Project design document form for small-scale CDM project activities

(Version 05.0)

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

PROJECT DESIGN DOCUMENT (PDD)	
Title of the project activity	10MW Adares Wind Power Project
Version number of the PDD	01
Completion date of the PDD	31.12.2015
Project participant(s)	YGT Elektrik Üretim A.Ş.
Host Party	Turkey
Sectoral scope and selected methodology(ies), and where applicable, selected standardized baseline(s)	AMS-I.D. Version 17
Estimated amount of annual average GHG emission reductions	14.918 tCO_2/year

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

YGT Elektrik Üretim A.Ş.. (hereafter referred to as “project proponent”or “YGT”) is targeting to build a 10 MW wind energy power plant (hereafter referred to as the “project”) in Selçuk, about 81 kilometres south of the city İzmir.

The proposed project activity received an operating license by the Energy Market Regulatory Authority (EMRA) on 12.05.2011. The commencement date of construction of the facility is Q3 2014 and the estimated start of operation of the facility is Q2 2015.

The proposed project activity will reduce greenhouse gas (GHG) emissions by using electricity from a renewable energy source instead of a fossil fuel and therefore displacing electricity which otherwise would have been generated by thermal power plants connected to the national grid. Thus, the proposed project activity is estimated to generate 24.791 MWh of net electricity per year and 14.918 tons of CO_2 emissions, which are harmful to the climate, are expected to be reduced by this climate-friendly technology, which otherwise would have been generated by a fossil fuel power plant and released to the atmosphere.

The proposed project activity will significantly contribute to the sustainable development of the region by achieving following benefits:

- Wind energy is a renewable energy source and thus, an energy resource that is continually replenished. Therefore, wind energy is not in conflict with the availability of energy for future generations, which is true for fossil fuels.

- As compared to the business-as-usual scenario (using fossil fuel for electricity production) in Turkey, reduction of greenhouse gas emissions (GHG) including carbon dioxide (CO_2) or nitrous oxide (N_2O). This will positively contribute to environment and climate protection.

- In addition to that, as compared to fossil-fuel power plants, other air emissions such as sulfur dioxide or particulates will be reduced, which will improve air quality for the local people.

- Replacement of fossil fuel generation and positive contribution to the use of climate-friendly electricity generation technologies and renewable energy mix in Turkey.

- Stimulation and commercialization of the use of grid connected renewable energy technologies and markets.

- Improvement of local livelihoods by creating local employment during the construction and operation phase of the facility.

- Contribution to the decrease of Turkey’s energy deficit and import dependency on fossil fuels.

The project proponent is convinced that the efficient use of wind energy will be a significant driving factor for sustainable development in Turkey, since both the scope of the created benefits and the range of the value and stakeholders’ chain through the proposed project activity is very wide as compared to the BAU scenario.

The proposed project activity’s contribution towards environmental, social, economic and technological development in line with Turkey’s policy could be summarized as follows:

Environmental Development

The main part of grid electricity is generated by use of different type of fuels which cause the emission greenhouse gases (CO2, CH4) and the other pollutants (SO_x, NO_x, CO, VOC and PM). Furthermore, process and transportation of these fuels also cause the emission greenhouse gases and the other pollutants. Additionally, the power plants which generate electricity by use of these fuels require high volumes of water consumption. With the proposed project activity, the consumption of these fuels will be replaced so that it will contribute to conservation of water, soil biodiversity as well as it will prevent the emission of greenhouse gases.

Social Development

The project will generate local employment both in the operation and also during construction phase of wind farm. Moreover, especially during operation phase, some services and consumables will be procured from local sources that will contribute the welfare of the region. Additionally, the employees in the wind farm will be provided by the project participant with health and safety trainings and also be trained in O&M of the project equipment and units by the machinery and equipment supplier.

Economic Development

The project will lead to permanent employment both in the power plant itself and also for the services outsourced. The employees, most of them being unskilled, will be fully employed in the plant and receive a social security. The project will also create part-time employment during the construction phase for construction workers, resulting in an improvement of their living conditions.

All these created jobs will have a significant impact on economic development and contribute to the economic well-being of the region.

Another benefit, related with the project activity is its positive contribution to the net foreign currency savings of Turkey related to natural gas imports by shifting some of electricity generation away from natural gas towards using internally available renewable sources. This will result in an improvement of Turkey's balance of payments and investment, and thus making more money free for the re-investment in the economic well-being of the population in Turkey.

Technological Development

The proposed project activity will contribute to wider usage of wind power technology and encourage the entrepreneurs to invest in wind power plants. As a result of that, expanding market volume will lead to interest of national industrialists to the wind power technologies. Hence, this will result in technology transfer and brand new research and development activities in the national level.

A.2. Location of project activity

A.2.1. Host Party

Turkey

A.2.2. Region/State/Province etc.

The Province of İzmir

A.2.3. City/Town/Community etc.

District of Selçuk, between the villages Sultaniye, Acarlar and Çamlık

A.2.4. Physical/Geographical location

The location of the proposed project is placed Çatalsan Tepe region of Selçuk, about 81 kilometres south of the city İzmir. The closest settlement area is Sultaniye which is 800 m far from the project site. However, due to the very few residents in the village[1], Acarlar[2] is considered as the closest settlemet area which is 1450 m far from the project site.[3]

Figure 1 – Map for the exact location of the project activity

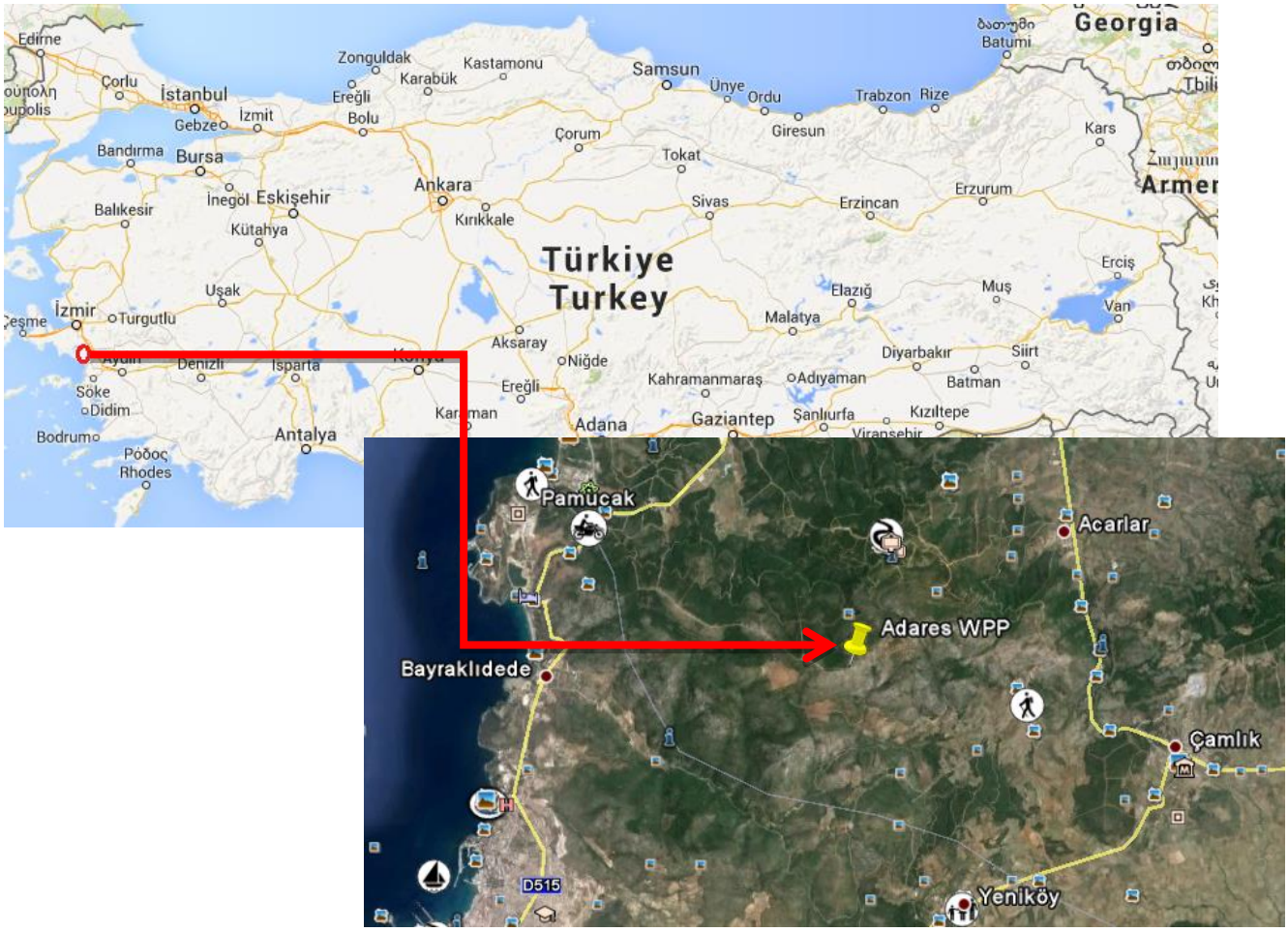

Table 1- Wind Turbine Unit Coordinates

Unit No	Latitude	Longitude
1	528034.00	4194691.00
2	528375.00	4194546.00
3	528721.00	4194552.00
4	529062.00	4194828.00

[1] http://www.yerelnet.org.tr/koyler/koy.php?koyid=249622

[2] http://www.yerelnet.org.tr/koyler/koy.php?koyid=249617

[3] See Project Introduction File (PIF), page 15 and page 20

5	**529395.00**	**4194946.00**

A.3. Technologies and/or measures

In the scope of the project, 5 wind turbines with the capacity of 2.0 MW are selected. The manufacturer of the wind turbines is Gamesa and the model is G90. The G90 is a two-megawatt turbine rated power, has a three-blade rotor diameter of 90 m and a swept area of 6,362 m2, has both aerodynamic braking system and hydraulic lightning protection in accordance with IEC 61024-1, pitch angle control for each of its blades and this supported by a tapered tower height of 78 meters consists of four sections. The lifetime of the turbines is 20 years.[4]

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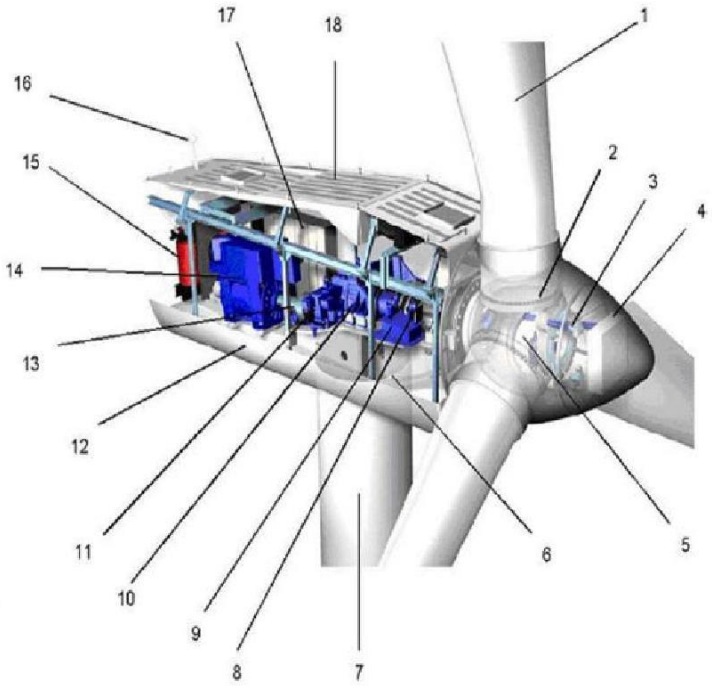
-

1 - Blade
2 - Blade bearing
3 - Pitch system
4 - Nose cone
5 - Hub
6 - Yaw system
7 - Tower
8 - Main bearing house
9 - Hydraulic unit
10 - Gearbox
11 - HSS brake
12 - Nacelle cover (bottom)
13 - High speed coupling
14 - Generator
15 - Transformer
16 - Anemometer and wind vane
17 - Top controller
18 - Nacelle cover (top)



A.4. 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)	YGT Elektrik Üretim A.Ş.	No

YGT Elektrik Üretim A.Ş. is the project participant of the project activity. Green Consult and Finance (GCF) is the carbon advisor in the project activity.

[4] www.gamesacorp.com/recursos/doc/rsc/compromisos/clientes/certificaciones-ohsas-y-i/documentacion-declaracion-ambiental-g90-english.pdf

A.5. Public funding of project activity

There is no recourse to any public funding by YGT Elektrik Üretim A.Ş. in the project activity. The project proponent hereby confirms that there is no divergence of Official Assistance Declaration (ODA) for the project activity.

A.6. Debundling for project activity

According to Appendix C, paragraph 2 of the Simplifies Modalities and Procedures for small-scale CDM project activities, a proposed small-scale project activity shall be considered as a debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

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

For the project activity under consideration none of the above applies. There is neither a registered small-scale project nor any submission of application to register another small-scale activity by YGT. Consequently, the project activity is not a debundled component of a larger CDM project activity and the project activity qualifies for the use of the Simplifies Modalities and Procedures for small-scale CDM project activities.

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

B.1. Reference of methodology and standardized baseline

According to the "Indicative simplified baseline methodologies and monitoring methodologies for selected small-scale CDM project activity categories in Appendix B of the simplified modalities and procedures for small-scale CDM project activities[5]", the approved baseline and monitoring methodology applicable to the project activity is:

Type I: Renewable Energy Project
Category I.D: Grid connected renewable electricity generation (Version 17 / EB 61)[6]

The following methodological tool will be used for the determination of the emission reductions from the project:

- Generation of electricity and supply to grid: "Tool to calculate the emission factor for an electricity system" (Version 04.0)[7]

[5] http://cdm.unfccc.int/Projects/pac/ssclistmeth.pdf

[6] http://cdm.unfccc.int/methodologies/SSCmethodologies/approved

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

B.2. Project activity eligibility

The applicability conditions according to AMS-I.D (Version 17 / EB 61) methodology are as follows:

1. *This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:*

    (a) Supplying electricity to a national or a regional grid; or

    (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.

The project activity is a renewable energy project which makes use of wind power for electricity production. The produced electricity is delivered to the electricity distribution system. Therefore, the project activity involves the production of electricity from a renewable energy source supplied to a carbon-intensive grid.

2. *If the new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.*

The project activity comprises the production of electricity from wind power without any co-firing of any fossil fuel in the power facility. Since the project activity does not include non-renewable component, the above condition is not applicable in the scenario.

3. *Combined heat and power (co-generation) systems are not eligible under this category.*

The project activity involves only the production of electricity from wind power. Thus, it is not a combined heat and power (co-generation) system and thus is eligible to be included in this category.

4. *In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.*

The project activity is a Greenfield (new facility) activity and does not involve the addition of renewable energy generation units at an existing renewable power generation facility. Thus, the above condition is not applicable in the scenario.

5. *In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.*

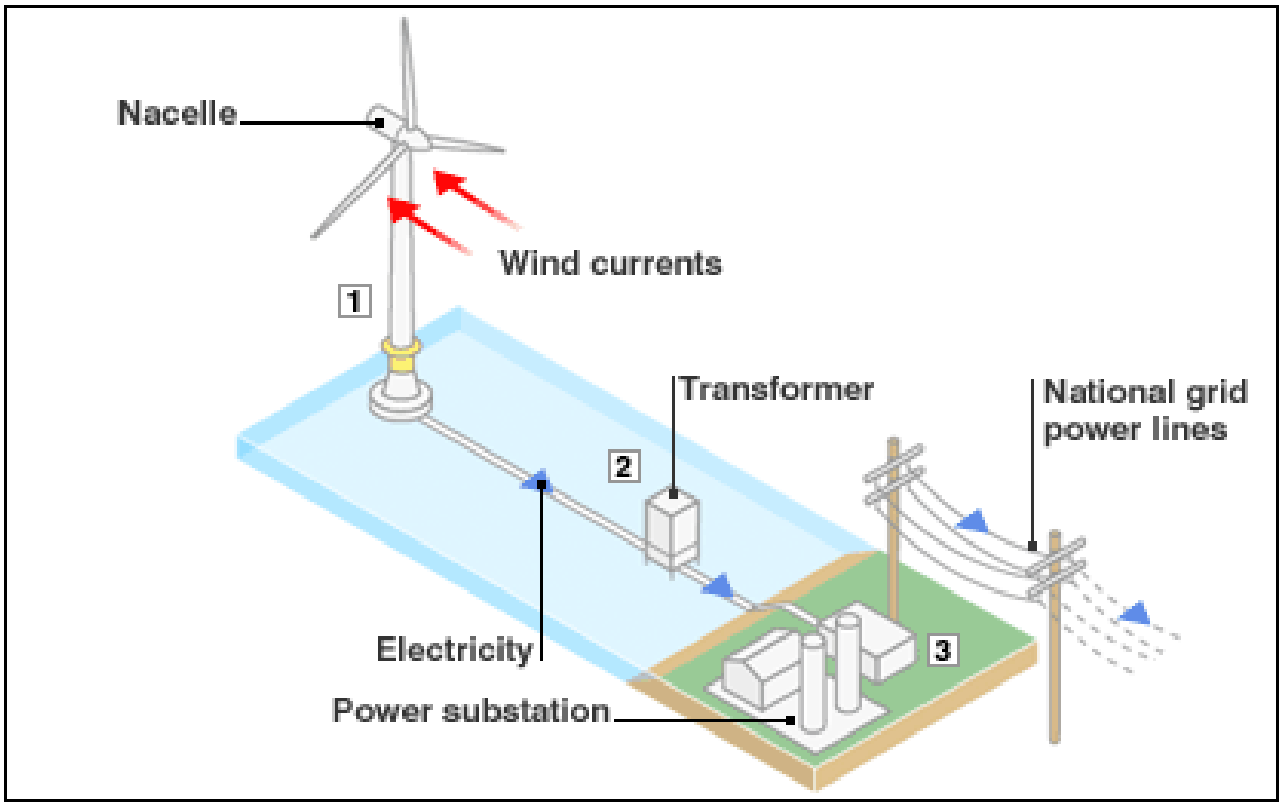
The project activity does neither to seek to retrofit nor to modify an existing facility. Thus, it is eligible to be included in this category. Furthermore, the capacity of the power generation facility is 10 MW which is less than the threshold limit of 15 MW. Thus, it is eligible under the small-scale CDM project category.

B.3. Project boundary

The project activity is a renewable energy project which makes use of wind power for electricity production. The produced electricity is delivered to the electricity distribution system. Figure 2 illustrates operation diagram of the project.

Figure 2 – Operation Diagram[8]

[8] http://newsimg.bbc.co.uk/media/images/44086000/gif/_44086717_wind_turbine_416.gif



1- Blades turn shaft inside nacelle - a box at top of turbine. Generator inside nacelle uses magnetic fields to convert rotational energy into electric energy
2- Transformer
3- National grid distributes power around the country

Table 2 shows the greenhouse gases which are considered in baseline calculation;

Table 2- Emission Sources

	Source	GHG	Included	Justification/Explanation
Baseline	Emissions due to electricity generation and and delivery to grid	CO_2	Yes	Main emission source
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
Project Activity	Emissions due to construction and operation of the project activity	CO_2	No	Minor emission source
		CH_4	No	Minor emission source

		N_2O	No	Minor emission source

B.4. Establishment and description of baseline scenario

Without the project activity the current electricity demand would be fulfilled either by the existing grid capacity, which is dominated by fossil fuel, or capacity enhancement of the existing grid. In Turkey, power generation is mainly based on coal and natural gas. Thus, any addition on capacity in future is more likely to be coal and natural gas based. In addition to that, the Turkish Government has announced year 2012 as the "Coal Year" to make enhanced use of the domestically available coal and promote it for the production of electricity.[9] This alternative is in compliance with all applicable and regulatory requirements and may be considered as part of the baseline.

Without the existence of the project activity, supplied electricity to the grid by the project would have otherwise been generated by already grid-connected mainly fossil-fuel based power plants or by addition of new generation sources. Thus, the baseline emissions from electricity production will be calculated by multiplying the electricity (kWh) sold to grid by the emission factor for the grid, which is calculated by using Option (a) of paragraph 12 for type I.D. (version 17):

(a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the "Tool to calculate the Emission Factor for an electricity system";

OR

(b) The weighted average emissions (in t CO_2/MWh) of the current generation mix. The data of the year in which project generation occurs must be used.

Calculations shall be based on data from an official source (where available) and made publicly available.

For the project activity, Option (a) has been used to determine the grid emission factor. According to the "tool to calculate the emission factor for an electricity system"[10], the simple method for calculating the operating margin (OM) can be used *"…if low-cost/must-run resources constitute less than 50% of total grid generation in 1) average of the five most recent years, or 2) based on long-term averages for hydro-electricity production."* Since the average percentage contribution of low-cost/must-run resources for the last five years constitute 23.2% and is less than 50% of total electricity generation supplied to the grid, the operating margin (OM) is calculated as Simple OM.

The calculations and values for average percentage contribution of low-cost/must-run resources, OM and BM, and the resulting combined margin (CM) emission factor can be found in sections B.6.1 and B.6.3.

B.5. Demonstration of additionality

The project is a small scale project activity so the project additionality is demonstrated as per "Guidelines on the demonstration of additionality of small-scale project activities" (Version: 09)[11]

[9] http://www.thelira.com/haber/87332/

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

[11] https://cdm.unfccc.int/UserManagement/FileStorage/I5FZTH0DK3O2QLA1VRWU9X7SE6MBY8

In line with this guideline, the Project is deemed to be additional if it faces at least one of the following barriers:
(a) Investment barriers
(b) Technological barriers
(c) Barrier due to prevailing practice
(d) Other barriers

The additionality of this wind power project is proven by using the Investment barrier (option a) in accordance with *Guidelines on the demonstration of additionality of small-scale project activities (Version: 09) & Guidelines on the Assessment of Investment Analysis* (*Version: 5*)[12].

(a) Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions;
As per this tool, it is to be determined that the project activity is not:
1. The most economically or financially attractive; or
2. Economically or financially feasible, without the revenue from the sale of certified emission reductions.

The details about the Investment ***Barrier*** and ***Suitability of benchmark*** will be submitted to DOE.

Prior Consideration

The decision in favour or against a project investment depends on the expected revenues and risks, like for every other private investment. As it is described above, the project activity is economically unattractive. Therefore, YGT made the decision of seeking additional funds through the generation and sales of carbon credits. The following activities clearly illustrate that GS VER was clearly considered prior to the implementation of the project.
The Table 8 below shows the chronology of key events with their related dates during the decision process of the VER project activity:

Table 8 - Key events and dates during the decision process of the VER project activity

No.	Date (DD/MM/YYYY)	Key Event
1	13/11/2012	First proposal from Green Consult and Finance
2	21/03/2013	Decision board of directors
3	01/07/2013	Agreement with Green Consult and Finance for Carbon Consultancy
4	06/07/2013	Local Stakeholders Consultation Meeting
5	20/09/2013	Agreement with Gamesa
6	30/10/2014	Start date of Construction
7	10/10/2015	Start date of commercial operation

According to Turkish regulations, a project developer is required to get an electricity generation license from EMRA. Thus, the issuance of the license cannot be considered as „Project Start Date" but a prerequisite to proceed for further project development activities.

[12] http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf

The Turbine contract date (20/09/2013) is considered project start date in line with the decision of EB41[13]. As per shown in the Table 8, YGT has considered the VER revenues and took a decision board of directors before the project start date (21.03.2013).

B.6. Emission reductions

B.6.1. Explanation of methodological choices

The project is a small scale project as it is identified in the section B.1. Additionally, the baseline of the project is explained in the section B.4. Therefore as it is stated in AMS I.D (Version 17), emission reduction calculations of the project will be calculated according to "Tool to calculate the emission factor for an electricity system" (Version 04.0).

As per paragraph 22 of AMS-I.D (Version 17) methodology, *"if the energy generating equipment is transferred from another activity, leakage is to be considered".* Since the project does not imply the transfer of the energy generating equipment from another activity, leakage is not considered.

B.6.2. Data and parameters fixed ex ante

(Copy this table for each piece of data and parameter.)

Data / Parameter	EG_{Gross}
Unit	MWh
Description	Gross electricity production by fossil fuel power sources in 2010, 2011, 2012
Source of data	TEIAS (Turkish Electricity Transmission Company) www.teias.gov.tr ; The distribution of gross electricity generation by primary energy resources and the electricity utilities in Turkey in 2010, 2011, 2012.
Value(s) applied	See calculations of the emission factor in section B.6.3
Choice of data or Measurement methods and procedures	According to "The Official Statistics Programme 2012-2016"[14], based on the Statistics Law of Turkey No 5429, TEIAS is the official source for the related data, therefore providing the most up-to-date and accurate information available.
Purpose of data	Calculating baseline emissions and emission reductions due to the electricity production
Additional comment	-

Data / Parameter	$FC_{i,y}$
Unit	tons (m^3 for gaseous fuels)
Description	Amount of fossil fuel i consumed in the project electricity system by generation sources in year y (2010, 2011, 2012).
Source of data	TEIAS www.teias.gov.tr ; Fuels consumed in thermal plants in Turkey by the electricity utilities in 2010, 2011, 2012.
Value(s) applied	See calculations of the emission factor in section B.6.3
Choice of data or Measurement methods and procedures	According to "The Official Statistics Programme 2012-2016"[15], based on the Statistics Law of Turkey No 5429, TEIAS is the official source for the related data, therefore providing the most up-to-date and accurate information available.

[13] http://cdm.unfccc.int/EB/041/eb41rep.pdf

[14] http://www.turkstat.gov.tr/rip/rip.pdf

[15] http://www.turkstat.gov.tr/rip/rip.pdf

Purpose of data	Calculating baseline emissions and emission reductions due to the electricity production
Additional comment	-

Data / Parameter	**$NCV_{i,y}$**
Unit	GJ/tons (m^3 for gaseous fuels)
Description	Net calorific value (energy content) of fossil fuel type i in year y
Source of data	Calculated based on TEIAS (www.teias.gov.tr) heating values of fuels consumed in thermal plants in Turkey by the electricity utilities in 2010, 2011, 2012.
Value(s) applied	See calculations of the emission factor in section B.6.3
Choice of data or Measurement methods and procedures	According to "The Official Statistics Programme 2012-2016"[16], based on the Statistics Law of Turkey No 5429, TEIAS is the official source for the related data, therefore providing the most up-to-date and accurate information available.
Purpose of data	Calculating baseline emissions and emission reductions due to the electricity production
Additional comment	-

Data / Parameter	**$EF_{CO2,i,,y}$**
Unit	tCO_2/GJ
Description	CO_2 emission factor of fossil fuel type i used in power unit m 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 of Chapter 1 of Volume 2 (Energy) of the 2006 IPCC Guidelines for National Greenhouse Gas Inventory http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.htm have been applied.
Value(s) applied	See calculations of the emission factor in section B.6.3
Choice of data or Measurement methods and procedures	There is no official information on the fuel specific default emission factor in Turkey. Therefore, IPCC values have been applied as referred in the "Tool to calculate the emission factor for an electricity system (version 04.0)".
Purpose of data	Calculating baseline emissions and emission reductions due to the electricity production
Additional comment	-

Data / Parameter	**$EG_{m,y}$**
Unit	MWh
Description	Net electricity generated by power plant/unit m
Source of data	TEIAS www.teias.gov.tr ; Generation units put into operation in 2010, 2011, 2012.
Value(s) applied	Appendix 4.
Choice of data or Measurement methods and procedures	Once for each crediting period using the most recent three historical years for which the data is available at the time of submission of the PDD to the DOE for validation.

[16] http://www.turkstat.gov.tr/rip/rip.pdf

Purpose of data	Calculating baseline emissions and emission reductions due to the electricity production
Additional comment	-

Data / Parameter	$\eta_{m,y}$
Unit	%
Description	Average net energy conversion efficiency of power unit m in year y
Source of data	Based on the „Environmental Map (Cevre Atlasi)" published by the Environmental Inventory Head Department under Ministry of Environment and Urbanization ; http://www.cedgm.gov.tr/CED/Files/cevreatlas%C4%B1/atlas_metni.pdf (p.197 table X.3.1; Thermal Plants and Environment)
Value(s) applied	See calculations of the emission factor in section B.6.3
Choice of data or Measurement methods and procedures	The average values of thermal plants in Turkey are taken from the report "Environmental Map".
Purpose of data	Calculating baseline emissions and emission reductions due to the electricity production
Additional comment	

B.6.3. Ex ante calculation of emission reductions

According to paragraph 10 of AMS-I.D (version 17), the baseline emissions are the product of electrical energy baseline expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor. That is,

$$BE_{Elec,y} = EG_{BL,y} \cdot EF_{CO_2,grid,y} \quad (1)$$

where;

$BE_{Elec,y}$ Baseline emissions from renewable energy production in year *y* (tCO_2)
$EG_{BL,y}$ Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y* (MWh)
$EF_{CO_2,grid,y}$ CO_2 emission factor of the grid in year *y* (tCO_2/MWh)

As explained in section B.4 "Baseline for grid electricity displacement", in the following calculations, Option (a) of paragraph 11 of AMS-I.D. (version 17), "*A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the "Tool to calculate the Emission Factor for an electricity system",* will be used.
The following six steps below, provided in the Methodological Tool "Tool to calculate the emission factor for an electricity system" (Version 04.0), are applied to calculate the combined margin (CM) emission factor, which in the equation above is denoted as $EF_{CO_2,grid,y}$

STEP 1 - Identify the relevant electricity systems

Since Turkey has nationwide single electricity grid.[17]

[17] www.teias.gov.tr

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",* will be used.

STEP 3 - Select a method to determine the operating margin (OM)

According to the Methodological Tool, the calculation of the OM emission factor is based on one of the following four methods:
(a) Simple OM; or
(b) Simple adjusted OM; or
(c) Dispatch data analysis OM; or
(d) Average OM.

Table 9 illustrates the share of primary sources in electricity generation in Turkey for the five most recent years. Hydro and other renewable energy sources are accepted as low cost/must run sources and their share in average of 5-years is 23.2%, which is below 50%. Thus, in accordance with the Methodological Tool, (a) Simple OM method will be used in the calculations. Other methods are not applicable due to lack of data.

Table 9 – 5 year development of the share of Low Cost Resource (LCR) Production (GWh)) in Turkey (2008 – 2012)[18]

	2008	2009	2010	2011	2012
GENERAL TOTAL	198.418,0	194.812,9	211.207,7	229.395,1	239.496,8
Hydro	33.269,8	35.958,4	51.795,5	52.338,6	57.865,0
Renewables and Waste	219,9	340,1	457,5	469,2	720,7
Geothermal and Wind	1.008,9	1.931,1	3.584,6	5.418,2	6.760,1
Share of LCRs	17,4%	19,6%	26,4%	25,4%	27,2%

The Ex-ante option which states that *"For grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation"*, has been chosen. That is, 3 year generation-weighted average based on the most recent data available has been selected for data vintage.

STEP 4 - Calculation of the Operating Margin (OM) emission factor according to the selected method

With regard to the calculation of the Simple OM, as per the Methodological Tool "Tool to calculate the emission factor for an electricity system" (Version 04.0), 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",* can only be used if

(a) The necessary data for Option A is not available; and
(b) 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; and
(c) Off-grid power plants are not included in the calculation.

Since for the use of Option A necessary data is not available, only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity

[18] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/uretim%20tuketim(23-47)/37(06-12).xls

supplied to the grid by these sources is known as well as Off-grid power plants are not included in the calculation, we will use Option B.

Under this 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 the fuel type(s) and total fuel consumption of the project electricity system, as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum FC_{i,y} \cdot NCV_{i,y} \cdot EF_{CO2,i,y}}{EG_y} \quad (2)$$

where

$EF_{grid,OMsimple,y}$ Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)
$FC_{i,y}$ Amount of fossil fuel type *i* consumed in the project electricity system in year y (mass or volume unit)
$NCV_{i,y}$ Net calorific value (energy content) of fossil fuel type *i* in year y (GJ/mass or volume unit)
$EF_{CO2,i,y}$ CO_2 emission factor of fossil fuel type *i* in year *y* (tCO_2/GJ)
EG_y Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year *y* (MWh)
i All fossil fuel types combusted in power sources in the project electricity system in year *y*
y The relevant year as per the data vintage

Since in the case for Turkey, electricity generated by solar and low cost biomass facilities are insignificant and there is no nuclear plant in Turkey, only hydro, wind and geothermal facilities are accepted as the low cost /must run plants.

The following official data are available on the website of the Turkish Electricity Transmission Company (TEIAS):

- Annual fuel consumption by fuel type[19],
- Annual heating values for fuels consumed for electricity generation[20],
- Annual electricity generation by fuel type, import and export[21]

Annual heating values for each fuel type are directly related with the fuel consumption and are used to calculate average Net Calorific Values (TJ/kt).

The calculation is based on data from 3 most recent years available 2010, 2011 and 2012 at TEIAS. The coefficients required for the calculation of CO_2 emission factor (tCO2/TJ) have been obtained through *IPCC 2006 Guidelines for National Greenhouse Gas Inventories* [22].

All the detailed calculations (NCVs etc.) as well as the data used for the calculations can be found in Appendix 4.

Table 10 shows the resulting CO_2 emissions from electricity generation for the years 2010-2012.

Table 10 – CO_2 emissions from electricity generation in tons (2010-2012)[23]

	2010	**2011**	**2012**	**Total CO_2 emissions (2010-2012)**
CO_2	99.426.891	111.256.589	112.520.745	323.204.224

[19] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/yak%C4%B1t48-53/49.xls

[20] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/yak%C4%B1t48-53/51.xls

[21] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/uretim%20tuketim(23-47)/37(06-12).xls

[22] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf

[23] Calculations will be submitted to DOE

emissions				

Table 11 illustrates the data with regard to the gross electricity production by all the relevant energy sources. Low-cost/must run resources like hydro, wind, MSW, geothermal and biomass do not emit fossil CO2 and thus are not taken into account in calculations.

Table 11 – Gross electricity production by fossil energy sources 2010-2012 (GWh)[24]

Fuel Type	2010	2011	2012
Hard Coal + Imported Coal	19.104,3	27.347,5	33.324,2
Lignite	35.942,1	38.870,4	34.688,9
Fuel Oil	2.143,8	900,5	981,3
Diesel Oil	4,3	3,1	657,4
LPG	0,0	0,0	0,0
Naphta	31,9	0,0	0,0
Natural Gas	98143,7	104.047,6	104.499,2
Total fossil fuels	**155.370**	**171.169**	**174.151**

Net electricity generated and supplied to the grid by thermal power plants has been calculated by making use of data obtained from TEIAS. The ratio between total gross and total net generation (including low-cost/must run plants) has been calculated for each year. The same ratio is assumed to be valid for all thermal plants and accordingly, total net generation by the plants has been calculated. Summing up total net generation with the imported electricity, total supply excluding low cost / must run sources for each year is determined and given in Table 12.

Table 12 - Net electricity generation from thermal power plants and total supply electricity to the grid (units in GWh)[25]

Year	Gross generation	Net generation	Net/Gross Ratio	Net gen. Fossil Fuels	Import	Total Supply to the Grid
2010	211207,7	203046,1	96.14%	149.366	789	150.510
2011	229395,1	217557,7	94.84%	162.336	812	166.892
2012	239496,8	227707,3	95.08%	165.578	1'144	171.405
Total Net Generation Thermal				**477.281**	**11.526**	***488.807***

As a result, OM emission factor considering the years 2010 - 2012 has been calculated as simply dividing the total CO_2 emission (Table 10) by the total net electricity supply to the grid (Table 12) which is:

$EF_{grid,OMsimple,y}$ = 0.661(tCO_2/MWh)

STEP 5 - Calculate the build margin (BM) emission factor

Last TEIAS statistics available at the time where the PDD has been written were the data from 2011.

As per indicated in the Methodological Tool, the project participant chose Option 1 *"For the first crediting period, calculate the build margin emission factor ex ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at*

[24] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/uretim%20tuketim(23-47)/37(06-12).xls

[25] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/uretim%20tuketim(23-47)/34(84-12).xls

the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period".

The project participant proceeded according to the defined procedure and diagram in the Methodological Tool (pp.20-21).

(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 ($SET_{5\text{-}units}$) and determine their annual electricity generation ($AEG_{SET\text{-}5\text{-}units}$, in MWh);

Since exact dates in the format DD/MM/YYY for the plants put into operation in 2011 are not available at TEIAS and the pants are listed in alphabetic order, to be conservative, $SET_{5\text{-}units}$ and their annual electricity generation are selected from the plants which have the largest annual electricity production. VER projects and revised projects excluded from the list . $AEG_{SET\text{-}5\text{-}units}$ is 10.779,60 GWh. The composition of $SET_{5\text{-}units}$ can be found in Appendix 4.

(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 as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20% of AEG_{total} (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) ($SET_{\geq 20\%}$) and determine their annual electricity generation ($AEG_{SET\text{-}\geq 20\%}$, in MWh);

$SET_{\geq 20\%}$ has been determined (see Appendix 4 for the full list). The total annual (gross) electricity generation of the most recent year 2012 (AEG_{total}) was 239496,8 GWh. Computationally, 20% of 239496,8 GWh would be 47.899 GWh. However, since, as compared to 2010, exact dates in the format DD/MM/YYY for the plants put into operation in 2009 and 2011 are not available at TEIAS, the set of sample, in addition to 2010and 2011, includes some randomly selected the plants put into operation in 2009, resulting in $AEG_{SET\text{-}\geq 20\%}$ of 47.932,4 GWh. Again,VER projects and revised projects excluded from the list. The full list of $AEG_{SET\text{-}\geq 20\%}$ can be found in Appendix 4.

(c) From $SET_{5\text{-}units}$ and $SET_{\geq 20\%}$ 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. In this case ignore steps (d), (e) and (f). Otherwise:
Since $AEG_{SET\text{-}\geq 20\%}$, > $AEG_{SET\text{-}5\text{-}units}$, both $SET_{\geq 20\%}$ and $AEG_{SET\text{-}\geq 20\%}$, are important for our purposes such that $SET_{\geq 20\%}$ is our SET_{sample} for the determination of the build margin (BM) emission factor. Since the date of the last power plant put into operation, being in our sample $AEG_{SET\text{-}\geq 20\%}$, is 2009 and therefore no power plant started to supply electricity to the grid more than 10 years ago, we can use SET_{sample} to calculate the build margin. Thus, we can ignore the next steps (d), (e) and (f), defined in the Methodological Tool.
The data are taken from TEIAS' yearly published reports *Capacity Projection* for the years 2011, 2010 and 2009[26]. It is important to note, that in some parts of those reports, there's a lack of data availability and granularity.
All the underlying calculations and data related with $SET_{5\text{-}units}$, $SET_{\geq 20\%}$ and SET_{sample}, $AEG_{SET\text{-}5\text{-}units}$ and $AEG_{SET\text{-}\geq 20\%}$ can be found in detail in Appendix 4.
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 electricity generation data is available, calculated as follows:

[26] http://www.teias.gov.tr/KapasiteProjeksiyonu.aspx

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} \cdot EF_{EL,m,y}}{\sum_{m} EG_{m,y}} \quad (3)$$

where

$EF_{grid,BM,y}$ Build margin CO_2 emission factor in year *y* (tCO_2/MWh)
$EG_{m,y}$ Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (mass or volume unit)
$EG_{EL,m,y}$ 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 electricity generation data is available

According to the Methodological Tool, the CO_2 emission factor of each power unit *m* ($EF_{EL,m,y}$) should be determined as per the guidance in Step 4 (a) 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.

Since power plant specific fuel consumption data is not available for Turkey, option A2 has been selected for the calculation of the CO_2 emission factor of each power unit *m* ($EF_{EL,m,y}$) as follows:

$$EF_{EL,m,y} = \frac{EF_{CO_2,i,y} \cdot 3.6}{\eta_{m,y}} \quad (4)$$

where

$EF_{ELm,y}$ CO_2 emission factor of the power unit m in year *y* (tCO_2/MWh)
$EF_{CO2,m,i,y}$ Average CO2 emission factor of fuel type *i* used in power unit m in year *y* (tCO2/GJ)
$\eta_{m,y}$ Average net energy conversion efficiency of power unit m in year *y* (ratio)
m All power units serving the grid in year *y* except low-cost/must-run power units
y The most recent year for which power generation data is available at the time of submission of the VER-PDD to the DOE for validation (ex-ante option)

Table 13 illustrates the average CO_2 emission factor of fuel types ($EF_{CO2,m}$) and the average net energy conversion efficiency of the power plants ($\eta_{m,y}$) used for the calculation of emission factor of the power units ($EF_{ELm,y}$). The values $EF_{CO2,m}$ has been taken from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Table 13 - Net electricity generation from thermal power plants and total supply electricity to the grid (units in GWh)

Fuel Type	**Average emission factor EFCO2,m,i,y (tCO2/GJ)**	**Average Efficiency (ηm,y)**	**Emission factor of the power unit EFEL,m,y (tCO2/MWh) Efficiency (ηm,y)**
Hard Coal + Imported Coal	94,60	39,00%	0,873
Lignite	90,90	39,00%	0,839
Fuel Oil	75,50	46,00%	0,591
Natural Gas	54,30	60,00%	0,326
Hydro	-	-	-

Waste and Renewables	-	-	-

By using the calculated total (gross) electricity generation of the SET_{sample} and the determined emission factors per power plant (i.e. fuel type), the resulting CO_2 emissions can be determined, which together with the calculated total (gross) electricity generation of the SET_{sample} serve as basis for the determination of the build margin (BM) emissions factor (see Table 14).

Table 14 - Electricity generated (GWh) by the power units included in the SET_{sample} and the resulting CO_2 emissions for the build margin calculation

Fuel Type	**Sample Group Total Electricty Generation (GWh)**	**Emission factor of the power unit EFEL,m,y (tCO2/MWh) Efficiency (ηm,y)**	**CO2 Emission (ktCO2)**
Hard Coal + Imported Coal	13.400,00	0,873	11.701,29
Lignite	184,00	0,839	154,39
Fuel Oil	701,15	0,591	414,29
Natural Gas	24.679,47	0,326	8.040,57
Hydro	8.815,39	-	-
Waste and Renewables	152,40	-	-
Total	**47.932,41**		**20.310,54**
EF Grid	**0,424**		

STEP 6 - Calculate the combined margin emissions factor

For the calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) option *" (a) Weighted average CM"* was applied which is calculated as follows:

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

where

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

According to the Methodological Tool, default weights for the operating margin and build margin emission factors for wind power generation activities are defined as:
w_{OM} =0.75; w_{BM} = 0.25

As a result:

$EF_{grid,CM,y}$ = 0.661 tCO2/MWh * 0.75 + 0.424 tCO2/MWh * 0.25 = 0,60175 tCO2/MWh

1) Project emissions:

Since the proposed project activity is involves electricity generation by use of wind power, it does not result in GHG emissions. Hence the project emissions are taken as 0.

2) Leakage:

Since the project does not imply the transfer of the energy generating equipment from another activity, leakage is not considered.

3) Baseline emissions and emission reductions (ex ante calculations):

As per formula (5), the calculated value for **$EF_{grid,CM,y}$ is 0,60175 tCO2/MWh.**

Therefore, according to formula (1), the baseline emissions from renewable energy production **$BE_{Elec,y}$** is **14.918 tCO_2/year** during the years 2015-2022.

B.6.4. Summary of ex ante estimates of emission reductions

Year	Baseline emissions (t CO_2e)	Project emissions (t CO_2e)	Leakage (t CO_2e)	Emission reductions (t CO_2e)
October 2015	2.486	0	0	2.486
2016	14.918	0	0	14.918
2017	14.918	0	0	14.918
2018	14.918	0	0	14.918
2019	14.918	0	0	14.918
2020	14.918	0	0	14.918
2021	14.918	0	0	14.918
October 2022	12.432	0	0	12.432
Total	104.426	0	0	104.426
Total number of crediting years	7 years			
Annual average over the crediting period	14.918	0	0	14.918

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

(Copy this table for each piece of data and parameter.)

Data / Parameter	**$EG_{facility,y}$**
Unit	MWh
Description	Quantity of net electricity generation supplied to the grid in year y by the project plant/unit that has been added under the project activity
Source of data	Project activity site
Value(s) applied	24.791
Measurement methods and procedures	The quantity of net electricity generation supplied to the grid by the project plant will recorded and reported based on the TEIAS meters at the project site. The electricity will be measured continuously and recorded at least monthly.
Monitoring frequency	Continuous measurement and monthly recording.
QA/QC procedures	Maintenance and calibration of TEIAS meters will be carried out according to the instructions of the manufacturer or legal requirements. Since TEIAS meters are sealed by TEIAS, the project participant cannot intervene with the devices.
Purpose of data	To calculate the Emission Reduction due to the electricity generation supplied to the grid
Additional comment	

B.7.2. Sampling plan

Not applicable

B.7.3. Other elements of monitoring plan

All monitoring procedures and requirements of the proposed project activity will be in accordance with the methodology AMS-I.D “Grid connected renewable electricity generation (version 17)”

The project owner YGT 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.

YGT 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. Duties therefore will be incorporated in the personnel’s daily activity schedules to ensure data continuity and high-quality data collection. 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.7.4. Date of completion of application of methodology and standardized baseline and contact information of responsible persons/ entities

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Date: 10.01.2013

As the project consultant: Green Consult and Finance Ltd.

Tel/Fax: +90 312 473 03 99
E-mail: yalcin.yilmaz@green-cf.com

Green Consult and Finance Ltd. is not a project participant.

As the project owner: YGT Elektrik Üretim A.Ş.

SECTION C. Duration and crediting period

C.1. Duration of project activity

C.1.1. Start date of project activity

Start date of the project activity is 20.09.2013; the date of agreement between YGT and Gamesa

C.1.2. Expected operational lifetime of project activity

Expected life time of the project is 20 years.

C.2. Crediting period of project activity

C.2.1. Type of crediting period

It is 1st Renewable Crediting Period.

C.2.2. Start date of crediting period

10.10.2015

C.2.3. Length of crediting period

7 Years and 0 Months

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

Please refer to the Local Stakeholders Consultation (LSC) Report and Gold Standard Passport for detailed information with regard to Environmental Impacts (EIA) of the project.

It is important to note that the project has received an official “Exempt from EIA Notice” from the Ministry of Environment and Urbanization (MoEU).

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

Detailed information with regard to the stakeholder consultation and the stakeholders’ comments is provided in the LSC Report, which is also available to DOE.

E.2. Summary of comments received

A detailed table with all the stakeholder comments and the responses is provided in the LSC Report.

E.3. Report on consideration of comments received

Please refer to LSC Report and Gold Standard Passport for detailed information with regard to Stakeholder comments.

SECTION F. Approval and authorization

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Appendix 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	YGT Elektrik Üretim A.Ş.
Street/P.O. Box	Nilüfer Organize Sanayi Bölgesi Selvi Cad. No:3
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City	Bursa
State/Region	-
Postcode	16140
Country	Turkey
Telephone	+90 224 411 03 04
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E-mail	mrifatesen@fcenerji.com.tr
Website	http://www.fcenerji.com.tr/
Contact person	
Title	
Salutation	Mr.
Last name	ESEN
Middle name	Rıfat
First name	Mustafa
Department	
Mobile	
Direct fax	+90 224 411 03 04
Direct tel.	+90 224 411 03 04
Personal e-mail	mrifatesen@fcenerji.com.tr

Appendix 2. Affirmation regarding public funding

No public funding is provided to the proposed project. The signed Official Development Assistance (ODA) declaration will be submitted to the DOE.

Appendix 3. Applicability of methodology and standardized baseline

Please see the section B.2.

Appendix 4. Further background information on ex ante calculation of emission reductions

BASELINE INFORMATION

Table 14 – $SET_{5\text{-}units}$ and $AEG_{SET\text{-}5\text{-}units}$

NAME OF THE POWER PLANT	CAPACITY (MW)	AVERAGE GENERATION (GWh)	FUEL TYPE	DATE OF PUTTING INTO OPERATION
ALKUMRU BARAJI VE HES (LİMAK HİD.)	261,27	828,00	HYDRO	2011
SAMSUN TEKKEKÖY EN. SAN. (AKSA EN.)	131,34	980,00	NATURAL GAS	2011
BEKİRLİ TES (İÇDAŞ ELEKTRİK EN.)	600,00	4.320,000	IMPORTED COAL	2011
ALİAĞA ÇAKMAKTEPE ENERJİ (İlave)	139,68	1051,6	NATURAL GAS	2011
AKSA ENERJİ (Antalya)	600	3600	NATURAL GAS	2011
TOTAL	***1.732,29***	***10.779,60***		

Table 15 – $SET_{\geq 20\%}$ and $AEG_{\geq 20\%}$

NAME OF THE POWER PLANT	CAPACITY (MW)	AVERAGE GENERATION (GWh)	FUEL TYPE	DATE OF PUTTING INTO OPERATION
KİLLİK RES (PEM ENERJİ A.Ş.)	40	0	WIND	2011
İNNORES ELEKTRİK YUNTDAĞ RÜZGAR	10	0	WIND	2011
ÇATALTEPE RES (ALİZE ENERJİ ELEKTRİK)	16	0	WIND	2011
ÇANAKKALE RES (ENERJİ-SA ENERJİ)	29,2	0	WIND	2011

BAKİ ELEKTRİK ŞAMLI RÜZGAR (İlave)	24	0	WIND	2011
AYVACIK RES (AYRES AYVACIK RÜZG.)	5	0	WIND	2011
AKRES (AKHİSAR RÜZGAR EN. ELEKT.)	43,8	0	WIND	2011
ZİYARET RES (ZİYARET RES ELEKTRİK)	22,5	0	WIND	2011
TURGUTTEPE RES (SABAŞ ELEKTRİK)	2	0	WIND	2011
ŞAH RES (GALATA WIND ENERJİ LTD. ŞTİ)	93	0	WIND	2011
SUSURLUK RES (ALANTEK ENERJİ ÜRET.)	45	0	WIND	2011
SOMA RES (SOMA ENERJİ) (İlave)	36,9	0	WIND	2011
SEYİTALİ RES (DORUK ENERJİ ELEKTRİK)	30	0	WIND	2011
SARES RES (GARET ENERJİ ÜRETİM)	7,5	0	WIND	2011
YEDİGÖZE HES (YEDİGÖZE ELEK.) (İlave)	155,33	425	HYDRO	2011
YEDİGÖL REG. VE HES (YEDİGÖL HİDR.)	21,9	77	HYDRO	2011
YAŞIL HES (YAŞIL ENERJİ ELEKTRİK)	3,8	15	HYDRO	2011
YAPRAK II HES (NİSAN ELEKTROMEK.)	10,8	32	HYDRO	2011
YAPISAN (KARICA REG. ve DARICA I HES)	13,32	0	HYDRO	2011
YAMAÇ HES (YAMAÇ ENERJİ ÜRETİM A.Ş.)	5,5	0	HYDRO	2011
ÜZÜMLÜ HES (AKGÜN ENERJİ ÜRETİM)	11,4	41	HYDRO	2011
TUZTAŞI HES (GÜRÜZ ELEKTRİK ÜR.)	1,6	10	HYDRO	2011
TEFEN HES (AKSU MADENCİLİK SAN.)	33	141	HYDRO	2011
SÖĞÜTLÜKAYA (POSOF III) HES	6,1	31	HYDRO	2011
SIZIR (KAYSERİ VE CİVARI EL. T.A.Ş)	5,8	46	HYDRO	2011
DAREN HES ELEKTRİK (SEYRANTEPE)	49,7	181,13	HYDRO	2011
SEFAKÖY HES (PURE ENERJİ ÜRETİM AŞ.)	33,1	0	HYDRO	2011
SAYAN HES (KAREL ELEKTRİK ÜRETİM)	14,9	0	HYDRO	2011
SARIKAVAK HES (ESER ENERJİ YAT. AŞ.)	8,1	0	HYDRO	2011
SARAÇBENDİ HES (ÇAMLICA ELEKTRİK)	25,5	0	HYDRO	2011
POYRAZ HES (YEŞİL ENERJİ ELEKTRİK)	2,66	10	HYDRO	2011
ÖREN REG. VE HES (ÇELİKLER ELEKTRİK)	6,6	16	HYDRO	2011

OTLUCA II HES (BEYOBASI ENERJİ ÜR.)	6,36	0	HYDRO	2011
OTLUCA I HES (BEYOBASI ENERJİ ÜR.)	37,5	0	HYDRO	2011
NARİNKALE REG. VE HES (EBD ENERJİ)	30,4	108	HYDRO	2011
MURATLI REG. VE HES (ARMAHES EL.)	26,7	94	HYDRO	2011
MOLU ENERJİ (Zamantı-Bahçelik HES)	4,2	30	HYDRO	2011
MENGE BARAJI VE HES (ENERJİSA ENERJİ)	44,7	0	HYDRO	2011
ÇANAKÇI HES (CAN ENERJİ ENTEGRE)	9,3	39	HYDRO	2011
ÇAMLIKAYA REG.VE HES (ÇAMLIKAYA EN)	2,824	0,8	HYDRO	2011
ÇAKIRMAN REG. VE HES (YUSAKA EN.)	6,98	22	HYDRO	2011
CEVHER I-II REG. VE HES (ÖZCEVHER EN.)	16,4	0	HYDRO	2011
BOĞUNTU HES (BEYOBASI ENERJİ)	3,8	17	HYDRO	2011
BERDAN	10,2	47,2	HYDRO	2011
BAYRAMHACILI BARAJI VE HES	47	175	HYDRO	2011
BALKONDU I HES (BTA ELEKTRİK ENERJİ)	9,2	33	HYDRO	2011
AYRANCILAR HES (MURADİYE ELEKTRİK)	32,1	0	HYDRO	2011
ALKUMRU BARAJI VE HES (LİMAK HİD.)	261,27	828	HYDRO	2011
AKSU REG. VE HES (KALEN ENERJİ)	5,2	16	HYDRO	2011
KUMKÖY HES (AES-IC İÇTAŞ ENERJİ)	17,49	98	HYDRO	2011
KULP I HES (YILDIZLAR ENERJİ ELK.ÜR.)	22,92	78	HYDRO	2011
KÖYOBASI HES (ŞİRİKOĞLU ELEKTRİK)	1,1	5	HYDRO	2011
KOZDERE HES (ADO MADENCİLİK ELKT.)	3,1	0	HYDRO	2011
KOVADA-II (BATIÇİM ENERJİ ELEKTRİK)	8,25	4,1	HYDRO	2011
KOVADA-I (BATIÇİM ENERJİ ELEKTRİK)	51,2	36,2	HYDRO	2011
KORUKÖY HES (AKAR ENERJİ SAN. TİC.)	3	22	HYDRO	2011
KIRAN HES (ARSAN ENERJİ A.Ş.)	9,7	0	HYDRO	2011
KESME REG. VE HES (KIVANÇ ENERJİ)	4,6	16	HYDRO	2011
KAZANKAYA REG. VE İNCESU HES (AKSA)	15	48	HYDRO	2011
KARASU II HES (İDEAL ENERJİ ÜRETİMİ)	3,1	13	HYDRO	2011
KARASU I HES (İDEAL ENERJİ	3,8	0	HYDRO	2011

ÜRETİMİ)				
KARASU 5 HES (İDEAL ENERJİ ÜRETİMİ)	4,1	0	HYDRO	2011
KARASU 4-3 HES (İDEAL ENERJİ ÜRETİMİ)	4,6	0	HYDRO	2011
KARASU 4-2 HES (İDEAL ENERJİ ÜRETİMİ)	10,4	0	HYDRO	2011
KALKANDERE REG. VE YOKUŞLU HES	23,36	0	HYDRO	2011
İNCİRLİ REG. VE HES (LASKAR ENERJİ)	25,2	126	HYDRO	2011
HASANLAR HES (DÜZCE ENERJİ BİRLİĞİ)	4,7	0	HYDRO	2011
HASANLAR	9,4	39	HYDRO	2011
HAKKARİ (Otluca) (NAS ENERJİ A.Ş.)	1,3	6	HYDRO	2011
HACININOĞLU HES (ENERJİ-SA ENERJİ)	142,3	360	HYDRO	2011
GÖKMEN REG. VE HES (SU-GÜCÜ ELEKT.)	2,869	13	HYDRO	2011
GİRLEVİK (BOYDAK ENERJİ)	3,04	21	HYDRO	2011
EŞEN-1 HES (GÖLTAŞ ENERJİ ELEKTRİK)	60	240	HYDRO	2011
ERKENEK (KAYSERİ VE CİVARI ENERJİ)	0,32	0	HYDRO	2011
ERENKÖY REG. VE HES (NEHİR ENERJİ)	21,5	87	HYDRO	2011
DURU 2 REG. VE HES (DURUCASU ELEK.)	4,5	22	HYDRO	2011
DERME (KAYSERİ VE CİVARI ENERJİ)	4,5	14	HYDRO	2011
DARCA HES (BÜKOR ELEKTRİK ÜRETİM)	8,9	0	HYDRO	2011
ÇUKURÇAYI HES (AYDEMİR ELEKTRİK ÜR.)	1,8	8	HYDRO	2011
ÇEŞMEBAŞI REG. VE HES (GİMAK EN.)	8,2	39	HYDRO	2011
AYDIN/GERMENCİK JEOTERMAL	20	150	GEOTHERMAL	2011
ŞANLIURFA OSB (RASA ENERJİ ÜR. A.Ş.)	116,76	800	NATURAL GAS	2011
ZORLU ENERJİ (B.Karıştıran)	7,2	54,07	NATURAL GAS	2011
YENİ UŞAK ENERJİ ELEKTRİK SANTRALI	8,73	65	NATURAL GAS	2011
TİRENDA TİRE ENERJİ ÜRETİM A.Ş.	58,38	410	NATURAL GAS	2011
TEKİRDAĞ-ÇORLU TEKS.TES.(NİL ÖRME)	2,677	21	NATURAL GAS	2011
SARAY HALI A.Ş.	4,3	33	NATURAL GAS	2011
SAMUR HALI A.Ş.	4,3	33	NATURAL GAS	2011
SAMSUN TEKKEKÖY EN. SAN. (AKSA EN.)	131,335	980	NATURAL GAS	2011
POLYPLEX EUROPA	3,904	30,7	NATURAL	2011

POLYESTER FİLM			GAS	
ODAŞ DOĞALGAZ KÇS (ODAŞ ELEKTRİK)	54,96	415	NATURAL GAS	2011
NUH ENERJİ EL. ÜRT.A.Ş. (ENERJİ SANT.-2)	119,98	900	NATURAL GAS	2011
MARDİN-KIZILTEPE (AKSA ENERJİ)	32,1	225	NATURAL GAS	2011
LOKMAN HEKİM ENGÜRÜ SAĞ.(SİNCAN)	0,5	4	NATURAL GAS	2011
KNAUF İNŞ. VE YAPI ELEMANLARI SN.	1,6	12	NATURAL GAS	2011
KAYSERİ KATI ATIK DEPONİ SAHASI	1,6	0	LANDFILL GAS	2011
KARKEY (SİLOPİ 1)	100,44	701,15	FUEL OIL	2011
İSTANBUL SABİHA GÖKÇEN UL.AR. HAV.	4	32	NATURAL GAS	2011
ITC-KA ENERJİ MAMAK KATI ATIK TOP.	2,826	0	LANDFILL GAS	2011
ITC-KA ENERJİ (SİNCAN) (İlave)	1,416	0	LANDFILL GAS	2011
ITC-KA EN. (ASLIM BİYOKÜTLE) KONYA	5,66	0	LANDFILL GAS	2011
ITC ADANA ENERJİ ÜRETİM (İlave)	1,415	0	LANDFILL GAS	2011
ISPARTA MENSUCAT (Isparta)	4,3	33	NATURAL GAS	2011
HG ENERJİ ELEKTRİK ÜRET. SAN.TİC. A.Ş.	52,38	366	NATURAL GAS	2011
HASIRCI TEKSTİL TİC. VE SAN. LTD. ŞTİ.	2	15	NATURAL GAS	2011
GÜLLE ENERJİ(Çorlu) (İlave)	3,9	17,97	NATURAL GAS	2011
GOREN-1 (GAZİANTEP ORGANİZE SAN.)	48,65	277	NATURAL GAS	2011
GORDİON AVM (REDEVCO ÜÇ EMLAK)	2	15	NATURAL GAS	2011
GLOBAL ENERJİ (PELİTLİK)	4	29,91	NATURAL GAS	2011
FRAPORT IC İÇTAŞ ANTALYA HAVALİMANI	8	64	NATURAL GAS	2011
CEV ENERJİ ÜRETİM(GAZİANTEP ÇÖP BİOGAZ)	5,7	0	LANDFILL GAS	2011
CENGİZ ENERJİ SAN.VE TİC.A.Ş.	35	281,29	NATURAL GAS	2011
CENGİZ ÇİFT YAKITLI K.Ç.E.S.	131,335	985	NATURAL GAS	2011
BOSEN ENERJİ ELEKTRİK ÜRETİM AŞ.	93	698,49	NATURAL GAS	2011
BOLU BELEDİYESİ ÇÖP TOP. TES. BİYOGAZ	1,1	0	LANDFILL GAS	2011
BEKİRLİ TES (İÇDAŞ ELEKTRİK EN.)	600	4320	IMPORTED COAL	2011
ALİAĞA ÇAKMAKTEPE ENERJİ (İlave)	139,68	1051,6	NATURAL GAS	2011
AKSA ENERJİ (Antalya)	600	3600	NATURAL	2011

			GAS	
AKSA AKRİLİK (İTHAL KÖM.+D.G)	25	189,08	NATURAL GAS	2011
AKIM ENERJİ BAŞPINAR (SÜPER FİLM)	25,32	177	NATURAL GAS	2011
Turguttepe Res (Sabaş Elektrik Ür.)	22	0	WIND	2010
Sares Res (Garet Enerji Üretim)	15	0	WIND	2010
Kuyucak Res (Alize Enerji Ür.)	25,6	0	WIND	2010
ÜtOPYA ELEKTRİK (DÜZOVA RES) (Addition)	15	0	WIND	2010
Belen ELEKTRİK BELEN Res (Addition)	6	0	WIND	2010
Soma Res (Bilgin Rüzgar San. En. Ür.)	90	0	WIND	2010
Ziyaret Res (Ziyaret Res Elektirk)	35	0	WIND	2010
BORASKO ENERJİ (BANDIRMA RES)	12	0	WIND	2010
MAZI-3 RES ELEKT.ÜR. A.Ş. (MAZI-3 RES)	7,5	0	WIND	2010
ROTOR ELEKTRİK (Gökçedağ Res)	22,5	0	WIND	2010
ALİZE ENERJİ (KELTEPE RES)	1,8	0	WIND	2010
Bakras En. Elek. Ür. A.Ş. Şenbük Res	15	0	WIND	2010
Bergama Res En. Ür. A.Ş. Aliağa Res	90	0	WIND	2010
Boreas Enerji (Boreas I Enez Res)	15	0	WIND	2010
Akdeniz Elektrik (Mersin Res)	33	0	WIND	2010
Deniz Elektrik (Sebenoba Res)	10	0	WIND	2010
Soma Enerji Üretim (Soma Res)	34,2	0	WIND	2010
Asmakinsan (Bandırma 3 RES)	24	0	WIND	2010
ROTOR ELEKTRİK (OSMANİYE RES)	55	0	WIND	2010
Kalkandere Reg. Ve Yokuşlu HES.	14,54	63	HYDRO	2010
Egemen 1B HES (Enersis Elektrik)	11,1	0	HYDRO	2010
FEKE 2 Barajı ve HES (Nisan Elek.)	69,34	223	HYDRO	2010
Umut III Reg. Ve HES (Nisan Elek.)	12	26	HYDRO	2010
Yedigöze HES (Yedigöze Elektrik)	155,33	474	HYDRO	2010
Egemen 1 HES (Enersis Elektrik)	8,82	0	HYDRO	2010
REŞADİYE 1 HES (TURKON MNG ELEKT.)	15,68	0	HYDRO	2010
Güzelçay II Hes (İlk Elektrik Enerji) (Addition)	4,96	0	HYDRO	2010
Murgul Bakır (Ç.kaya) (Addition)	19,6	40,5	HYDRO	2010
Burç Bendi ve Hes (Akkur Enerji)	27,33	113	HYDRO	2010
Sabunsuyu II HES (Ang Enerji Elk.)	7,35	21	HYDRO	2010
Egemen 1 HES (Enersis Elektrik)	19,9	0	HYDRO	2010
REŞADİYE 1 HES (TURKON	15,68	0	HYDRO	2010

MNG ELEKT.)				
Ulubat Kuvvet Tüneli ve Hes	97	372	HYDRO	2010
Azmak II Reg. Ve Hes	-18,066	0	HYDRO	2010
Kahta I HES (Erdemyıldız Elektrik Üretim)	7,12	35	HYDRO	2010
Erenköy Reg. Ve Hes (Türkerler)	21,456	87	HYDRO	2010
Narinkale Reg. Ve Hes (EBD Enerji)	3,1	10	HYDRO	2010
Kahraman Reg. Ve Hes (Katırcıoğlu)	1,42	6	HYDRO	2010
Kozan Hes (Ser-Er Enerji)	4	9	HYDRO	2010
REŞADİYE 2 HES (TURKON MNG ELEKT.)	26,14	0	HYDRO	2010
Selen Elektrik (Kepezkaya Hes)	28	0	HYDRO	2010
Tektuğ Elektrik (Andırın Hes)	40,5	106	HYDRO	2010
Güdül I Reg. Ve HES (Yaşam Enerji)	2,36	14	HYDRO	2010
Ceyhan Hes. (Berkman Hes) (Enova En.)	25,2	103	HYDRO	2010
Karşıyaka HES (Akua Enerji Üret.)	1,592	8	HYDRO	2010
Bulam Reg. Ve Hes (MEM Enerji ELK.)	7,03	0	HYDRO	2010
Gök Reg. Ve Hes (Gök Enerji El. San.)	10,008	43	HYDRO	2010
Kayabükü Reg. Ve Hes (Elite Elektrik)	14,58	0	HYDRO	2010
Yavuz Reg. Ve Hes (Masat Enerji)	22,5	83	HYDRO	2010
Kirpilik Reg. Ve Hes (Özgür Elektrik)	6,24	22	HYDRO	2010
ÖZGÜR ELEKTRİK (AZMAK I REG.VE HES)	5,913	0	HYDRO	2010
Dim Hes (Diler Elektrik Üretim)	38,25	123	HYDRO	2010
Damlapınar Hes. (Cenay Elektrik Üretim)	16,424	0	HYDRO	2010
Dinar Hes. (Elda Elekrik Üretim)	4,44	15	HYDRO	2010
Çamlıkaya Reg. Ve Hes	5,648	19	HYDRO	2010
Erikli-Akocak Reg. Ve Hes	82,5	0	HYDRO	2010
Kale Reg. Ve Hes (Kale Enerji Ür.)	34,14	116	HYDRO	2010
Güzelçay-I-II Hes (İlk Elektrik Enerji)	8,1	0	HYDRO	2010
Paşa Reg. Ve Hes (Özgür Elektrik)	8,68	0	HYDRO	2010
Erenler Reg. Ve Hes. (BME Bir. Müt. En.)	45	85	HYDRO	2010
Ceyhan Hes. (Oşkan Hes.) (Enova En.)	23,889	98	HYDRO	2010
Çakıt Hes. (Çakıt Enerji)	20,18	0	HYDRO	2010
Akım Enerji (Cevizli Reg. Ve Hes.)	91,4	330	HYDRO	2010
Karadeniz El. Üret. (Uzundere-1 Hes)	62,2	165	HYDRO	2010
Birim Hidr. Üretim A.Ş. (Erfelek Hes)	3,225	19	HYDRO	2010

KAR-EN Karadeniz El. A.Ş. Aralık Hes	12,41	0	HYDRO	2010
Fırtına Elektrik Üretim A.Ş. (Sümer Hes)	21,6	70	HYDRO	2010
UZUNÇAYIR HES (Tunceli) (Addition)	27,33	105	HYDRO	2010
Nisan E. Mekanik En. (Başak Reg. Hes.)	6,85	22	HYDRO	2010
Beytek El. Ür. A.Ş. (Çataloluk Hes.)	9,54	0	HYDRO	2010
Birim Hidr. Üretim A.Ş. (Erfelek Hes)	3,225	19	HYDRO	2010
ÖZGÜR ELEKTRİK (AZMAK I REG.VE HES)	5,913	0	HYDRO	2010
Nuryol Enerji (Defne Reg. Ve hes.)	7,23	22	HYDRO	2010
Doğubay Elektrik (Sarımehmet Hes)	3,1	10	HYDRO	2010
Hetaş Hacısalihoğlu (Yıldızlı Hes)	1,2	5	HYDRO	2010
Asa Enerji (Kale Reg. Ve Hes.)	9,57	0	HYDRO	2010
Peta Müh. En. (Mursal II Hes.)	4,5	19	HYDRO	2010
Alakır Hes.	2,06	6	HYDRO	2010
UZUNÇAYIR HES (Tunceli) (Addition)	27,33	105	HYDRO	2010
Bayburt Hes	14,631	51	HYDRO	2010
Cindere HES (Denizli) (Addition)	9,065	28,29	HYDRO	2010
Kulp IV HES	12,298	46	HYDRO	2010
Selimoğlu Reg. Ve Hes	8	0	HYDRO	2010
Menderes Jeotermal Dora-2	9,5	0	GEOTHERMAL	2010
Tuzla Jeotermal	7,5	0	GEOTHERMAL	2010
International Hospital Istanbul	0,77	6	NATURAL GAS	2010
SİLOPİ ELEKTRİK ÜRETİM A.Ş.(ESENBOĞA)	-44,784	0	FUEL OIL	2010
RASA ENERJİ (VAN) (Addition)	10,124	64,41	NATURAL GAS	2010
Aksa Enerji (Demirtaş/Bursa)	-1,14	0	NATURAL GAS	2010
ALTEK ALARKO Elektrik Santralleri	21,89	151,36	NATURAL GAS	2010
Polyplex Europa Polyester Film	7,808	61	NATURAL GAS	2010
Ak-Enerji (DG+N) (Deba-Denizli)	-15,6	0	NATURAL GAS	2010
Ak-Enerji (Uşak OSB)	-15,24	0	NATURAL GAS	2010
Sönmez Enerji Üretim (Uşak) (Addition)	2,564	19,77	NATURAL GAS	2010
FRİTOLAY GIDA SAN.VE TİC. AŞ. (Addition)	0,33	2,4	BIOGAS	2010
Aliağa Çakmaktepe Enerji A.Ş.(Aliağa/İZMİR) (Addition)	69,84	556	NATURAL GAS	2010
MARMARA PAMUKLU MENS.	26,19	203,76	NATURAL	2010

SN.TİC.A.Ş. (Addition)			GAS	
Eren Enerji (Addition)	600	4006	IMPORTED COAL	2010
Eren Enerji (Addition)	600	4006	IMPORTED COAL	2010
Uğur Enerji (Addition)	12	100	NATURAL GAS	2010
Enerji-SA (Bandırma)	930,8	7540	NATURAL GAS	2010
Kırka Boraks	10	65	NATURAL GAS	2010
ITC-KA Adana Biyokütle Sant.	9,9	0	BIOMASS	2010
Sönmez Enerji Üretim (Uşak)	32,242	272,55	NATURAL GAS	2010
Kurtoğlu Bakır Kurşun San.A.Ş.	1,585	12	NATURAL GAS	2010
CAN ENERJİ (Çorlu - Tekirdağ)	29,1	203	NATURAL GAS	2010
Binatom Elektrik Üretim A.Ş.	2	13	NATURAL GAS	2010
Keskinoğlu Tavukçuluk ve Dam. İşl.	3,495	25	NATURAL GAS	2010
Cengiz Enerji	101,95	802	NATURAL GAS	2010
RB Karesi İthalat İhracat Tekstil	8,6	65	NATURAL GAS	2010
Flokser Tekstil (Çerkezköy/Tekirdağ)	5,172	42	NATURAL GAS	2010
Eren Enerji	160	1068	IMPORTED COAL	2010
ALTEK ALARKO Elektrik Santralleri	60,1	420	NATURAL GAS	2010
Aksa Enerji (Antalya)	25	175,46	NATURAL GAS	2010
Söktaş	-4,5	0	NAPHTA	2010
Uğur Enerji	48,2	406	NATURAL GAS	2010
Simko (Kartal)	-2,054	0	NATURAL GAS	2010
Cengiz Enerji	101,95	802	NATURAL GAS	2010
ATAER ENERJİ	49	278	NATURAL GAS	2010
ITC-KA ENERJİ (SİNCAN)	1,416	0	LANDFILL GAS	2010
Yıldız Entegre Ağaç (kocaeli)	12,368	80,1	NATURAL GAS	2010
Aksa Enerji (Antalya)	25	175,46	NATURAL GAS	2010
RASA ENERJİ (VAN)	26,19	166,6	NATURAL GAS	2010
FLOKSER TEKSTİL SAN.AŞ.(Çatalça/istanbul)(SüetserTesisi)	-2,1	0	NATURAL GAS	2010
Konya Şeker	6	40	LIGNITE	2010
GLOBAL ENERJİ (PELİTLİK)	3,544	27,06	NATURAL	2010

			GAS	
ORTADOĞU ENERJİ (ODA YERİ) (Eyüp/İST.)	4,245	0	LANDFILL GAS	2010
Akbaşlar (Addition)	1,54	12,08	NATURAL GAS	2010
Gaziantep Landfill	1,131	0	BIOGAS	2010
ALTINMARKA GIDA	4,6	33	NATURAL GAS	2010
Can Tekstil	7,832	86,75	NATURAL GAS	2010
Eti Soda	24	144	LIGNITE	2010
KORES KOCADAĞ RES (Urla/İZMİR)	15	0	WIND	2009
SOMA ENERJİ ÜRETİM (SOMA RES)(Addition)	10,8	0	WIND	2009
ROTOR ELEKTRİK (OSMANİYE RES)	22,5	0	WIND	2009
SOMA ENERJİ ÜRETİM (SOMA RES)(Addition)	16,2	0	WIND	2009
BELEN ELEKTRİK BELEN RÜZGAR-HATAY	15	0	WIND	2009
ALİZE ENERJİ (SARIKAYA RES) (Şarköy)	28,8	0	WIND	2009
BORASKO ENERJİ (BANDIRMA RES)	21	0	WIND	2009
BELEN ELEKTRİK BELEN RÜZGAR-HATAY	15	0	WIND	2009
BORASKO ENERJİ (BANDIRMA RES)	24	0	WIND	2009
MAZI-3 RES ELEKT.ÜR. A.Ş. (MAZI-3 RES)	10	0	WIND	2009
ROTOR ELEKTRİK (OSMANİYE RES)	17,5	0	WIND	2009
BAKİ ELEKTRİK ŞAMLI RÜZGAR	33	0	WIND	2009
MAZI-3 RES ELEKT.ÜR. A.Ş. (MAZI-3 RES)	12,5	0	WIND	2009
SAYALAR RÜZGAR (Doğal Enerji)	3,6	0	WIND	2009
SOMA ENERJİ ÜRETİM (SOMA RES)	18	0	WIND	2009
AK ENERJİ (AYYILDIZ RES)	15	0	WIND	2009
ÜTOPYA ELEKTRİK (DÜZOVA RES)	15	0	WIND	2009
ROTOR ELEKTRİK (OSMANİYE RES)	17,5	0	WIND	2009
ALİZE ENERJİ (KELTEPE RES)	18,9	0	WIND	2009
ALİZE ENERJİ (ÇAMSEKİ RES)	20,8	0	WIND	2009
DATÇA RES (Datça) (Addition)	11,8	0	WIND	2009
AYEN ENERJİ A.Ş. AKBÜK RÜZGAR (Addition)	14,7	0	WIND	2009
AYEN ENERJİ A.Ş. AKBÜK RÜZGAR	16,8	0	WIND	2009
DATÇA RES (Datça)	8,9	0	WIND	2009
BAKİ ELEKTRİK ŞAMLI RÜZGAR	36	0	WIND	2009

ÖZGÜR ELEKTRİK (AZMAK II REG.VE HES)	24,407	0	HYDRO	2009
SARITEPE HES (GENEL DİNAMİK SİS.EL.)	2,45	10	HYDRO	2009
YEŞİLBAŞ ENERJİ (YEŞİLBAŞ HES)	14	56	HYDRO	2009
UZUNÇAYIR HES (Tunceli)	27,33	105	HYDRO	2009
SARITEPE HES (GENEL DİNAMİK SİS.EL.)	2,45	10	HYDRO	2009
REŞADİYE 3 HES (TURKON MNG ELEKT.)	22,3	0	HYDRO	2009
TEKTUĞ (Erkenek) (Additon)	6,514	26	HYDRO	2009
TÜM ENERJİ (PINAR REG. VE HES)	30,09	138	HYDRO	2009
ERVA ENERJİ (KABACA REG. VE HES)	4,24	16,5	HYDRO	2009
YAPISAN (KARICA REG. ve DARICA I HES)	48,5	0	HYDRO	2009
ELESTAŞ ELEKTRİK (YAZI HES)	1,109	6	HYDRO	2009
ERVA ENERJİ (KABACA REG. VE HES)	4,24	16,5	HYDRO	2009
FİLYOS ENERJİ (YALNIZCA REG. VE HES)	14,43	0	HYDRO	2009
ELESTAŞ ELEKTRİK (YAYLABEL HES)	5,1	20	HYDRO	2009
AKÇAY HES ELEKTRİK ÜR. (AKÇAY HES)	28,78	95	HYDRO	2009
ÖZTAY ENERJİ (GÜNAYŞE REG.VE HES)	8,3	0	HYDRO	2009
ANADOLU ELEKTRİK (ÇAKIRLAR HES)	16,158	60	HYDRO	2009
OBRUK HES	212,4	473	HYDRO	2009
KAYEN ALFA ENERJİ (KALETEPE HES)	10,2	37	HYDRO	2009
AKUA ENERJİ (KAYALIK REG. VE HES)	5,8	39	HYDRO	2009
ŞİRİKÇİOĞLU EL.(KOZAK BENDİ VE HES)	4,4	15	HYDRO	2009
CİNDERE HES (Denizli)	19,146	58	HYDRO	2009
KALEN ENERJİ (KALEN I - II HES)	15,65	52,17	HYDRO	2009
BEREKET ENERJİ (KOYULHİSAR HES)	42	329	HYDRO	2009
YPM GÖLOVA HES (Suşehri/SİVAS)	1,05	0	HYDRO	2009
YPM SEVİNDİK HES (Suşehri/SİVAS)	5,714	36	HYDRO	2009
LAMAS III - IV HES (TGT ENERJİ ÜRETİM)	35,674	150	HYDRO	2009
ÖZYAKUT ELEK. ÜR.A.Ş. (GÜNEŞLİ HES)	1,8	8	HYDRO	2009
BEYOBASI EN. ÜR. A.Ş. (SIRMA HES)	5,88	23	HYDRO	2009
TOCAK I HES (YURT ENERJİ ÜRETİM SN.)	4,76	13	HYDRO	2009

BAĞIŞLI REG. VE HES (CEYKAR ELEKT.)	19,714	66,04	HYDRO	2009
DEĞİRMENÜSTÜ EN. (KAHRAMANMARAŞ)	12,85	35,28	HYDRO	2009
BAĞIŞLI REG. VE HES (CEYKAR ELEKT.)	9,857	32,96	HYDRO	2009
TEKTUĞ (Erkenek)	6	24	HYDRO	2009
TAŞOVA YENİDEREKÖY HES (HAMEKA A.Ş.)	1,98	10	HYDRO	2009
SİLOPİ ELEKTRİK ÜRETİM A.Ş.(ESENBOĞA)	44,784	315	FUEL OIL	2009
AKSA ENERJİ (MANİSA) (Addition)	62,9	498,07	NATURAL GAS	2009
FALEZ ELEKTRİK ÜRETİMİ A.Ş.	11,748	88	NATURAL GAS	2009
DESA ENERJİ ELEKTRİK ÜRETİM A.Ş.	9,8	70	NATURAL GAS	2009
TAV İSTANBUL TERMİNAL İŞLETME. A.Ş.	3,26	27,28	NATURAL GAS	2009
SELKASAN KAĞIT PAKETLEME MALZ. İM.	9,9	73	NATURAL GAS	2009
CAM İŞ ELEKTRİK (Mersin) (Addition)	126,1	1008	NATURAL GAS	2009
AK GIDA SAN. VE TİC. A.Ş. (Pamukova)	7,5	61	NATURAL GAS	2009
DALSAN ALÇI SAN. VE TİC. A.Ş.	1,165	9	NATURAL GAS	2009
İÇDAŞ ÇELİK (Addition)	135	961,67	IMPORTED COAL	2009
DELTA ENERJİ ÜRETİM VE TİC.A.Ş. (Addition)	13	101,18	NATURAL GAS	2009
ORTADOĞU ENERJİ (ODA YERİ) (Addition)	5,66	0	LANDFILL GAS	2009
RASA ENERJİ (VAN)	78,57	500	NATURAL GAS	2009
GLOBAL ENERJİ (PELİTLİK)	8,553	65,31	NATURAL GAS	2009
İÇDAŞ ÇELİK (Addition)	135	961,67	IMPORTED COAL	2009
ITC-KA ENERJİ (SİNCAN)	2,832	0	LANDFILL GAS	2009
ZORLU ENERJİ (B.Karıştıran) (Addition)	49,53	395,21	NATURAL GAS	2009
ORTADOĞU ENERJİ (KÖMÜRCÜODA)	5,804	0	BIOGAS	2009
AKSA ENERJİ (Antalya) (Addition)	300	2310	NATURAL GAS	2009
MARMARA PAMUKLU MENS. SN.TİC.A.Ş.	34,92	271,68	NATURAL GAS	2009
ANTALYA ENERJİ (Addition)	41,82	302,24	NATURAL GAS	2009
AKSA ENERJİ (Antalya) (Addition)	300	2310	NATURAL GAS	2009
MAURİ MAYA SAN. A.Ş.	2	16,52	NATURAL GAS	2009
SİLOPİ ELEKTRİK ÜRETİM A.Ş.	135	945	ASPHALTIT	2009

NUH ÇİMENTO SAN. TİC. A.Ş.(Nuh Çim.) (Addition)	46,95	328,65	NATURAL GAS	2009
TESKO KİPA KİTLE PAZ. TİC. VE GIDA A.Ş.	2,33	18	NATURAL GAS	2009
KEN KİPAŞ ELKT. ÜR.(KAREN) (K.Maraş)	17,46	73,36	NATURAL GAS	2009
DELTA ENERJİ ÜRETİM VE TİC.A.Ş.	60	467	NATURAL GAS	2009
GÜRMAT ELEKT. (GÜRMAT JEOTERMAL)	47,4	313	GEOTHERMAL	2009
SÖNMEZ ELEKTRİK(Uşak) (Addition)	8,73	67,29	NATURAL GAS	2009
KASAR DUAL TEKSTİL SAN. A.Ş. (Çorlu)	5,67	38	NATURAL GAS	2009
AKSA AKRİLİK KİMYA SN. A.Ş. (YALOVA)	70	539	NATURAL GAS	2009
TAV İSTANBUL TERMİNAL İŞLETME. A.Ş.	6,52	54,56	NATURAL GAS	2009
ORTADOĞU ENERJİ (ODA YERİ) (Addition)	4,245	0	LANDFILL GAS	2009
ARENKO ELEKTRİK ÜRETİM A.Ş. (Denizli)	12	84	NATURAL GAS	2009
ERDEMİR(Ereğli-Zonguldak)	36,1	217,95	NATURAL GAS	2009
ITC-KA ENERJİ MAMAK KATI ATIK TOP.MERK.	2,826	0	WASTES	2009
TÜPRAŞ RAFİNERİ(Aliağa/İzmir)	24,7	170	NATURAL GAS	2009

Table 16 - Heating values HVi,y for fossil fuels for electricity generation (Tcal) & (TJ)

	in Tcal			***in Tcal***		
Fuel Type	**2010**	**2011**	**2012**	**2010**	**2011**	**2012**
Hard Coal+Imported Coal+Asphaltite	39.546	57.567	71.270	165.573	241.023	298.394
Lignite	96.551	107.210	93.587	404.240	448.865	391.829
Fuel Oil	8.569	5.280	5.625	35.877	22.106	23.550
Diesel Oil	209	155	1.884	877	649	7.886
LPG	0,00	-	0,00	0,00	-	0,00
Naphta	105	-	-	440	-	-
Natural Gas	194.487	202.064	203.766	814.279	846.002	853.129

*1 Tcal = 4.1868 TJ

Table 17 - Fossil Fuel Consumption $FC_{i,m,y}$ for electricity generation (1000 m3 for gas and ton for others) & (1'000'000 m3 for gas and ton for others)

	1000 m3 for gas and ton for others			*1'000'000 m3 for gas and 1000 ton for others*		
Fuel Type	**2010**	**2011**	**2012**	**2010**	**2011**	**2012**
Hard Coal+Imported Coal+Asphaltite	7.419.703	10.574.434	12.258.462	7.420	10.574	12.258
Lignite	56.689.392	61.507.310	55.742.463	56.689	61.507	55.742
Fuel Oil	891.782	531.608	564.796	892	532	565
Diesel Oil	20.354	15.047	176.379	20	15	176
LPG	0,00	-	0,00	0,00	-	0,00
Naphta	13.140	-	-	13	-	-
Natural Gas	21.783.414	22.804.587	23.090.121	21.783	22.805	23.090

Table 18 – $NCV_{i,y}$ (Average Net Calorific Values for fossil fuels for electricity generation (TJ/million m^3 for natural gas and TJ/kton for others) and EF (Emission Factor of fossil Fuels)

Fuel Type	**2010**	**2011**	**2012**	**Lower COEF (tCO2/t)**
Hard Coal + Imported Coal	22,32	22,79	24,34	94,60
Lignite	7,13	7,30	7,03	90,90
Fuel Oil	40,23	41,58	41,70	75,50
Diesel Oil	43,09	43,15	44,71	72,60
LPG	0,00	-	0,00	61,60
Naphta	33,50	-	-	69,30
Natural Gas	37,38	37,10	36,95	54,30

Table 19 - Yearly emissions $EF_{CO2,i,y}$ per fossil fuel type in tCO_2

Fuel Type	**2010**	**2011**	**2012**	**Lower COEF (tCO2/t)**
Hard Coal + Imported Coal	15.663.232	22.800.742	28.228.061	94,60
Lignite	36.745.389	40.801.816	35.617.214	90,90
Fuel Oil				

	2.708.730	1.668.985	1.778.007	75,50
Diesel Oil	63.675	47.138	572.556	72,60
LPG	-	-	-	61,60
Naphta	30.503	-	-	69,30
Natural Gas	44.215.363	45.937.907	46.324.907	54,30

Appendix 5. Further background information on monitoring plan

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Appendix 6. Summary of post registration changes

Document information

Version	*Date*	*Description*
05.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the project design document form for small-scale CDM project activities (these instructions supersede the "Guidelines for completing the project design document form for small-scale CDM project activities" (Version 01.1)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the project activity in B.7.4 and **Hata! Başvuru kaynağı bulunamadı.**; • Change the reference number from *F-CDM-SSC-PDD* to *CDM-PDD-SSC-FORM*; • Editorial improvement.
04.1	11 April 2012	Editorial revision to change history box by adding EB meeting and annex numbers in the Date column.
04.0	13 March 2012	EB 66, Annex 9 Revision required to ensure consistency with the “Guidelines for completing the project design document form for small-scale CDM project activities”

Version	*Date*	*Description*
03.0	15 December 2006	EB 28, Appendix 44 • The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.
02.0	08 July 2005	EB 20, Annex 14 • The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
01.0	21 January 2003	EB 07, Annex 05 Initial adoption.

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