Project design document form for CDM project activities

(Version 07.0)

Complete this form in accordance with the Attachment "Instructions for filling out the project design document form for CDM project activities" at the end of this form.

PROJECT DESIGN DOCUMENT (PDD)	
Title of the project activity	BARBAROS WIND POWER PLANT PROJECT 12MW
Version number of the PDD	01
Completion date of the PDD	26/08/2016
Project participant(s)	VERIM ENERJI YATIRIM ÜRETIM VE TIC. A.Ş
Host Party	TURKEY
Applied methodology(ies) and, where applicable, applied standardized baseline(s)	AMS-I.D."Grid Connected Renewable Electricity Generation, version 18, EB 81, Annex 24, 28 Nov 2014
Sectoral scope(s) linked to the applied methodology(ies)	Energy Industries/Renewable Energies/Wind Energy/Grid Connected[1] 'AMS-I.D."Grid Connected Renewable Electricity Generation, version 18'
Estimated amount of annual average GHG emission reductions	24072.43 t CO^2/per year[2]

[1] The information retrieved from the 'List of Sectoral Scopes, ver 02

[2] The detailed information can be found in the section B.5.

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

Since renewable energy sources use local sources, they are sustainable, providing energy safety as well as being harmless to the environment locally, nationally and globally. They do not pollute the air, water or land.

In order to contribute to the electricity generation of our country and to popularize electricity generation from wind energy which is considered as one of the most important technologies among the renewable energy resources, Verim Enerji Yatırım Üretim ve Tic. A.Ş. has been granted electricity generation license from EMRA for Barbaros WPP project on 28.06.2012.

Barbaros Wind Power Plant Project pursues both to contribute to providing energy needs of Turkey and to create local industry as well as providing employment. Barbaros Wind Power Plant Project is located in Tekirdağ province, Şarköy district of Turkey and has the installed capacity of 12 MW. Estimated completion date of the entire project is mid-2016. Power plant will include 3 turbines with 3200 kW unit capacity and 1 turbine with 2850 kW unit capacity. Annual electricity generation is calculated as 42.000.000[3] KWh which will be transmitted to the national substation at Tekirdağ transformer station through the Asya-Port Distribution Station. Barbaros WPP will provide employment to the project region in terms of qualified staff such as engineers, technicians and machine operators as well as regular personnel since the priority of employment during both the construction period and operation period will be given to the region.

At the present time, even if wind energy cannot answer the energy demand, usage of the wind power plants are increasing day by day. Some of the basic reasons of this increasing are low management expense and unnecessary raw material. Nowadays, mostly fossil fuels are used for electric generation. Due to these fuels have an extinction risk and they are harmful for environment, usage of the alternative energy sources become compulsory.

Wind Turbines are very important about the CO_2 emission reduction. Recently Wind Power Plants become popular because of that, energy is generated with natural sources and also these plants do not cause natural source waste.

According to the calculations expected total emission reduction for chosen crediting period is 168507.01 t CO_2.

The characteristics of the wind energy;
1. Wind is abundant and free in atmosphere
2. Renewable and clean energy source
3. Has a low density
5. Do not cause environmental pollution

A.2. Location of project activity

A.2.1. Host Party

Turkey

A.2.2. Region/State/Province etc.

[3] Total capacity and electricity generation retrieved from the Generation Licence of the Barbaros WEPP

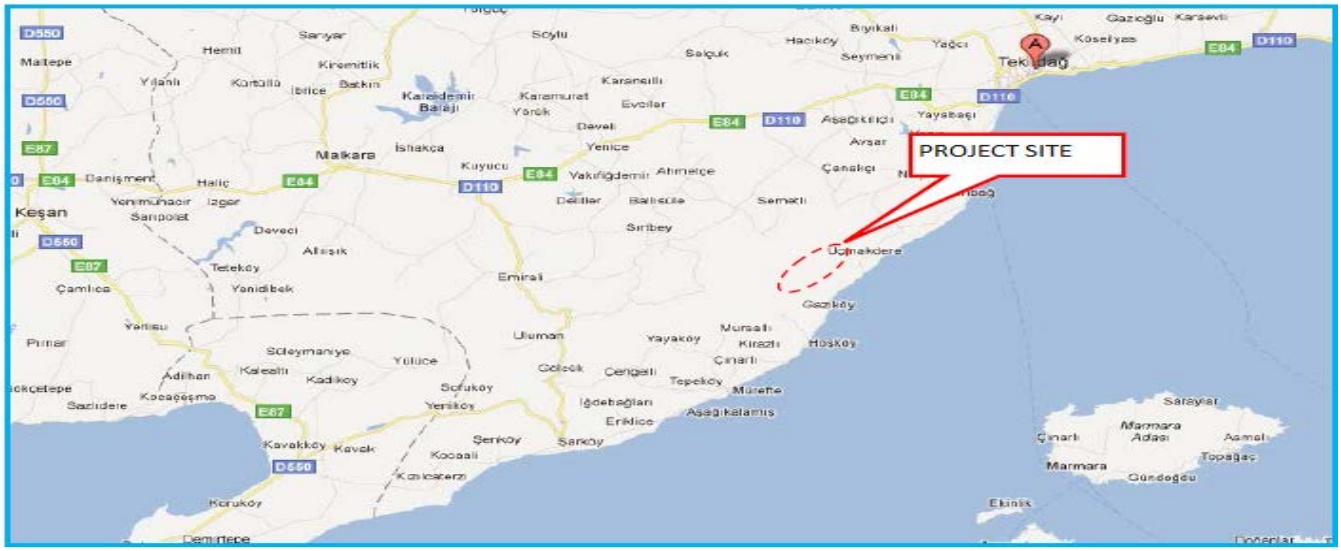
Barbaros WPP is located in Tekirdağ province, Turkey

A.2.3. City/Town/Community etc.

Şarköy district of Tekirdağ

A.2.4. Physical/Geographical location

The figure below shows the location of the project site.



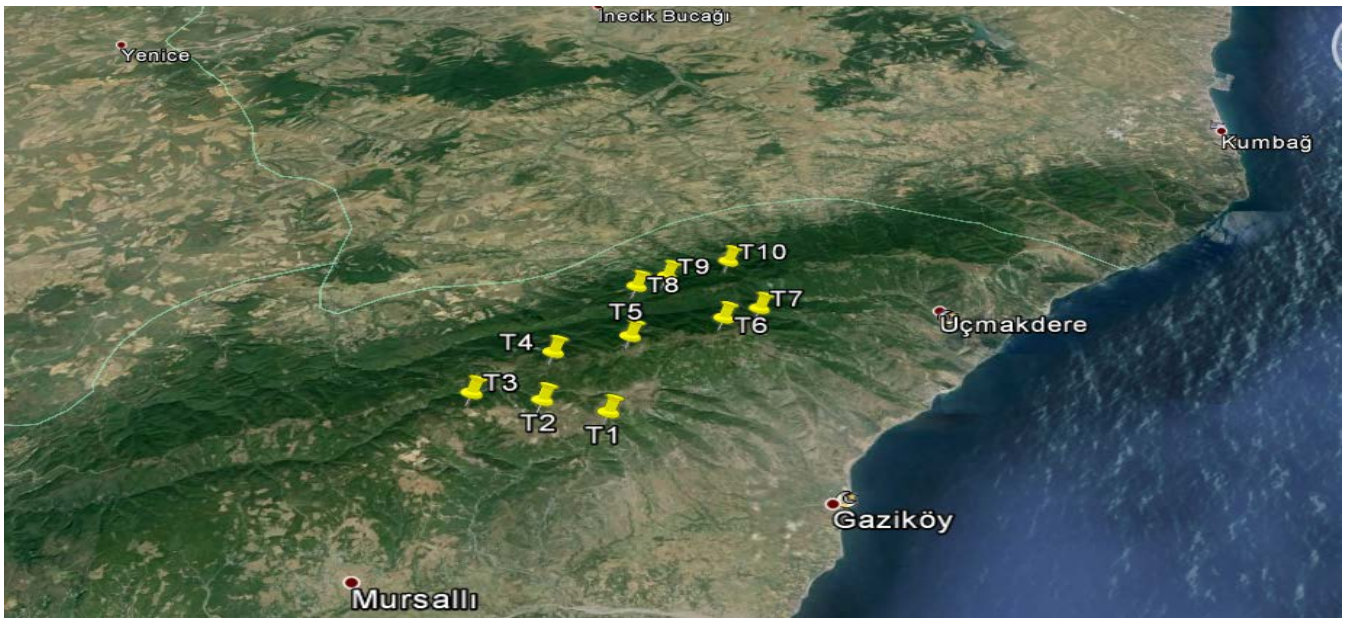


Figure 1 Map and Satellite View of Project Area

Table 1 Barbaros Wind Turbines Coordinates[4]

Coordinate order : Right Up Datum : ED-50 Type : UTM D.O.M. 27 Zone 35 Scaling Factor : 6 degree			Coordinate order: latitude, longitude Datum : WGS-84 Type : Geographic D.O.M. : -- Zone : -- Scaling Factor : ----------
Point	**Y**	**X**	**Y:X**
T 1	523957.350	4512669.595	40.76295709:27.28335226
T 2	522761.620	4513041.084	40.76633755:27.26919894
T 3	521467.213	4513238.438	40.76815012:27.25386898
T 4	522918.342	4514509.627	40.77956246:27.27110961
T 5	524363.667	4514991.401	40.78386103:27.28825660
T 6	526163.066	4515624.094	40.78950532:27.30960869
T 7	526882.826	4516042.019	40.79324690:27.31815762
T 8	524502.975	4516924.305	40.80126923:27.28998335
T 9	525118.254	4517243.553	40.80412660:27.29729008
T 10	526372.029	4517812.396	40.80921166:27.31217775

Table 2 Switchyard Coordinates[5]

Coordinate order : Right Up Datum : ED-50 Type : UTM D.O.M. :27 Zone 35 Scaling Factor : 6 degree			Coordinate order: latitude, longitude Datum : WGS-84 Type : Geographic D.O.M. : -- Zone : -- Scaling Factor : ----------
Point	**Y**	**X**	**Y:X**
S 1	526643.111	4515843.224	40.79146392:27.31530777
S 2	526743.111	4515843.224	40.79146068:27.31649305

[4] Retrieved from Barbaros WPP Project Description File

[5] Retrieved from Barbaros WPP Project Description File

S 3	526743.111	4515743.224	40.79055984:27.31648878
S 4	526643.111	4515743.224	40.79056309:27.31530351
Total Area	**10.000 m^2**		

Table 3 Barbaros Power Plant Area Coordinates[6]

Coordinate order : Right Up **Datum : ED-50** **Type : UTM** **D.O.M. :27** **Zone 35** **Scaling Factor : 6 degree**			**Coordinate order: latitude, longitude** **Datum : WGS-84** **Type : Geographic** **D.O.M. : --** **Zone : --** **Scaling Factor : ----------**
Point	**Y**	**X**	**Y:X**
K 1	526372.029	4518722.979	40.81741449:27.31221620
K 2	526827.320	4518600.984	40.81630083:27.31760956
K 3	527160.617	4518267.687	40.81328740:27.32154706
K 4	527263.337	4517884.332	40.80983066:27.32274825
K 5	527607.146	4516363.955	40.79612307:27.32675733
K 6	527693.409	4516042.019	40.79322002:27.32776560
K 7	527584.811	4515636.728	40.78957266:27.32646049
K 8	527317.297	4515369.213	40.78717176:27.32327809
K 9	526529.225	4514911.623	40.78307539:27.31391838
K 10	526229.084	4514831.201	40.78236056:27.31035792
K 11	524784.259	4514565.909	40.78001540:27.29322441
K 12	524348.837	4512598.327	40.76230358:27.28798776
K 13	524312.925	4512464.304	40.76109733:27.28755709
K 14	524162.641	4512314.020	40.75974796:27.28577080
K 15	523957.350	4512259.012	40.75925840:27.28333656
K 16	523823.745	4512294.812	40.75958478:27.28175508
K 17	522678.015	4512652.903	40.76284295:27.26819430
K 18	522650.660	4512660.233	40.76290973:27.26787047
K 19	521406.253	4512844.189	40.76460011:27.25313320
K 20	521261.922	4512882.863	40.76495230:27.25142446
K 21	521111.638	4513033.147	40.76630996:27.24964893
K 22	521056.630	4513238.438	40.76816071:27.24900407
K 23	521111.638	4513443.729	40.77000865:27.24966277
K 24	521201.242	4513533.334	40.77081360:27.25072753
K 25	522442.563	4514867.920	40.78280329:27.26548410
K 26	522613.050	4515038.408	40.78433438:27.26751076
K 27	522839.091	4515098.975	40.78487378:27.27019193
K 28	523897.664	4515359.471	40.78719042:27.28274781
K 29	523697.980	4516945.158	40.80148064:27.28044121
K 30	523800.990	4517329.596	40.80494085:27.28167700
K 31	524097.684	4517626.290	40.80760500:27.28520584
K 32	524438.886	4517717.715	40.80841848:27.28925462
K 33	524904.164	4517796.771	40.80911672:27.29477407
K 34	524982.259	4517817.697	40.80930281:27.29570080
K 35	525653.685	4518337.931	40.81396864:27.30368262
K 36	525916.738	4518600.984	40.81633004:27.30681253

[6] Retrieved from Barbaros WPP Project Description File

Wind Turbines

The capacity of Barbaros Wind Power Plant Project is 12 MW and the number of turbines is 4. The capacities of the 3 units are 3200 kW and the capacity of 1 unit is 2850 kW.

The amount of annual production is 42.000 MWh. The project is planned to connect to Tekirdağ Substation that has 34,5 kV medium voltage. Latest building technologies will be used in the project. National and international standard values will be based in used materials.[7]

Table 4 Technical Specifications of ENERCON E82/2.0 MW Turbines[8]

Turbines	**GEARLESS, VARIABLE SPEED, VARIABLE AREA, CONTROLLED**
Nominal generation	2000 kW
Blade diameter	82 m
Hub elevation	78-138 m
Blade Type	**Upwind with active blade order**
Blade number	3
Blade area	5281 m^2
Operating Range	6-19,5 period/min
Direction of Rotation	Clockwise
Direction	To the wind
Blade	
Material	Fiberglass with lightning protection which is supported with epoxy
Blade Connection	Steel
Generator	
Power	2.0 MW
Type	ENERCON direct sliding synchronized circular generator

Table 5 Technical Specifications of MİTSUBİSHİ MWT-1000A/1.0 MW Turbines

Turbines	**VARIABLE SPEED, UPWIND, HORIZANTAL AXIS**
Nominal generation	1000 kW
Blade diameter	61,4 m
Hub elevation	55 m / 60 m / 69 m
Blade Type	**Upwind, Horizontal Axis**
Blade number	3
Blade area	19,8 period/min
Operating Range	Clockwise
Direction of Rotation	Upwind
Blade	
Material	Glass Fiber Reinforced Polymer (GFRP)
Blade Connection	Steel
Lightning Sensor	**Conductor**
Generator	
Power	1.0 MW

[7] Barbaros WPP, Generation Licence File, page 1/3

[8] The information retrieved from the Barbaros WPP Project Description File

Type	Induction generator (with 4 polar)
Voltage	600 V / 690 V

The wind turbines like the other turbines, transform the movement of the linear fluid (air) to the rotational movement. In other, it means words transformation from the kinetic energy of the wind to the rotational mechanic energy. Obtained mechanic energy transforms to the electric energy bay way of the alternator inside of the turbine. The generated energy in one wind farm is transmitted to the switch gear and then the energy transmitted to the grid.

The lifetime of the equipment are indicated in the Barbaros WPP Project Description File as fallow:
Turbines have 20 years lifetime
Transformers have at least 20 years lifetime

A.3. Technologies and/or measures

Applied approved baseline and monitoring methodology:

AMS-I.D.CM0002 “Grid-connected renewable electricity generation, version 18”

Used tools:

- Tool for the demonstration and assessment of additionally, version 07.0.
- Tool to calculate the emission factor for an electricity system, version 05.0.

A.4. Parties And Project Participants

Table 6 Table of Parties and Project Participants

Party involved (host) indicates host Party	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Turkey (Host Country)	Verim Enerji Yatırım Üretim ve Tic. A.Ş	No

Verim Enerji Yatırım Üretim ve TİC. A.Ş. is the generation licence owner of the project activity. Full contact information for the project participants is provided in Annex 1.

ENÇEV Enerji Çevre Yatırımları ve Danışmanlığı Haritacılık İmar İnşaat A.Ş is the carbon consultant for this project.

A.5. Public funding of project activity

The project does not obtain public funding.

SECTION B. Application of selected approved baseline and monitoring methodology and standardized baseline

B.1. Reference of methodology and standardized baseline

Applied approved baseline and monitoring methodology:

- AMS-I.D "Grid-connected renewable electricity generation, version 18"

Used tools:

- Tool for the demonstration and assessment of additionally, version 07.0.
- Tool to calculate the emission factor for an electricity system, version 05.0.

B.2. Applicability of methodology and standardized baseline

Methodology "AMS-I.D. "Grid-connected renewable electricity generation, version 18", is applicable to the proposed project activity because it fulfils the required criteria:

- This methodology comprises renewable energy generation units, such as wind that is supplying electricity to a national grid.
- It is a greenfield plant.
- The installed capacity of the proposed project activity is 12 MW which is lower than 15 MW.

The project activity will not have a capacity extension at any year of the crediting period. The project activity may include renewable energy power plant of wind power plant.

This methodology was prepared for the small scale projects which have lower installed capacity than 15 MW. The installed capacity of the Barbaros WPP project is 12 MW that is higher than 15 MW. Therefore this methodology is applicable for the project. This methodology comprises renewable energy generation units, such as wind that is supplying electricity to a national grid.

In addition to that the fallowing "Install a Greenfield power plant" situation is implied in the methodology. The Barbaros WPP project is Greenfield power plant project. Therefore that is also support to applicability of the methodology.

The other condition which makes the methodology applicable for the project is stated as "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".

B.3. Project boundary

In the "AMS-I.D.Grid-connected renewable electricity generation, version 18, "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" is implied.

The proposed project and the power plants which are connected to the Turkish National Grid are included in the spatial extent of the project boundary.

For this project there is GHG emission only in construction phase. The diesel oil of the equipment and the GHG during the excavation are the GHG emission sources.

Table 7 Emission factors of the diesel used equipment

Polluter	Diesel (kg/t)
Carbon Monoxide	9,7
Hydrocarbons	29,0
Nitrogen Oxides	36,0
Sulphur Oxides	6,5
Dust	18

Emission due to the equipment that use the diesel as fuel:

Carbon Monoxide = 9,7 kg/t x 0,1 t/sec = 0,97 kg/h

Hydrocarbon = 29,0 kg/t x 0,1 t/sec=2,9 kg/h

Nitrogen Oxides = 36,0 kg/t x 0,1t/sec = 3,6 kg/h

Sulphur Oxides =6,5 kg/t x 0,1 t/sec = 0,6 kg/h

Dust =18 kg/t x 0,1 t/sec = 1,8 kg/h

These calculations are calculated based on the data if the equipment works at the same time. In practice they will not work at the same time. Therefore these values will be lower than these results.

Table 8 Emissions due to the excavation

Dust Cause	Emission Amount	Emission Flowrate
Stripping Excavation	0,025 kg/ton	4,1ton/h x 0,025 kg/ton = 0,1 kg/h
Total Emission	0,1 kg/h	

B.4. Establishment and description of baseline scenario

In respect of small-scale consolidated methodology AMS-I.D “Grid Connected Renewable Electricity Generation, version 18”, the baseline scenario is that the 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 into the grid”.

Since the proposed project activity is "The installation of a new grid-connected renewable power plant ", the baseline scenario is defined as the consolidation of electricity delivered to the grid by the project activity and electricity generated by the operation of grid-connected power plants in Turkey and electricity produced by the new generation sources.

Installed electricity generation capacity in Turkey has reached 69,519.8 megawatts (MW) as of 2014. Fossil fuels account for % 60.13 of the total installed capacity and hydro, geothermal, and wind account for the remaining % 39.87.[9]

Table 9 Breakdown of installed capacity of Turkish grid, 2014[10]

Primary Energy Source	**MW**	**% of installed capacity, 2014**
Thermal	41,801.8	60.13
Hydro	23,643.2	34.01
Geothermal	404.9	0,58
Wind	3,629.7	5.22
Solar	40.2	0.06
TOTAL	**69,519.8**	**100**

Electricity demand of Turkey has been growing continuously since the last decade due to the rapid growth in economy. In 2014, the electricity demand was 257,220.1 GWh which corresponds to an increase of 4.4% compared to the previous year. The increase or decrease rates for electricity are presented in table below.

Table 10 The energy demand and increase rates between years 2004-2014[11]

Year	Energy Demand (GWh)	% increase
2004	150,017.5	6,3
2005	160,794	7,2
2006	174,637.3	8,6
2007	190,000.2	8,8
2008	198,085.2	4,3
2009	194.079.1	-2,0
2010	210.434	8,4
2011	230.306,3	9,4
2012	242369.9	5,2
2013	246,356.6	1.6
2014	257,220.1	4.4

[9] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/kguc(1-13)/1.xls
[10] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/kguc(1-13)/4.xls
[11] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/uretim%20tuketim(24-48)/25.xls

Turkey, who intends to sustain its development, has tent to manage its energy supply-demand balance by the way of developing and constructing high capacity coal and natural gas power plants. The large natural resource availability, especially the abundance of economically accessible lignite and the governmental agreements on purchasing natural gas and accordingly developing infrastructure works promote the development of thermal power plants. In the absence of the proposed project activity, the same amount of electricity is required to be supplied by either the current power plants or by increasing the number of thermal power plants thus increasing GHG emissions.

In respect of small-scale consolidated methodology AMS-I.D "Grid Connected Renewable Electricity Generation, version 18" the baseline is only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.

$$BE_y = EG_{PY,y} \times EF_{grid,CM,y} \quad \textbf{(Equation 1)}$$

Where:

BE_y = Baseline Emissions in year y (tCO_2/yr)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$EF_{grid,CM,y}$ = 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" (t CO2/MWh)

Quantity of net electricity generation ($EG_{PJ,y}$) is equal to quantity of net electricity generation ($EG_{facility,y}$)supplied by the project plant/unit to the grid in year y (MWh/yr) for greenfield plants.

B.5. Demonstration of additionally

The project additionally is demonstrated through use of the "Tool for the demonstration and assessment of additionally, version 07.0.0".

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

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

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

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

Table 11 Alternatives to the project activity

Alternative A	Proposed project developed without the VER revenues
Alternative B	The continuation of the current situation (no project activity & no other alternative undertaken)
Alternative C	Construction of a thermal power plant with the same installed capacity or the same annual power output.

Alternative A is the implementation of the project without carbon revenue. Alternative B is the continuation of current situation, no project activity. Alternative B does not seem as a realistic option due to expected energy demand increase in Turkey. The next figure shows the energy demand projection (conservative scenario) between 2015 and 2024 prepared by TEİAS. Based on this fact, the electric generation in Turkey

should be increased anyway in accordance with the expected energy demand. Therefore, no action alternative is not a plausible option and WEPPs should be constructed in order to generate clean energy where applicable.

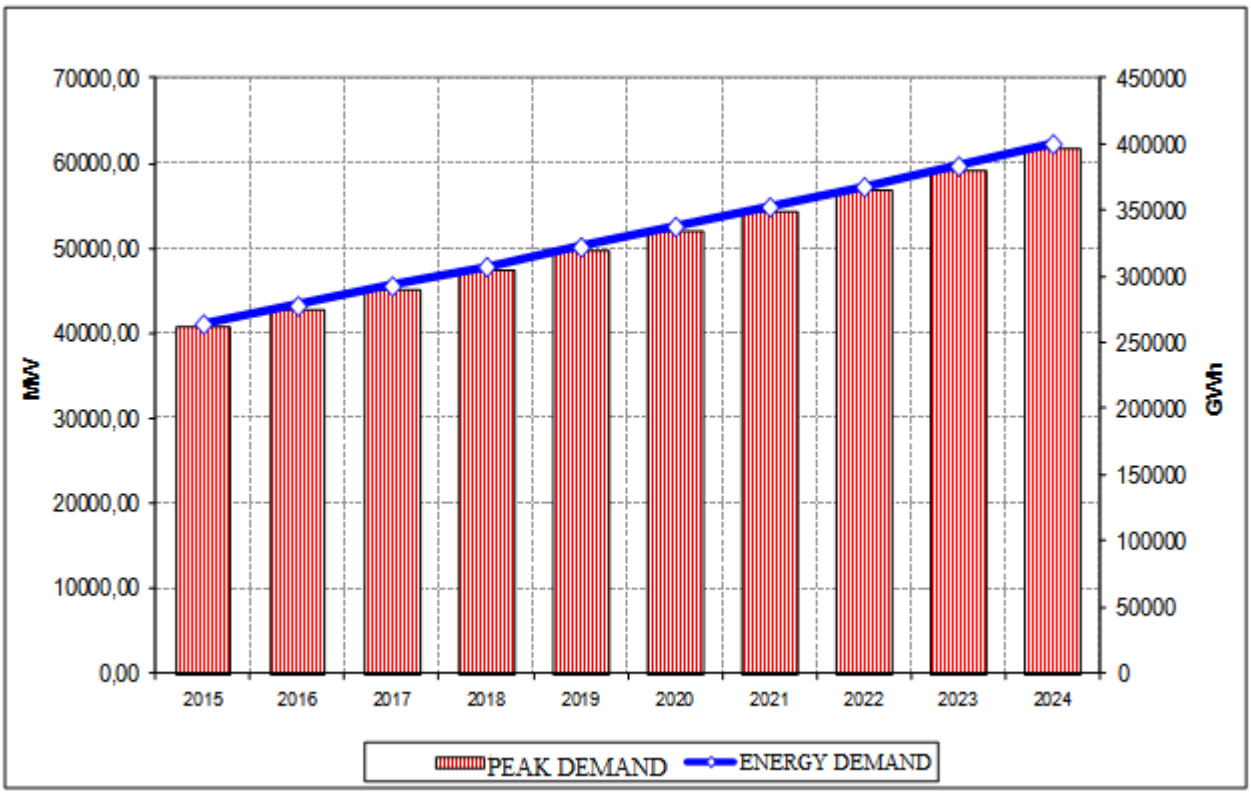


Figure 2 The energy demand projection between 2015 and 2024 (low demand)[12]

The last alternative, Alternative C, is considered as a significant alternative to the project activity as baseline scenario. Since the share of thermal plants in the installed capacity of Turkey is considerably high which correspond 41,801.8 MW of total 69,519.8 MW installed capacity according to 2014 Turkish electrical statistics taken from TEIAS (Turkish Electricity Transmission Company).[13]

[12] http://www.teias.gov.tr/YayinRapor/apk/projeksiyon/index.htm

[13] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/kguc(1-13)/4.xls

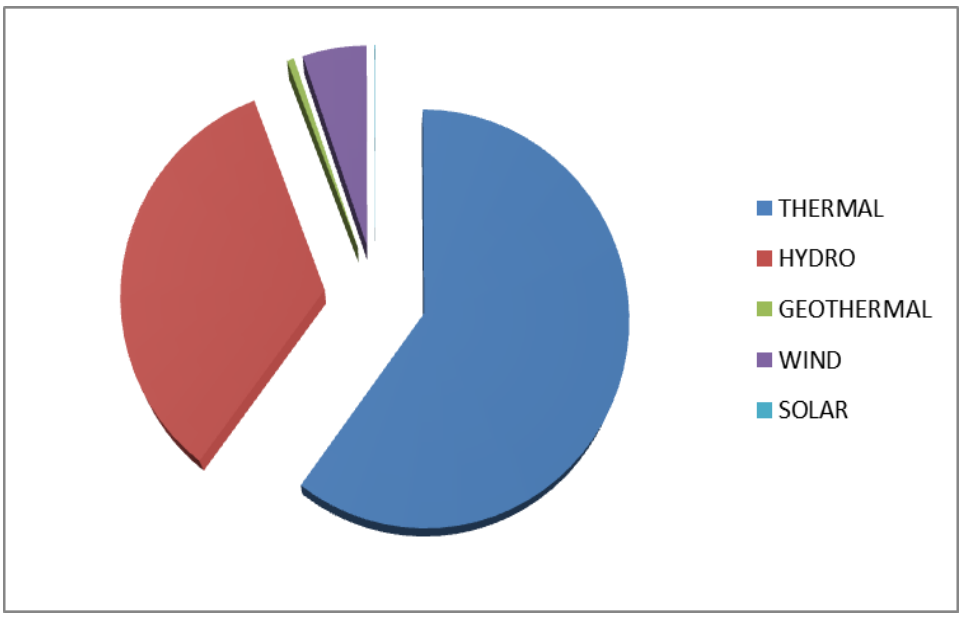


Figure 3 The distribution of installed capacity of Turkey by primary energy sources in 2014[14]

[14] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/kguc(1-13)/4.xls

Outcome of Step 1a

Three alternatives are considered for the proposed project. However due to the increasing electricity demand in Turkey, Alternative B, which is the continuation of the current situation is an unrealistic option. Therefore, Alternatives A and C are the two alternatives to be evaluated.

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

The following applicable mandatory laws and regulations have been identified:

1. Electricity Market Law [Law Number: 6446 Enactment Date: 30.03.2013][15]
2. Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy [Law Number: 5346 Ratification Date: 10.05.2005 Enactment Date: 18.05.2005][16]
3. Environment Law [Law Number: 2872 Ratification Date: 09.08.1983 Enactment Date: 11.08.1983][17]
4. Energy Efficiency Law [Law Number 5627, Enactment Date 02/05/2007] [18]

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

Outcome of Step 1b

Mandatory legislation and regulations for each alternative are taken into account in sub-step 1b. Based on the above analysis, the proposed project activity is concluded not to be the only alternative amongst the ones considered by the project participants that is in compliance with mandatory regulations.

Step 2: Investment analysis

The investment analysis for Barbaros Wind Energy Power Plant project in this Step 2 will be evaluated the following the four sub-steps:

(i) Determine appropriate analysis method;
(ii) Apply analysis method;
(iii) Calculation and comparison of financial indicators;
(iv) Sensitivity analysis.

Sub-step 2a: Determine appropriate analysis method

The "Tool for the demonstration and assessment of additionally, ver 07.0.0", lists three possible analysis methods;

- Option I. Simple cost analysis;
- Option II. Investment comparison analysis; and
- Option III. Benchmark analysis.

Option I cannot be used, since the financial and economic benefits generated by the proposed project activity.

[15] http://www.resmigazete.gov.tr/main.aspx?home=http://www.resmigazete.gov.tr/eskiler/2013/03/20130330.htm&main=http://www.resmigazete.gov.tr/eskiler/2013/03/20130330.htm

[16] Retrieved from http://www.eie.gov.tr/duyurular/YEK/LawonRenewableEnergyReources.pdf

[17] Retrieved from http://rega.basbakanlik.gov.tr

[18] Retrieved from http://www.eie.gov.tr/english/announcements/EV_kanunu/EnVer_kanunu_tercume_revize2707.doc

Between Option II and Option III, benchmark analysis method (Option III) is preferred as the investment analysis method for the proposed project.

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

To select or calculate a benchmark with reliable and valid is very difficult in due to the market volatility (government bond rates etc.), its changes over time and project type has its own characteristics (supply, demand, price etc.). Institutional capacity is necessary for these calculations. In this regard, the recognized and accepted widely the calculations (indicators) of international institutions (WB, IMF, UNCTAD, IFF etc.) can be used as benchmark. Since this IRR refers to wind plant in the republic of Turkey, the Equity IRR of World Bank can be used which is 15%. [19] This accepted benchmark IRR provides a more accurate and conservative view of the investment analysis effort. Eventually, the benchmark (15%) will be applied for comparison with the equity IRR determined in this investment analysis of the Barbaros WEPP project.

As is known, there are also benchmarks for other countries in the appendix of "Guidelines on the assessment of investment analysis, version 05" When it is seen, the highest benchmark is %17 and the lowest benchmark is % 9.5 among the lots of countries for energy industries. In this Tool, the benchmark IRR (The expected return on equity) is composed of four elements: (a) a risk free rate of return; (b) an equity risk premium; (c) a risk premium for the host country; and (d) an adjustment factor to reflect the risk of projects in different sectorial scopes. All values are expressed in real terms.

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

The internal rate of return (IRR) calculation is a convenient technique for Barbaros WPP Project in benchmark analysis. As it is known, IRR is a percentage figure that describes the yield or return of an investment over a multiyear period. For a given series of cash flows, the IRR is the discount rate that results in a net present value (NPV) of zero.
IRR can be calculated using directly the main parameters of project and other relevant financial items. In accordance with the "Guidelines on the assessment of investment analysis, version 05", EB 62, and Annex 5, 5th clause, All input values used in the investment analysis are referred to the Barbaros WPP Financial Model Summary conducted in October 2014.

Table 12 Main parameters used for investments analysis

Parameters	Unit	Data Value
Installed Capacity	MWe	12 (Generation Licence)
Electricity Generated	MWh	42000 (Generation Licence)
Investment Cost (VAT included)	USD	20,817,077 (Summary Financial Model)
Feed-in Tariff	€ Cents/KWh	6.8 (Summary Financial Model)
Expected VERs price	€/ tCO2-eq	4.5 (Summary Financial Model)
Corporate Tax [20]	%	20
VAT	%	18 (Summary Financial Model)

The main parameters and items have been considered in the table above for the cash inflow and cash outflow of the Project.

(i) The cash inflow or income stream

The primary legislation for a reasonable projection of income stream is the "Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy (No.5346)". According to Article 6 of the Law, the price to be applicable to the electrical energy to be purchased within the scope of Law for each year shall be the Turkish average wholesale electricity price in the previous year determined by the Energy

[19] Retrieved from World bank-Project Appraisal Document on a IBRD Loan and a Proposed Loan from Clean Technology Fund to TKSB an TB with the Guarantee of Turkey (Report No: 46808-TR, dated May 1, 2009, page 81)

[20] "Corporate Tax Law" published on the official gazette on 21/06/2006, no 26205, clause 32

Market Regulatory Agency (EMRA). This applicable price may not be less than the Turkish Lira equivalent of 5 euro cent per KWh and may not be more than the Turkish Lira equivalent of 5.5 Eurocent per KWh. However, legal entities (project participant) that hold licenses based on renewable energy resources and which have the opportunity to sell above the limit of 5.5 Eurocent per KWh in the market shall benefit from this opportunity.

We considered 1 USD = 2.260 TL[21] and 1 EURO = 2.89[22] TL (exchange rate/selling). When the annual electricity generation was taken as 42,000 MWh, in the case of selling the generated electricity with the price of 6.8 Eurocent/KWh [23], **3,652,141.59 USD** will be earned. It is assumed constant selling price of electricity during the 49 years of operation. There are four key elements in determining policies of electricity sale prices in Turkey. These are oil prices, climate, government strategies and economic stability of Turkey. During the license period of 49 years, it cannot be known how these four concepts will change. Oil prices changes globally. Energy production decreases and increases with change in climatic conditions. The other two issues are relevant to on-going financial situation in Turkey. Therefore, it is inevitable of assuming selling prices constant for 49 years.

In the framework of Project, the Government gave guarantee to proposed project to buy 100 percent of power to be generated from power plant only first ten years. After the first 10 yearly periods, electricity sales prices and amounts will depend on electricity market condition. As it can be seen above, main assumption (conservative approach) is to adopt the same income stream projections in both the first 10 years and following 40 years. Besides, there is no export competence in the scope of license and the Project is derived from regional market potential (EU etc.). Hence, the income stream projections are based on rather the conservative assumptions.

(ii) The cash inflow or income stream

According to the IRR calculations of the Barbaros WPP Project the summary of the investment cost and the other necessary costs (total project cost, VAT, financial cost) are itemized as follows:

Table 13 Barbaros WPP Project and Investment Costs (USD)

Units	Total	References of Inputs
Construction	**2.240.640**	(Summary Financial Model)
Turbines	**11.632.640**	(Summary Financial Model)
Other Electro mechanic Equipment	**1.568.000**	(Summary Financial Model)
Invisible Costs	**897.160**	(Summary Financial Model)
Energy Transmission Line	**1.196.800**	(Summary Financial Model)
Engineering and General Expenses	**1.305.123**	(Summary Financial Model)
PROJECT COST	**18.840.362**	(Summary Financial Model)
Interest During Construction	**714.410**	(Summary Financial Model)
TOTAL INVESTMENT COST	**19.554.772**	(Summary Financial Model)
VAT	**1.262.304**	VAT is 18% indicated in Barbaros WPP Financial Model Summary Investment Section
TOTAL INVESTMENT COST + VAT	**20.747.367**	(Summary Financial Model)

Note: Please follow the IRR calculations excel sheet for more details.

In accordance with the conducted Feasibility Study Report of the proposed project, the expense of operation and maintenance is tabulated below;

[21] The exchange rate on 17 October 2014 of Turkish Central Bank

[22] The exchange rate on Barbaros WPP Financial Model Summary dated 17.10.2014

[23] The conservative approach is preferred with the highest earning amount.

Table 14 The Barbaros WPP project annual expense (operation and maintenance cost)

Units	Operation and Maintenance Cost (USD)[24]
Operating Personnel	110.485
Maintenance, Repair and Auxiliary Equipment	250.637
General Expenses and Other Expenses	159.845
Insurance	63.938
Deposits	675.677
License Payment	574
TOTAL	**1.261.156**

Note: Please follow the IRR calculations excel sheet for more details.

(iii) Earnings before Interest, Depreciation (EBITD)

These gross earnings figures are tabulated and included in the accounts and stated in the IRR excel sheet briefly.

(iv) Depreciation

Depreciation related to the project, which has been deducted in estimating gross earnings on which tax is calculated, added back to net profits in line with the suggestion in the tool "Tool for the demonstration and assessment of additionality, version 7.0.0", EB 70.

(v) Interest Expenses

Interest expenses are applied with respect to expected credit conditions on the year of feasibility study applied.

(vi) Corporate Tax Base

Corporate Tax Base = Revenue – Costs – Depreciation – Interest Expenses

(vii) Corporate Tax Amount

Corporate income tax is applied at 20% rate on the tax amount as per the Corporate Tax Law (published on official gazette on 21/06/2006, no: 26205, clause 32). However taxpayers pay provisional tax at the rate of corporate tax, these payments are deducted from corporate tax of current period. It is important that when business profit (dividend) is distributed company holders as project participants, the income tax is levied on the income of these persons from business activities as well as corporate tax liability.

(viii) Net Earnings

Net Earnings = Tax Base – Tax Amount

(ix) Deduction of Input VAT

Project participant has the right to deduct input VAT of investment cost. Paid input VAT in the investment period is deducted the VAT amount in the following years.[25] VAT is 18% as per the VAT Law (no: 3067, date: 25/10/1984).

[24] Barboros WPP Financial Model Summary

(x) Instalment Payment

Repayments of principal are tabulated and included in the accounts and stated in the IRR excel sheet briefly.

(xi) Net Cash Flow

Net Earnings + Depreciation + Netting of VAT – Instalment Payment

(xi) Net present value (NP) and Equity IRR

For a given series of net cash flows (the difference between the present value of cash inflows and cash outflows), Equity IRR of the Barbaros WPP Project 7,71 % is the discount rate that results in an NPV of zero (without considering the carbon revenue).

With respect to "Guidelines on the Assessment of Investment Analysis", version 05; the fair value of project activity assets at the end of the assessment period should be included as a cash inflow in the final year. Hence, the fair value was calculated in accordance with local accounting regulations and included as a cash inflow in the final year.

However, as per *4628 numbered Law* of Turkish Legislations, at the end of electricity production license as of 49 years, the project activity with all units shall be granted to government with no salvage value. Hence, in reality, the salvage value of project activity assets will be not be given to investor.

When we consider to today's technology, high capital stock will be transferred from Project to the public contributing to public welfare. Therefore, this salvage value can be seen positive impact on community (public utility) in terms of sustainability development matrix.

(xii) Equity IRR, VER Income and the Benchmark

As is mentioned above, Equity IRR has been calculated as 7,71 % without considering the carbon revenue. When benchmark IRR is taken as 15%, the Project is not financially attractive. We consider 4.5 EURO VER Sales Unit Price (conservative prediction) and taxation. When we include the carbon revenues in the cash flows, the Equity IRR increases to nearly 11,34 %. The IRR even with VERs remains lower than the benchmark of 15%.[26]

Sub-step 2d: Sensitivity Analysis

Sensitivity analysis is used to determine how different values of independent variables will affect dependent variables under a given set of assumptions. This subchapter can cover a diversity of complexities and difficulties that may arise in an investment analysis, including issues of electricity generation, electricity price, and corporate tax and other financial burdens, electricity demands etc. The aim is to bring to the attention of persons concerned a number of issues that are known in cash flows circles and IRR calculations.

Independent variables and accepted affecting IRR as a dependent variable is assessed below.

(i) The cash inflow or income stream

[26] Please see the excel sheet of IRR analysis.

- Constant selling price of electricity during the 47 years of operation (2 year construction period)

Independent variables affecting pricing: The Government as the main driver mostly determines the price level in the market. Due to slow progress in market liberalization, there may not be change in this situation in short and medium term. It is generally expected that the **public sector borrowing requirement (PSBR) to be rise, pressure on the level of electricity price to increase. After the global crises, Turkish Government's** manoeuvring ability within the budget is very limited. Moreover, significant opposition from consumers (household, industry etc.) may meet the increasing electricity price. Therefore, price movement may remain flat in the coming years.

On the other hand, privatization of the important parts of Turkey's Electricity Distribution Industry has carried out recently. The privatization of electricity distribution companies will aid the fight against **illegal electricity usage in Turkey**. The rate of illegal electricity usage in Turkey increased from 14.4 % to 17.7% from 2008 to 2009, according to the recent data from the Turkish Electricity Distribution Company (TEDAŞ)[27]. According to the data in 2013, 162 billion kWh electric distributed and 31 billion kWh of that was lost energy[28]. It means %19 of energy is lost. As seen in data the illegal usage is increasing every year. Therefore, increased energy costs to consumers and public fall. As the rate of illegal electricity usage decreases, institutional structure of market; transparency is strengthening. Right price signals lead to efficient choices among existing alternatives for consumer, producer and the Government.

- Constant annual generation of electricity during operation period

Independent variables affecting generation: The climatic conditions and **catastrophic risks.** As it is known, the estimated electricity generation based on historical hydrological data. Big deviation can be seen in the context of global climate change. Therefore, these effects on generation may be negative or positive. Both of them are risks on the proposed project.

- It is assumed that annual generation (100%) will be sold during the operation period. It is not considered the demand conditions of electricity market. Besides, there is no export competence in the scope of license and the Project is derived from vast market potential (EU etc.).

Independent variables affecting the demands: To assess the predictions for demands of using more realistic assumptions, it is needed to develop a framework of multi-dimensional analysis. For instance, growth scenarios, a short and long run the price and income elasticity of demand for electricity etc. are main subjects.[29] There is no doubt that it is not possible to handle the dimensions with all its aspects. We only underline importance of GDP and industrial (especially manufacturing) sector in the demand context.

In Turkey, growth rate is an important variable which affected the electricity consumption positively in the long term.[30] Export-led growth as model is valid in Turkey.[31] The growth performance predominantly depends on global demand and falling global demand could have a major impact. Industry (especially manufacturing) with input-output connections is also the key sector in terms of growth performance and constituted more than 40% of total Turkey electrical consumption. Therefore, the electricity demand conditions of domestic market are drastically affected by the global economy cycles. On the other hand the largest elasticity is found in industry. Household demand for electricity is much less elastic than industrial energy use.[32] After the first ten years, income stream of Project will be able to fluctuate.

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[27] http://www.emo.org.tr/ekler/46f664ab2833d59_ek.pdf?dergi

[28] http://enerjienstitusu.com/2015/03/17/kacak-elektrik-ile-mucadele-uzerine-bir-degerlendirme/

[29] The price elasticity of demand is, by definition, the percentage change in demand that is caused by a one per cent change in price. This definition is also validated for the income elasticity.

[30] KAPUSUZOGLU, Ayhan and KARAN, Mehmet Baha (2010), "An Analysis of the Co-integration and Causality Relationship between Electricity Consumption and Gross Domestic Product (GDP) in the Developing Countries: An Empirical Study of Turkey", *Business and Economics Research Journal, Volume* 1, Number 3.

[31] BİLGİN, Cevat and SAHBAZ, Ahmet (2009): "Türkiye'de Büyüme ve İhracat Arasındaki Nedensellik İlişkileri", published in *Gaziantep Üniversitesi Sosyal Bilimler Dergisi*, Vol. 8, No. 1 (2009): pp. 177-198. This paper is to investigate the relations between export and growth for Turkey by using 1987-2006 monthly data. According to the test results, export-led growth is verified for the specified period.

[32] ACKERMAN, Frank, (2008). "Carbon Markets and Beyond: The Limited Role of Prices and Taxes in Climate and Development Policy," *G-24 Discussion Papers 53*, United Nations Conference on Trade and Development.

(ii) The cash outflow and costs

- Independent variables affecting investment costs: Especially important differences between predicted construction costs and realized construction costs can be revealed in disfavor and favor of the Project.

Independent variables affecting operational costs: Constant annual wages during the 50 years of operation is assumed. In other words, it is not considered possible reel wage increases and decreases. Indeed real wages that have been adjusted for inflation is more than predicted (constant) level in order to prosperity over time. The possible changes of wages, and other current expenses, the fiscal liabilities (especially levied by the local administration) are not considered in baseline analysis.

Despite possible limitations –especially in absence of compound effects and probability distribution– this sensitivity analysis provides a general outlook of the investment analysis effort. A range of 10% fluctuations in parameters (electricity price and costs) can be taken in this analysis.

Table 15 The Sensitivity Analysis for Barbaros WPP Project

Parameter	Variation	IRR
Investment Cost	increased 10%	3,20 %
	decreased 10%	25,22 %
Electricity Generation	increased 10%	29,58 %
	decreased 10%	0.58%
Unit Price of Electricity	increased 10%	29,58 %
	decreased 10%	0,58 %
Operational Cost	increased 10%	4,53 %
	decreased 10%	11,65 %

The income has two variables; amount of electricity generated and unit price of electricity.[33] Therefore, income can be a parameter just by the way of variation in these 2 variables, which means that the increase in income can be a result of either increase in amount of electricity generated or increase in unit price of electricity. The decrease in income can be a result of either decrease in amount of electricity generated or decrease in unit price of electricity.

It may be seen from the sensitivity analysis that the 49 years Equity IRR value for the proposed project activity is less than the benchmark IRR (15%). Likewise, this analysis has not been considered macro risks (a projection about budget deficits, current account deficits, saving deficits, public and private debt stock etc. of Turkey economy) as well as micro risks (project, sectoral etc.).

Outcome of Step 2:

[33] Income = electricity generated (KWh) x unit price of electricity (USD/KWh)

The investment and sensitivity analysis shows that the VER revenues will improve the Equity IRR and make the project more attractive for investors. Considering that figures above do not precisely reflect the investment risk (systematic and unsystematic risks) the role of the carbon income is significant to enable the project to proceed and for a favourable investment decision taken. Based on the analysis and information above, it is concluded that project is not the attractive and can be considered as additional to the baseline scenario for indicated benefits in the first chapter.

The plant load factor is a measure of average capacity utilization. As per "Guidelines for the Reporting and Validation of Plant Load Factors, version 1" EB48, Annex 11;

The plant load factor shall be defined ex-ante in the CDM-PDD according to one of the following three options:
(a) The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval;
(b) The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company);

(b) was satisfied since, the components of the equation of plant load factor was determined by the engineering company which conducted the Feasibility Study. The PLF determined in line with (b) was provided to the bank to receive credit.
By definition, the ratio of average load to total capacity and the equation is;

$$PLF = \frac{Gross\ Generation}{Installed\ Capacity\ x\ Number\ of\ hours}$$

Where;
PLF = Plant Load Factor
Gross generation = Annual electricity generation (MWh)
Installed Capacity = the installed generation capacity within the project activity (MWe)
Number of hours = number of hours in a year (hrs.)

PLF = 42,000 MWh / [12 MWe[34][35] *x (365 day x 24 hrs/day)]*
PLF = 0,39

Table 16 Milestones of the Project

TASK NAME	DATES
Board Decision as prior consideration of CDM	23/12/2014
Feasibility Study Report	01/06/2013
EIA Exemption	28/03/2012
Electricity Production License by EMRA	28/06/2012
Contract with EN-ÇEV (the Consultant of Carbon Credits)	27/01/2014
Turbine Contract	23/12/2014
LSC Meeting	21/03/2013
Contract with TEIAS about grid connection	20/02/2014
Starting date of construction activities – starting date of project activity	28/04/2014
Transformer order contract	17/09/2015
Electric work contract	16/11/2015

[34] Barbaros WPP Financial Model Summary

[35] Barbaros WPP Financial Model Summary

Application to amendment of EMRA Electricity Generation License	12/09/2013 Amendment of Connection Point 18/11/2013 Amendment of Stakeholder 07/02/2014 Arrangement of coordinates 30/12/2014 Completion Time
Expected Commissioning Date	01/09/2016

Outcome of Step 2:

Step 3: Barrier analysis

The barrier analysis step has not been applied for the proposed project.

Step 4: Common practice analysis

This section includes the analysis of the extent to which the proposed project type (e.g. technology or practice) has already diffused in the relevant sector and region.

The following Sub-steps discuss the existing common practice.

Sub-step 4a- Analyse other activities similar to the proposed project activity

The list of operational wind power plants could be seen in next table.

Table 17. The List of Operational Wind Power Plant[36][37][38]

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
MARMARİS ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Manastır WEPP	YALOVA	12	SMALL	
DATÇA RÜZGÂR ENERJİSİ ELEKTRİK ÜRETİM A.Ş.	Datça WEPP	MUĞLA	12	SMALL	
YALOVA RÜZGÂR ENERJİSİNDEN ELEKTRİK ÜRETİM A.Ş.	Karacabey WEPP	BURSA	27,9	LARGE	
GARET ENERJİ ÜRETİM VE TİCARET ANONİM ŞİRKETİ	Kırkağaç WEPP	MANİSA	45	LARGE	
SİNCİK RÜZGAR ELEKTRİK ÜRETİM A.Ş.	Sincik WEPP	ADIYAMAN	25	LARGE	Validated

[36] http://lisans.epdk.org.tr/epvys-web/faces/pages/lisans/elektrikUretim/elektrikUretimOzetSorgula.xhtml

[37] http://geka.org.tr/yukleme/dosya/5f60844e55155eb66280abe69e42aa51.pdf

[38] http://www.geothermal-energy.org/pdf/IGAstandard/EGC/2013/EGC2013_CUR-32.pdf

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
LODOS KARABURUN ELEKTRİK ÜRETİM A.Ş.	Karaburun WEPP	İZMİR	120	LARGE	
GARET ENERJİ ÜRETİM VE TİCARET ANONİM ŞİRKETİ	Karadağ WEPP	İZMİR	10	SMALL	
BORES BOZCAADA RÜZGAR NER. SANT. SAN. VE TİC. A.Ş.	Bozcaada WEPP	ÇANAKKALE	10,2	SMALL	
SARAY DÖKÜM VE MADENİ AKSAM SANAYİ TURİZM A.Ş.	Saray WEPP	TEKİRDAĞ	4	SMALL	Registered
PETKİM PETROKİMYA HOLDİNG A.Ş.	Petkim	İZMİR	25	LARGE	
SUNJÜT SUN'İ JÜT SANAYİ VE TİCARET A.Ş.	Hadımköy-İstanbul WEPP	İSTANBUL	1,2	SMALL	
DÜZHAN ENERJİ YATIRIM ÜRETİM VE TİCARET A.Ş.	Tire	İZMİR	50	LARGE	
AYRES ELEKTRİK ÜRETİM A.Ş.	Ovares	AYDIN	15	LARGE	Registered
KIRCA ENERJİ YATIRIM ÜRETİM VE TİCARET A.Ş.	Kalfaköy WEPP	BALIKESİR	10	SMALL	
TAŞOLUK ELEKTRİK ÜRETİM DAĞITIM SANAYİ VE TİCARET A.Ş.	Çataltepe – Hisarardı WEPP	AYDIN	45	LARGE	
FUATRES ELEKTRİK ÜRETİM A.Ş.	Mut WEPP	MERSİN	79.9	LARGE	Validated
DEMİR RES MÜHENDİSLİK ENERJİ ÜRETİM A.Ş.	Korudağı	TEKİRDAĞ	3	SMALL	
TAN ELEKTRİK ÜRETİM A.Ş.	Aliağa WEPP	İZMİR	9,6	SMALL	Listed
NM ENERJİ ELEKTRİK ÜRETİM LİMİTED ŞİRKETİ	Poyraz	BALIKESİR	30	LARGE	
ÇEVRİM ENERJİ YATIRIM ÜRETİM VE TİCARET A.Ş.	Şile	İSTANBUL	50	LARGE	
FUATRES ELEKTRİK ÜRETİM A.Ş.	Harmanlık WEPP	BURSA	50	LARGE	Registered
SANKO RÜZGAR ENERJİSİ SANAYİ VE TİCARET A.Ş.	Gazi - 9	ÇANAKKALE	51	LARGE	

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
MARMARİS ELEKTRİK ÜRETİM A.Ş.	Esenköy	YALOVA	18,45	LARGE	
BAŞAK KLİMA RÜZGAR ENERJİSİNDEN ELEKTRİK ÜRETİMİ SANTRALİ VE SERVİSİ LİMİTED ŞİRKETİ	Göztepe WEPP	ÇANAKKALE	3	SMALL	
BOYLAM ENERJİ YAT. ÜRETİM TİCARET A.Ş.	Saros	ÇANAKKALE	138	LARGE	
DENGE ENERJİ ÜRETİM SANAYİ VE TİCARET A.Ş.	Kurtini	MERSİN	14	SMALL	
MUTLU GELİBOLU ELEKTRİK ÜRETİM YATIRIM İNŞAAT SANAYİ VE TİCARET A.Ş.	Yeniköy	ÇANAKKALE	48	LARGE	
VARYAP VARLIBAŞLAR YAPI SANAYİ TURİZM YATIRIMLARI TİCARET VE ELEKTRİK ÜRETİM A.Ş.	Yağcılar	İZMİR	10	SMALL	
YANDER ELEKTRİK MÜH. MÜŞ. İNŞ. TUR. VE TİCARET A.Ş.	Mersinli	İZMİR	55	LARGE	
HNS ENERJİ ÜRETİM ANONİM ŞİRKETİ	Akkuş	ORDU	10	SMALL	
TATLIPINAR ENERJİ ÜRETİM A.Ş.	Tatlıpınar WEPP	BALIKESİR	125	LARGE	
BAĞLAR ELEKTRİK ÜRETİM A.Ş.	Bağlar WEPP	KONYA	100	LARGE	Listed
SERİN ENERJİ ELEK. ÜR. DAĞ. PAZ. SANAYİ VE TİC. A.Ş.	Ortamandıra WEPP	BALIKESİR	10	SMALL	Registered
AYES ELEKTRİK ÜRETİM A.Ş.	Yeniköy	ÇANAKKALE	15	LARGE	
ELESTAS ELEKTRİK ÜRETİM A.Ş.	Orhanlı	HATAY	9	SMALL	
İZMİT KANDIRA RES ELEKTRİK ÜRETİM A.Ş.	Dikili	KOCAELİ	5	SMALL	
DÜNYA ENERJİ ÜRETİM A.Ş.	Kocatepe	MANİSA	25	LARGE	
YILDIZ ENERJİ ELEKTRİK ÜRETİM A.Ş.	Güllük	MUĞLA	33	LARGE	
SİMAY ELEKTRİK ÜRETİM A.Ş.	Küptepe	İSTANBUL	10	SMALL	

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
BEŞİKTEPE ÜRETİM VE TİCARET LİMİTED ŞİRKETİ	Kıyıköy	TEKİRDAĞ	41	LARGE	
SANKO RÜZGAR ENERJİSİ SANAYİ VE TİCARET A.Ş.	Hilal-2 WEPP	KARAMAN	6,999	SMALL	Registered
AİRRES ELEKTRİK ÜRETİM SANAYİ VE TİCARET A.Ş.	Airres-4	KIRKLARELİ	55	LARGE	Validated
OSRES ELEKTRİK ÜRETİM A.Ş.	Kızılcaterzi	EDİRNE	12	SMALL	
SERBEST ENERJİ SANAYİ	Aydos	İSTANBUL	14	SMALL	
ENİ ENERJİ İNŞAAT TAAH. TİC. VE SAN. A.Ş.	Maslaktepe	ÇANAKKALE	20	LARGE	
EDİNCİK ENERJİ ÜRETİM A.Ş.	Edincik WEPP	BALIKESİR	56,4	LARGE	Registered
ESİNTİ ENERJİ ÜRETİM TİCARET VE SANAYİ A.Ş.	Kınık	İZMİR	50	LARGE	
HANAY ELEKTRİK ÜRETİM A.Ş.	Elmalı	MERSİN	27	LARGE	Listed
Z .T ENERJİ ELEKTRİK ÜRETİM SANAYİ VE TİCARET A.Ş.	Çerçikaya WEPP	HATAY	57	LARGE	Listed
KOVANCI ENERJİ ÜRETİM PAZ. İTH. VE İHR. ANONİM ŞİRKETİ	HASANoba	ÇANAKKALE	51	LARGE	
TÜRKAY ALTERNATİF ENERJİDEN ELEKTRİK ÜRETİM SANAYİ VE TİCARET A.Ş.	Gündoğdu	BURSA	9	SMALL	
GYY ELEKTRİK ÜRETİM A.Ş.	Özbek	HATAY	24	LARGE	
FUATRES ELEKTRİK ÜRETİM A.Ş.	Fuatres	İZMİR	30	LARGE	Listed
EGENER ELEKTRİK ÜRETİM VE MAKİNE SAN. TİC. A.Ş.	Karabel	İZMİR	3	SMALL	
PAŞA ENERJİ YATIRIM ÜRETİM TİCARET A.Ş.	Mahmut Şevket Paşa-1	İSTANBUL	8	SMALL	
ÇANRES ELEKTRİK ÜRETİM A.Ş.	Sadıllı WEPP	EDİRNE	33	LARGE	Registered

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
YENİ BELEN ENERJİ ELEKTRİK ÜRETİM SANAYİ VE TİCARET A.Ş	Şenbük WEPP	HATAY	27	LARGE	Registered
BARKAN ENERJİ YAT. ÜRETİM TİCARET A.Ş.	Şapdağı	BALIKESİR	54.99	LARGE	Listed
VENTO ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Bergama	İZMİR	26,4	LARGE	
RÜZGAR ELEKTRİK ÜRETİM LİMİTED ŞİRKETİ	Akyar	MUĞLA	15	LARGE.	
BERGRES ELEKTRİK ÜRETİM A.Ş.	Bergres	İZMİR	69.95	LARGE	
GERES ELEKTRİK ÜRETİM A.Ş.	Geres WEPP	MANİSA	30	LARGE	Issued
BRİZA RÜZGAR ELEKTRİK ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ	Kavaklı WEPP	BALIKESİR	50	LARGE	Issued
BAHAR ENERJİ ELEKTRİK ÜRETİM SANAYİ VE TİCARET LİMİTED ŞİRKETİ	G WEPP	ÇANAKKALE	5	SMALL	
GARET ENERJİ ÜRETİM VE TİCARET A.Ş.	Gökres-2 WEPP	MANİSA	35	LARGE	
EVRENCİK RÜZGAR ENERJİSİNDEN ELEKTRİK ÜRETİM LİMİTED ŞİRKETİ	Evrencik	KIRKLARELİ	120	LARGE	
RÜZGAR ELEKTRİK ÜRETİM LİMİTED ŞİRKETİ	Geriş	MUĞLA	11.2	SMALL	
BIÇAKCILAR ÇANDARLI ELEKTRİK ÜRETİM LİMİTED ŞİRKETİ	Bitane	İZMİR	7.2	SMALL	
BETİM ENERJİ YAT. ÜRETİM VE TİCARET ANONİM ŞİRKETİ	Ömerli	İSTANBUL	100	LARGE	
ÖZ-YEL ELEKTRİK ÜRETİM LİMİTED ŞİRKETİ	Gaziosmanpaşa WEPP	İSTANBUL	50	LARGE	
BALİ RÜZGAR ELEKTRİK ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ	Çakıl	İSTANBUL	52.5	LARGE	
AYEN ENERJİ A.Ş.	Akbük II WEPP	MUĞLA	20	LARGE	Issued
AHSEN ENERJİ ÜRETİM TİCARET VE SANAYİ ANONİM ŞİRKETİ	Akdağ	KONYA	23	LARGE	

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
SÖKE RÜZGAR ENERJİSİNDEN ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Söke	AYDIN	45	LARGE	Registered
SÜPER ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Çataltepe	İSTANBUL	10	SMALL	
GRC YENİLENEBİLİR ENERJİ ÜRETİMİ SANAYİ VE TİCARET LİMİTED ŞİRKETİ	Çataltepe	İSTANBUL	2	SMALL	
DERNE TEMİZ ENERJİ ÜRETİM ANONİM ŞİRKETİ	Zeliha	KIRKLARELİ	15	LARGE	
ADO ENERJİ ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ	Akyurt	TOKAT	12.8	SMALL	
ALADAĞ RÜZGAR ENERJİÜRETİM SAN.VE TİC.A.Ş.	Kuyulukoyak	KONYA	16	LARGE	
YUVA ENERJİ YAT. ÜRETİM VE TİCARET ANONİM ŞİRKETİ	Yuvacık	KOCAELİ	120	LARGE	
ISIDER ENERJİ ÜRETİM PAZ. İTH. VE İHR. ANONİM ŞİRKETİ	Kocalar	ÇANAKKALE	26	LARGE	
FUATRES ELEKTRİK ÜRETİM A.Ş.	Koru WEPP	ÇANAKKALE	50	LARGE	Registered
MELTEM ENERJİ ELEKTRİK ÜRETİM A.Ş.	Ege WEPP	İZMİR	7	SMALL	Listed
PAMUKOVA RÜZGAR ENERJİ YATIRIM ÜRETİM VE TİCARET ANONİM ŞİRKETİ	Pamukova	SAKARYA	20	LARGE	
GÖKOVA ELEKTRİK ÜRETİM VE TİCARET LTD.ŞTİ.	Alapınar	MUĞLA	0.8	SMALL	
SANCAK ENERJİ HİZMETLERİ A.Ş.	Yamaçtepe-2	İSTANBUL	30	LARGE	
REA ELEKTRİK ÜRETİM TİCARET VE SANAYİ LİMİTED ŞİRKETİ	Zincirli	KAYSERİ	12	SMALL	Listed
ERTAN ENERJİ ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Ertan	İSTANBUL	3	SMALL	
ESİN RÜZGAR ENERJİ ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ	Çamınbaşı	ANTALYA	27	LARGE	
SİBELRES ELEKTRİK ÜRETİM A.Ş.	Sibel WEPP	İZMİR	80	LARGE	Listed

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
SE SANTRAL ELEKTRİK ÜRETİM SANAYİ VE TİCARET A.Ş.	Yahyalı WEPP	KAYSERİ	52,5	LARGE	Registered
MB ELEKTRİK ÜRETİM LİMİTED ŞİRKETİ	Mahyadağ	KIRKLARELİ	30	LARGE	
POLAT ELEKTRİK ÜRETİM İNŞAAT İTHALAT İHRACAT ANONİM ŞİRKETİ	Polat-2	SAMSUN	9	SMALL	
MANRES RÜZGAR ENERJİ ÜRETİMİ SAN. VE TİCARET A.Ş.	Günaydın WEPP	BALIKESİR	20,75	LARGE	Issued
BABADAĞ ELEKTRİK ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ	Marmara	BALIKESİR	10	SMALL	Listed
ABK ENERJİ ELEKTRİK ÜRETİM A.Ş.	Çatalbük	AYDIN	25	LARGE	
RK RÜZGAR ENERJİ SANTRALLERİ ELEKTRİK ÜRETİM SANAYİ VE TİCARET LTD. ŞTİ.	Paşalimanı WEPP	BALIKESİR	0,8	SMALL	
AYSU ENERJİ SANAYİ VE TİCARET ANONİM ŞİRKETİ	Karadere	KIRKLARELİ	15	LARGE	Registered
EKİM ELEKTRİK MÜH. MÜŞ. İNŞ. TUR. VE TİCARET LİMİTED ŞİRKETİ	Havza	SAMSUN	48	LARGE	
ÇAPAR ELEKTRİK ÜRETİM LİMİTED ŞİRKETİ	Yılmaz	İZMİR	12.5	SMALL	
HASANBEYLİ ENERJİ A.Ş.	Hasanbeyli WEPP	OSMANİYE	50	LARGE	Registered
ESİT ENERJİ A.Ş.	Ada 2 WEPP	BALIKESİR	3,2	SMALL	
BAY TEMİZ ENERJİ ELEKTRİK ÜRETİM İNŞAAT SANAYİ VE TİCARET ANONİM ŞİRKETİ	Kartal	ESKİŞEHİR	39	LARGE	
GÜRAL PORSELEN TURİZM VE VİTRİFİYE SANAYİ ANONİM ŞİRKETİ	Germiyan WEPP	İZMİR	9.6	SMALL	Listed
YARES ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Yalova	BURSA	50.01	LARGE	
ALANOBA ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Ilbır	MUĞLA	50	LARGE	
GÜNDOĞDU RÜZGAR ENERJİ ÜRE.SAN.VE TİC.A.Ş.	Demirözü	SİVAS	37	LARGE	

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
HACİM ENERJİ YAT. ÜRETİM VE TİCARET ANONİM ŞİRKETİ	Geyve	SAKARYA	50	LARGE	Listed
POLATBAY ENERJİ ÜRETİM İNŞAAT SANAYİ VE TİCARET ANONİM ŞİRKETİ	Ayvalık-1	BALIKESİR	9	SMALL	
ORSA ENERJİ ELEKTRİKÜRETİM A.Ş.	Fener	KARABÜK	5	SMALL	
ÖRES ELEKTRİK ÜRETİM A.Ş.	Salman WEPP	İZMİR	20	LARGE	
İÇDAŞ ÇELİK ENERJİ TERSANE VE ULAŞIM SANAYİ A.Ş.	İçdaş Biga WEPP	ÇANAKKALE	60	LARGE	
SİLİVRİ ENERJİ ANONİM ŞİRKETİ	Silivri WEPP	İSTANBUL	45	LARGE	Validated
DERBENT ENERJİ ÜRETİM PAZARLAMA İTHALAT VE İHRACAT ANONİM ŞİRKETİ	Üçpınar	ÇANAKKALE	99	LARGE	
DERNE TEMİZ ENERJİ ÜRETİM ANONİM ŞİRKETİ	Fatma	MUĞLA	77.4	LARGE	
ADO ENERJİ ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ	Konakpınar	SİVAS	12	SMALL	
ARE ELEKTRİK ÜRETİM TİCARET VE SANAYİ LİMİTED ŞİRKETİ	Kurtkayası WEPP	KAYSERİ	45	LARGE	Validated
BAK ENERJİ ÜRETİMİ ANONİM ŞİRKETİ	Yahyalı	KAYSERİ	82.5	LARGE	Listed
LODOS KARABURUN ELEKTRİK ÜRETİM A.Ş.	Karaburun	İZMİR	223	LARGE	
KÜTLE ENERJİ YAT. ÜR. VE TİCARET ANONİM ŞİRKETİ	Bağarası	AYDIN	46	LARGE	Listed
UFUK ENERJİ ELEKTRİK ÜRETİM A.Ş.	Poyrazgölü WEPP	BALIKESİR	30	LARGE	
BOYDAK ENERJİ ÜRETİM VE TİCARET A.Ş.	Çanta WEPP	İSTANBUL	45	LARGE	Registered
KORDA ENERJİ ÜRETİM PAZ. İTH. VE İHR. ANONİM ŞİRKETİ	Denizli	DENİZLİ	66	LARGE	Listed
BORARES ENERJİ ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Karova	MUĞLA	30	LARGE	

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
YENİ ENERJİ YATIRIM ÜRETİM VE TİCARET ANONİM ŞİRKETİ	Yenihisar	AYDIN	20	LARGE	Listed
İLETKEN ENERJİ YATIRIM ÜRETİM VE TİCARET ANONİM ŞİRKETİ	Gökdağ	KOCAELİ	10	SMALL	
KAZANIM ENERJİ YATIRIM ÜRETİM VE TİCARETANONİM ŞİRKETİ	Bafa	AYDIN	35	LARGE	
ÇEKİM ENERJİ YAT. ÜRETİM TİCARET ANONİM ŞİRKETİ	Bozüyük	BİLECİK	90	LARGE	
KİRAZ ENERJİ YATIRIM ÜRETİM VE TİCARET ANONİM ŞİRKETİ	Kirazlı	İZMİR	50	LARGE	
TEPE ENERJİ SANTRALİ ELEKTRİK ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ	Karatepe	TEKİRDAĞ	13	SMALL	
İSTRES ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Tayakadın	İSTANBUL	50	LARGE	
AKIŞ ENERJİ YATIRIM ÜRETİM VE TİCARET ANONİM ŞİRKETİ	Söke WEPP	AYDIN	104	LARGE	Listed
EKSEL ELEKTRİK ÜRETİM SANAYİ VE TİCARET LİMİTED ŞİRKETİ	Alares	MANİSA	10	SMALL	
KARHES KARADENİZ HİDRO ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Gündalan	İZMİR	5	SMALL	
SUAY EN. SANAYİ VE TİCARET ANONİM ŞİRKETİ	Akbük	AYDIN	9.6	SMALL	Registered
AROVA RES ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Yalova WEPP	YALOVA	54	LARGE	Listed
ARNAZ RES ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Uşak WEPP	UŞAK	54	LARGE	Listed
EKŞİ ENERJİ ÜRETİM ANONİM ŞİRKETİ	Arapkir	MALATYA	10	SMALL	
MURSAL ENERJİ ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ	Karaçayır	SİVAS	10	SMALL	Listed
YGT ELEKTRİK ÜRETİM A.Ş.	Adares WEPP	İZMİR	10	SMALL	Listed
EFİL ENERJİ ÜRETİM TİCARET VE SANAYİ ANONİM ŞİRKETİ	Kartaldağı	GAZİANTEP	63	LARGE	Listed

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
YİĞİT RÜZGAR ENERJİSİNDEN ELEKTRİK ÜRETİMİ SANAYİ VE TİCARET LİMİTED ŞİRKETİ	Kumres	ANTALYA	10	SMALL	
TAYF ENERJİ YATIRIM ÜRETİM VE TİCARET A.Ş.	Ödemiş WEPP	İZMİR	20	LARGE	Listed
ELFA ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Umurlar	BALIKESİR	36.4	LARGE	Listed
KANGAL ELEKTRİK ENERJİ ÜRETİM VE TİCARET ANONİM ŞİRKETİ	Kangal	SİVAS	128	LARGE	Listed
BALABANLI RÜZGAR ENERJİSİNDEN ELEKTRİK ÜRETİM A.Ş.	Balabanlı WEPP	TEKİRDAĞ	50	LARGE	Registered
TAMYELİ ENERJİ YATIRIM ÜRETİM VE TİCARET ANONİM ŞİRKETİ	İncesu	AFYONKARAHİSAR	10	SMALL	
ARI EN ELEKTRİK ÜRETİM A.Ş.	Sakarbayır	İSTANBUL	3	SMALL	Listed
SAĞANAK ENERJİ YAT. ÜRETİM TİCARET ANONİM ŞİRKETİ	Kandıra	KOCAELİ	49	LARGE	
İZDEM ENERJİ YATIRIM ÜRETİM TİCARET ANONİM ŞİRKETİ	Afyon-2	AFYONKARAHİSAR	88	LARGE	
ARI EN ELEKTRİK ÜRETİM A.Ş.	Gazi	İSTANBUL	5	SMALL	
BEREKETLİ ELEKTRİK ENERJİ ÜRETİM VE TİCARET ANONİM ŞİRKETİ	Bereketli	TOKAT	30	LARGE	Listed
STEAG RÜZGAR SÜLOĞLU ENERJİ ÜRETİM VE TİCARET A.Ş.	Süloğlu WEPP	EDİRNE	60	LARGE	Validated
OLGU ENERJİ YATIRIM ÜRETİM VE TİC. A.Ş.	Dinar WEPP	AFYONKARAHİSAR	115	LARGE	Validated
ABH ELEKTRİK ÜRETİM TARIM HAYVANCILIK İNŞAAT TİCARET ANONİM ŞİRKETİ	Alibeyhüyüğü	KONYA	3	SMALL	
MUTLUER ENERJİ İNŞ. YAT. MAD. SANAYİ VE TİCARET ANONİM ŞİRKETİ	Mutlu WEPP 5	KONYA	44	LARGE	Listed
MERİÇ RÜZGAR ENERJİSİ ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Hamzabeyli	EDİRNE	3	SMALL	
DERNE TEMİZ ENERJİ ÜRETİM A.Ş.	Kanije WEPP	EDİRNE	64	LARGE	

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
EBER ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Eber	AFYONKARAHİSAR	36	LARGE	
KALE ENERJİ ÜRETİM TİCARET VE SANAYİ A.Ş.	Dilek	KAHRAMANMARAŞ	27.5	LARGE	Listed
ŞEHZADE ENERJİ ÜRETİM TİCARET SANAYİ LİMİTED ŞİRKETİ	Amasya	AMASYA	42	LARGE	Listed
KARDEMİR HADDECİLİK VE ELEKTRİK ÜRETİM SANAYİ TİCARET LTD. ŞTİ.	Bozyaka WEPP	İZMİR	12	SMALL	Issued
KAVRAM ENERJİ YAT. ÜR. VE TİCARET ANONİM ŞİRKETİ	Uluborlu	ISPARTA	60.012	LARGE	Listed
PAKMEM ELEKTRİK ÜRETSAN. VE TİC.A.Ş.	Cerit	KAHRAMANMARAŞ	90	LARGE	Listed
SAFİR ENERJİ YAT. ÜRETİM VE TİCARET ANONİM ŞİRKETİ	Meryem	BİLECİK	30	LARGE	
SONSES ENERJİ YATIRIM ÜRETİM VE TİCARET ANONİM ŞİRKETİ	Zonguldak	ZONGULDAK	120	LARGE	
ZORLU RÜZGAR ENERJİSİ ELEKTRİK ÜRETİMİ ANONİM ŞİRKETİ	Demirciler WEPP	GAZİANTEP	23.3	LARGE	Registered
ZORLU RÜZGAR ENERJİSİ ELEKTRİK ÜRETİMİ ANONİM ŞİRKETİ	Sarıtepe	OSMANİYE	50	LARGE	Registered
ZEYTİNELİ RES ELEKTRİK ÜRETİM A.Ş.	Zeytineli WEPP	İZMİR	49,5	LARGE	Registered
KIROBA ELEKTRİK ÜRETİM A.Ş.	Madranbaba WEPP	AYDIN	19,5	LARGE	Listed
ABK ÇEŞME R.E.S ENERJİ, ELEKRİK ÜRETİM A.Ş.	Çeşme WEPP	İZMİR	15	LARGE	Registered
ZİYARET RES ELEKTRİK ÜRETİM SANAYİ VE TİCARET A.Ş.	Ziyaret WEPP	HATAY	75	LARGE	Issued
ÜÇGEN SEFERİHİSAR RÜZGAR ENER.ELEKT.ÜRETİM A.Ş.	Seferihisar	İZMİR	14	SMALL	Listed
MERZİFON ENERJİ ANONİM ŞİRKETİ	Kayadüzü	AMASYA	75	LARGE	Issued
ÇEŞME ENERJİ ANONİM ŞİRKETİ	Ovacık	İZMİR	18	LARGE	

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
SEFERİHİSAR ENERJİ A.Ş.	Seferihisar	İZMİR	16	LARGE	Registered
TEPERES ELEKTRİK ÜRETİM A.Ş.	Tepe WEPP	İSTANBUL	6.85	SMALL	
BAKRAS ENERJİ ELEKTRİK ÜRETİM VE TİCARET A.Ş.	Şenbük WEPP	HATAY	38,1	LARGE	Issued
ENERJİSA ENERJİ ÜRETİM A.Ş.	Dağpazarı WEPP	MERSİN	39	LARGE	Issued
TOKAT ENERJİ ANONİM ŞİRKETİ	Killik WEPP	TOKAT	85	LARGE	Issued
SUSURLUK ENERJİ ANONİM ŞİRKETİ	Susurluk WEPP	BALIKESİR	72.5	LARGE	Issued
ESYEL GLOBAL ELEKTİRİK ÜRETİM ANONİM ŞİRKETİ	Ardıçlı WEPP	KONYA	50	LARGE	
BİLGİN RÜZGAR SANTRALİ ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Soma WEPP	MANİSA	120	LARGE	Issued
BERGAMA RES ENERJİ ÜRETİM ANONİM ŞİRKETİ	Aliağa	İZMİR	120	LARGE	Registered
GARET ENERJİ ÜRETİM VE TİCARET A.Ş.	Sares WEPP	ÇANAKKALE	27.5	LARGE	Issued
ÇALIK RÜZGAR ENERJİSİ ELEKTRİK ÜRETİM LİMİTED ŞİRKETİ	Demircili	İZMİR	40	LARGE	Listed
ÇALIK RÜZGAR ENERJİSİ ELEKTRİK ÜRETİM LİMİTED ŞİRKETİ	Sarpıncık	İZMİR	32	LARGE	Listed
AYEN ENERJİ ANONİM ŞTİ.	Korkmaz	İZMİR	24	LARGE	Listed
AYEN ENERJİ ANONİM ŞTİ.	Mordoğan	İZMİR	30.75	LARGE	Validated
HASSAS TEKNİK ENERJİ ELEKTRİK ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ	Urla WEPP	İZMİR	15	LARGE	Registered
OKMAN ENERJİ ELEKTRİK ÜRETİM VE YATIRIM ANONİM ŞİRKETİ	Karadağ	İZMİR	16.25	LARGE	Listed
EOLOS RÜZGAR ENERJİSİ ÜRETİM ANONİM ŞİRKETİ	Şenköy WEPP	HATAY	29.784	LARGE	Listed

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
EGENDA EGE ENERJİ ÜRETİM A.Ş.	Mordoğan WEPP	İZMİR	13,8	SMALL	
EGENDA EGE ENERJİ ÜRETİM A.Ş.	Germiyan WEPP	İZMİR	10,8	SMALL	
EGENDA EGE ENERJİ ÜRETİM A.Ş.	Urla WEPP	İZMİR	13	SMALL	Registered
EGENDA EGE ENERJİ ÜRETİM A.Ş.	Alaçatı WEPP	İZMİR	16	LARGE	Registered
YAYLAKÖY RES ELEKTRİK ÜRETİM A.Ş.	Yaylaköy WEPP	İZMİR	15	LARGE	Registered
AL-YEL ELEKTRİK ÜRETİM A.Ş.	Geycek WEPP	KIRŞEHİR	150	LARGE	Registered
GALATA WIND ENERJİ A.Ş.	Şah WEPP	BALIKESİR	105	LARGE	Issued
BURSA TEMİZ ENERJİ ELEKTRİK ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ	Bandırma III WEPP	BALIKESİR	40	LARGE	Issued
AKSA ENERJİ ÜRETİM A.Ş.	Atik	HATAY	30	LARGE	
ENERJİSA ENERJİ ÜRETİM A.Ş.	Çanakkale WEPP	ÇANAKKALE	29.9	LARGE	Issued
CAN ENERJİ ENTEGRE ELEKTRİK ÜRETİM A.Ş.	Metristepe WEPP	BİLECİK	50	LARGE	Issued
BANDIRMA ENERJİ VE ELEKTRİK ÜRETİM TİCARET ANONİM ŞİRKETİ	Bandırma WEPP	BALIKESİR	89.7	LARGE	
DOĞAL ENERJİ ELEKTRİK ÜRETİM A.Ş.	Kozbeyli WEPP	İZMİR	32,2	LARGE	Registered
DOĞAL ENERJİ ELEKTRİK ÜRETİM A.Ş.	Samurlu WEPP	İZMİR	34,5	LARGE	Registered
ABK ENERJİ ELEKTRİK ÜRETİM A.Ş.	Söke WEPP	AYDIN	30	LARGE	Issued
AKSU TEMİZ ENERJİ ELEKTRİK ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ	Aksu	KAYSERİ	80	LARGE	Registered
YAPISAN ELEKTRİK ÜRETİM A.Ş.	Bandırma WEPP	BALIKESİR	50	LARGE	

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
ALİZE ENERJİ ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Kuyucak	MANİSA	50.1	LARGE	Issued
GALATA WIND ENERJİ A.Ş.	Mersin WEPP	MERSİN	34	LARGE	Issued
SABAŞ ELEKTRİK ÜRETİM A.Ş.	Turguttepe WEPP	AYDIN	24	LARGE	Registered
DARES DATÇA RÜZGAR ENERJİ SANTRALI SANAYİ VE TİCARET ANONİM ŞİRKETİ	Datça WEPP	MUĞLA	41.6	LARGE	Issued
ÜTOPYA ELEKTRİK ÜRETİM SANAYİ VE TİCARET A.Ş.	Düzova WEPP	İZMİR	51,5	LARGE	Issued
BORES BOZCAADA RÜZGAR ENER.SANT.SAN.VE TİC.A.Ş.	Boraes 1 WEPP	EDİRNE	20	LARGE	
ENERJİSA ENERJİ ÜRETİM A.Ş.	Balıkesir WEPP	BALIKESİR	143	LARGE	Issued
ALİZE ENERJİ ELEKTRİK ÜRETİM A.Ş.	Sarıkaya WEPP	TEKİRDAĞ	41.5	LARGE	Issued
ALİZE ENERJİ ELEKTRİK ÜRETİM A.Ş.	Keltepe WEPP	BALIKESİR	29.9	LARGE	Issued
ALİZE ENERJİ ELEKTRİK ÜRETİM A.Ş.	Çataltepe WEPP	BALIKESİR	16	LARGE	Issued
ALİZE ENERJİ ELEKTRİK ÜRETİM A.Ş.	Çamseki WEPP	ÇANAKKALE	66.8	LARGE	Issued
DORUK ENERJİ ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ	Seyitali	İZMİR	37	LARGE	Issued
POYRAZ ENERJİ ELEKTRİK ÜRETİM A.Ş.	Poyraz WEPP	BALIKESİR	54,9	LARGE	Registered
SOMA ENERJİ ELEKTRİKÜRETİM AŞ	Soma WEPP	MANİSA	240.1	LARGE	Registered
ALENKA ENERJİ ÜRETİM VE YATIRIM LTD. ŞTİ.	Kıyıköy WEPP	KIRKLARELİ	100	LARGE	Issued
AYEN ENERJİ A.Ş.	Akbük WEPP	AYDIN	31,5	LARGE	
AYRES AYVACIK RÜZGAR ENERJİSİNDEN ELEKTRİK ÜRETİM SANTRALI LTD. ŞTİ.	Ayres WEPP	ÇANAKKALE	4,998	SMALL	

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
KAPIDAĞ RÜZGAR ENERJİSİ SANTRALI ELEKTRİK ÜRETİM SANAYİ VE TİCARET ANONİM ŞİRKETİ	Kapıdağ WEPP	BALIKESİR	34.85	LARGE	Listed
AKENERJİ ELEKTRİK ÜRETİM A.Ş.	Ayyıldız WEPP	BALIKESİR	15	LARGE	Issued
BELEN ELEKTRİK ÜRETİM A.Ş.	Belen WEPP	HATAY	48	LARGE	Issued
YAPISAN ELEKTRİK ÜRETİM A.Ş.	Mazı 3	İZMİR	55	LARGE	Issued
KORES KOCADAĞ RÜZGARENERJİ SANTRALIÜRETİM A.Ş.	Kocadağ-2 WEPP	İZMİR	25	LARGE	Issued
ALİZE ENERJİ ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Germiyan	İZMİR	10.7	SMALL	Registered
MARE MANASTIR RÜZGAR ENERJİ SANTRALİ SANAYİ VE TİCARET ANONİM ŞİRKETİ	Mazı I	İZMİR	56.2	LARGE	Issued
AKHİSAR ENERJİ A.Ş.	Akhisar WEPP	MANİSA	55	LARGE	
DENİZ ELEKTRİK ÜRETİM LTD. ŞTİ.	Sebenoba	HATAY	60	LARGE	
İNNORES ELEKTRİK ÜRETİM A.Ş.	Yuntdağ	İZMİR	60	LARGE	Issued
DOĞAL ENERJİ ELEKTRİK ÜRETİM A.Ş.	Sayalar WEPP	BALIKESİR	54,2	LARGE	Registered
BAKİ ELEKTRİK ÜRETİM LİMİTED ŞİRKETİ	Şamlı	BALIKESİR	126.5	LARGE	Issued
SANKO RÜZGAR ENERJİSİ SANAYİ VE TİCARET ANONİM ŞİRKETİ	Çatalca	İSTANBUL	100	LARGE	Issued
ROTOR ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	Gökçedağ	OSMANİYE	135	LARGE	Issued
DENİZ ELEKTRİK ÜRETİM LTD. ŞTİ.	Karakurt WEPP	MANİSA	10,8	SMALL	
ANEMON ENERJİ ELEKTRİK ÜRETİM ANONİM ŞİRKETİ	İntepe	ÇANAKKALE	55.7	LARGE	Issued
LODOS ELEKTRİK ÜRETİM.ANONİM ŞİRKETİ	Kemerburgaz	İSTANBUL	34	LARGE	Issued

PROJECT OWNER	POWER PLANT	PROVINCE	INSTALLED CAPACITY (MWe)	SCALE	CDM
DOĞAL ENERJİ ELEKTRİK ÜRETİM A.Ş.	Burgaz WEPP	ÇANAKKALE	14,9	SMALL	Issued
BALIKESİR RÜZGAR ENERJİSİNDEN ELEKTRİK ÜRETİM SANTRALI LİMİTED ŞİRKETİ	Alibey Adası	BALIKESİR	30	LARGE	

CDM Activities
Small Scale
Both small and CDM Activities

In the table above wind power plants are listed. The colours show the CDM active plants, Small Scale plants and the both small scale and CDM active plants. In the table below distribution of the installed capacity of the sources in Turkey is shown.

Table 18 Distribution of the installed capacity according to the sources[39] (2014)

Sources	Installed Capacity, MW
Thermic Sources	41801.4

[39] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2011/kguc(1-12)/3.xls

Sources	Installed Capacity, MW
Hydraulic	23643,2
Geo-Thermal	404,9
Wind	3629,7
Solar	40,2
Total	69519,8

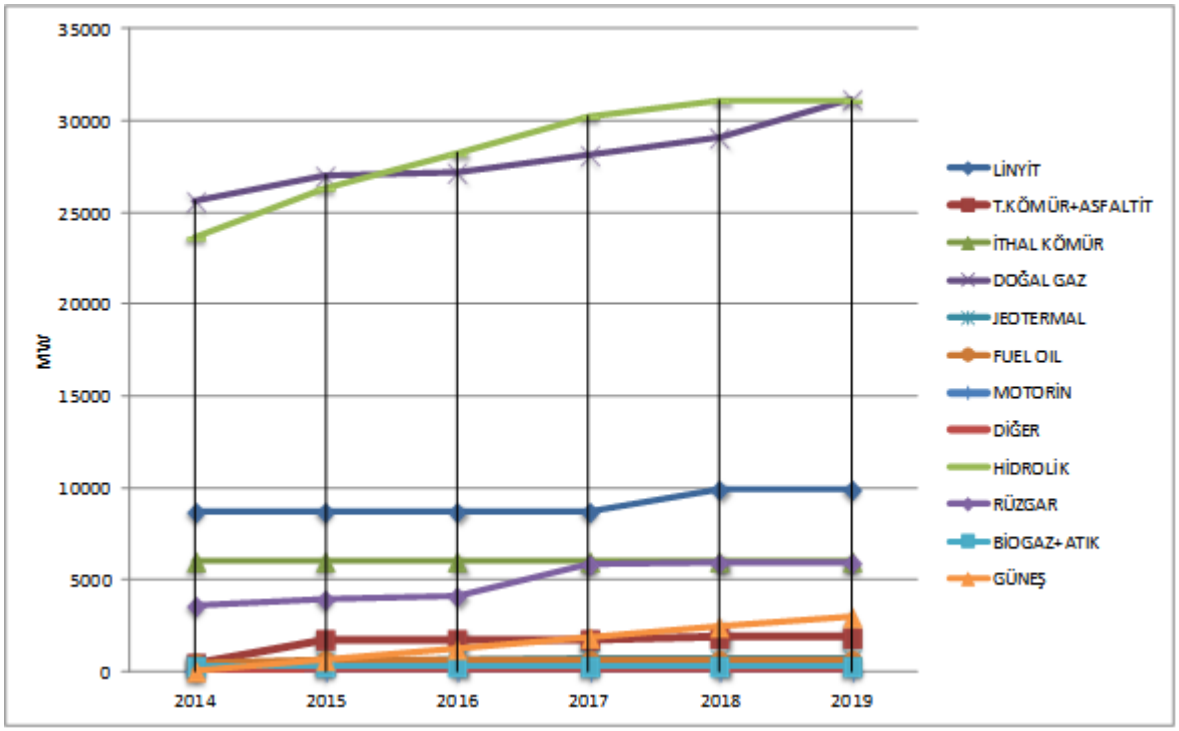


Figure 4 Capacity of the energy sources

Note that: The dark purple on the top represents the natural gas, light green on the top represents the import coal and the light purple in the lower part represents the wind.

As it seen in the table, wind energy corresponds only %5 of the total installed capacity. Also as seen in the graph thermic sources are used more than the solar or wind energy. In order to decrease the lignite or coal usage for energy producing, supporting the CDM active wind power plants is very important and necessary for Turkey.

B.6. Emission reductions

B.6.1. Explanation of methodological choices

The emission reductions resulting from the proposed project are calculated according to AMS-I.D. “Grid Connected Renewable Electricity Generation, version 18” ”.

Project Emissions

According to AMS-I.D. “Grid Connected Renewable Electricity Generation, version 18”, for most renewable energy project activities, PEy = 0.

Baseline Emissions

According to AMS-I.D. “Grid Connected Renewable Electricity Generation, version 18”; Baseline emissions are the emissions from the project activity of the electricity generation, only includes CO_2 emission. It is assumed that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and by added new grid-connected power plants. The baseline emission calculations are here in below:

$$BE_y = EG_{PJ,y} \times EF_{grid,y} \quad \textbf{(Equation 1)}$$

Where:

BE_y = Baseline Emissions in year y (tCO_2/yr)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$EF_{grid,CM,y}$ = 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” (t CO2/MWh)

1. **<u>Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)</u>**

The planned project is a new wind power plant (Greenfield power plant). Therefore, when the $EG_{PJ,y}$ is calculated, the next equation is used.

$$EG_{pj,y} = EG_{facility,y} \quad \textbf{(Equation 2)}$$

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$EG_{facility,}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)

2. Combined margin CO_2 emission factor for grid connected power generation in year y

The combined margin CO_2 emission factor is calculated using "Tool to calculate the emission factor for an electricity system, ver. 05.0".

The following six steps below are used to determine combined margin (CM) emission factor:

Step 1: Identify the relevant electricity systems;

According to the "Tool to calculate the emission factor for an electricity system, version 05.0", a grid/Project electricity system is defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity (e.g. the renewable power plant location or the consumers where electricity is being saved) and that can be dispatched without significant transmission constraints. In Turkey, only one transmission system which is national transmission system is defined and only TEİAŞ is in the charge of all transmission system. Correspondingly, in this project activity the project electricity system include the project site and all power plants attached to the Interconnected Turkish National Grid.

Electricity imports are defined as transfers from connected electricity systems to the project electricity system. Hence, determining the operating margin emission factor, 0 tCO_2/MWh emission factor has been determined for net electricity imports from the connected electricity system.

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

For the calculation of the operating margin and build margin emission factor, "Option I: Only grid power plants are included in the calculation", is used.

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.

Options (b) and (c) are not preferred due to the scarcity of data for Turkey. Option (d) is not preferred since low-cost/must run resources do not constitute more than 50% of total grid generation. Simple OM method will be used in the calculations. Other methods are not applicable due to lack of data.

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

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

Option A: Based on the net electricity generation and a CO_2 emission factor of each power unit; or
Option B: Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

Option B can only be used if; (1) no necessary data for option (A), (2) only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known, (3) off-grid power plants are not included in the calculation.

For the project in question, ***Option B*** is preferred since,

- Electricity generation and CO_2 data for individual power units are not available.
- Only renewable power generation are considered as low cost/must run resources.
- Off-grid power plants are not included in calculations.
- The fuel consumption of different fuel types data for power plants/ units are available in the official source, TEIAS.

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

$$EF_{grid,OMsimple,y} = \frac{\sum_i (FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y})}{EG_y} \qquad \textbf{(Equation 3)}$$

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

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

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

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

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 = the three most recent years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex-ante option) on data vintage in step 3.

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

In terms of vintage data, the "Tool to Calculate the Emission Factor for an Electricity System, ver. 04.0", provides two options to be chosen; option 1 and option 2.

Option 1 states that; for the first crediting period, the BM 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 BM 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 the renewable of the crediting period to the DOE. For the third crediting period, the BM emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

In this respect, **option 1** was chosen to identify the vintage data.

The sample group of power unit m used to calculate the build margin should be determined as per the procedure in the tool.

a) Identify the set of five power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently (SET5-units) and determine their annual electricity generation (AEGSET-5-units, in MWh);

b) Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEG total in MWh). Identify the set of power units, excluding power units registered to CDM project starting with power units, that started to supply electricity to the grid most recently and that comprise 20% of AEG total (SET≥20%) and their annual electricity generation (AEGSET≥20% in MWh);

c) From SET 5-units and SET≥20% select the set of power units that comprises the larger annual electricity generation (SET sample);

Identify the date when the power units in SET sample started to supply electricity to the grid. If none of the power units in SET sample started to supply electricity to the grid more than 10 years ago, then use SET sample to calculate the build margin.

Turkey's total electricity generation in 2013 is 240,154.00 GWh. The 20% of AEG total was calculated as 48,030.00 GWh, accordingly.

The selected set of power units ($SET_{\geq 20\%}$) which was started to supply electricity to the grid most recently and comprise 20% of AEG_{total} is the capacity addition is selected from year 2012 to 2010. Power plants registered as CDM projects were excluded from the set. (Electricity generation of power plants has not been clarified by TEİAŞ since 2013. Only installed capacities as MW have been clarified. Therefore, the capacity addition is selected from year 2012 to 2010. Power plants registered as CDM projects were excluded from the set).

The $AEG_{SET\geq 20\%}$ is calculated as 49,155.40 GWh as per the set of power units.

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:

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}}$$ **(Equation 4)**

$EF_{grid, BM, y}$ = 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

The CO_2 emission factor of each power unit m ($EF_{EL,m,y}$)should be determined as per the guidance in Step 4 section 6.4.1 for the simple OM, using Options A1, A2 or A3, using for y the most recent historical year for which electricity generation data is available, and using for m the power units included in the build margin.

Option A2 is preferred because plant specific fuel consumption data is not available for Turkey. The calculation of the CO_2 emission factor for each power unit m ($EF_{EL,m,y}$) is shown below.

$$EF_{EL,my} = \frac{EF_{CO2,m,i,y} \times 3.6}{\eta_{m,y}}$$ **(Equation 5)**

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

y = the relevant year as per the data vintage chosen in Step 3

Step 6: Calculate the combined margin emissions factor

The calculation of the combined margin (CM) emission factor**,** $EF_{grid, CM, y}$, is based on the following methods;

a) Weighted average CM
b) Simplified CM

The weighted average CM method is preferred to calculate.

a) Weighted average CM method:

The combined margin emissions factor is calculated as follows:

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

$EF_{grid, CM, y}$ = Combined 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)
$EF_{grid, BM, y}$ = Build margin CO_2 emission factor in year *y* (tCO_2/MWh)
w_{OM} = Weighting of the operating margin emission factor (%)
w_{BM} = Weighting of the build margin emission factor (%)

"Tool to calculate the emission factor for an electricity system, ver. 05.0" states that;
The following default values should be used for $\mathbf{w_{OM}}$ and $\mathbf{w_{BM}}$:
• Wind and solar power generation project activities: $\mathbf{w_{OM}}$ = 0.75 and $\mathbf{w_{BM}}$ = 0.25 (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods;
• All other projects: $\mathbf{w_{OM}}$ = 0.5 and $\mathbf{w_{BM}}$ = 0.5 for the first crediting period, and $\mathbf{w_{OM}}$ = 0.25 and $\mathbf{w_{BM}}$ = 0.75 for the second and third crediting period, unless otherwise specified in the approved methodology which refers to this tool.

Therefore $\mathbf{w_{OM}}$ = 0.75 and $\mathbf{w_{BM}}$ = 0.25 is used for the Barbaros WEPP.

Emission Reductions (ER_y)
Emission reductions are calculated as follows:

$$ERy = BEy - PEy$$ **(Equation 7)**

ER_y = Emission reductions in year y ($t CO_2e/y$)
BE_y = Baseline Emissions in year y ($t CO_2e/y$)
PE_y = Project emissions in year y ($t CO_2e/y$)

B.6.2. Data and parameters fixed ex ante

Data / Parameter	**$EF_{grid, OM simple, y}$**
Unit	t CO2/MWh
Description	Simple operating margin CO2 emission factor in year y
Source of data	Calculated by equation 3
Value(s) applied	0.631
Choice of data or Measurement methods and procedures	The used data in formula is taken from justified sources as is seen from part B.5.1 of this PDD.
Purpose of data	$EF_{grid,CM}$
Additional comment	

Data / Parameter	**EG_y**
Unit	MWh
Description	Net electricity generated and delivered to the grid by all power sources serving the system, excluding low-cost/must-run units/plants, in year y

Source of data	TEIAS (Turkish Electrical Transmission Company) Annual development of Turkey's gross electricity generation-imports-exports and demand 1975-2014, Annual development of electricity generation-consumption-losses in Turkey between 1984 and 2014[40][41].
Value(s) applied	Table 13
Choice of data or Measurement methods and procedures	According to ''Turkish Statistics Law and Official Statistics Program'' TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Purpose of data	**$EF_{grid, OM simple, y}$**
Additional comment	

Data / Parameter	**$FC_{i, y}$**
Unit	ton/gas 10^3 m^3
Description	Amount of fossil fuel consumed in the project electricity system by generation sources in year y
Source of data	TEIAS (Turkish Electricity Transmission Company) Fuels consumed in thermal power plants in Turkey by the electric utilities for year y[42]
Value(s) applied	Table 12
Choice of data or Measurement methods and procedures	According to ''Turkish Statistics Law and Official Statistics Program'' TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Purpose of data	**$NCV_{i,y}$, $EF_{grid, OM simple, y}$**
Additional comment	

Data / Parameter	**Heat Value**
Unit	Tcal
Description	Amount of heat produced by the consumption of a unit quantity of fuel types consumed in thermal power plants
Source of data	TEIAS (Turkish Electricity Transmission Company) Heating values of fuels consumed in thermal plants in Turkey by the electricity utilities (2006-2014) [43]
Value(s) applied	Table 12
Choice of data or Measurement methods and procedures	According to ''Turkish Statistics Law and Official Statistics Program'' TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available. Heat value is divided by FC to determine NCV.(The formula is taken from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 1 of Volume 2,Box 1.1)
Purpose of data	**$NCV_{i,y}$**

[40] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/uretim%20tuketim(24-48)/25.xls
[41] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/uretim%20tuketim(24-48)/31(2006-2014).xls

[42] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/yak%C4%B1t49-54/50.xls

[43] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/yak%C4%B1t49-54/52.xls

Additional comment	In order to convert the data from Tcal to GJ; the equations below are used. 1Tcal=1000Gcal, 1GJ = 0.238846 Gcal, Density of natural gas is considered to be 0.695kg/m^3

Data / Parameter	**$NCV_{i, y}$**
Unit	GJ/kg
Description	Net calorific value (energy content) of fossil fuel type *i* in year *y*
Source of data	TEIAS (Turkish Electricity Transmission Company) Fuels consumed in thermal power plants in Turkey by the electric utilities for year y[44] Heating values of fuels consumed in thermal plants in Turkey by the electricity utilities (2006-2014) [45]
Value(s) applied	Table 12
Choice of data or Measurement methods and procedures	According to ''Turkish Statistics Law and Official Statistics Program'' TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Purpose of data	**$EF_{grid, OM simple, y}$**
Additional comment	In order to convert the data source units to the required units; 1ton=1000 kg.

Data / Parameter	**$EF_{C02,i,y}$**
Unit	t CO_2/GJ
Description	CO_2 emission factor of fossil fuel type *i* in year *y*
Source of data	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 and Annex 1 for sub-bituminous of Chapter 1 of Volume 2 (Energy) of the 2006 IPCC Guidelines for National Greenhouse Gas Inventory[46]
Value(s) applied	Table 12
Choice of data or Measurement methods and procedures	There is no information on the fuel specific default emission factor in Turkey, hence, IPCC values has been used as referred in the ''Tool to calculate the emission factor for an electricity system, version 04.''.
Purpose of data	**$EF_{EL,m,y}$**
Additional comment	In order to convert the data source units to the required units; 1ton=1000 kg.

Data / Parameter	**$EF_{grid, BM, y}$**
Unit	tCO2/MWh
Description	Build margin CO_2 emission factor in year y
Source of data	Calculated by equation 4
Value(s) applied	0.3988
Choice of data or Measurement methods and procedures	Calculated *ex-ante* and comprised capacity addition of power plants between years 2012-2010 according to the "Tool to calculate emission factor for an electricity system"
Purpose of data	**$EF_{grid,}$** CM

[44] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/uretim%20tuketim(24-48)/25.xls

[45] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/yak%C4%B1t49-54/52.xls

[46] https://www.ipcc.ch/meetings/session25/doc4a4b/vol2.pdf

Additional comment	

Data / Parameter	**$EF_{EL, m, y}$**
Unit	tCO_2e/MWh
Description	CO_2 emission factor of power unit *m* in year *y*
Source of data	Calculated by equation 5
Value(s) applied	Table 15
Choice of data or Measurement methods and procedures	Calculated *ex-ante* according to the "Tool to calculate emission factor for an electricity system" version 05.0"
Purpose of data	**$EF_{grid, BM, y}$**
Additional comment	

Data / Parameter	**$\eta_{m, y}$**
Unit	-
Description	Average net energy conversion efficiency of power unit m in year y
Source of data	Tool to calculate the emission factor for an electricity system, Annex 1
Value(s) applied	Table 15
Choice of data or Measurement methods and procedures	Since there is no current efficiency values of power units in Turkey, the efficiency values o are retrieved from Tool
Purpose of data	**$EF_{EL, m, y}$**
Additional comment	

Data / Parameter	**$EG_{m, y}$**
Unit	MWh
Description	Net quantity of electricity generated and delivered to the grid by power unit *m*, in year *y*
Source of data	Barbaros WEPP, ER Calculations
Value(s) applied	Table 16
Choice of data or Measurement methods and procedures	According to ''Turkish Statistics Law and Official Statistics Program'' TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Purpose of data	**$EF_{grid, BM, y}$**
Additional comment	In order to convert the data from GWh to MWh GJ; the equation below is used. 1GWh=1000 MWh

Data / Parameter	**$EF_{grid, CM, y}$**
Unit	tCO_2e/MWh
Description	Combined margin CO_2 emission factor in year *y*
Source of data	Calculated data applied to the equation 6
Value(s) applied	0.573
Choice of data or Measurement methods and procedures	Calculated *ex-ante* according to the "Tool to calculate emission factor for an electricity system"
Purpose of data	BE_y
Additional comment	

B.6.3. Ex ante calculation of emission reductions

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

Project Emissions

1. Project emissions:

Project emission is zero.

B.6.4. Baseline Emissions

1.Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$$BE_y = EG_{pj,y} \times EF_{grid,CM,y} \quad \text{(Equation 2)}$$

$$EG_{pj,y} = EG_{facility} \quad \text{(Equation 2)}$$

2. Combined margin CO_2 emission factor for grid connected power generation in year y

The operating margin emission factor

For the calculation of the Simple OM, the amounts of fuel consumption (FCi, y) values for relevant years are given in table below for year 2014.

Table 19. Heat Values, FC, NCV and EF_{CO2} values of each fuel source in 2014

Fuel Type	FC (tones)	Heat Value (MJ)	NCV (MJ/kg)	EF_{CO2} (kg/TJ = tones/ GJ)
Hard Coal + Imported Coal + Asphalted	14501934,00	346744816000,00	23,91	92800,00
Lignite	57696139,00	409680544000,00	7,10	90900,00
Fuel Oil	754283	31145696000,00	41,29	75500,00
Diesel Oil	119988	5209080000,00	43,41	72600,00
LPG	0	0,00	0,00	61600,00
Naphtha	0	0,00	0,00	69300,00
Natural Gas	25426014	952483416000,00	37,46	54300,00

The values of the other years' can be found in Annex 3 in a tabular form.

In order to calculate the OM, the net electricity generated and delivered to the grid by all sources excluding the low-cost/must run resources is required. However, net generation national data is only available for total of power sources. Due to this fact, the internal consumption ratio is used to identify the net electricity generation by thermal sources. The difference of low-cost/must-run generation and supplied to grid amount is the generation by thermal sources. The internal consumption of thermal plants is determined by means of ratio. The thermal generation excluding internal consumption gives the net generation excluding low-cost/must-run as is followed by next table. After addition of import electricity, the EGy is determined.

Table 20. Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost / must-run power plants / units, in year *y* (GWh)

Electricity Generation (GWh)	Supplied to grid	Low-cost/ must -run	Thermal	Internal consumption (%)	Internal consumption of thermal	Net generation	Import	EGy (Wh)
2012	233534,0	64625,10	174871,7	4,92	8608,26	166263,44	5826,7	172090143,41
2013	236406,4	68341,50	171812,45	4,65	7996,28	163816,17	7429,4	171245566,10
2014	247402,2	51546,20	200416,6	4,97	9953,84	190462,76	7953,3	198416095,41

Table 21. Electricity Weighted $EF_{grid, OMsimple, y}$ (tCO_2/MWh)

	2012	2013	2014
	EF grid, OM simple, y, i (tCO_2/MWh)		
Hard Coal + Imported Coal + Asphalted	0,16	0,16	0,16
Lignite	0,21	0,18	0,19
Fuel Oil	0,01	0,01	0,01
Diesel Oil	0,00	0,00	0,00
LPG	0,00	0,00	0,00
Naphta	0,00	0,00	0,00
Natural Gas	0,27	0,27	0,26
Total	**0,65**	**0,62**	**0,62**
3-year generation weighted average (tCO2/MWh)	**0,631**		

The build margin (BM) emission factor

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 equation 4.

In order to use equation 4, it is required to know $EF_{EL,m,y}$.

$EF_{EL,m,y}$ is determined according to equation 5. In this process, average net energy conversion efficiency and other required data are given in the following tables.

Table 22. $EF_{EL, m, y}$ Calculation

Fuel Type	EF CO_2 (tCO_2/Gj)	η Generation Efficiency (%)	$EF_{EL,m,y}$ (tCO_2/MWh)
Hard Coal + Imported Coal + Asphaltite	0,0928	0,390	0,8566
Lignite	0,0909	0,390	0,8391
Fuel Oil	0,0755	0,460	0,5909
Diesel Oil	0,0726	0,460	0,5682
LPG	0,0616	0,460	0,4821
Naphtha	0,0693	0,460	0,5423
Natural Gas	0,0543	0,600	0,3258

The multiplication of emission factor and electricity generation of capacity addition by source is the amount of emission by source which is divided by total capacity addition between year 2012- 2010 which comprises 20% of total generation, excluding projects registered to CDM, gives the build margin CO_2 emission factor (see equ. 4). Next table shows the data applied.

Table 23. BM calculation by capacity addition

Fuel Type	Electricity generation Capacity addition (GWh) [$EG_{m,y}$]	$EF,EL_{,m,y}$ (tCO_2/MWh)	Emission by source ($EG_{m,y}$)x($EF,EL_{,m,y}$)
IMPORTED COAL+ASPHALTITE	13052,77	0,8566	11181,20359
LIGNITE	0	0,8391	762,1921957
Fuel-oil	1289,95	0,5909	0
Natural Gas	23520,44	0,3258	7662,959352
Wind	751,40	0	0
Geothermal	532,00	0	0
Hydro	9455,21	0	0
Waste	553,63	0	0
Total	49155,402		19606,35514

$EF_{grid, BM, y}$ = 19606,36 / 49155,402 = 0.3988 tCO_2/MWh

The combined margin (CM) emission factor

"Tool to calculate the emission factor for an electricity system, ver. 05.0" states that;
The following default values should be used for w_{OM} and w_{BM}:
• Wind and solar power generation project activities: w_{OM} = 0.75 and w_{BM} = 0.25 (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods;
• All other projects: w_{OM} = 0.5 and w_{BM} = 0.5 for the first crediting period, and w_{OM} = 0.25 and w_{BM} = 0.75 for the second and third crediting period, unless otherwise specified in the approved methodology which refers to this tool.

Since the proposed project is WEPP, the weighs for the operating margin and build margin emission factors are 0.75 and 0.25 respectively. Therefore;

$EF_{grid, CM}$ = (0.631 *x* 0. 75) + (0.398 *x* 0.25) = **0. 573 tCO_2/ MWh**

Project Emissions (PE_y)

Emission Reductions (ER_y)

$PE_{FF,y}$ = 0 t CO_{2e}/yr

Emission reductions are calculated as follows:

(42000 MWh/y x 0. 573 t CO_2e/MWh) – 0 = **24072.4263 t CO_2e/yr**

Table 24 Summary of ex ante estimates of emission reductions

Year	Baseline emissions (t CO_2e)	Project emissions (t CO_2e)	Emission reductions (t CO_2e)
01/09/2016-31/12/2016	8024.22	0	8024.22
2017	24072.43	0	24072.43
2018	24072.43	0	24072.43
2019	24072.43	0	24072.43
2020	24072.43	0	24072.43
2021	24072.43	0	24072.43
2022	24072.43	0	24072.43
01/01/2023-01/09/2023	16048.21	0	16048.21
Total	168507.01	0	168507.01
Total number of crediting years	7 years		
Annual average over the crediting period	24072.43	0	24072.43

Note that; 01/09/2016 is indicated as the expected date

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Data / Parameter	EGy
Unit	MWh/yr
Description	Net electricity exported to the grid in the year y
Source of data	Meter Reading Forms issued by governmental officers and signed by both parties.
Value(s) applied	The annual electricity fed to the grid is estimated as 42000 MWh[47]
Measurement methods and procedures	The net electricity is measured continuously by a power meter at the grid interface and recorded monthly
Monitoring frequency	Monthly
QA/QC procedures	• A spare meter is used for crosschecking the accuracy and both meters are calibrated if required. • Data measured by meters and will be crosschecked with the data uploaded to PMUM.
Purpose of data	Calculation of emission reductions
Additional comment	

Data / Parameter:	Employment (job quality)
Description:	Trainings are an important issue to improve the job quality of employees.

[47] Barbaros WPP Generation License

Description of measurement methods and procedures to be applied, inc. frequency:	Respective staff is trained regarding health and safety issues and first aid. There is also technical training regarding the operation of the equipment. The trainees receive a certificate after these trainings. Therefore the training given to the respective staff will be monitored by the certificates that they will obtain following their education.
Frequency	Annually
QA/QC procedures to be applied:	The trainees receive a certificate after these trainings.
Any comment:	
Data / Parameter:	Employment (quantity)
Description:	The project activity will create a substantial number of jobs in the project area.
Description of measurement methods and procedures to be applied, inc. frequency:	The personnel employed will be registered in the Social Security Institution (SSK). The number of the personnel will be monitored by the domicile and Social Security Institution documents. Domicile documents will prove how many people had been employed in the region. Apart from the documents the registration of an employee to the Social Security Institution may be monitored by the web portal of SSK by simply entering the ID number of the respective employee.
Frequency	Annually
QA/QC procedures to be applied:	
Any comment:	

B.7.2. Sampling plan

All monitoring procedures and requirements of the proposed project activity will be in accordance with the methodologies AMS-I.D. “Grid-connected electricity generation from renewable sources”

The project developer has planned and will implement monitoring procedures and measures with regard to the monitoring methodology chosen for this project activity, guaranteeing that emission reductions are calculated in an accurate and conservative manner. The project developer will designate a person in charge for monitoring and recording of all the required information and documentation related with the GHG emissions covered in this PDD. The designated person in charge will be directly under the control of the Managing Director of the company. He will collect, record and store all the information for further archival or verification. Detailed responsibilities and authorities for project management, monitoring procedures and QA/QC procedures would be drawn up for the purpose and put in place. The collected information will be stored in the form of raw data in log books developed especially for the purpose of monitoring and recording data related to VER GS protocols.

These records will form part of the registered monitoring protocol for the use by verification companies. All the parameters monitored under the monitoring plan will be kept for a period of 2 years after the end of the crediting period or the last issuance of GS VERs, whichever occurs later.

B.7.3. Other elements of monitoring plan

The generated electricity will already be recorded continuously by OSOS (Otomatik Sayaç Okuma Sistemi-Automatic Metering Device Monitoring System) and read by “Millli Yük Tevzi Merkezi” which works directly depending upon TEIAS. The electricity generation amount is recorded to the document for every month. Hence no new additional protocol will be needed to monitor the electricity generation. The Plant Manager will be responsible for the electricity generated, gathering all relevant data and keeping the records on daily basis. They will be informed about VER concepts and mechanisms and how to monitor and collect the data which will be used for emission reduction calculations.

The generation data collected during the first crediting period will be submitted to EN-ÇEV Energy Environmental Investments and Consultancy Inc. who will be responsible for calculating the emission reduction subject to verification: Generation data will be used to prepare monitoring reports which will be used to determine the emission reduction from the project activity. These reports will be submitted to the duly authorized and appointed Designated Operational Entity–DOE- before each verification period.

In case of a major failure of metering device, electricity generation by the plant since the last measurement will be able to be monitored by another metering device at the inlet of the main substation operated by TEIAS where the electricity is fed to the grid.

Calibration of the metering devices will be made by TEIAS and sealed during first operation of the plant. Pursuant to "Measurement and Measurement Equipment Inspection Regulation" of the Ministry of Commerce and Industry, Article 9." [48] periodical inspections of electrical meters and the related current and voltage transformers are controlled every ten years. The meters will be calibrated by TEIAS when there is a significant inconsistency between two devices using a fixed template[49] or upon request by either project owner or TEIAS[50]. The manufacturers of the electrical meters do not require any periodical calibration.

In addition to two metering devices, the generated electricity can be cross checked from the website[51] of TEIAS-PMUM (Market Financial Settlement Centre). However it must be noted that PMUM web page will show the net electricity generated; less transmission loss, in order to match the data, the figures taken from PMUM web site must be multiplied by transmission loss factor of the grid.

The net electricity fed to the grid will be measured continuously by metering devices and recorded by TEIAS monthly and form the basis for invoicing using the template formed by TEIAS[52]. The production operator of plant will record the generation data monthly. For consistency, recorded data will be compared with electricity sale receipts. All data collected will be recorded daily and archived both as electronically and as hard copy for at least two year in order to be able to monitor the archived net electricity production. When the power plant starts to generate electricity, the data recording will be started. Every record will be achieved for at least two years after its measurement.

Operating Manager is Overall responsibilities of compliance with VER monitoring plan and operation of plant.

Operator-Technician: Responsible for keeping data to day running of plant, recording, monitoring of relevant data and periodical reporting. Staff will responsible for day to day operation and maintenance of the plant and equipment. All staff will be trained and will have certificate for working with high voltage equipment.

Accounting and Chancellery: Responsible for keeping data about power sales, invoicing and purchasing.

EN-ÇEV (The Consultant): Responsible for emission reduction calculations, preparing monitoring report and periodical verification process.

The potential sustainable development benefits of Barbaros WEPP will be monitored as per effected indicators of sustainable development matrix. Those indicators are either crucial for an overall positive impact on sustainable development or particularly sensitive to changes in the framework conditions.

B.8. Date of completion of application of methodology and standardized baseline and contact information of responsible persons/ entities

Name of entity determining the baseline:
EN-ÇEV Energy Environmental Investments Consultancy Inc.
Address: Mahatma Gandi Caddesi, No: 92/2-3-4-6-7 06680 G.O.P – Ankara/ TURKEY
Tel: +90 312 447 26 22
Fax: +90 312 446 38 10
Contact Person: Pelin ZENGİN, Emrah ÖZTÜRK
E-mail: *emrah@encev.com.tr, pelin@encev.com.tr*

[48] Retrieved from http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.6381&MevzuatIliski=0&sourceXmlSearch=%C3%B6l%C3%A7%C3%BC%20ve%20%C3%B6l%C3%A7%C3%BC
[49] Retrieved from http://www.teias.gov.tr/mali/GDUY/PRO_FORM/OLCUM/DAG02.xls
[50] Retrieved from http://www.epdk.gov.tr/english/regulations/electric/balancing/balancing.doc
[51] Please see http://pmum.teias.gov.tr
[52] Retrieved from http://www.teias.gov.tr/mali/GDUY/PRO_FORM/OLCUM/K01.xls

SECTION C. Duration and crediting period

C.1. Duration of project activity

C.1.1. Start date of project activity

01/10/2015 – According to the Gold Standard Requirements V2.2 “”’Start date of the project’ means the earliest date at which either the implementation or construction or real action of a project begins”. Therefore indicated date is chosen as the earliest date which is construction start date.

C.1.2. Expected operational lifetime of project activity

In Barbaros WPP Electric Generation License operational lifetime is indicated as 49 years.

C.2. Crediting period of project activity

C.2.1. Type of crediting period

Renewable crediting period, first.

C.2.2. Start date of crediting period

01/09/2016 is the Commissioning date which is the operation start date. Due to with starting of the operation, electric generation and the crediting period will be start.

C.2.3. Length of crediting period

7 years 0 months 0 days.

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

According to “Environmental Impact Assessment Regulation”, which has taken force upon promulgation in Official Gazette Issue No 26939 of 17.06.2008, the project falls in to Annex 2 (Projects require an Project Description File). Therefore, a project description file has been prepared.

The Environmental Impact Assessment (EIA) study for the project was made on 28/03/2012 and the “EIA Not Required” decision per the submitted Project Description Report has been issued by Tekirdağ Governorship, Ministry of Environment and Urbanisation. The environmental impacts of the project have evaluated and the following mitigation measures are proposed in the environmental management plan.

The project will contribute to improve the environmental situation in the region and in the country. Avoiding fossil fuel-based electricity will enhance the air quality and help to reduce the adverse effects on the climate. Renewable technologies and wind based electricity will be introduced and sustainable development will be promoted. The project activity itself will not have any significant negative impacts on humans, plants, animal life and biodiversity. No environmental impact has been considered significant as a result of the preliminary environmental impact assessment and “EIA Not Required” decision has been issued by Tekirdağ Governorship, Ministry of Environment and Urbanisation.

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

Local Stakeholder Meeting was carried by BORGA CARBON CONSULTING and summarized below. The consultant to the project has changed on April 2015 as EN-ÇEV ENERJİ ÇEVRE YATIRIMLARI DANIŞMANLIĞI HARİTACILIK İMAR İNŞAAT A.Ş

Local Stakeholder Consultation Meeting

According to the Gold Standard requirements, local stakeholders were identified including local people, local and national NGOs, project developers and entities involved in implementation and operation of the project activity. A list of project participants invited for the stakeholder consultation meeting is presented in the stakeholder meeting report. According to the guidelines in the Gold Standard Toolkit, the project proponent BORGA CARBON CONSULTING invited local residents, local/national policy makers, and local/national/international NGOs via mail and follow-up calls. An invitation letter was sent out in Turkish phone/mail to the above mentioned stakeholders mentioned above. Furthermore, an invitation letter was published in Turkish in the regional newspaper "Şarkköy" on 19/03/2013.

Within the invitation process many local people, local authorities, village headmen and organizations have been invited. But even if we insisted on their attendance, none of the NGO's or authorities attended the meeting. During the Stakeholder Feedback Round, we will be getting in touch with them, organize appointments if possible to get their opinions about the project. As seen from the participation list above and the original copies attached in Annex 5, 31 local people attended the meeting. We can easily say that the local people's interest and support on the project is far beyond our expectations.

The meeting was held in Ormanlı Village Coffee House at 21:00pm. The participation was really high. The participants welcomed by Gözde Özveren from BorgaCarbon and Emrah Akıntürk and Ali Şensoy from the investor company Verim Enerji. The aim of the meeting was explained to the participants by Gözde Özveren and a presentation of the meeting including the meeting agenda, non-technical summary, matrices and evaluation forms were distributed to the participants. The presentation started by Gözde Özveren's speech about climate change and new energy generation technologies reducing the environmental impacts. Supported by the videos and slight shows of sample renewable energy power plants from all around the world, the participants were informed about the benefits of renewable energy generation. Owner Company Verim Enerji's representatives talked about the technical characteristics of the project as well as the beneficiaries of the project to the environment and the local area. The presentations were followed by face to face questions and answers session and discussions on sustainable development indicators.

E.2. Summary of comments received

Based on the comments from stakeholders, there is no need to make any alterations on the project design. The company will take all the precautions about the concerns of the stakeholders such as excavation due to the project and will try to do its best to provide contributions to the region. The company will give priority to the local labour force and provide in contributions for infrastructure improvements upon the requests of the stakeholders, if possible.

E.3. Report on consideration of comments received

General view about the project was positive. Stakeholders asked some questions about the project location, the amount of trees that will be cut and relevant permissions and the turbine operations. The representatives of the Investor Company and BorgaCarbon explained the participants the licensing applications, forestry permissions and how the project location has been selected. Stakeholders' concerns regarding the forestry land have been overcame by explaining the permissions achieved and fees paid to the provincial directorate of forestry and water works. Other than these few concerns, the stakeholders did

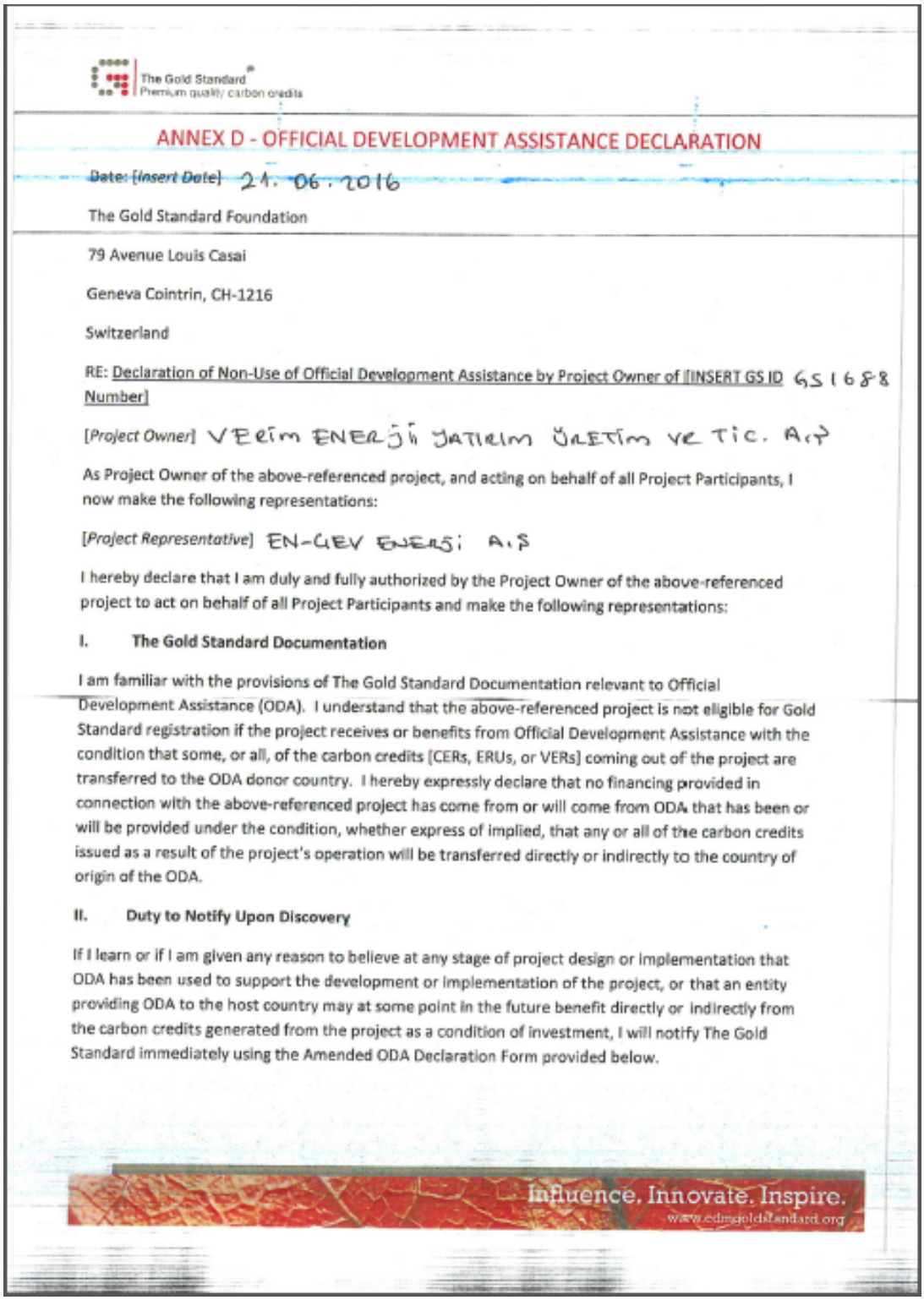
not raise any questions and the whole opinions regarding the sustainable development issues were positive.

SECTION F. Approval and authorization

Annex 1. Contact information of project participants and responsible persons/ entities

Project participant and/or responsible person/ entity	☒ Project participant ☐ Responsible person/ entity for application of the selected methodology (ies) and, where applicable, the selected standardized baselines to the project activity
Organization name	Verim Enerji Yatırım Üretim ve Tic. Aş
Street/P.O. Box	Turan Güneş Bulvarı, Galip Erdem Caddesi
Building	No:11
City	Ankara
State/Region	Çankaya
Postcode	06550
Country	Turkey
Telephone	+90 (312) 492 03 06
Fax	+90 (312) 492 03 67
E-mail	
Website	www.turkerler.com
Contact person	Gökhan Yardım
Title	General Manager
Salutation	Mr.
Last name	Yardım
Middle name	
First name	Gökhan
Department	Energy
Mobile	
Direct fax	+ 90 (312) 492 03 67
Direct tel.	+90 (312) 492 03 06
Personal e-mail	gyardim@turkerler.com

Annex 2. Information Regarding Public Funding



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ANNEX D - OFFICIAL DEVELOPMENT ASSISTANCE DECLARATION

Date: ~~[insert Date]~~ 21.06.2016

The Gold Standard Foundation

79 Avenue Louis Casai

Geneva Cointrin, CH-1216

Switzerland

RE: Declaration of Non-Use of Official Development Assistance by Project Owner of [INSERT GS ID Number] GS1688

[*Project Owner*] VERİM ENERJİ YATIRIM ÜRETİM VE TİC. A.Ş

As Project Owner of the above-referenced project, and acting on behalf of all Project Participants, I now make the following representations:

[*Project Representative*] EN-GEV ENERJİ A.Ş

I hereby declare that I am duly and fully authorized by the Project Owner of the above-referenced project to act on behalf of all Project Participants and make the following representations:

I. The Gold Standard Documentation

I am familiar with the provisions of The Gold Standard Documentation relevant to Official Development Assistance (ODA). I understand that the above-referenced project is not eligible for Gold Standard registration if the project receives or benefits from Official Development Assistance with the condition that some, or all, of the carbon credits [CERs, ERUs, or VERs] coming out of the project are transferred to the ODA donor country. I hereby expressly declare that no financing provided in connection with the above-referenced project has come from or will come from ODA that has been or will be provided under the condition, whether express of implied, that any or all of the carbon credits issued as a result of the project's operation will be transferred directly or indirectly to the country of origin of the ODA.

II. Duty to Notify Upon Discovery

If I learn or if I am given any reason to believe at any stage of project design or implementation that ODA has been used to support the development or implementation of the project, or that an entity providing ODA to the host country may at some point in the future benefit directly or indirectly from the carbon credits generated from the project as a condition of investment, I will notify The Gold Standard immediately using the Amended ODA Declaration Form provided below.

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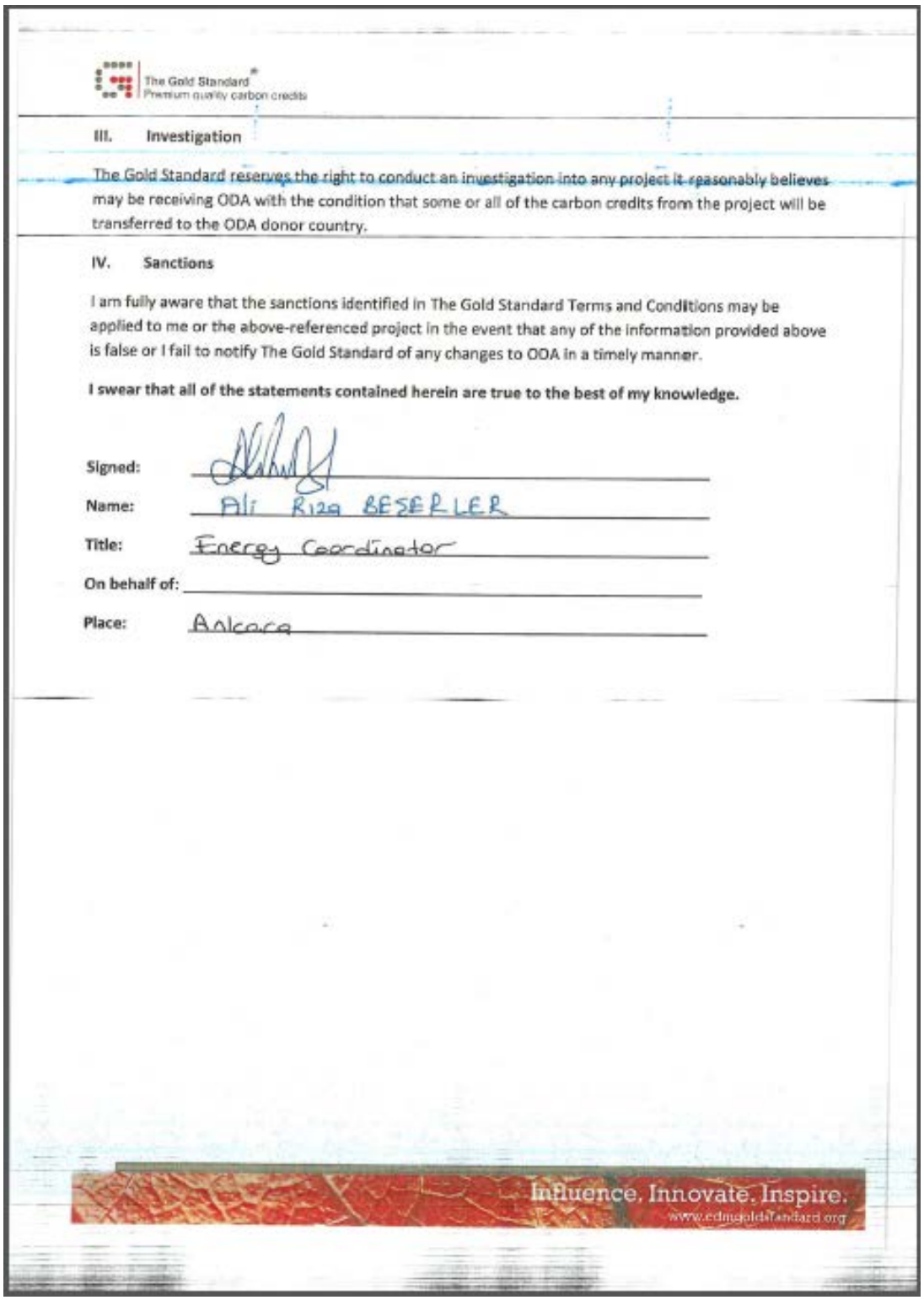

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III. Investigation

The Gold Standard reserves the right to conduct an investigation into any project it reasonably believes may be receiving ODA with the condition that some or all of the carbon credits from the project will be transferred to the ODA donor country.

IV. Sanctions

I am fully aware that the sanctions identified in The Gold Standard Terms and Conditions may be applied to me or the above-referenced project in the event that any of the information provided above is false or I fail to notify The Gold Standard of any changes to ODA in a timely manner.

I swear that all of the statements contained herein are true to the best of my knowledge.

Signed:

Name: Ali Rıza BESERLER

Title: Energy Coordinator

On behalf of:

Place: Balcova

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AMENDED OFFICIAL DEVELOPMENT ASSISTANCE DECLARATION

Date: [*Insert Date*] 21.06.2016

The Gold Standard Foundation

79 Avenue Louis Casai

Geneva Cointrin, CH-1216

Switzerland

RE: Amended Official Development Assistance Declaration For [insert project GS ID number] GS 1688

DİT Rıza Beşerler VERİM Enerji Yatırım Üretim ve Tic. A.Ş.

I, [insert full name], on behalf of [insert name of Company], and in reference to [insert project GS ID number], submitted the Official Development Assistance Declaration to The Gold Standard on [insert date]. It has come to my attention that there has been a material change in the role of ODA for the development or implementation of [insert project GS ID number]. GS 1688 GS 1688

[Please explain the changes here]

I understand that The Gold Standard will contact me to discuss the consequences of these changes for this project.

I swear that all of the statements contained herein are true to the best of my knowledge.

Signed: _____

Name: Ali Rıza BEŞER-LER

Title: Energy Coordinator

On behalf of: _____

Place: Ankara

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Annex 3. Baseline Information

2012			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
ACARSOY TERMİK KOM.ÇEV.SANT. (ACARSOY EN.)	50	NATURAL GAS	375,0
AFYON DGKÇ (DEDELİ DOĞALGAZ ELEKTRİK ÜR.)	126,1	NATURAL GAS	945,0
AGE DOĞALGAZ KOM. ÇEV. SANT. (AGE DENİZLİ)	94	NATURAL GAS	1057,0
AGE DOĞALGAZ KOM. ÇEV. SANT. (AGE DENİZLİ)	47	NATURAL GAS	
ALES DOĞALGAZ KOM. ÇEV. SANT. (ALES ELEKT.)	49	NATURAL GAS	370,0
BİLECİK DOĞALGAZ ÇS. (TEKNO DOĞALGAZ ÇEV.)	25,8	NATURAL GAS	190,0
BİLECİK DOĞALGAZ KÇS. (DEDELİ DOĞALGAZ EL.)	19,4	NATURAL GAS	945,0
BİLECİK DOĞALGAZ KÇS. (DEDELİ DOĞALGAZ EL.)	107,03	NATURAL GAS	
BİNATOM ELEKTRİK ÜRETİM A.Ş. (Emet/KÜTAHYA)	2,145	NATURAL GAS	78,0
BİNATOM ELEKTRİK ÜRETİM A.Ş. (Emet/KÜTAHYA)	2,145	NATURAL GAS	
BİNATOM ELEKTRİK ÜRETİM A.Ş. (Emet/KÜTAHYA)	4,044	NATURAL GAS	
BİNATOM ELEKTRİK ÜRETİM A.Ş. (Emet/KÜTAHYA)	2,022	NATURAL GAS	
BİS ENERJİ(Sanayi/ Bursa)	458	NATURAL GAS	3450,0
BOSEN ENERJİ ELEKTRİK ÜRETİM AŞ.(Bursa)	27,96	NATURAL GAS	209,9
ENERJİ-SA (ÇANAKKALE)	0,915	NATURAL GAS	7,3
ENERJİ-SA (KÖSEKÖY)	120	NATURAL GAS	930,0
ENERJİ-SA (MERSİN)	1,465	NATURAL GAS	11,5
ENERJİ-SA (Zeytinli/ADANA)	0,83	NATURAL GAS	5,8
İŞBİRLİĞİ ENERJİ ÜRETİM SAN. VE TİC. A.Ş.	19,46	NATURAL GAS	146,0
NAKSAN ENERJİ ELEKTRİK ÜRETİM A.Ş.	8	NATURAL GAS	60,0
NAKSAN ENERJİ ELEKTRİK ÜRETİM A.Ş.	8	NATURAL GAS	60,0
ODAŞ DOĞALGAZ KÇS (ODAŞ ELEKTRİK ÜRETİM)	54,96	NATURAL GAS	414,1
ODAŞ DOĞALGAZ KÇS (ODAŞ ELEKTRİK ÜRETİM)	18,32	NATURAL GAS	138,0
OFİM ENERJİ SANTRALI (OSTİM FİNANS VE İŞ MER.)	2,05	NATURAL GAS	16,0
PANCAR ELEKTRİK ÜRETİM A.Ş.	17,46	NATURAL GAS	260,0

2012			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
PANCAR ELEKTRİK ÜRETİM A.Ş.	17,46	NATURAL GAS	
SODA SANAYİ A.Ş. (Mersin)	252,2	NATURAL GAS	1765,0
ŞANLIURFA OSB (RASA ENERJİ ÜRETİM A.Ş.)	11,72	NATURAL GAS	82,1
YENİ UŞAK ENERJİ ELEKTRİK SANTRALI	8,73	NATURAL GAS	71,0
YENİ UŞAK ENERJİ ELEKTRİK SANTRALI	1	NATURAL GAS	
ZORLU ENERJİ (B.Karıştıran)	25,7	NATURAL GAS	192,8
	1582,916	NATURAL GAS	11779,58
AKKÖY II HES (AKKÖY ENERJİ A.Ş.)	114,84	HYDRO	899
AKKÖY II HES (AKKÖY ENERJİ A.Ş.)	114,84	HYDRO	
AKKÖY-ESPİYE HES (KONİ İNŞAAT SAN. A.Ş.)	8,912	HYDRO	40
ALABALIK REG. VE HES SANTRALI I-II (DARBOĞAZ ELK. ÜR. SAN.)	13,84	HYDRO	41
ANAK HES (KOR-EN KORKUTELİ ELEK. ÜRET. SAN.)	3,76	HYDRO	15
ARAKLI-1 REG. VE HES(YÜCEYURT ENERJİ ÜRETİM)	10,203	HYDRO	38,94
ARAKLI-1 REG. VE HES(YÜCEYURT ENERJİ ÜRETİM)	13,067	HYDRO	50
ARCA HES (GÜRSU TEMİZ ENERJİ ÜRETİM A.Ş.)	5,45	HYDRO	65
ARCA HES (GÜRSU TEMİZ ENERJİ ÜRETİM A.Ş.)	10,9	HYDRO	
ARPA REG. VE HES (MCK ELEKTRİK ÜRETİM A.Ş.)	32,412	HYDRO	78
AVCILAR HES (AVCILAR ENERJİ ELEKTRİK ÜRET.)	16,743	HYDRO	49
AYANCIK HES (İLK ELEKTRİK ENERJİ ÜRETİMİ SN.)	15,6	HYDRO	65
AYRANCILAR HES (MURADİYE ELEKTRİK ÜRETİM)	9,359	HYDRO	38,112
BAĞIŞTAŞ II HES (AKDENİZLİ ELEKTRİK ÜRETİM)	32,4	HYDRO	122
BALKUSAN BARAJI VE HES 1 NOLU SANT. (KAREN)	13	HYDRO	40
BALKUSAN BARAJI VE HES 2 NOLU SANT. (KAREN)	25	HYDRO	80
BANGAL REG. VE KUŞLUK HES (KUDRET ENERJİ)	17	HYDRO	56
BEKTEMUR HES (DİZ-EP ELEKTRİK ÜRETİM LTD.)	3,492	HYDRO	20
BOYABAT BARAJI VE HES (BOYABAT ELEKTRİK)	513	HYDRO	1468

2012			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
BÜYÜKDÜZ HES (AYEN ENERJİ A.Ş.)	68,862	HYDRO	192
CAN 1 HES (HED ELEKTRİK ÜRETİM A.Ş.)	1,844	HYDRO	10
CEYHAN HES (BERKMAN HES) (ENOVA EN ÜRET.)	12,605	HYDRO	50,35
CUNİŞ REG. VE HES (RİNERJİ RİZE ELEKTRİK ÜR.)	2,8	HYDRO	36
CUNİŞ REG. VE HES (RİNERJİ RİZE ELEKTRİK ÜR.)	5,6	HYDRO	
ÇAĞLAYAN HES (ÇAĞLAYAN HES ENERJİ ÜRETİM)	6	HYDRO	21
ÇARŞAMBA HES (ÇARŞAMBA ENERJİ ELEKTRİK)	11,31	HYDRO	63
ÇINAR-1 HES (AYCAN ENERJİ ÜRETİM TİC. VE SN.)	9,26	HYDRO	34
ÇUKURÇAYI HES (AYDEMİR ELEKTRİK ÜRETİM A.Ş.)	1,8	HYDRO	4
DEMİRCİLER HES (PAK ENERJİ ÜRETİMİ SAN.)	3,124	HYDRO	35
DEMİRCİLER HES (PAK ENERJİ ÜRETİMİ SAN.)	5,317	HYDRO	
DOĞANKAYA HES (MAR-EN ENERJİ ÜRET. TİC.)	20,55	HYDRO	98
DUMLU HES (DUMLU ENERJİ ELEKTRİK ÜRETİM)	3,982	HYDRO	9
EGER HES (EGER ELEKTRİK ÜRETİM LTD. ŞTİ.)	1,92	HYDRO	10
ESENDURAK HES (MERAL ELEKTRİK ÜRETİM)	9,33	HYDRO	43
FEKE 1 HES (AKKUR ENERJİ ÜRETİM TİC. VE SAN.)	29,4	HYDRO	117
FEKE 2 BARAJI VE HES (AKKUR ENERJİ ÜRETİM)	69,34	HYDRO	223
FINDIK I HES (ADV ELEKTRİK ÜRETİM LTD. ŞTİ.)	11,25	HYDRO	48
GEMCİLER REG. VE HES (BOZTEPE ENERJİ ÜRET.)	7,98	HYDRO	35
GÖKGEDİK HES (UHUD ENERJİ ÜRETİM TİC.)	20,49	HYDRO	100
GÖKGEDİK HES (UHUD ENERJİ ÜRETİM TİC.)	3,776	HYDRO	
GÜDÜL 2 HES (YAŞAM ENERJİ ELEKTRİK ÜRETİM)	4,88	HYDRO	20
GÜLLÜBAĞ BARAJI VE HES (SENENERJİ ENERJİ)	96	HYDRO	384
GÜNDER REG. VE HES (ARIK ENERJİ ÜRETİM A.Ş.)	28,22	HYDRO	84
GÜNDER REG. VE HES (ARIK ENERJİ ÜRETİM A.Ş.)	0	HYDRO	
HORU REG. VE HES (MARAŞ ENERJİ YATIRIM SN.)	4,24	HYDRO	34

2012			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
HORU REG. VE HES (MARAŞ ENERJİ YATIRIM SN.)	4,24	HYDRO	
HORYAN HES (HORYAN ENERJİ A.Ş.)	5,68	HYDRO	23
KARTALKAYA HES (SIR ENERJİ ÜRETİM SAN.)	8,001	HYDRO	27
KAYAKÖPRÜ 2 HES (ARSAN ENERJİ A.Ş.)	10,2	HYDRO	36
KIRIKDAĞ HES (ÖZENİR ENERJİ ELEKTRİK ÜRET.)	16,86	HYDRO	71
KOZDERE HES (ADO MADENCİLİK ELEKTRİK ÜR.)	6,12	HYDRO	9,21
KÖKNAR HES (AYCAN ENERJİ ÜRETİM TİC.)	8,024	HYDRO	25
KÜRCE REG. VE HES (DEDEGÖL ENERJİ)	12,046	HYDRO	48
MENGE BARAJI VE HES (ENERJİSA ENERJİ)	44,71	HYDRO	102
MİDİLLİ REG. VE HES (MASAT ENERJİ ELEKTRİK)	20,97	HYDRO	81
MURAT I-II REG. VE HES (MURAT HES ENERJİ EL.)	35,628	HYDRO	189
MURATLI REG. VE HES (ARMAHES ELEKTRİK ÜR.)	11	HYDRO	27,43
MURSAL I HES (PETA MÜHENDİSLİK ENERJİ)	4,18	HYDRO	17
NİKSAR HES (NİKSAR ENERJİ ÜRETİM LTD. ŞTİ.)	20,08	HYDRO	248
NİKSAR HES (NİKSAR ENERJİ ÜRETİM LTD. ŞTİ.)	20,08	HYDRO	
ÖREN REG. VE HES (ÇELİKLER ELEKTRİK ÜRETİM)	19,932	HYDRO	21,73
PAPART HES (ELİTE ELEKTRİK ÜRETİM)	22	HYDRO	106
PAPART HES (ELİTE ELEKTRİK ÜRETİM)	4,6	HYDRO	
POLAT HES (ELESTAŞ ELEKTRİK ÜRETİM A.Ş.)	3,28	HYDRO	28
POLAT HES (ELESTAŞ ELEKTRİK ÜRETİM A.Ş.)	3,28	HYDRO	
SANCAR REG. VE HES (MELİTA ELEKTRİK ÜRETİM)	0,74	HYDRO	3
SARIHIDIR HES (MOLU ENERJİ ÜRETİM A.Ş.)	6	HYDRO	24
SEYRANTEPE HES (SEYRANTEPE ELEKT. ÜRET.)	56,84	HYDRO	207
SIRAKONAKLAR HES (2M ENERJİ ÜRETİM A.Ş.)	18	HYDRO	69
SULUKÖY HES (DU ELEKTRİK ÜRETİM A.Ş.)	6,924	HYDRO	28
ŞİFRİN REG. VE HES (BOMONTİ ELK. MÜH. MÜŞ.)	6,744	HYDRO	18

2012			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
TELEME REG. VE HES (TAYEN ELEKTRİK ÜRET.)	1,57	HYDRO	11
TELLİ I-II HES (FALANJ ENERJİ ELEKTRİK ÜRET.)	8,72	HYDRO	32
TUĞRA REG. VE HES (VİRA ELEKTRİK ÜRETİM A.Ş.)	4,9	HYDRO	18
TUNA HES (NİSAN ELEKTROMEKANİK ENERJİ)	37,19	HYDRO	92
TUZKÖY HES (BATEN ENERJİ ÜRETİMİ A.Ş.)	8,44	HYDRO	68
TUZLAKÖY-SERGE REG. VE HES (TUYAT ELEKT.)	7,14	HYDRO	21
UMUT I REG. VE HES (NİSAN ELEKTROMEKANİK)	5,8	HYDRO	21
ÜÇKAYA HES (ŞİRİKÇİOĞLU ELEKTRİK ÜRETİM A.Ş.)	1,04	HYDRO	5
VİZARA REG. VE HES (ÖZTÜRK ELEKT. ÜRET. LTD.)	8,578	HYDRO	27
YAĞMUR REG. VE HES (BT BORDO ELK. ÜR.)	8,946	HYDRO	32
YAMANLI III KAPS. GÖKKAYA HES (MEM ENERJİ)	28,54	HYDRO	105
YAMANLI III KAPS. HİMMETLİ HES (MEM ENERJİ)	26,98	HYDRO	100
YAVUZ HES (AREM ENERJİ ÜRETİM A.Ş.)	5,8	HYDRO	14
YEDİSU HES (ÖZALTIN ENERJİ ÜRETİM VE İNŞAAT)	15,14	HYDRO	72
YEDİSU HES (ÖZALTIN ENERJİ ÜRETİM VE İNŞAAT)	7,57	HYDRO	
YILDIRIM HES (BAYBURT ENERJİ ÜRETİM VE TİC.)	7,118	HYDRO	39
YILDIRIM HES (BAYBURT ENERJİ ÜRETİM VE TİC.)	3,559	HYDRO	
YOKUŞLU KALKANDERE HES (SANKO ENERJİ)	5,2	HYDRO	23,40
ZEYTİN BENDİ HES (ZEYTİN ENERJİ ÜRET. SAN.)	5,2	HYDRO	18
ZEYTİN BENDİ HES (ZEYTİN ENERJİ ÜRET. SAN.)	0	HYDRO	0
	1987,288	HYDRO	6922,172
AKSU RES (AKSU TEMİZ ENERJİ ELEKTRİK ÜRETİM)	36	WIND	216
AKSU RES (AKSU TEMİZ ENERJİ ELEKTRİK ÜRETİM)	30	WIND	
AKSU RES (AKSU TEMİZ ENERJİ ELEKTRİK ÜRETİM)	6	WIND	
BALIKESİR RES (BARES ELEKTRİK ÜRETİM A.Ş.)	13,75	WIND	434
BALIKESİR RES (BARES ELEKTRİK ÜRETİM A.Ş.)	16,5	WIND	

2012			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
BALIKESİR RES (ENERJİSA ENERJİ ÜRETİM A.Ş.)	24,75	WIND	
BALIKESİR RES (ENERJİSA ENERJİ ÜRETİM A.Ş.)	16,5	WIND	
BALIKESİR RES (ENERJİSA ENERJİ ÜRETİM A.Ş.)	19,25	WIND	
BALIKESİR RES (ENERJİSA ENERJİ ÜRETİM A.Ş.)	22	WIND	
BANDIRMA RES (YAPISAN ELEKTRİK ÜRETİM A.Ş.)	5	WIND	20
BOZYAKA RES (KARDEMİR HADDECİLİK VE ELEKT.)	12	WIND	38
DAĞPAZARI RES (ENERJİSA ENERJİ ÜRETİM A.Ş.)	36	WIND	120
DAĞPAZARI RES (ENERJİSA ENERJİ ÜRETİM A.Ş.)	3	WIND	
DİNAR RES (OLGU ENERJİ YATIRIM ÜRETİM)	16,1	WIND	60
GÜNAYDIN RES (MANRES ELEKTRİK ÜRETİM A.Ş.)	10	WIND	40
İNNORES ELEKTRİK YUNTDAĞ RÜZGAR (Aliağa-İZMİR)	5	WIND	20,26
KARADAĞ RES (GARET ENERJİ ÜRETİM)	10	WIND	34
KAYADÜZÜ RES (BAKTEPE ENERJİ A.Ş.)	7,5	WIND	129
KAYADÜZÜ RES (BAKTEPE ENERJİ A.Ş.)	25	WIND	
KAYADÜZÜ RES (BAKTEPE ENERJİ A.Ş.)	6,5	WIND	
KOZBEYLİ RES (DOĞAL ENERJİ ELEKTRİK ÜRETİM)	20	WIND	70
METRİSTEPE RES (CAN ENERJİ ENTEGRE ELEKT.)	27,5	WIND	85
METRİSTEPE RES (CAN ENERJİ ENTEGRE ELEKT.)	11,5	WIND	
POYRAZ RES (POYRAZ ENERJİ ELEKTRİK ÜRETİM)	14	WIND	156,4
POYRAZ RES (POYRAZ ENERJİ ELEKTRİK ÜRETİM)	20	WIND	
SAMURLU RES (DOĞAL ENERJİ ELEKTRİK ÜRET.)	12	WIND	70
SAMURLU RES (DOĞAL ENERJİ ELEKTRİK ÜRET.)	10	WIND	
SOMA RES (SOMA ENERJİ ELEKTRİK ÜRETİM A.Ş.)	24	WIND	82,27
SÖKE-ÇATALBÜK RES (ABK ENERJİ ELEKTRİK)	18	WIND	110
SÖKE-ÇATALBÜK RES (ABK ENERJİ ELEKTRİK)	12	WIND	
ŞENKÖY RES (EOLOS RÜZGAR ENERJİSİ ÜRETİM)	26	WIND	87

2012			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
	515,85	WIND	1771,93
AREL ENERJİ BİYOKÜTLE TESİSİ (AREL ÇEVRE)	1,2	WASTE	18
AREL ENERJİ BİYOKÜTLE TESİSİ (AREL ÇEVRE)	1,2	WASTE	
BEREKET ENERJİ ÜRETİM A.Ş. (BİOGAZ)	0,635	WASTE	5
EKİM BİYOGAZ (EKİM GRUP ELEKTRİK ÜRETİM)	1,2	WASTE	10
ITC ADANA ENERJİ ÜRETİM (ADANA BİOKÜTLE SNT)	4,245	WASTE	31,83
ITC BURSA ENERJİ ÜRETİM SAN. VE TİC. A.Ş.	7	WASTE	80
ITC BURSA ENERJİ ÜRETİM SAN. VE TİC. A.Ş.	1,4	WASTE	
ITC BURSA ENERJİ ÜRETİM SAN. VE TİC. A.Ş.	1,4	WASTE	
İZAYDAŞ (İZMİT ÇÖP)(Köseköy)	0,33	WASTE	2,2
KAYSERİ KATI ATIK DEPONİ SAHASI (HER ENERJİ)	1,305	WASTE	9,9
KOCAELİ ÇÖP BİYOGAZ (LFG) (KÖRFEZ ENERJİ)	1,2	WASTE	18
KOCAELİ ÇÖP BİYOGAZ (LFG) (KÖRFEZ ENERJİ)	1,063	WASTE	
ORTADOĞU ENERJİ (KÖMÜRCÜODA) (Şile/İSTANBUL)	2,83	WASTE	22,04
ORTADOĞU ENERJİ (ODA YERİ) (Eyüp/İSTANBUL)	4,092	WASTE	31,805
SAMSUN AVDAN KATI ATIK (SAMSUN AVDAN EN.)	2,4	WASTE	18
SEZER BİO ENERJİ (KALEMİRLER ENERJİ ELEKTR.)	0,5	WASTE	4
	32	WASTE	250,775
	64	WASTE	501,55
DENİZ JEOTERMAL (MAREN MARAŞ ELEKTRİK)	24	GEOTHERMAL	191
SİNEM JEOTERMAL (MAREN MARAŞ ELEKTRİK)	24	GEOTHERMAL	191
	48	GEOTHERMAL	382
AKSA AKRİLİK KİMYA SAN. A.Ş. (İTHAL KÖM.+D.G)	75	COAL	525
EREN ENERJİ ELEKTRİK ÜRETİM A.Ş.	30	COAL	195,97
	105	COAL	720,97

2011			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
ADİLCEVAZ (MOSTAR ENERJİ ELEKTRİK)	0,394	HYDROLIC	0,8
AHLAT (MOSTAR ENERJİ ELEKTRİK)	0,201	HYDROLIC	0,6
AKSU REG. VE HES (KALEN ENERJİ)	5,2	HYDROLIC	16
ALKUMRU BARAJI VE HES (LİMAK HİD.)	174,18	HYDROLIC	828
ALKUMRU BARAJI VE HES (LİMAK HİD.)	87,09		
AYRANCILAR HES (MURADİYE ELEKTRİK)	18,718	HYDROLIC	128
AYRANCILAR HES (MURADİYE ELEKTRİK)	13,377		
AYVACIK RES (AYRES AYVACIK RÜZG.)	5	HYDROLIC	17
BALKONDU I HES (BTA ELEKTRİK ENERJİ)	9,191	HYDROLIC	33
BAYBURT (BOYDAK ENERJİ)	0,396	HYDROLIC	7,9
BAYRAMHACILI BARAJI VE HES	47	HYDROLIC	175
BERDAN	10,2	HYDROLIC	47,2
BESNİ KAYSERİ VE CİVARI ENERJİ)	0,272	HYDROLIC	0,5
BOĞUNTU HES (BEYOBASI ENERJİ)	3,801	HYDROLIC	17
BÜNYAN (KAYSERİ VE CİVARI EL. T.A.Ş)	1,156	HYDROLIC	3,4
CEVHER I-II REG. VE HES (ÖZCEVHER EN.)	16,36	HYDROLIC	65
ÇAĞ-ÇAĞ (NAS ENERJİ A.Ş.)	14,4	HYDROLIC	25
ÇAKIRMAN REG. VE HES (YUSAKA EN.)	6,98	HYDROLIC	22
ÇAMARDI (KAYSERİ VE CİVARI EL. T.A.Ş)	0,069	HYDROLIC	0,2
ÇAMLICA III HES (ÇAMLICA ELEKTRİK)	27,618	HYDROLIC	43
ÇAMLIKAYA REG.VE HES (ÇAMLIKAYA EN)	2,824	HYDROLIC	6,31
ÇANAKÇI HES (CAN ENERJİ ENTEGRE)	4,633	HYDROLIC	39
ÇANAKÇI HES (CAN ENERJİ ENTEGRE)	4,633		
ÇEMİŞKEZEK (BOYDAK ENERJİ)	0,116	HYDROLIC	0,8
ŞELALE HES (MURADİYE ELEKTRİK ÜR.)	13,377	HYDROLIC	56,57
	467,186	**HYDROLIC**	**1532,28**

2011			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
AKIM ENERJİ BAŞPINAR (SÜPER FİLM)	25,32	**NATURAL GAS**	**177,00**
AKSA AKRİLİK (İTHAL KÖM.+D.G)	25	**NATURAL GAS**	**175,00**
AKSA ENERJİ (Antalya)	300	**NATURAL GAS**	**3600,00**
AKSA ENERJİ (Antalya) (İlave)	300		
ALİAĞA ÇAKMAKTEPE ENERJİ (İlave)	130,95	**NATURAL GAS**	**1054,00**
ALİAĞA ÇAKMAKTEPE ENERJİ (İlave)	8,73		
BOSEN ENERJİ ELEKTRİK ÜRETİM AŞ.	93	**NATURAL GAS**	**698,09**
CENGİZ ÇİFT YAKITLI K.Ç.E.S.	131,335	**NATURAL GAS**	**985,00**
CENGİZ ENERJİ SAN.VE TİC.A.Ş.	35	**NATURAL GAS**	**281,30**
GLOBAL ENERJİ (PELİTLİK)	4	**NATURAL GAS**	**29,90**
GOREN-1 (GAZİANTEP ORGANİZE SAN.)	48,65	**NATURAL GAS**	**277,00**
HAMİTABAT (Lisans Tadili)	36	**NATURAL GAS**	**237,90**
HG ENERJİ ELEKTRİK ÜRET. SAN.TİC. A.Ş.	52,38	**NATURAL GAS**	**366,00**
NUH ENERJİ EL. ÜRT.A.Ş. (ENERJİ SANT.-2)	119,98	**NATURAL GAS**	**900,00**
ODAŞ DOĞALGAZ KÇS (ODAŞ ELEKTRİK)	54,96	**NATURAL GAS**	**415,00**
SAMSUN TEKKEKÖY EN. SAN. (AKSA EN.)	131,335	**NATURAL GAS**	**980,00**
ŞANLIURFA OSB (RASA ENERJİ ÜR. A.Ş.)	116,76	**NATURAL GAS**	**800,00**
TİRENDA TİRE ENERJİ ÜRETİM A.Ş.	58,38	**NATURAL GAS**	**410,00**
YENİ UŞAK ENERJİ ELEKTRİK SANTRALI	8,73	**NATURAL GAS**	**65,00**
ZORLU ENERJİ (B.Karıştıran)	7,2	**NATURAL GAS**	**54,07**
	1687,71	**NATURAL GAS**	**11505,26**
AKRES (AKHİSAR RÜZGAR EN. ELEKT.)	20	**WIND**	**165,00**
AKRES (AKHİSAR RÜZGAR EN. ELEKT.)	20		
AKRES (AKHİSAR RÜZGAR EN. ELEKT.)	3,75		
BAKİ ELEKTRİK ŞAMLI RÜZGAR (İlave)	24	**WIND**	**92,60**
BANDIRMA ENERJİ (BANDIRMA RES)	3	**WIND**	**10,97**

2011			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
ÇANAKKALE RES (ENERJİ-SA ENERJİ)	25,3	**WIND**	**92,00**
ÇANAKKALE RES (ENERJİ-SA ENERJİ)	4,6		
ÇATALTEPE RES (ALİZE ENERJİ ELEKTRİK)	16	**WIND**	**52,00**
İNNORES ELEKTRİK YUNTDAĞ RÜZGAR	10	**WIND**	**40,57**
KİLLİK RES (PEM ENERJİ A.Ş.)	20	**WIND**	**86,00**
KİLLİK RES (PEM ENERJİ A.Ş.) (İlave)	15		
KİLLİK RES (PEM ENERJİ A.Ş.) (İlave)	5		
	166,65	**WIND**	**539,14**
AYDIN/GERMENCİK JEOTERMAL	20	**GEOTHERMAL**	**150**
BOLU BELEDİYESİ ÇÖP TOP. TES. BİYOGAZ	1,131	**WASTE**	**7,50**
CEV ENERJİ ÜRETİM(GAZİANTEP ÇÖP BİOGAZ)	4,524	**WASTE**	**29,40**
ITC ADANA ENERJİ ÜRETİM (İlave)	1,415	**WASTE**	**10,40**
ITC-KA EN. (ASLIM BİYOKÜTLE) KONYA	4,245	**WASTE**	**44,50**
ITC-KA EN. (ASLIM BİYOKÜTLE) KONYA	1,415		
ITC-KA ENERJİ MAMAK KATI ATIK TOP.	2,826	**WASTE**	**18,91**
ITC-KA ENERJİ (SİNCAN) (İlave)	1,416	**WASTE**	**44,50**
KAYSERİ KATI ATIK DEPONİ SAHASI	1,56	**WASTE**	**12,00**
	18,532	**WASTE**	**167,21**
BATMAN	0,475	**FUEL-OIL**	**3,30**
KARKEY (SİLOPİ 1)	100,44	**FUEL-OIL**	**701,15**
MARDİN-KIZILTEPE (AKSA ENERJİ)	32,1	**FUEL-OIL**	**225,00**
MOSB Enerji Elektrik Üretim Ltd. Şti.(İlave)	43,5	**FUEL-OIL**	**360,50**
	176,515	**FUEL-OIL**	**1289,95**
BEKİRLİ TES (İÇDAŞ ELEKTRİK EN.)	600	**IMPORTED COAL**	**4320,00**

2010			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
AKSA ENERJİ (ANTALYA)	25	NATURAL GAS	385
AKSA ENERJİ (ANTALYA)	25	NATURAL GAS	
ALİAĞA ÇAKMAKTEPE ENERJİ (İlave)	69,84	NATURAL GAS	557,92
ALTEK ALARKO ELEKTRİK SANTRALLARI	60,1	NATURAL GAS	567
ALTEK ALARKO ELEKTRİK SANTRALLARI	21,89	NATURAL GAS	
ATAER ENERJİ ELEKTRİK ÜRETİM A.Ş.	49	NATURAL GAS	277,88
BİNATOM ELEKTRİK ÜRETİM A.Ş.	2	NATURAL GAS	13
CAN ENERJİ ELEKTRİK ÜR. A.Ş.(Tekirdağ)	29,1	NATURAL GAS	203
CENGİZ ENERJİ SAN. VE TİC. A.Ş. (Tekkeköy)	101,95	NATURAL GAS	1604
CENGİZ ENERJİ SAN. VE TİC. A.Ş. (Tekkeköy)	101,95	NATURAL GAS	
ENERJİ-SA (BANDIRMA)	1.000,00	NATURAL GAS	7540
GLOBAL ENERJİ (PELİTLİK)	3,544	NATURAL GAS	27,06
RASA ENERJİ (VAN)	26,19	NATURAL GAS	231
RASA ENERJİ (VAN) (İlave)	10,124	NATURAL GAS	
SÖNMEZ ENERJİ ÜRETİM (UŞAK)	33,242	NATURAL GAS	276,06
SÖNMEZ ENERJİ ÜRETİM (UŞAK) (İlave)	2,564	NATURAL GAS	
UĞUR ENERJİ ÜR. TİC.VE SAN. A.Ş. (İlave)	12	NATURAL GAS	506
UĞUR ENERJİ ÜRETİM TİC. VE SAN. A.Ş.	48,2	NATURAL GAS	
	1621,694	**NATURAL GAS**	**12187,92**
ALAKIR HES (YURT ENERJİ ÜRETİM)	**2,06**	**HYDROLIC**	**6,00**
AKIM ENERJİ (CEVİZLİK REG. VE HES)	**91,4**	**HYDROLIC**	**330,00**
ASA ENERJİ (KALE REG.ve HES)	**9,57**	**HYDROLIC**	**32,00**
BAYBURT HES (BAYBURT ENERJİ ÜRET.)	**14,631**	**HYDROLIC**	**51,00**
BEYTEK EL. ÜR. A.Ş. (ÇATALOLUK HES)	**9,54**	**HYDROLIC**	**31,00**
BİRİM HİDR. ÜRETİM AŞ. (ERFELEK HES)	**3,225**	**HYDROLIC**	**19,00**
BİRİM HİDR. ÜRETİM AŞ. (ERFELEK HES)	**3,225**	**HYDROLIC**	

2010			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
BULAM REG. VE HES (MEM ENERJİ ELK.)	**7,03**	**HYDROLIC**	**33,00**
BURÇ BENDİ VE HES (AKKUR ENERJİ)	**27,33**	**HYDROLIC**	**113,00**
CEYHAN HES (BERKMAN HES)(ENOVA EN.)	**12,605**	**HYDROLIC**	**201,00**
CEYHAN HES (BERKMAN HES)(ENOVA EN.)	**12,605**	**HYDROLIC**	
CEYHAN HES (OŞKAN HES) (ENOVA EN.)	**23,889**	**HYDROLIC**	
CİNDERE HES (İlave)	**9,065**	**HYDROLIC**	**28,28**
ÇAKIT HES (ÇAKIT ENERJİ A.Ş.)	**20,18**	**HYDROLIC**	**96,00**
ÇAMLIKAYA REG. VE HES	**5,648**	**HYDROLIC**	**19,00**
DAMLAPINAR HES (CENAY ELEKTRİK ÜR.)	**16,424**	**HYDROLIC**	**92,00**
DİM HES (DİLER ELEKTRİK ÜRETİM)	**38,25**	**HYDROLIC**	**123,00**
DİNAR HES (ELDA ELEKTRİK ÜRETİM)	**4,44**	**HYDROLIC**	**15,00**
DOĞUBAY ELEKTRİK (SARIMEHMET HES)	**3,1**	**HYDROLIC**	**10,00**
EGEMEN 1 HES (ENERSİS ELEKTRİK)	**8,82**	**HYDROLIC**	**72,00**
EGEMEN 1B HES (ENERSİS ELEKTRİK)	**11,1**	**HYDROLIC**	
ERENKÖY REG. VE HES (TÜRKERLER)	**21,456**	**HYDROLIC**	**87,00**
ERENLER REG. ve HES (BME BİR.MÜT.EN.)	**45**	**HYDROLIC**	**85,00**
ERİKLİ-AKOCAK REG. ve AKOCAK HES	**41,25**	**HYDROLIC**	**257,00**
ERİKLİ-AKOCAK REG. ve AKOCAK HES	**41,25**	**HYDROLIC**	**257,00**
FEKE 2 BARAJI VE HES (AKKUR ENERJİ)	**69,34**	**HYDROLIC**	**223,00**
FIRTINA ELEKTRİK ÜR. A.Ş. (SÜMER HES)	**21,6**	**HYDROLIC**	**70,00**
GÖK REG. ve HES (GÖK ENERJİ EL. SAN.)	**10,008**	**HYDROLIC**	**43,00**
GÜDÜL I REG. VE HES (YAŞAM ENERJİ)	**2,36**	**HYDROLIC**	**14,00**
GÜZELÇAY-I HES (İLK ELEKTRİK ENERJİ)	**3,14**	**HYDROLIC**	**43,00**
GÜZELÇAY-II HES (İLK ELEKTRİK ENERJİ)	**4,96**	**HYDROLIC**	
HETAŞ HACISALİHOĞLU (YILDIZLI HES)	**1,2**	**HYDROLIC**	**5,00**
KAHRAMAN REG. VE HES (KATIRCIOĞLU)	**1,42**	**HYDROLIC**	**6,00**

2010			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
KAHTA I HES (ERDEMYILDIZ ELEK. ÜRT.)	**7,12**	**HYDROLIC**	**35,00**
KALE REG. VE HES (KALE ENERJİ ÜR.)	**34,14**	**HYDROLIC**	**116,00**
KALKANDERE REG. VE YOKUŞLU HES	**14,54**	**HYDROLIC**	**63,00**
KARADENİZ EL. (UZUNDERE-1 HES)(İlave)	**31,076**	**HYDROLIC**	**165,00**
KARADENİZ EL.ÜRET. (UZUNDERE-1 HES)	**31,076**	**HYDROLIC**	
KAR-EN KARADENİZ EL.A.Ş. ARALIK HES	**12,41**	**HYDROLIC**	**56,00**
KARŞIYAKA HES (AKUA ENERJİ ÜRET.)	**1,592**	**HYDROLIC**	**8,00**
KAYABÜKÜ REG. VE HES (ELİTE ELEKT.)	**14,58**	**HYDROLIC**	**49,00**
KİRPİLİK REG. VE HES (ÖZGÜR ELEKTRİK)	**6,24**	**HYDROLIC**	**22,00**
KOZAN HES (SER-ER ENERJİ)	**4**	**HYDROLIC**	**9,00**
KULP IV HES (YILDIZLAR EN.ELK.ÜR.AŞ.)	**12,298**	**HYDROLIC**	**41,00**
MURGUL BAKIR (Ç.Kaya) (İlave)	**19,602**	**HYDROLIC**	**40,50**
NARİNKALE REG. VE HES (EBD ENERJİ)	**3,1**	**HYDROLIC**	**10,00**
NİSAN E.MEKANİK EN. (BAŞAK REG. HES)	**6,85**	**HYDROLIC**	**22,00**
NURYOL ENERJİ (DEFNE REG. VE HES)	**7,23**	**HYDROLIC**	**22,00**
ÖZGÜR ELEKTRİK (AZMAK I REG.VE HES)	**5,913**	**HYDROLIC**	**43,00**
ÖZGÜR ELEKTRİK (AZMAK I REG.VE HES)	**5,913**	**HYDROLIC**	
PAŞA REG. VE HES (ÖZGÜR ELEKTRİK)	**8,68**	**HYDROLIC**	**34,00**
PETA MÜHENDİSLİK EN. (MURSAL II HES)	**4,5**	**HYDROLIC**	**19,00**
REŞADİYE 1 HES (TURKON MNG ELEKT.)	**15,68**	**HYDROLIC**	**126,00**
REŞADİYE 2 HES (TURKON MNG ELEKT.)	**26,14**	**HYDROLIC**	**210,00**
SABUNSUYU II HES (ANG ENERJİ ELK.)	**7,35**	**HYDROLIC**	**21,00**
SELEN ELEKTRİK (KEPEZKAYA HES)	**28**	**HYDROLIC**	**124,00**
SELİMOĞLU REG. VE HES	**8,8**	**HYDROLIC**	**35**
TEKTUĞ ELEKTRİK (ANDIRIN HES)	**40,5**	**HYDROLIC**	**106,00**
ULUABAT KUVVET TÜNELİ VE HES	**48,51**	**HYDROLIC**	**372,00**

2010			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
ULUABAT KUVVET TÜNELİ VE HES (İlave)	**48,51**	**HYDROLIC**	**372,00**
UMUT III REG. VE HES (NİSAN ELEKTR.)	**12**	**HYDROLIC**	**26,00**
UZUNÇAYIR HES (Tunceli) (İlave)	**27,33**	**HYDROLIC**	**216,64**
UZUNÇAYIR HES (Tunceli) (İlave)	**27,33**	**HYDROLIC**	**216,64**
YAVUZ REG. VE HES (MASAT ENERJİ)	**22,5**	**HYDROLIC**	**83,00**
YEDİGÖZE HES (YEDİGÖZE ELEKTRİK)	**155,33**	**HYDROLIC**	**474,00**
	1295,961	**HYDROLIC**	**5498,06**
ALİZE ENERJİ (KELTEPE RES)	**1,8**	**WIND**	**6,35**
AKDENİZ ELEKTRİK (MERSİN RES)	**33**	**WIND**	**100,00**
ASMAKİNSAN (BANDIRMA 3 RES)	**20**	**WIND**	**85,00**
ASMAKİNSAN (BANDIRMA 3 RES)	**4**	**WIND**	
BAKRAS EN. ELKT.ÜR. A.Ş. ŞENBÜK RES	**15**	**WIND**	**47,00**
BELEN ELEKTRİK (BELEN RES) (İlave)	**6**	**WIND**	**19,00**
BERGAMA RES EN. ÜR. A.Ş. ALİAĞA RES	**52,5**	**WIND**	**355,00**
BERGAMA RES EN. ÜR. A.Ş. ALİAĞA RES	**37,5**	**WIND**	
BORASKO ENERJİ (BANDIRMA RES)	**12**	**WIND**	**47,78**
BOREAS ENERJİ (BOREAS I ENEZ RES)	**15**	**WIND**	**49,00**
DENİZ ELEKTRİK (SEBENOBA RES)	**10**	**WIND**	**36,66**
KUYUCAK RES (ALİZE ENERJİ ÜR.) (İlave)	**17,6**	**WIND**	**110,00**
KUYUCAK RES (ALİZE ENERJİ ÜRET.)	**8**	**WIND**	
MAZI-3 RES ELEKTRİK (MAZI-3 RES)	**7,5**	**WIND**	**26,25**
ROTOR ELEKTRİK (GÖKÇEDAĞ RES)	**20**	**WIND**	**84,97**
ROTOR ELEKTRİK (GÖKÇEDAĞ RES) (İlave)	**2,5**	**WIND**	**84,97**
ROTOR ELEKTRİK (OSMANİYE RES)	**20**	**WIND**	**207,70**
ROTOR ELEKTRİK (OSMANİYE RES)	**17,5**	**WIND**	
ROTOR ELEKTRİK (OSMANİYE RES)	**17,5**	**WIND**	

2010			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
SARES RES (GARET ENERJİ ÜRETİM)	**15**	**WIND**	**60,00**
SOMA ENERJİ ÜRETİM (SOMA RES)	**4,5**	**WIND**	**114,00**
SOMA ENERJİ ÜRETİM (SOMA RES)	**7,2**	**WIND**	
SOMA ENERJİ ÜRETİM (SOMA RES)	**7,2**	**WIND**	
SOMA ENERJİ ÜRETİM (SOMA RES)	**6,3**	**WIND**	
SOMA ENERJİ ÜRETİM (SOMA RES) (İlave)	**9**	**WIND**	
SOMA RES (BİLGİN RÜZGAR SAN) (İlave)	**27,5**	**WIND**	**307,00**
SOMA RES (BİLGİN RÜZGAR SAN. EN.ÜR.)	**32,5**	**WIND**	
SOMA RES (BİLGİN RÜZGAR SAN.)(İlave)	**30**	**WIND**	
TURGUTTEPE RES (SABAŞ ELEKTRİK ÜR.)	**22**	**WIND**	**64,00**
ÜTOPYA ELEKTRİK (DÜZOVA RES) (İlave)	**15**	**WIND**	**46,00**
ZİYARET RES (ZİYARET RES ELEK.)(İlave)	**22,5**	**WIND**	**140,00**
ZİYARET RES (ZİYARET RES ELEKTRİK)	**12,5**	**WIND**	
	528,6	**WIND**	**1990,677**
MENDERES GEOTERMAL DORA-2	**9,5**	**GEOTHERMAL**	**73**
TUZLA JEOTERMAL	**7,5**	**GEOTHERMAL**	**55**
	17	**GEOTHERMAL**	**128**
ITC-KA ENERJİ (SİNCAN)	**1,416**	**WASTE**	**11,12**
ORTADOĞU ENERJİ (ODA YERİ) (Eyüp/İST.)	**4,245**	**WASTE**	**33,35**
ITC ADANA BİOKÜTLE SANT.	**11,32**	**WASTE**	**80**
	16,981	**WASTE**	**124,47**
EREN ENERJİ ELEKTRİK ÜR. A.Ş. (İlave)	**600**	**IMPORTED COAL**	
EREN ENERJİ ELEKTRİK ÜR. A.Ş. (İlave)	**600**	**IMPORTED COAL**	**9080**
EREN ENERJİ ELEKTRİK ÜRETİM A.Ş.	**160**	**IMPORTED COAL**	
	1360	**IMPORTED COAL**	

2009			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
GÜRMAT ELEKT. (GÜRMAT JEOTERMAL)	47,4	**GEOTHERMAL**	**313**
AK GIDA SAN. VE TİC. A.Ş. (Pamukova)	7,5	NATURAL GAS	61
AKSA AKRİLİK KİMYA SN. A.Ş. (YALOVA)	70	NATURAL GAS	539
AKSA ENERJİ (Antalya) (Güç Değişikliği)	16,2	NATURAL GAS	4744,74
AKSA ENERJİ (Antalya) (İlave)	300	NATURAL GAS	
AKSA ENERJİ (Antalya) (İlave)	300	NATURAL GAS	
AKSA ENERJİ (MANİSA) (İlave)	10,5	NATURAL GAS	498,072
AKSA ENERJİ (MANİSA) (İlave)	52,4	NATURAL GAS	
ANTALYA ENERJİ (İlave)	41,8	NATURAL GAS	302,096
ARENKO ELEKTRİK ÜRETİM A.Ş. (Denizli)	12	NATURAL GAS	84
CAM İŞ ELEKTRİK (Mersin) (İlave)	126,1	NATURAL GAS	1008
ÇELİKLER TAAH. İNŞ. (RİXOX GRAND)	2	NATURAL GAS	16
DALSAN ALÇI SAN. VE TİC. A.Ş.	1,2	NATURAL GAS	9
DELTA ENERJİ ÜRETİM VE TİC.A.Ş.	47	NATURAL GAS	467
DELTA ENERJİ ÜRETİM VE TİC.A.Ş. (İlave)	13	NATURAL GAS	
DESA ENERJİ ELEKTRİK ÜRETİM A.Ş.	9,8	NATURAL GAS	70
ENTEK KÖSEKÖY(İztek) (Düzeltme)	0,8	NATURAL GAS	98,68
ENTEK KÖSEKÖY(İztek) (Düzeltme)	36,3	NATURAL GAS	
FALEZ ELEKTRİK ÜRETİMİ A.Ş.	11,7	NATURAL GAS	88
GLOBAL ENERJİ (PELİTLİK)	8,6	NATURAL GAS	65,66
GÜL ENERJİ ELKT. ÜRET. SN. VE TİC. A.Ş.	24,3	NATURAL GAS	170
KASAR DUAL TEKSTİL SAN. A.Ş. (Çorlu)	5,7	NATURAL GAS	38
KEN KİPAŞ ELKT. ÜR.(KAREN) (K.Maraş)	17,5	NATURAL GAS	75,36
MARMARA PAMUKLU MENS. SN.TİC.A.Ş.	34,9	NATURAL GAS	271,53
MAURİ MAYA SAN. A.Ş.	0,3	NATURAL GAS	19

2009			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
MAURİ MAYA SAN. A.Ş.	2	NATURAL GAS	
NUH ÇİMENTO SAN. TİC. A.Ş.(Nuh Çim.) (İlave)	47	NATURAL GAS	329
RASA ENERJİ (VAN)	78,6	NATURAL GAS	500
SELKASAN KAĞIT PAKETLEME MALZ. İM.	9,9	NATURAL GAS	73
SÖNMEZ ELEKTRİK(Uşak) (İlave)	8,7	NATURAL GAS	67,057
TAV İSTANBUL TERMİNAL İŞLETME. A.Ş.	3,3	NATURAL GAS	82
TAV İSTANBUL TERMİNAL İŞLETME. A.Ş.	6,5	NATURAL GAS	
TESKO KİPA KİTLE PAZ. TİC. VE GIDA A.Ş.	2,3	NATURAL GAS	18
ZORLU ENERJİ (B.Karıştıran) (İlave)	49,5	NATURAL GAS	394,96
	1357,4	NATURAL GAS	10089,155
AKÇAY HES ELEKTRİK ÜR. (AKÇAY HES)	28,8	HYDROLIC	95
AKUA ENERJİ (KAYALIK REG. VE HES)	5,8	HYDROLIC	39
ANADOLU ELEKTRİK (ÇAKIRLAR HES)	16,2	HYDROLIC	60
BAĞIŞLI REG. VE HES (CEYKAR ELEKT.)	9,9	HYDROLIC	99
BAĞIŞLI REG. VE HES (CEYKAR ELEKT.)	19,7	HYDROLIC	
BEREKET ENERJİ (KOYULHİSAR HES)	42	HYDROLIC	329
BEYOBASI EN. ÜR. A.Ş. (SIRMA HES)	5,9	HYDROLIC	23
CİNDERE HES (Denizli)	19,1	HYDROLIC	59,58
DEĞİRMENÜSTÜ EN. (KAHRAMANMARAŞ)	12,9	HYDROLIC	35,425
DENİZLİ ELEKTRİK (EGE I HES)	0,9	HYDROLIC	4
ELESTAŞ ELEKTRİK (YAYLABEL HES)	5,1	HYDROLIC	20
ELESTAŞ ELEKTRİK (YAZI HES)	1,1	HYDROLIC	6
ERVA ENERJİ (KABACA REG. VE HES)	4,2	HYDROLIC	33
ERVA ENERJİ (KABACA REG. VE HES)	4,2	HYDROLIC	
FİLYOS ENERJİ (YALNIZCA REG. VE HES)	14,4	HYDROLIC	67
KAYEN ALFA ENERJİ (KALETEPE HES)	10,2	HYDROLIC	37

2009			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
LAMAS III - IV HES (TGT ENERJİ ÜRETİM)	35,7	HYDROLIC	150
OBRUK HES	212,4	HYDROLIC	473
ÖZGÜR ELEKTRİK (AZMAK II REG.VE HES)	24,4	HYDROLIC	91
ÖZTAY ENERJİ (GÜNAYŞE REG.VE HES)	8,3	HYDROLIC	29
ÖZYAKUT ELEK. ÜR.A.Ş. (GÜNEŞLİ HES)	0,6	HYDROLIC	8
ÖZYAKUT ELEK. ÜR.A.Ş. (GÜNEŞLİ HES)	1,2	HYDROLIC	
SARITEPE HES (GENEL DİNAMİK SİS.EL.)	2,5	HYDROLIC	20
SARITEPE HES (GENEL DİNAMİK SİS.EL.)	2,5	HYDROLIC	
ŞİRİKÇİOĞLU EL.(KOZAK BENDİ VE HES)	4,4	HYDROLIC	15
TAŞOVA YENİDEREKÖY HES (HAMEKA A.Ş.)	2	HYDROLIC	10
TEKTUĞ (Erkenek)	6	HYDROLIC	50
TEKTUĞ (Erkenek) (İlave)	6,5	HYDROLIC	
TOCAK I HES (YURT ENERJİ ÜRETİM SN.)	4,8	HYDROLIC	13
TÜM ENERJİ (PINAR REG. VE HES)	30,1	HYDROLIC	138
UZUNÇAYIR HES (Tunceli)	27,3	HYDROLIC	105
YAPISAN (KARICA REG. ve DARICA I HES)	48,5	HYDROLIC	328
YAPISAN (KARICA REG. ve DARICA I HES)	48,5	HYDROLIC	
YEŞİLBAŞ ENERJİ (YEŞİLBAŞ HES)	14	HYDROLIC	56
YPM GÖLOVA HES (Suşehri/SİVAS)	1,1	HYDROLIC	3
YPM SEVİNDİK HES (Suşehri/SİVAS)	5,7	HYDROLIC	36
	686,9	**HYDROLIC**	**2432,005**
AK ENERJİ (AYYILDIZ RES)	15	WIND	51
ALİZE ENERJİ (ÇAMSEKİ RES)	20,8	WIND	82
ALİZE ENERJİ (KELTEPE RES)	18,9	WIND	65
ALİZE ENERJİ (SARIKAYA RES) (Şarköy)	28,8	WIND	96
AYEN ENERJİ A.Ş. AKBÜK RÜZGAR	16,8	WIND	123

2009			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
AYEN ENERJİ A.Ş. AKBÜK RÜZGAR (İlave)	14,7	WIND	
BAKİ ELEKTRİK ŞAMLI RÜZGAR	36	WIND	337,33
BAKİ ELEKTRİK ŞAMLI RÜZGAR	33	WIND	
BELEN ELEKTRİK BELEN RÜZGAR-HATAY	15	WIND	95
BELEN ELEKTRİK BELEN RÜZGAR-HATAY	15	WIND	
BORASKO ENERJİ (BANDIRMA RES)	21	WIND	179
BORASKO ENERJİ (BANDIRMA RES)	24	WIND	
DATÇA RES (Datça)	0,8	WIND	61,0135
DATÇA RES (Datça)	8,9	WIND	
DATÇA RES (Datça) (İlave)	11,8	WIND	
KORES KOCADAĞ RES (Urla/İZMİR)	15	WIND	56
MAZI-3 RES ELEKT.ÜR. A.Ş. (MAZI-3 RES)	10	WIND	79
MAZI-3 RES ELEKT.ÜR. A.Ş. (MAZI-3 RES)	12,5	WIND	
ROTOR ELEKTRİK (OSMANİYE RES)	17,5	WIND	218
ROTOR ELEKTRİK (OSMANİYE RES)	17,5	WIND	
ROTOR ELEKTRİK (OSMANİYE RES)	22,5	WIND	
SAYALAR RÜZGAR (Doğal Enerji)	3,6	WIND	11,368
SOMA ENERJİ ÜRETİM (SOMA RES)	18	WIND	150
SOMA ENERJİ ÜRETİM (SOMA RES)(İlave)	10,8	WIND	
SOMA ENERJİ ÜRETİM (SOMA RES)(İlave)	16,2	WIND	150
ÜTOPYA ELEKTRİK (DÜZOVA RES)	15	WIND	46
	439,1	**WIND**	**1799,7115**
CARGILL TARIM VE GIDA SAN. TİC. A.Ş.	0,1	WASTE	**0,7**
ITC-KA ENERJİ (SİNCAN)	2,8	WASTE	22
ORTADOĞU ENERJİ (KÖMÜRCÜODA)	5,8	WASTE	45
ORTADOĞU ENERJİ (ODA YERİ) (İlave)	4,2	WASTE	77,953

2009			
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**
ORTADOĞU ENERJİ (ODA YERİ) (İlave)	5,7	WASTE	
ITC-KA ENERJİ MAMAK KATI ATIK TOP.MERK.	2,8	WASTE	21,062
	21,4	**WASTE**	**166,715**
ALKİM ALKALİ KİMYA (Cihanbeyli/KONYA)	**0,4**	**LIGNITE**	**3**
İÇDAŞ ÇELİK (İlave)	**135**	**IMPORTED COAL**	**1923,33**
İÇDAŞ ÇELİK (İlave)	**135**	**IMPORTED COAL**	
	270	**IMPORTED COAL**	
SİLOPİ ELEKTRİK ÜRETİM A.Ş.	**135**	**ASFALTITE**	**945**
ERDEMİR(Ereğli-Zonguldak)	39,2	FUEL OIL	221,02
SİLOPİ ELEKTRİK ÜRETİM A.Ş.(ESENBOĞA)	44,8	FUEL OIL	315
TÜPRAŞ RAFİNERİ(Aliağa/İzmir)	24,7	FUEL OIL	171,77
TÜPRAŞ O.A.RAFİNERİ(Kırıkkale)(Düzeltme)	10	FUEL OIL	70
	118,7	**FUEL OIL**	**777,79**

REGGISTERED AS CDM ACTIVITIES

2012			
BALIKESİR RES (BARES ELEKTRİK ÜRETİM A.Ş.)	13,75	WIND	434
BALIKESİR RES (BARES ELEKTRİK ÜRETİM A.Ş.)	16,5	WIND	
BALIKESİR RES (ENERJİSA ENERJİ ÜRETİM A.Ş.)	24,75	WIND	
BALIKESİR RES (ENERJİSA ENERJİ ÜRETİM A.Ş.)	16,5	WIND	
BALIKESİR RES (ENERJİSA ENERJİ ÜRETİM A.Ş.)	19,25	WIND	
BALIKESİR RES (ENERJİSA ENERJİ ÜRETİM A.Ş.)	22	WIND	
DAĞPAZARI RES (ENERJİSA ENERJİ ÜRETİM A.Ş.)	36	WIND	120
DAĞPAZARI RES (ENERJİSA ENERJİ ÜRETİM A.Ş.)	3	WIND	
GÜNAYDIN RES (MANRES ELEKTRİK ÜRETİM A.Ş.)	10	WIND	40
İNNORES ELEKTRİK YUNTDAĞ RÜZGAR (Aliağa-İZMİR)	5	WIND	20,26

2012			
KAYADÜZÜ RES (BAKTEPE ENERJİ A.Ş.)	7,5	WIND	129
KAYADÜZÜ RES (BAKTEPE ENERJİ A.Ş.)	25	WIND	
KAYADÜZÜ RES (BAKTEPE ENERJİ A.Ş.)	6,5	WIND	
METRİSTEPE RES (CAN ENERJİ ENTEGRE ELEKT.)	27,5	WIND	85
METRİSTEPE RES (CAN ENERJİ ENTEGRE ELEKT.)	11,5	WIND	
SOMA RES (SOMA ENERJİ ELEKTRİK ÜRETİM A.Ş.)	24	WIND	82,27
SÖKE-ÇATALBÜK RES (ABK ENERJİ ELEKTRİK)	18	WIND	110
SÖKE-ÇATALBÜK RES (ABK ENERJİ ELEKTRİK)	12	WIND	
	298,75	**WIND**	**1020,53**
ITC ADANA ENERJİ ÜRETİM (ADANA BİOKÜTLE SNT)	4,245	WASTE	31,83
KOCAELİ ÇÖP BİYOGAZ (LFG) (KÖRFEZ ENERJİ)	1,2	WASTE	18
KOCAELİ ÇÖP BİYOGAZ (LFG) (KÖRFEZ ENERJİ)	1,063	WASTE	
SAMSUN AVDAN KATI ATIK (SAMSUN AVDAN EN.)	2,4	WASTE	18
	8,908	**WASTE**	**67,83**
	Total	**1088,36**	

2011			
ŞELALE HES (MURADİYE ELEKTRİK ÜR.)	**13,377**	**HYDROLIC**	**56,57**
AKRES (AKHİSAR RÜZGAR EN. ELEKT.)	20	WIND	165,00
AKRES (AKHİSAR RÜZGAR EN. ELEKT.)	20		
AKRES (AKHİSAR RÜZGAR EN. ELEKT.)	3,75		
BAKİ ELEKTRİK ŞAMLI RÜZGAR (İlave)	24	WIND	92,60
BANDIRMA ENERJİ (BANDIRMA RES)	3	WIND	10,97
ÇANAKKALE RES (ENERJİ-SA ENERJİ)	25,3	WIND	92,00
ÇANAKKALE RES (ENERJİ-SA ENERJİ)	4,6		
ÇATALTEPE RES (ALİZE ENERJİ ELEKTRİK)	16	WIND	52,00
İNNORES ELEKTRİK YUNTDAĞ RÜZGAR	10	WIND	40,57

2011			
KİLLİK RES (PEM ENERJİ A.Ş.)	20	WIND	86,00
KİLLİK RES (PEM ENERJİ A.Ş.) (İlave)	15		
KİLLİK RES (PEM ENERJİ A.Ş.) (İlave)	5		
	166,65	**WIND**	**539,14**
BOLU BELEDİYESİ ÇÖP TOP. TES. BİYOGAZ	1,131	WASTE	7,50
CEV ENERJİ ÜRETİM(GAZİANTEP ÇÖP BİOGAZ)	4,524	WASTE	29,40
ITC ADANA ENERJİ ÜRETİM (İlave)	1,415	WASTE	10,40
	7,07	**WASTE**	**47,3**
	Total	**643,01**	

2010			
AKIM ENERJİ (CEVİZLİK REG. VE HES)	91,4	HYDROLIC	330,00
BEYTEK EL. ÜR. A.Ş. (ÇATALOLUK HES)	9,54	HYDROLIC	31,00
ÇAKIT HES (ÇAKIT ENERJİ A.Ş.)	20,18	HYDROLIC	96,00
KALKANDERE REG. VE YOKUŞLU HES	14,54	HYDROLIC	63,00
KAR-EN KARADENİZ EL.A.Ş. ARALIK HES	12,41	HYDROLIC	56,00
REŞADİYE 1 HES (TURKON MNG ELEKT.)	15,68	HYDROLIC	126,00
SELEN ELEKTRİK (KEPEZKAYA HES)	28	HYDROLIC	124,00
SELİMOĞLU REG. VE HES	8,8	HYDROLIC	35
ULUABAT KUVVET TÜNELİ VE HES	48,51	HYDROLIC	372,00
ULUABAT KUVVET TÜNELİ VE HES (İlave)	48,51	HYDROLIC	372,00
	297,57	**HYDROLIC**	**1605**
AKDENİZ ELEKTRİK (MERSİN RES)	33	WIND	100,00
BAKRAS EN. ELKT.ÜR. A.Ş. ŞENBÜK RES	15	WIND	47,00
BELEN ELEKTRİK (BELEN RES) (İlave)	6	WIND	19,00
BERGAMA RES EN. ÜR. A.Ş. ALİAĞA RES	52,5	WIND	355,00
BERGAMA RES EN. ÜR. A.Ş. ALİAĞA RES	37,5	WIND	

2010			
BOREAS ENERJİ (BOREAS I ENEZ RES)	15	WIND	49,00
KUYUCAK RES (ALİZE ENERJİ ÜR.) (İlave)	17,6	WIND	110,00
KUYUCAK RES (ALİZE ENERJİ ÜRET.)	8	WIND	
MAZI-3 RES ELEKTRİK (MAZI-3 RES)	7,5	WIND	26,25
ROTOR ELEKTRİK (OSMANİYE RES)	20	WIND	207,70
ROTOR ELEKTRİK (OSMANİYE RES)	17,5	WIND	
ROTOR ELEKTRİK (OSMANİYE RES)	17,5	WIND	
SARES RES (GARET ENERJİ ÜRETİM)	15	WIND	60,00
SOMA ENERJİ ÜRETİM (SOMA RES)	4,5	WIND	114,00
SOMA ENERJİ ÜRETİM (SOMA RES)	7,2	WIND	
SOMA ENERJİ ÜRETİM (SOMA RES)	7,2	WIND	
SOMA ENERJİ ÜRETİM (SOMA RES)	6,3	WIND	
SOMA ENERJİ ÜRETİM (SOMA RES) (İlave)	9	WIND	
SOMA RES (BİLGİN RÜZGAR SAN) (İlave)	27,5	WIND	307,00
SOMA RES (BİLGİN RÜZGAR SAN. EN.ÜR.)	32,5	WIND	
SOMA RES (BİLGİN RÜZGAR SAN.)(İlave)	30	WIND	
TURGUTTEPE RES (SABAŞ ELEKTRİK ÜR.)	22	WIND	64,00
ZİYARET RES (ZİYARET RES ELEK.)(İlave)	22,5	WIND	140,00
ZİYARET RES (ZİYARET RES ELEKTRİK)	12,5	WIND	
	443,3	**WIND**	**1598,95**
MENDERES GEOTERMAL DORA-2	9,5	GEOTHERMAL	73
TUZLA JEOTERMAL	7,5	GEOTHERMAL	55
	17	**GEOTHERMAL**	**128**
ITC ADANA BİOKÜTLE SANT.	**11,32**	**WASTE**	**80**
	Total	**3411,95**	

2009			
BAĞIŞLI REG. VE HES (CEYKAR ELEKT.)	9,9	Hydro	99
BAĞIŞLI REG. VE HES (CEYKAR ELEKT.)	19,7		
BEYOBASI EN. ÜR. A.Ş. (SIRMA HES)	5,9	Hydro	23
DEĞİRMENÜSTÜ EN. (KAHRAMANMARAŞ)	12,9	hydro	35,425
ELESTAŞ ELEKTRİK (YAYLABEL HES)	5,1	hydro	20
ELESTAŞ ELEKTRİK (YAZI HES)	1,1	hydro	6
ÖZTAY ENERJİ (GÜNAYŞE REG.VE HES)	8,3	hydro	29
	62,9	**hydro**	**212,425**
AK ENERJİ (AYYILDIZ RES)	15	wind	51
ALİZE ENERJİ (ÇAMSEKİ RES)	20,8	wind	82
ALİZE ENERJİ (KELTEPE RES)	18,9	wind	65
ALİZE ENERJİ (SARIKAYA RES) (Şarköy)	28,8	wind	96
AYEN ENERJİ A.Ş. AKBÜK RÜZGAR	16,8	wind	123
AYEN ENERJİ A.Ş. AKBÜK RÜZGAR (İlave)	14,7		
BAKİ ELEKTRİK ŞAMLI RÜZGAR	36	wind	337,33
BAKİ ELEKTRİK ŞAMLI RÜZGAR	33		
BELEN ELEKTRİK BELEN RÜZGAR-HATAY	15	wind	95
BELEN ELEKTRİK BELEN RÜZGAR-HATAY	15		
DATÇA RES (Datça)	0,8	wind	61,0135
DATÇA RES (Datça)	8,9		
DATÇA RES (Datça) (İlave)	11,8		
KORES KOCADAĞ RES (Urla/İZMİR)	15	wind	56
MAZI-3 RES ELEKT.ÜR. A.Ş. (MAZI-3 RES)	10	wind	79
MAZI-3 RES ELEKT.ÜR. A.Ş. (MAZI-3 RES)	12,5		
ROTOR ELEKTRİK (OSMANİYE RES)	17,5	wind	218
ROTOR ELEKTRİK (OSMANİYE RES)	17,5		
ROTOR ELEKTRİK (OSMANİYE RES)	22,5		

2009			
SAYALAR RÜZGAR (Doğal Enerji)	3,6	wind	11,368
	334,1	**wind**	**1274,7115**
ERDEMİR(Ereğli-Zonguldak)	**39,2**	**fuel oil**	**221,02**

Annual electricity generation of 2013 (AEG total)	**240.154,00**	**GWh**
20 % of AEG total	**48.030,80**	**GWh**
AEG SET 5	**49155,40**	**GWh**

	2012	**2011**	**2010**	
HYDROLIC	6922,17	1475,71	1057,33	**9455,21**
NATURAL GAS	11779,58	11505,26	235,6	**23520,44**
WIND	751,40	0,00	0	**751,40**
WASTE	433,72	119,91	0	**553,63**
GEOTHERMAL	382,00	150	0	**532,00**
FUEL OIL	0,00	1289,95	0	**1289,95**
LIGNITE	0	0	0	**0,00**
IMPORTED COAL+ASPHALTITE	720,97	4320,00	8011,80	**13052,77**
	20989,84	**18860,83**	**9304,73**	**49155,40**
	49155,40			

IN YEAR 2010, THE POWER PLANTS FROM THE LAST DAY OF 2010 TO PREVIOUS DAYS				
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**	**COMMISSIONING DATE**
TURGUTTEPE RES (SABAŞ ELEKTRİK ÜR.)	22	WIND	64,00	30.12.2010
KALKANDERE REG. VE YOKUŞLU HES	14,54	HYDROLIC	63,00	30.12.2010
RASA ENERJİ (VAN) (İlave)	10,124	NATURAL GAS	64,4	29.12.2010
EREN ENERJİ ELEKTRİK ÜR. A.Ş. (İlave)	600	**IMPORTED COAL**	4005,9	29.12.2010
EGEMEN 1B HES (ENERSİS ELEKTRİK)	11,1	HYDROLIC	40,12	28.12.2010

IN YEAR 2010, THE POWER PLANTS FROM THE LAST DAY OF 2010 TO PREVIOUS DAYS				
COMPANY	**INSTALLED POWER (MW)**	**TYPE**	**ELEC. GENERATION**	**COMMISSIONING DATE**
FEKE 2 BARAJI VE HES (AKKUR ENERJİ)	69,34	HYDROLIC	223,00	24.12.2010
SARES RES (GARET ENERJİ ÜRETİM)	15	WIND	60,00	22.12.2010
ALTEK ALARKO ELEKTRİK SANTRALLARI	21,89	NATURAL GAS	151,4	18.12.2010
UMUT III REG. VE HES (NİSAN ELEKTR.)	12	HYDROLIC	26,00	13.12.2010
KUYUCAK RES (ALİZE ENERJİ ÜR.) (İlave)	17,6	WIND	75,63	09.12.2010
KUYUCAK RES (ALİZE ENERJİ ÜR.) (İlave)	17,6	WIND	75,63	09.12.2010
SÖNMEZ ENERJİ ÜRETİM (UŞAK) (İlave)	2,564	NATURAL GAS	19,8	07.12.2010
YEDİGÖZE HES (YEDİGÖZE ELEKTRİK)	155,33	HYDROLIC	474,00	02.12.2010
REŞADİYE 1 HES (TURKON MNG ELEKT.)	15,68	HYDROLIC	126,00	26.11.2010
EGEMEN 1 HES (ENERSİS ELEKTRİK)	8,82	HYDROLIC	31,88	26.11.2010
ULUABAT KUVVET TÜNELİ VE HES (İlave)	48,51	HYDROLIC	372,00	25.11.2010
KUYUCAK RES (ALİZE ENERJİ ÜRET.)	8	WIND	34,37	11.11.2010
SOMA RES (BİLGİN RÜZGAR SAN.)(İlave)	30	WIND	102,33	11.11.2010
GÜZELÇAY-II HES (İLK ELEKTRİK ENERJİ)	4,96	HYDROLIC	26,33	11.11.2010
MURGUL BAKIR (Ç.Kaya) (İlave)	19,602	HYDROLIC	40,50	11.11.2010
KARADENİZ EL. (UZUNDERE-1 HES)(İlave)	31,076	HYDROLIC	82,50	07.11.2010
BURÇ BENDİ VE HES (AKKUR ENERJİ)	27,33	HYDROLIC	113,00	04.11.2010
EREN ENERJİ ELEKTRİK ÜR. A.Ş. (İlave)	600	**IMPORTED COAL**	4005,9	01.11.2010
		TOTAL	**9304,73**	

CDM

IMPORTED COAL	8011,80
HYDROLIC	1057,33
WIND	0
NATURAL GAS	235,6

	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
	FC (Unit:Ton/gas 103 m3)					Heat Value (Tcal.)				
Hard Coal+Imported Coal+Asphaltite	7419703,00	10574434,00	12258462,00	12105930,00	14501934,00	39.546	57.567	71.270	68.785	82.874
Lignite	56689392,00	61507310,00	55742463,00	47120306,00	57696139,00	96.551	107.210	93.587	81.676	97.916
Fuel Oil	891782	531608	564796	573534	754283	8.569	5.280	5.625	5.837	7.444
Diesel Oil	20354	15047	176379	129359	119988	209	155	1.884	1.363	1.245
LPG	0	0	0	0	0	0	0	0	0	0
Naphta	13140	0	0	0	0	105	0	0	0	0
Natural Gas	21783414	22804587	23090121	22909746	25426014	194.487	202.064	203.766	203.244	227.649

2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
		Heat Value (MJ)			NCV (MJ/kg.)				
165462543448,00	240861457680,00	298194320152,00	287795436425,76	346744816000,00	22,30	22,78	24,33	23,77	23,91
403969363080,00	448564673520,00	391566493392,00	341733388160,00	409680544000,00	7,13	7,29	7,02	7,25	7,10
35853227368,00	22090976080,00	23534012576,00	24423003792,00	31145696000,00	40,20	41,56	41,67	42,58	41,29
876472688,00	648854720,00	7881170680,00	5703745952,00	5209080000,00	43,06	43,12	44,68	44,09	43,41
0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
439859736,00	0,00	0,00	0,00	0,00	33,47	0,00	0,00	0,00	0,00
813734674920,00	845436194400,00	852558500448,00	850371628248,00	952483416000,00	37,36	37,07	36,92	37,12	37,46

lower	upper	2010	2011	2012	2013	2014
EF CO2 (kg/TJ)				EG y (MWh)		
92800,00	100000,00	150949827,21	167337105,18	172090143,41	171245566,10	198416095,41
90900,00	115000,00					
75500,00	78800,00					
72600,00	74800,00					
61600,00	65600,00					
69300,00	76300,00					
54300,00	58300,00					

	∑(FCxNCVxEF)/Egy				t CO2
	2010	**2011**	**2012**	**2013**	**2014**
Hard Coal+Imported Coal+Asphaltite	0,10	0,13	0,16	0,16	0,16
Lignite	0,24	0,24	0,21	0,18	0,19
Fuel Oil	0,02	0,01	0,01	0,01	0,01
Diesel Oil	0,00	0,00	0,00	0,00	0,00
LPG	0,00	0,00	0,00	0,00	0,00
Naphta	0,00	0,00	0,00	0,00	0,00
Natural Gas	0,29	0,27	0,27	0,27	0,26
	EF grid, Omsimple, y (t CO2/MWh)				
Total	**0,66**	**0,66**	**0,65**	**0,62**	**0,62**

electricity generation (GWh)	Supplied to Grid	Low-cost/Must-run	Thermal	Internal Consumption (%)	Internal Consumption of Thermal	Net Generation	Import
2010	204189,9	55380,10	155827,6	3,86	6021,57	149806,03	1143,8
2011	222113,5	57756,80	171638,3	5,16	8856,99	162781,31	4555,8
2012	233534,0	64625,10	174871,7	4,92	8608,26	166263,44	5826,7
2013	236406,4	68341,50	171812,45	4,65	7996,28	163816,17	7429,4
2014	247402,2	51546,20	200416,6	4,97	9953,84	190462,76	7953,3
total	1143645,97	297649,70					

BM CALCULATIONS

Fuel Type	EF CO2 (kgCO2/Tj)	EF CO2 (tCO2/Gj)	η Generation Efficiency* (%)	EF,EL,my (tCO2/MWh)
Hard Coal+Imported Coal+Asphaltite	92800,00	0,0928	0,390	0,8566
Lignite	90900,00	0,0909	0,390	0,8391
Fuel Oil	75500,00	0,0755	0,460	0,5909
Diesel Oil	72600,00	0,0726	0,460	0,5682
LPG	61600,00	0,0616	0,460	0,4821
Naphta	69300,00	0,0693	0,460	0,5423
Natural Gas	54300,00	0,0543	0,600	0,3258

	2012	**2011**	**2010**	**Total**
Hard Coal+Imported Coal+Asphaltite	720,97	4320,00	8011,80	13052,77
Fuel Oil	0,00	1289,95	0,00	1289,95
Hydrolic	6922,17	1475,71	1057,33	9455,21
Natural Gas	11779,58	11505,26	235,6	23520,44
Wind	751,40	0,00	0,00	751,40
Geothermal	382,00	150,00	0,00	532,00
Waste	433,72	119,91	0,00	553,63
Lignite	0	0	0	0
				49155,402

EF grid, Omsimple, y	0,631
EF grid, BM, y	0,39886471
Efgrid,CM,y	0,573

ANNEX 4. MONITORING INFORMATION

Please see Section B.6 for detailed information.

ANNEX 5. LSC Participant List

VERİM ENERJİ

BORGA CARBON consulting

BARBAROS RÜZGAR SANTRALİ PROJESİ PAYDAŞLAR TOPLANTISI KATILIMCI LİSTESİ

Tarih:

Saat:

Yer:

İsim	Meslek / Pozisyon	Tel No/Adres	İmza
Şerif Şen	Beyoğlu muhtarı	0536 617 3311	
Hayri [illegible]	Ormanlı köyü	0531 623 0613	
Bayram Yücel	Ormanlı köyü	0536 257 0418	
Şaban Eser	Ormanlı köyü	0537 674 8853	
Bekir Mert	Alevli köyü muhtarı	0535 419 37 75	
Hikmet Ateş	Ormanlı köyü muhtarı	0535 399 53 09	
Cahit [illegible]	Çiftçilik		
Orhan [illegible]	[illegible]	0543 375 18 60	
Recep Tiryan	Çiftçilik	0546 967 77 74	
Cemil [illegible]	"		
Ramazan Güney	"	0544 636 97 74	
Fehmi [illegible]	"	0545 587 09 44	
Serdal Soriç	Hayvancılık	0543 261 22 77	
Rıdvan [illegible]	–		
[illegible]	–		

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BOGA CARBON consulting

BARBAROS RÜZGAR SANTRALİ PROJESİ PAYDAŞLAR TOPLANTISI KATILIMCI LİSTESİ

Tarih:			
Saat:			
Yer:			
İsim	Meslek / Pozisyon	Tel No/Adres	İmza
Ahmet Can	Çiftçi	0537 552 79 35	
Mehmet Bayhan	Çiftçi		
Nevzat Gezer	Öğretmen	0536 7870450	
İsmail Alan	Çiftçilik		
Hasan Öcek	Çiftçilik		
Hüseyin Acar	"		
Reyyan Polat	"		
Süleyman Akyar	"	0537 973 59 37	
Şevket Altıntaş	Öğretmen	0541 411 70 07	
Tevfik Mert	Çiftçilik	0542 248 34 16	
Abdullah Oğuz	Güzellik Teknisyeni		
Abdullah YAŞAR	Hakim	05362197920	
Ercan Gürbüz	Gazi Çay müdürü	05326926148	
SALİH TUNCER ESEN	Öğretmen	05366083	
Raif Özdemir	TATARLI Muh	05375889169	

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Saat:			
Yer:			
İsim	Meslek / Pozisyon	Tel No/Adres	İmza
Erdoğan Kaya	Muhtar	05334152122	