only TEİAŞ is in the charge of all transmission system related activities. Moreover, a communication with representative of TEIAS, 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 neighboring countries. Complying with the rules of the tool, the emission factor for imports from neighboring 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.[39] 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.

[37] See, http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf

[38] See, http://www.ongurergan.av.tr/en-EN/mevzuat/Electric%20Market%20Licensing%20Regulation.doc (page 21)

[39] See, http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf

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.

The Simple Operating Margin (OM) emission factor ($EF_{grid, OM, y}$) is calculated as the generation weighted average CO_2 emissions per unit net electricity generation (tCO_2/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 11: Share of Low Cost Resource (LCR) Production 2007-2011 (Production in GWh)[40]

	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
Renewable 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.

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

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

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

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 the Annex. Total CO_2 emission due to electricity generation in Turkey for the years of 2009, 2010 and 2011 are given in **Table *12***.

Table 12: CO_2 emissions from electricity production 2009-2011 ($ktCO_2$)

	2009	**2010**	**2011**
CO_2-Emmissions	97,863	98,478	109,963

Table 13 presents the gross electricity production data by all the relevant energy sources. Low-cost/must run resources like hydro, wind, geothermic and biomass do not emit fossil CO_2 and thus are not taken into account in calculations.

Table 13: Gross electricity production by fossil energy sources 2009-2011 (GWh)[41]

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**

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

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

Table 14: Net/gross electricity production 2009-2011 (GWh)[42]

	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 15 shows the resulting net data for fossil fuel generation and adds electricity imports.

Table 15: 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 fulfill 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 16: Calculation of Weighted $EF_{grid,OMsimple,y}$ ($ktCO_2/GWh$)

	2009	2010	2011
CO_2-Emmissions ($ktCO_2$)	97,863	98,478	98,478
Net Electricity Supplied to Grid by relevant sources (GWh)	150,809.7	150,510.0	150,510.0
$EF_{grid,OMsimple,y}$ ($ktCO_2/GWh$)	0.6489	0.6543	0.6543
3-year Generation Weighted Average $EF_{grid,OMsimple,y}$ ($ktCO_2/GWh$)	0.6542		

➔ **$EF_{grid,OMsimple,y} = 0.6542 (ktCO_2/GWh)$**

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

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,

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.

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 the Annex. The derivation of the values presented in

Table 17 is contained in a separate excel file which is available for validation.

Energy Source	2010	2011	Sample Group Total Generation (GWh)	Energy Source
Natural Gas	12,705.5	12,484.3	**25,189.7**	Natural Gas
Lignite	0.0	0.0	**0.0**	Lignite
Coal	9,080.0	4,320.0	**13,400.0**	Coal
Fuel Oil	0.0	701.2	**701.2**	Fuel Oil
Hydro	3,336.8	3,730.4	**7,067.2**	Hydro
Renewable	0.0	150.0	**150.0**	Renewables
TOTAL	**25,122.3**	**21,385.8**	**46,508.09**	**TOTAL**

Table 17: Sample group generation for BM emission factor calculation (GWh)

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 follows:

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

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 formulation of emission factor is given below:

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

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 18. For BM factor calculation, since no official emission factors for different fuel types are available, lower confidence default values of IPCC Guidelines are applied.

Table 18: BM emission factor calculation using equation (2) and (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**			

$EF_{grid,BM,y}$ = 0.3707 tCO_2/MWh

➔

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

$EF_{grid,CM,y}$=0.5833 tCO_2/MWh

➔

Baseline emissions include only CO2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity, calculated as follows:

BEy = (EGy - EGbaseline) x EFgrid,CM,y (6)

Where:

BEy = Baseline emissions in year y (tCO2/yr).

EGy = Electricity supplied by the project activity to the grid (MWh).

EGbaseline = Baseline electricity supplied to the grid in the case of modified or retrofit facilities (MWh). For new power plants this value is taken as zero.

EFgrid,CM,y = Combined margin CO2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system".

The project activity is the installation of a new grid-connected renewable power plant so, EGbaseline = 0

Then:

ERy = BEy = EGy * EFgrid,CM,

= 49,822 MWh/year * 0.5833 tCO2/MWh

= 29,062 tCO2/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

LEy is 0, as it is not considered according to ACM0002. PEy is 0 because project is a wind power generation activity (Only for geothermal and Hydro project activities, it should be considered according to ACM0002).

3.4 Net GHG Emission Reductions and Removals

Emission reductions are calculated as follows:

$ER_y = BE_y - PE_y - LE_y$ **(5)**

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).

Year	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)
2016*	16,953	0	0	16,953
2017	29,062	0	0	29,062
2018	29,062	0	0	29,062
2019	29,062	0	0	29,062
2020	29,062	0	0	29,062

2021	29,062	0	0	29,062
2022	29,062	0	0	29,062
2023	29,062	0	0	29,062
2024	29,062	0	0	29,062
2025	29,062	0	0	29,062
2026**	12,109	0	0	12,109
Total	290,620	0	0	290,620

*Starts from 1st of June 2016
** Ends at 31st of May 2026

4 MONITORING

4.1 Data and Parameters Available at Validation

Data / 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 13**
Justification of choice of data or description of measurement methods and procedures applied	TEIAS is the national electricity transmission company, which makes available the official data of all power plants in Turkey.
Purpose of Data	Calculation of baseline emissions
Comments	-

Data / Parameter	$\mathbf{EF_{grid, CM, y}}$
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
Purpose of Data	Emission Factor is fixed at ex-ante calculation.
Comments	-

Data / 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 14** and **Table 15**
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 all power plants in Turkey. 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 14**). 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 15**).
Purpose of Data	Data used for emission reduction calculation
Comments	-

Data / 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 18** and See Table 21
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)
Purpose of Data	Data used for emission reduction calculation
Comments	-

Data / 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/uretimKapasitePro onu.pdf http://www.epdk.org.tr/yayin_rapor/elektrik/yayin/uretimKapasitePro onu2008_2017.pdf http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU200 http://www.teias.gov.tr/projeksiyon/KAPASITE%20PROJEKSIYONU 2010.pdf http://www.epdk.org.tr/documents/10157/8edb1470-7667-4ce1-8ce 21d1ce4e4761 http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf
Value applied:	Table 23
Justification of choice of data or description of measurement methods and procedures applied	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 preparation was for 2011.

Purpose of Data	Data used for emission reduction calculation
Comments	-

Data / 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 18**
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
Purpose of Data	Data used for emission reduction calculation
Comments	-

Data / 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 19
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.
Purpose of Data	Data used for emission reduction calculation
Comments	-

Data / 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 20**
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 all power plants in Turkey.
Purpose of Data	Data used for emission reduction calculation
Comments	-

Data / 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, **Hata! Başvuru kaynağı bulunamadı.** and **Hata! Başvuru kaynağı bulunamadı.**, is preferred to default IPCC data as these are more reliable.
Value applied:	See Table 21
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.
Purpose of Data	Data used for emission reduction calculation
Comments	-

4.2 Data and Parameters Monitored

Data / 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, web screenshots 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"[43]
Frequency of monitoring/recording	Continuous monitoring and at least monthly recording
Value applied:	**49,822 MWh/year**
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[44]: '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'[45] (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

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

	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.
Purpose of data	Calculation of emission reductions
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.
Comments	-

4.3 Monitoring Plan

As the necessary baseline emission factors are all defined ex ante (Operating and Built Margin, see baseline description), the most important information to be monitored is the amount of electricity fed into the grid by Alaçatı WPP. This value will be monitored continuously by metering devices, one of them being the main one in the substation, which provides the data for the monthly invoicing to TEİAŞ.

The collected data will be kept by Egenda during the crediting period and until two years after the last issuance of VERs for the Alaçatı WPP activity for that crediting period.

Given a data vintage based on ex ante monitoring and selection of a renewable 7 year crediting period, the Combined Margin will be recalculated at any renewal of the crediting period using the valid baseline methodology.

A backup power generator will be installed in power plant. In case, emissions from back-up power generator exceed 1% of the total emission reductions, they will be accounted as project emissions in each verification period. Operating hours of back-up power generator will be monitored with that purpose.

Potential leakage emissions in the context of power sector projects are emissions arising due to activities such as power plant construction, fuel handling and land inundation. However, according to the methodology, those emission sources do not need to be taken into account.

Operational and Management Structure

As described before, there are two main factors important for the calculation of emission reductions. The only relevant data that have to be monitored is only net electricity generation ($EG_{facility,y}$) per year. Since project emission is zero no additional monitoring is required. The generation data are subject to the strict internal quality control systems of both parties. The monthly meter reading documents are stored by Egenda and TEİAŞ. The settlement notification, which is issued by TEİAŞ and includes the meter reading data, is stored on a TEİAŞ file server and accessible for Egenda via a secured website. The meters themselves can always be read as plausibility check for verification. The other important parameter is the emission factor. It is approved according to strict quality control parameters from an independent external party. With this, no additional structures or processes have to be implemented to insure the availability and high quality of the necessary data for monitoring.

At the end of each monitoring period, which is planned to generally last one year, from the monthly meter reading records the net electricity generation amounts as calculated by electricity supplied to the grid minus withdrawn from the system, will be added up to the yearly net electricity generation and total project emissions will be subtracted from this amount and result data will be multiplied with the combined margin emission factor with the help of an excel spread sheet that also contains the combined margin calculation. Thus, the complete baseline approach is always transparent and traceable. For the elaboration and quality assurance of the monitoring report, Lif Enerji, an expert in the project mechanisms who already supported in the project design, is assigned. However, in order to continue improving the monitoring procedures and therefore also the future monitoring reports, internal quality check shall be fulfilled by Lif Enerji. The monitoring reports are checked and in cases of mistakes and inconsistencies in the monitoring report, revisions with improvements shall be done. Furthermore, external year verification assures that the emission reductions calculations are transparent and traceable.

For the operation of Alaçatı WPP, below hierarchy is planned:

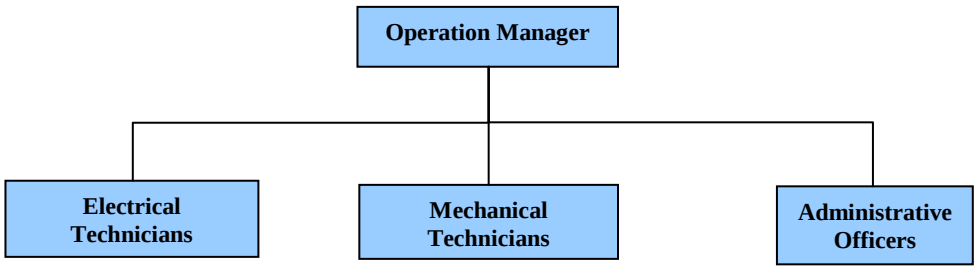


Figure 7: Operation and Management diagram

Egenda will keep all the data needed for the calculation of emission reductions during the crediting period and until two years after the last issuance of VCS for Alaçatı WPP

Because of 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. Dedicated emergency procedures are not provided, as there is no possibility of overstating emission reductions due to emergency cases.

5 ENVIRONMENTAL IMPACT

Alaçatı 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.

Bidiversity; 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.

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. [46] Nevertheless a stakeholder meeting held on 8th of November 2012 in Alaçatı Municipality meeting hall which is the closest settlement area to the project area. Details of the meeting could be found below.

[46] 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

Minutes of LSC Meeting

Local Stakeholder Meeting held on 08.11.2012 in Alaçatı Municipality meeting hall. However as it is explained above no one participated in the meeting. In order to reach the local stakeholders and hear their opinions, project proponent went to their shops and talked with them in the street.

Locals of the Alaçatı are not stranger to the wind power plants. In that region there are many wind power plants, that's way most of the locals did not pay attention to the local stakeholder meeting of the Alaçatı WPP. Also locals supported to wind power plants as it can be understood from the evaluation forms.

Total 8 locals are asked about opinion on the project. At first project proponent verbally informed them about the project and distributed them non-technical summary of the project. Most of the locals said that "we know about the wind power plant, we got used to them, we are supporting them". After the end of the interview, project proponent informed locals about the continuous input mechanism. E-mail addresses and phone numbers of project owner and consultant were announced. Local stakeholders were encouraged to give feedback about the project.

The interviews were closed by a full support from participants.

A view from presentation at the meeting hall of Alaçatı Municipality

A view from presentation at the meeting hall of Alaçatı Municipality

A view from presentation at the meeting hall of Alaçatı Municipality

A view from streets of Alaçatı

A shop in the Alaçatı

Interview with the journalist in Alaçatı

Interview with a shop owner

APPENDIX 1: <BASELINE INFORMATION>

Calculation of Total CO_2 from OM Power Plants:

Table 19: $HV_{i,y}$ (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 20: $FC_{i,y}$ (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 21: $NCV_{i,y}$ (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 22: 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 23: 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	Annual Generation (GWh)	Fuel Type
1	Konya Şeker	2010	6,000	40,00	Lignite
2	FLOKSER TEKSTİL SAN.AŞ.(Çatalça/istanbul)(SüetserTesisi)	2010	-2,100	0,00	Natural Gas
3	RASA ENERJİ (VAN)	2010	26,190	166,60	Natural Gas
4	Aksa Enerji (Antalya)	2010	25,000	175,46	Natural Gas
5	Yıldız Entegre Ağaç (kocaeli)	2010	12,368	80,10	Natural Gas
6	ITC-KA ENERJİ (SİNCAN)	2010	1,416	0,00	Landfill Gas
7	ATAER ENERJİ	2010	49,000	278,00	Liqued Fuel + N.Gas
8	Cengiz Enerji	2010	101,950	802,00	Natural Gas
9	Simko (Kartal)	2010	-2,054	0,00	Natural Gas
10	Uğur Enerji	2010	48,200	406,00	Natural Gas
11	Söktaş	2010	-4,500	0,00	Nafta
12	Aksa Enerji (Antalya)	2010	25,000	175,46	Natural Gas
13	ALTEK ALARKO Elektrik Santralleri	2010	60,100	420,00	Natural Gas
14	Eren Enerji	2010	160,000	1068,00	Imported coal
15	Flokser Tekstil (Çerkezköy/Tekirdağ)	2010	5,172	42,00	Natural Gas
16	RB Karesi İthalat İhracat Tekstil	2010	8,600	65,00	Natural Gas
17	Cengiz Enerji	2010	101,950	802,00	Natural Gas

18	Keskinoğlu Tavukçuluk ve Dam. İşl.	2010	3,495	25,00	Natural Gas
19	Binatom Elektrik Üretim A.Ş.	2010	2,000	13,00	Natural Gas
20	CAN ENERJİ (Çorlu - Tekirdağ)	2010	29,100	203,00	Natural Gas
21	Kurtoğlu Bakır Kurşun San.A.Ş.	2010	1,585	12,00	Natural Gas
22	Sönmez Enerji Üretim (Uşak)	2010	32,242	272,55	Natural Gas
23	ITC-KA Adana Biyokütle Sant.	2010	9,900	0,00	Biomass
24	Kırka Boraks	2010	10,000	65,00	Liqued Fuel + N.Gas
25	Enerji-SA (Bandırma)	2010	930,800	7540,00	Natural Gas
26	Uğur Enerji (Addition)	2010	12,000	100,00	Natural Gas
27	Eren Enerji (Addition)	2010	600,000	4006,00	Imported coal
28	Eren Enerji (Addition)	2010	600,000	4006,00	Imported coal
29	MARMARA PAMUKLU MENS. SN.TİC.A.Ş. (Addition)	2010	26,190	203,76	Natural Gas
30	Aliağa Çakmaktepe Enerji A.Ş.(Aliağa/İZMİR) (Addition)	2010	69,840	556,00	Natural Gas
31	FRİTOLAY GIDA SAN.VE TİC. AŞ. (Addition)	2010	0,330	2,40	Biogas
32	Sönmez Enerji Üretim (Uşak) (Addition)	2010	2,564	19,77	Natural Gas
33	Ak-Enerji (Uşak OSB)	2010	-15,240	0,00	Liqued Fuel + N.Gas
34	Ak-Enerji (DG+N) (Deba-Denizli)	2010	-15,600	0,00	Liqued Fuel + N.Gas
35	Polyplex Europa Polyester Film	2010	7,808	61,00	Natural Gas
36	ALTEK ALARKO Elektrik Santralleri	2010	21,890	151,36	Natural Gas
37	Aksa Enerji (Demirtaş/Bursa)	2010	-1,140	0,00	Natural Gas
38	RASA ENERJİ (VAN) (Addition)	2010	10,124	64,41	Natural Gas
39	SİLOPİ ELEKTRİK ÜRETİM A.Ş.(ESENBOĞA)	2010	-44,784	0,00	Fuel Oil
40	International Hospital Istanbul	2010	0,770	6,00	Natural Gas
41	Tuzla Jeotermal	2010	7,500	0,00	Geothermal
42	Menderes Jeotermal Dora-2	2010	9,500	0,00	Geothermal
43	Selimoğlu Reg. Ve Hes	2010	8,000	0,00	Hydro (run of river)
44	Kulp IV HES	2010	12,298	46,00	Hydro (run of river)
45	Cindere HES (Denizli) (Addition)	2010	9,065	28,29	Hydro (With Dam)
46	Bayburt Hes	2010	14,631	51,00	Hydro (run

					of river)
47	UZUNÇAYIR HES (Tunceli) (Addition)	2010	27,330	105,00	Hydro (With Dam)
48	Alakır Hes.	2010	2,060	6,00	Hydro (run of river)
49	Peta Müh. En. (Mursal II Hes.)	2010	4,500	19,00	Hydro (run of river)
50	Asa Enerji (Kale Reg. Ve Hes.)	2010	9,570	0,00	Hydro (run of river)
51	Hetaş Hacısalihoğlu (Yıldızlı Hes)	2010	1,200	5,00	Hydro (run of river)
52	Doğubay Elektrik (Sarımehmet Hes)	2010	3,100	10,00	Hydro (run of river)
53	Nuryol Enerji (Defne Reg. Ve hes.)	2010	7,230	22,00	Hydro (run of river)
54	ÖZGÜR ELEKTRİK (AZMAK I REG.VE HES)	2010	5,913	0,00	Hydro (run of river)
55	Birim Hidr. Üretim A.Ş. (Erfelek Hes)	2010	3,225	19,00	Hydro (run of river)
56	Beytek El. Ür. A.Ş. (Çataloluk Hes.)	2010	9,540	0,00	Hydro (run of river)
57	Nisan E. Mekanik En. (Başak Reg. Hes.)	2010	6,850	22,00	Hydro (run of river)
58	UZUNÇAYIR HES (Tunceli) (Addition)	2010	27,330	105,00	Hydro (With Dam)
59	Fırtına Elektrik Üretim A.Ş. (Sümer Hes)	2010	21,600	70,00	Hydro (run of river)
60	KAR-EN Karadeniz El. A.Ş. Aralık Hes	2010	12,410	0,00	Hydro (run of river)
61	Birim Hidr. Üretim A.Ş. (Erfelek Hes)	2010	3,225	19,00	Hydro (run of river)
62	Karadeniz El. Üret. (Uzundere-1 Hes)	2010	62,200	165,00	Hydro (run of river)
63	Akım Enerji (Cevizli Reg. Ve Hes.)	2010	91,400	330,00	Hydro (run of river)
64	Çakıt Hes. (Çakıt Enerji)	2010	20,180	0,00	Hydro (run of river)
65	Ceyhan Hes. (Oşkan Hes.) (Enova En.)	2010	23,889	98,00	Hydro (run of river)
66	Erenler Reg. Ve Hes. (BME Bir. Müt. En.)	2010	45,000	85,00	Hydro (run of river)
67	Paşa Reg. Ve Hes (Özgür Elektrik)	2010	8,680	0,00	Hydro (run of river)
68	Güzelçay-I-II Hes (İlk Elektrik Enerji)	2010	8,100	0,00	Hydro (run of river)
69	Kale Reg. Ve Hes (Kale Enerji Ür.)	2010	34,140	116,00	Hydro (run of river)
70	Erikli-Akocak Reg. Ve Hes	2010	82,500	0,00	Hydro (run of river)
71	Çamlıkaya Reg. Ve Hes	2010	5,648	19,00	Hydro (run of river)
72	Dinar Hes. (Elda Elekrik Üretim)	2010	4,440	15,00	Hydro (run of river)
73	Damlapınar Hes. (Cenay Elektrik Üretim)	2010	16,424	0,00	Hydro (run

					of river)
74	Dim Hes (Diler Elektrik Üretim)	2010	38,250	123,00	Hydro (run of river)
75	ÖZGÜR ELEKTRİK (AZMAK I REG.VE HES)	2010	5,913	0,00	Hydro (run of river)
76	Kirpilik Reg. Ve Hes (Özgür Elektrik)	2010	6,240	22,00	Hydro (run of river)
77	Yavuz Reg. Ve Hes (Masat Enerji)	2010	22,500	83,00	Hydro (run of river)
78	Kayabükü Reg. Ve Hes (Elite Elektrik)	2010	14,580	0,00	Hydro (run of river)
79	Gök Reg. Ve Hes (Gök Enerji El. San.)	2010	10,008	43,00	Hydro (run of river)
80	Bulam Reg. Ve Hes (MEM Enerji ELK.)	2010	7,030	0,00	Hydro (run of river)
81	Karşıyaka HES (Akua Enerji Üret.)	2010	1,592	8,00	Hydro (run of river)
82	Ceyhan Hes. (Berkman Hes) (Enova En.)	2010	25,200	103,00	Hydro (run of river)
83	Güdül I Reg. Ve HES (Yaşam Enerji)	2010	2,360	14,00	Hydro (run of river)
84	Tektuğ Elektrik (Andırın Hes)	2010	40,500	106,00	Hydro (run of river)
85	Selen Elektrik (Kepezkaya Hes)	2010	28,000	0,00	Hydro (run of river)
86	REŞADİYE 2 HES (TURKON MNG ELEKT.)	2010	26,140	0,00	Hydro (run of river)
87	Kozan Hes (Ser-Er Enerji)	2010	4,000	9,00	Hydro (run of river)
88	Kahraman Reg. Ve Hes (Katırcıoğlu)	2010	1,420	6,00	Hydro (run of river)
89	Narinkale Reg. Ve Hes (EBD Enerji)	2010	3,100	10,00	Hydro (run of river)
90	Erenköy Reg. Ve Hes (Türkerler)	2010	21,456	87,00	Hydro (run of river)
91	Kahta I HES (Erdemyıldız Elektrik Üretim)	2010	7,120	35,00	Hydro (run of river)
92	Azmak II Reg. Ve Hes	2010	-18,066	0,00	Hydro (run of river)
93	Ulubat Kuvvet Tüneli ve Hes	2010	97,000	372,00	Hydro (With Dam)
94	REŞADİYE 1 HES (TURKON MNG ELEKT.)	2010	15,680	0,00	Hydro (run of river)
95	Egemen 1 HES (Enersis Elektrik)	2010	19,900	0,00	Hydro (run of river)
96	Sabunsuyu II HES (Ang Enerji Elk.)	2010	7,350	21,00	Hydro (run of river)
97	Burç Bendi ve Hes (Akkur Enerji)	2010	27,330	113,00	Hydro (run of river)
98	Murgul Bakır (Ç.kaya) (Addition)	2010	19,600	40,50	Hydro (run of river)
99	Güzelçay II Hes (İlk Elektrik Enerji) (Addition)	2010	4,960	0,00	Hydro (run of river)
100	REŞADİYE 1 HES (TURKON MNG ELEKT.)	2010	15,680	0,00	Hydro (run

					of river)
101	Egemen 1 HES (Enersis Elektrik)	2010	8,820	0,00	Hydro (run of river)
102	Yedigöze HES (Yedigöze Elektrik)	2010	155,330	474,00	Hydro (With Dam)
103	Umut III Reg. Ve HES (Nisan Elek.)	2010	12,000	26,00	Hydro (run of river)
104	FEKE 2 Barajı ve HES (Nisan Elek.)	2010	69,340	223,00	Hydro (With Dam)
105	Egemen 1B HES (Enersis Elektrik)	2010	11,100	0,00	Hydro (run of river)
106	Kalkandere Reg. Ve Yokuşlu HES.	2010	14,540	63,00	Hydro (run of river)
107	ROTOR ELEKTRİK (OSMANİYE RES)	2010	55,000	0,00	Wind
108	Asmakinsan (Bandırma 3 RES)	2010	24,000	0,00	Wind
109	Soma Enerji Üretim (Soma Res)	2010	34,200	0,00	Wind
110	Deniz Elektrik (Sebenoba Res)	2010	10,000	0,00	Wind
111	Akdeniz Elektrik (Mersin Res)	2010	33,000	0,00	Wind
112	Boreas Enerji (Boreas I Enez Res)	2010	15,000	0,00	Wind
113	Bergama Res En. Ür. A.Ş. Aliağa Res	2010	90,000	0,00	Wind
114	Bakras En. Elek. Ür. A.Ş. Şenbük Res	2010	15,000	0,00	Wind
115	ALİZE ENERJİ (KELTEPE RES)	2010	1,800	0,00	Wind
116	ROTOR ELEKTRİK (Gökçedağ Res)	2010	22,500	0,00	Wind
117	MAZI-3 RES ELEKT.ÜR. A.Ş. (MAZI-3 RES)	2010	7,500	0,00	Wind
118	BORASKO ENERJİ (BANDIRMA RES)	2010	12,000	0,00	Wind
119	Ziyaret Res (Ziyaret Res Elektirk)	2010	35,000	0,00	Wind
120	Soma Res (Bilgin Rüzgar San. En. Ür.)	2010	90,000	0,00	Wind
121	Belen ELEKTRİK BELEN Res (Addition)	2010	6,000	0,00	Wind
122	ÜtOPYA ELEKTRİK (DÜZOVA RES) (Addition)	2010	15,000	0,00	Wind
123	Kuyucak Res (Alize Enerji Ür.)	2010	25,600	0,00	Wind
124	Sares Res (Garet Enerji Üretim)	2010	15,000	0,00	Wind
125	Turguttepe Res (Sabaş Elektrik Ür.)	2010	22,000	0,00	Wind
126	AKIM ENERJİ BAŞPINAR (SÜPER FİLM)	2011	25,320	177,00	Natural Gas
127	AKSA AKRİLİK (İTHAL KÖM.+D.G)	2011	25,000	189,08	Natural Gas
128	AKSA ENERJİ (Antalya)	2011	600,000	3600,00	Natural Gas
129	ALİAĞA ÇAKMAKTEPE ENERJİ (İlave)	2011	139,680	1051,60	Natural Gas
130	BEKİRLİ TES (İÇDAŞ ELEKTRİK EN.)	2011	600,000	4320,00	Imported coal
131	BOLU BELEDİYESİ ÇÖP TOP. TES. BİYOGAZ	2011	1,100	0,00	Landfill Gas
132	BOSEN ENERJİ ELEKTRİK ÜRETİM AŞ.	2011	93,000	698,49	Natural Gas
133	CENGİZ ÇİFT YAKITLI K.Ç.E.S.	2011	131,335	985,00	Natural Gas
134	CENGİZ ENERJİ SAN.VE TİC.A.Ş.	2011	35,000	281,29	Natural Gas
135	CEV ENERJİ ÜRETİM(GAZİANTEP ÇÖP BİOGAZ)	2011	5,700	0,00	Landfill Gas

136	FRAPORT IC İÇTAŞ ANTALYA HAVALİMANI	2011	8,000	64,00	Natural Gas
137	GLOBAL ENERJİ (PELİTLİK)	2011	4,000	29,91	Natural Gas
138	GORDİON AVM (REDEVCO ÜÇ EMLAK)	2011	2,000	15,00	Natural Gas
139	GOREN-1 (GAZİANTEP ORGANİZE SAN.)	2011	48,650	277,00	Natural Gas
140	GÜLLE ENERJİ(Çorlu) (İlave)	2011	3,900	17,97	Natural Gas
141	HASIRCI TEKSTİL TİC. VE SAN. LTD. ŞTİ.	2011	2,000	15,00	Natural Gas
142	HG ENERJİ ELEKTRİK ÜRET. SAN.TİC. A.Ş.	2011	52,380	366,00	Natural Gas
143	ISPARTA MENSUCAT (Isparta)	2011	4,300	33,00	Natural Gas
144	ITC ADANA ENERJİ ÜRETİM (İlave)	2011	1,415	0,00	Landfill Gas
145	ITC-KA EN. (ASLIM BİYOKÜTLE) KONYA	2011	5,660	0,00	Landfill Gas
146	ITC-KA ENERJİ (SİNCAN) (İlave)	2011	1,416	0,00	Landfill Gas
147	ITC-KA ENERJİ MAMAK KATI ATIK TOP.	2011	2,826	0,00	Landfill Gas
148	İSTANBUL SABİHA GÖKÇEN UL.AR. HAV.	2011	4,000	32,00	Natural Gas
149	KARKEY (SİLOPİ 1)	2011	100,440	701,15	Fuel Oil
150	KAYSERİ KATI ATIK DEPONİ SAHASI	2011	1,600	0,00	Landfill Gas
151	KNAUF İNŞ. VE YAPI ELEMANLARI SN.	2011	1,600	12,00	Natural Gas
152	LOKMAN HEKİM ENGÜRÜ SAĞ.(SİNCAN)	2011	0,500	4,00	Natural Gas
153	MARDİN-KIZILTEPE (AKSA ENERJİ)	2011	32,100	225,00	Natural Gas
154	NUH ENERJİ EL. ÜRT.A.Ş. (ENERJİ SANT.-2)	2011	119,980	900,00	Natural Gas
155	ODAŞ DOĞALGAZ KÇS (ODAŞ ELEKTRİK)	2011	54,960	415,00	Natural Gas
156	POLYPLEX EUROPA POLYESTER FİLM	2011	3,904	30,70	Natural Gas
157	SAMSUN TEKKEKÖY EN. SAN. (AKSA EN.)	2011	131,335	980,00	Natural Gas
158	SAMUR HALI A.Ş.	2011	4,300	33,00	Natural Gas
159	SARAY HALI A.Ş.	2011	4,300	33,00	Natural Gas
160	TEKİRDAĞ-ÇORLU TEKS.TES.(NİL ÖRME)	2011	2,677	21,00	Natural Gas
161	TİRENDA TİRE ENERJİ ÜRETİM A.Ş.	2011	58,380	410,00	Natural Gas
162	YENİ UŞAK ENERJİ ELEKTRİK SANTRALI	2011	8,730	65,00	Natural Gas

163	ZORLU ENERJİ (B.Karıştıran)	2011	7,200	54,07	Natural Gas
164	ŞANLIURFA OSB (RASA ENERJİ ÜR. A.Ş.)	2011	116,760	800,00	Natural Gas
165	AYDIN/GERMENCİK JEOTERMAL	2011	20,000	150,00	Geothermal
166	ÇEŞMEBAŞI REG. VE HES (GİMAK EN.)	2011	8,200	39,00	Hydro (run of river)
167	ÇUKURÇAYI HES (AYDEMİR ELEKTRİK ÜR.)	2011	1,800	8,00	Hydro (run of river)
168	DARCA HES (BÜKOR ELEKTRİK ÜRETİM)	2011	8,900	0,00	Hydro (run of river)
169	DERME (KAYSERİ VE CİVARI ENERJİ)	2011	4,500	14,00	Hydro (run of river)
170	DURU 2 REG. VE HES (DURUCASU ELEK.)	2011	4,500	22,00	Hydro (run of river)
171	ERENKÖY REG. VE HES (NEHİR ENERJİ)	2011	21,500	87,00	Hydro (run of river)
172	ERKENEK (KAYSERİ VE CİVARI ENERJİ)	2011	0,320	0,00	Hydro (run of river)
173	EŞEN-1 HES (GÖLTAŞ ENERJİ ELEKTRİK)	2011	60,000	240,00	Hydro (run of river)
174	GİRLEVİK (BOYDAK ENERJİ)	2011	3,040	21,00	Hydro (run of river)
175	GÖKMEN REG. VE HES (SU-GÜCÜ ELEKT.)	2011	2,869	13,00	Hydro (run of river)
176	HACININOĞLU HES (ENERJİ-SA ENERJİ)	2011	142,300	360,00	Hydro (run of river)
177	HAKKARİ (Otluca) (NAS ENERJİ A.Ş.)	2011	1,300	6,00	Hydro (run of river)
178	HASANLAR	2011	9,400	39,00	Hydro (run of river)
179	HASANLAR HES (DÜZCE ENERJİ BİRLİĞİ)	2011	4,700	0,00	Hydro (run of river)
180	İNCİRLİ REG. VE HES (LASKAR ENERJİ)	2011	25,200	126,00	Hydro (run of river)
181	KALKANDERE REG. VE YOKUŞLU HES	2011	23,360	0,00	Hydro (run of river)
182	KARASU 4-2 HES (İDEAL ENERJİ ÜRETİMİ)	2011	10,400	0,00	Hydro (run of river)
183	KARASU 4-3 HES (İDEAL ENERJİ ÜRETİMİ)	2011	4,600	0,00	Hydro (run of river)
184	KARASU 5 HES (İDEAL ENERJİ ÜRETİMİ)	2011	4,100	0,00	Hydro (run of river)
185	KARASU I HES (İDEAL ENERJİ ÜRETİMİ)	2011	3,800	0,00	Hydro (run of river)
186	KARASU II HES (İDEAL ENERJİ ÜRETİMİ)	2011	3,100	13,00	Hydro (run of river)
187	KAZANKAYA REG. VE İNCESU HES (AKSA)	2011	15,000	48,00	Hydro (run of river)
188	KESME REG. VE HES (KIVANÇ ENERJİ)	2011	4,600	16,00	Hydro (run of river)
189	KIRAN HES (ARSAN ENERJİ A.Ş.)	2011	9,700	0,00	Hydro (run of river)
190	KORUKÖY HES (AKAR ENERJİ SAN. TİC.)	2011	3,000	22,00	Hydro (run

					of river)
191	KOVADA-I (BATIÇİM ENERJİ ELEKTRİK)	2011	51,200	36,20	Hydro (run of river)
192	KOVADA-II (BATIÇİM ENERJİ ELEKTRİK)	2011	8,250	4,10	Hydro (run of river)
193	KOZDERE HES (ADO MADENCİLİK ELKT.)	2011	3,100	0,00	Hydro (run of river)
194	KÖYOBASI HES (ŞİRİKOĞLU ELEKTRİK)	2011	1,100	5,00	Hydro (run of river)
195	KULP I HES (YILDIZLAR ENERJİ ELK.ÜR.)	2011	22,920	78,00	Hydro (run of river)
196	KUMKÖY HES (AES-IC İÇTAŞ ENERJİ)	2011	17,490	98,00	Hydro (run of river)
197	AKSU REG. VE HES (KALEN ENERJİ)	2011	5,200	16,00	Hydro (run of river)
198	ALKUMRU BARAJI VE HES (LİMAK HİD.)	2011	261,270	828,00	Hydro (run of river)
199	AYRANCILAR HES (MURADİYE ELEKTRİK)	2011	32,100	0,00	Hydro (run of river)
200	BALKONDU I HES (BTA ELEKTRİK ENERJİ)	2011	9,200	33,00	Hydro (run of river)
201	BAYRAMHACILI BARAJI VE HES	2011	47,000	175,00	Hydro (run of river)
202	BERDAN	2011	10,200	47,20	Hydro (run of river)
203	BOĞUNTU HES (BEYOBASI ENERJİ)	2011	3,800	17,00	Hydro (run of river)
204	CEVHER I-II REG. VE HES (ÖZCEVHER EN.)	2011	16,400	0,00	Hydro (run of river)
205	ÇAKIRMAN REG. VE HES (YUSAKA EN.)	2011	6,980	22,00	Hydro (run of river)
206	ÇAMLIKAYA REG.VE HES (ÇAMLIKAYA EN)	2011	2,824	0,80	Hydro (run of river)
207	ÇANAKÇI HES (CAN ENERJİ ENTEGRE)	2011	9,300	39,00	Hydro (run of river)
208	MENGE BARAJI VE HES (ENERJİSA ENERJİ)	2011	44,700	0,00	Hydro (run of river)
209	MOLU ENERJİ (Zamantı-Bahçelik HES)	2011	4,200	30,00	Hydro (run of river)
210	MURATLI REG. VE HES (ARMAHES EL.)	2011	26,700	94,00	Hydro (run of river)
211	NARİNKALE REG. VE HES (EBD ENERJİ)	2011	30,400	108,00	Hydro (run of river)
212	OTLUCA I HES (BEYOBASI ENERJİ ÜR.)	2011	37,500	0,00	Hydro (run of river)
213	OTLUCA II HES (BEYOBASI ENERJİ ÜR.)	2011	6,360	0,00	Hydro (run of river)
214	ÖREN REG. VE HES (ÇELİKLER ELEKTRİK)	2011	6,600	16,00	Hydro (run of river)
215	POYRAZ HES (YEŞİL ENERJİ ELEKTRİK)	2011	2,660	10,00	Hydro (run of river)
216	SARAÇBENDİ HES (ÇAMLICA ELEKTRİK)	2011	25,500	0,00	Hydro (run of river)
217	SARIKAVAK HES (ESER ENERJİ YAT. AŞ.)	2011	8,100	0,00	Hydro (run

					of river)
218	SAYAN HES (KAREL ELEKTRİK ÜRETİM)	2011	14,900	0,00	Hydro (run of river)
219	SEFAKÖY HES (PURE ENERJİ ÜRETİM AŞ.)	2011	33,100	0,00	Hydro (run of river)
220	DAREN HES ELEKTRİK (SEYRANTEPE)	2011	49,700	181,13	Hydro (run of river)
221	SIZIR (KAYSERİ VE CİVARI EL. T.A.Ş)	2011	5,800	46,00	Hydro (run of river)
222	SÖĞÜTLÜKAYA (POSOF III) HES	2011	6,100	31,00	Hydro (run of river)
223	TEFEN HES (AKSU MADENCİLİK SAN.)	2011	33,000	141,00	Hydro (run of river)
224	TUZTAŞI HES (GÜRÜZ ELEKTRİK ÜR.)	2011	1,600	10,00	Hydro (run of river)
225	ÜZÜMLÜ HES (AKGÜN ENERJİ ÜRETİM)	2011	11,400	41,00	Hydro (run of river)
226	YAMAÇ HES (YAMAÇ ENERJİ ÜRETİM A.Ş.)	2011	5,500	0,00	Hydro (run of river)
227	YAPISAN (KARICA REG. ve DARICA I HES)	2011	13,320	0,00	Hydro (run of river)
228	YAPRAK II HES (NİSAN ELEKTROMEK.)	2011	10,800	32,00	Hydro (run of river)
229	YAŞIL HES (YAŞIL ENERJİ ELEKTRİK)	2011	3,800	15,00	Hydro (run of river)
230	YEDİGÖL REG. VE HES (YEDİGÖL HİDR.)	2011	21,900	77,00	Hydro (run of river)
231	YEDİGÖZE HES (YEDİGÖZE ELEK.) (İlave)	2011	155,330	425,00	Hydro (run of river)
232	SARES RES (GARET ENERJİ ÜRETİM)	2011	7,500	0,00	Wind
233	SEYİTALİ RES (DORUK ENERJİ ELEKTRİK)	2011	30,000	0,00	Wind
234	SOMA RES (SOMA ENERJİ) (İlave)	2011	36,900	0,00	Wind
235	SUSURLUK RES (ALANTEK ENERJİ ÜRET.)	2011	45,000	0,00	Wind
236	ŞAH RES (GALATA WİND ENERJİ LTD. ŞTİ)	2011	93,000	0,00	Wind
237	TURGUTTEPE RES (SABAŞ ELEKTRİK)	2011	2,000	0,00	Wind
238	ZİYARET RES (ZİYARET RES ELEKTRİK)	2011	22,500	0,00	Wind
239	AKRES (AKHİSAR RÜZGAR EN. ELEKT.)	2011	43,800	0,00	Wind
240	AYVACIK RES (AYRES AYVACIK RÜZG.)	2011	5,000	0,00	Wind
241	BAKİ ELEKTRİK ŞAMLI RÜZGAR (İlave)	2011	24,000	0,00	Wind
242	ÇANAKKALE RES (ENERJİ-SA ENERJİ)	2011	29,200	0,00	Wind
243	ÇATALTEPE RES (ALİZE ENERJİ ELEKTRİK)	2011	16,000	0,00	Wind
244	İNNORES ELEKTRİK YUNTDAĞ RÜZGAR	2011	10,000	0,00	Wind
245	KİLLİK RES (PEM ENERJİ A.Ş.)	2011	40,000	0,00	Wind

APPENDIX 2: < GENERATION LICENCE AND EIA IS NOT REQUIRED CERTIFICATE >

T.C.
ENERJİ PİYASASI DÜZENLEME KURUMU

EPDK

ÜRETİM LİSANSI

Bu Lisans kapsamındaki üretim tesisi Yenilenebilir Enerji Kaynağı kullanmaktadır.

Lisans No : EÜ/1622-5/1178

Tarih : 29/05/2008

Bu Lisans; **Egenda Ege Enerji Üretim Anonim Şirketi**'ne, İzmir ili, Çeşme ilçesinde, rüzgar enerjisine dayalı Alaçatı 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 1622-5 sayılı Kararı ile verilmiştir.

Hasan KÖKTAŞ
Başkan

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

T.C.
İZMİR VALİLİĞİ
İL ÇEVRE VE ORMAN MÜDÜRLÜĞÜ

Karar Tarihi : 18/5/2009
Karar No : 666

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 **" 16 MW kapasiteli Alaçatı 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 ,Çeşme İlçesi Kızılkayakaradağ-Karadağ Mevkiinde haritanın Urla-L16-b4 paftasında (16 adet 1000 kW 'lık Türbin)