**PROJECT DESIGN DOCUMENT FORM
FOR SMALL-SCALE CDM PROJECT ACTIVITIES (F-CDM-SSC-PDD)
Version 04.1**

PROJECT DESIGN DOCUMENT (PDD)

Title of the project activity	Gunaydin WPP
Version number of the PDD	09
Completion date of the PDD	02/06/2014
Project participant(s)	MANRES Elektrik Üretim A.Ş. - (Project Owner) GTE CARBON (Project Developer)
Host Party(ies)	Turkey
Sectoral scope(s) and selected methodology(ies)	Sectoral scope 1: Energy Industries (Renewable-/non-renewable sources) Methodology: ACM0002: Grid-connected electricity generation from renewable sources --- Version 14.0.0
Estimated amount of annual average GHG emission reductions	33,300 tCO_2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

The proposed project is a small scale wind power plant project located within the boundaries of Manyas District of Balıkesir province.

The project has been initially implemented as having 12.5MWm/10MWe as per the license issued on 09/02/2012. Project has been commissioned on 20/11/2012. On 31/03/2014, installed capacity has been upgraded as 20 MWm/20MWe. As per the license issued by Energy Market Regulatory Authority (EMRA) all legal rights of the project is given to MANRES Elektrik Üretim A.Ş. for 49 years including pre-construction and construction periods. Purpose of the proposed project is to generate electricity by utilizing the renewable energy potential to meet increasing electricity demand and thus reduce fossil fuel consumption.

The proposed project involves installation of three new turbines (2.5 MW GE) in addition to existing five turbines each having 2.5 MWm capacity such that total number of turbines will be eight and total output of the project will be limited to 20MWe. Turbines outputs will be transmitted to the switchyard area via underground cabling. The extension turbines will be placed within the same project site[1] Total land used for a single turbine is estimated as 400m^2 including turbines basements, crane pads, switchyard and access roads. [2] Electricity generated at project will be fed to the national grid via Mustafa Kemal Paşa Substation using 134 pylons build during initial phase.[3]

During micro siting and optimization studies, several layouts have been compiled using different turbines. After capacity extension, total output of the project will increase from 36.7GWh to 55.5 GWh as per the P90 value of 10 year average as per the Energy Assessment Report prepared by Garrad Hassan. Annual emission reduction will increase from 22,020 tCO_2 to 33,300 tCO_2 per year. Average lifetime of turbines are assumed as 25 years as per ”Tool to Determine Remaining Lifetime of Equipment” [4]

Main goals of the Proposed Projects include;

- Utilization of the renewable energy potential of Turkey in order to meet rapidly increasing electricity demand and contribute achieving energy security.
- Increase share of WPPs in electricity generation mix of Turkey and reduction of GHG emissions.
- Contribute to the national economic development by creating direct and indirect job opportunities during construction and operation phases.
- Reduce import dependency of fossil fuel dominated electricity sector and diversify generation mix through use of local resources.
- Contribution to sustainable development through supporting local community and local economy.

In terms of sustainable development project not only contributes to emission reduction through use of renewable resources and creating job opportunities. In terms of environmental impact, project is considered to have positive impact on air quality due to avoided NOx, PM and SO_2 emissions whereas no

[1] Gunaydın WPP ESIA Extension Report page XI
[2] Gunaydın WF ESIA Report page 32
[3] Gunaydın WPP ESIA Report page 32
[4] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf

negative impact on water quality other pollutants and biodiversity has been identified. As per the national regulations, a project introductory file (PIF) has been prepared for the project to assess the environmental impacts. In addition to national requirements, a full Environmental and Social Impact Analysis(ESIA) study has been carried out for the project for compliance with international standards.

According to the research conducted by State Planning Organization (SPO) on socio-economic level of Districts in Turkey, Manyas District is ranked as 465th among 872 Districts in Turkey in terms of development level and classified in third(out of six) group. About 79.5% of the population works on agriculture and 16,7% works on service sector whereas 3.87% works on industry.[5]

In addition to contribution to local economy, project will also contribute use of local and renewable resources to meet the increasing energy demand of Turkey and reduce dependency on fossil fuels. According to Turkish Electricity Transmission Company (TEIAS) statistics, in 2012 about 73.0%[6] of the electricity has been generated via thermal power plants whereas 43.63% was from natural gas (NG) power plants[7] which is fully imported and 23.09 bn m^3 NG has been consumed[8]. In terms of fuel dependency, considering the expected annual generation, proposed project is expected to replace about 12.26 million m^3 natural gas [9] and other fossil fuel import and consumption and thus contribute to balance of payments and increase air quality.

Milestone	**Date**
Preliminary EIA	February 2009
Contribution Fee Agreement	24/09/2011
License Issuance	11/11/2011
Collecting offers for carbon agreement	15/11/2011
EM Equipment Purchase Contract*	20/12/2011
Carbon Agreement	24/01/2012
EIA Exemption Letter	25/01/2012
License Revision	09/02/2012
LSC Meeting	21/02/2012
Connection Agreement	03/04/2012
Construction Subcontractor Agreement	03/04/2012
Forest Permission	20/04/2012
Commissioning Date	20/11/2012
LSC meeting for capacity extension	31/10/2013
Loan Agreement for Extension	27/06/2013
EIA Exemption Letter for Capacity Extension	05/03/2014
Turbine Agreement for Capacity Extension	18/03/2014
Amended License for Capacity Extension	31/03/2014
Expected Start of Construction for Extension	July 2014
Expected Commissioning Date for Extension	December 2014

Table 1. Milestones for Gunaydin WPP
*Date of investment decision

[5] http://www.dpt.gov.tr/DocObjects/Download/3159/ilce.pdf (Page 148)
[6] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/uretim%20tuketim(23-47)/38.xls
[7] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/uretim%20tuketim(23-47)/46.xls
[8] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2012/yak%C4%B1t48-53/49.xls
[9] BOTAS Average NG price for 2012 considered in calculations (http://www.botas.gov.tr/index.asp)

A.2. Location of project activity

A.2.1. Host Party(ies)

Host country is Turkey. Although Turkey, the Host Country, passed legislation in Parliament on 05/02/2009 to ratify the Kyoto Protocol - Turkey does not have a quantitative emission reduction limit yet. As such, Turkey will in the interim period continues to be eligible for voluntary emission reduction projects.

A.2.2. Region/State/Province etc.

Project is located within boundaries of Balıkesir Province of Turkey

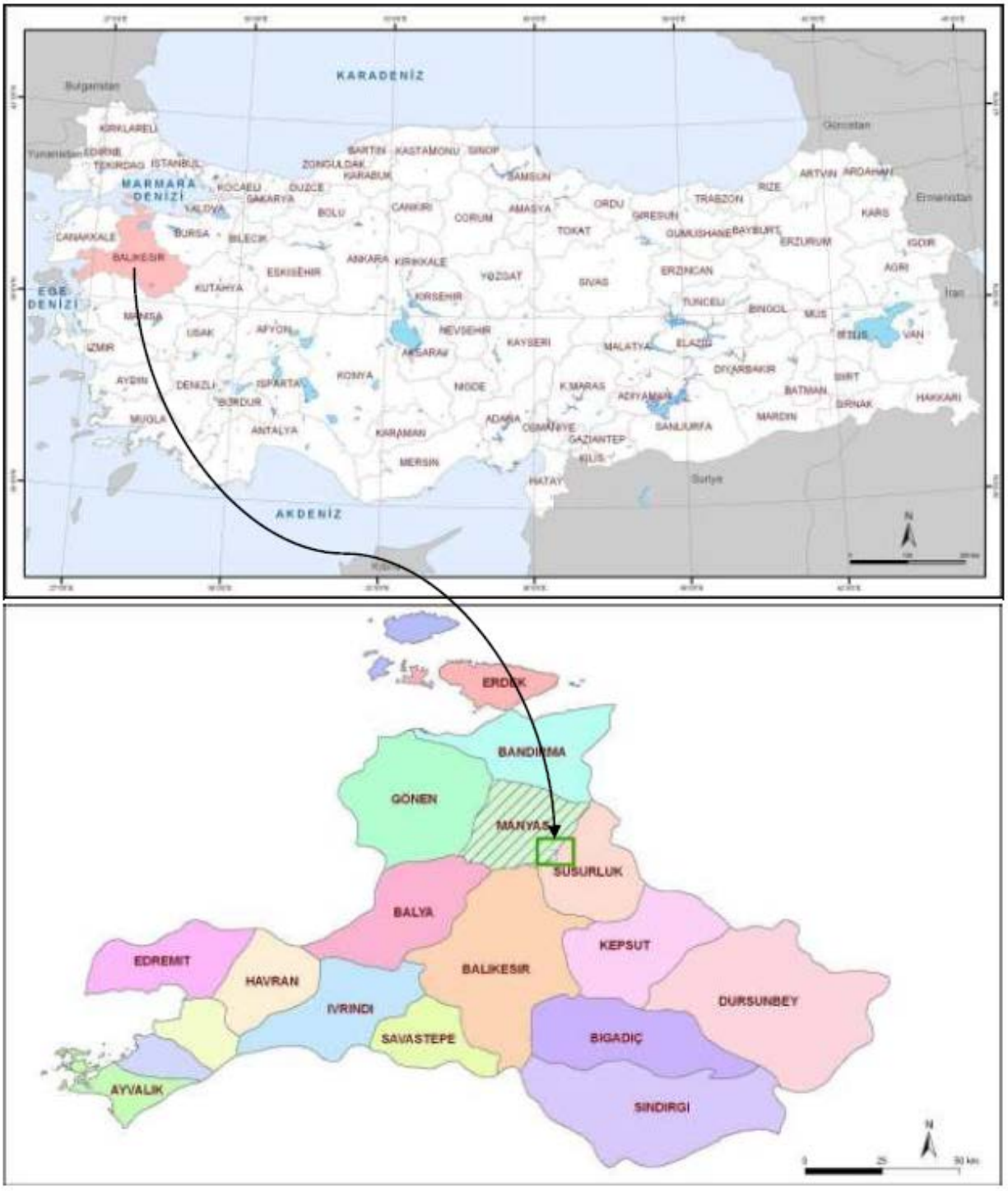
A.2.3. City/Town/Community etc.

Nearest settlement to the project boundaries is Yaylakoy village which is about 1 km from the project site

A.2.4. Physical/ Geographical location

Zone(35S) (ED50)	Easting(m)	Northing(m)
T1	586478	4425918
T2	586566	4425088
T3	586463	4425636
T4	586268	4425305
T5	585994	4425329
EX1	586582	4426185
EX2	586792	4425776
EX3	586249	4425719
Switchyard	586009	4425184

Table 2 : Turbine Coordinates


KARADENİZ
Bulgaristan
Gürcistan
Yunanistan
Ermenistan
İran
Suriye
MARMARA DENİZİ
EGE DENİZİ
AKDENİZ
KIRKLARELİ
EDİRNE
TEKİRDAĞ
İSTANBUL
ÇANAKKALE
BALIKESİR
BURSA
YALOVA
KOCAELİ
SAKARYA
DÜZCE
BOLU
BİLECİK
ESKİŞEHİR
KÜTAHYA
MANİSA
İZMİR
UŞAK
AFYON
AYDIN
DENİZLİ
ISPARTA
BURDUR
MUĞLA
ANTALYA
KONYA
AKSARAY
NİĞDE
NEVŞEHİR
KIRŞEHİR
KIRIKKALE
ANKARA
ÇANKIRI
KASTAMONU
ZONGULDAK
KARABÜK
BARTIN
SİNOP
SAMSUN
ÇORUM
AMASYA
TOKAT
YOZGAT
SİVAS
ORDU
GİRESUN
TRABZON
RİZE
ARTVİN
ARDAHAN
GÜMÜŞHANE
BAYBURT
ERZURUM
ERZİNCAN
TUNCELİ
BİNGÖL
MUŞ
BİTLİS
VAN
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IĞDIR
KARS
KAYSERİ
MALATYA
ELAZIĞ
DİYARBAKIR
BATMAN
ŞIRNAK
SİİRT
HAKKARİ
MARDİN
ŞANLIURFA
GAZİANTEP
OSMANİYE
ADANA
KİLİS
HATAY
K.MARAŞ
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EDREMİT
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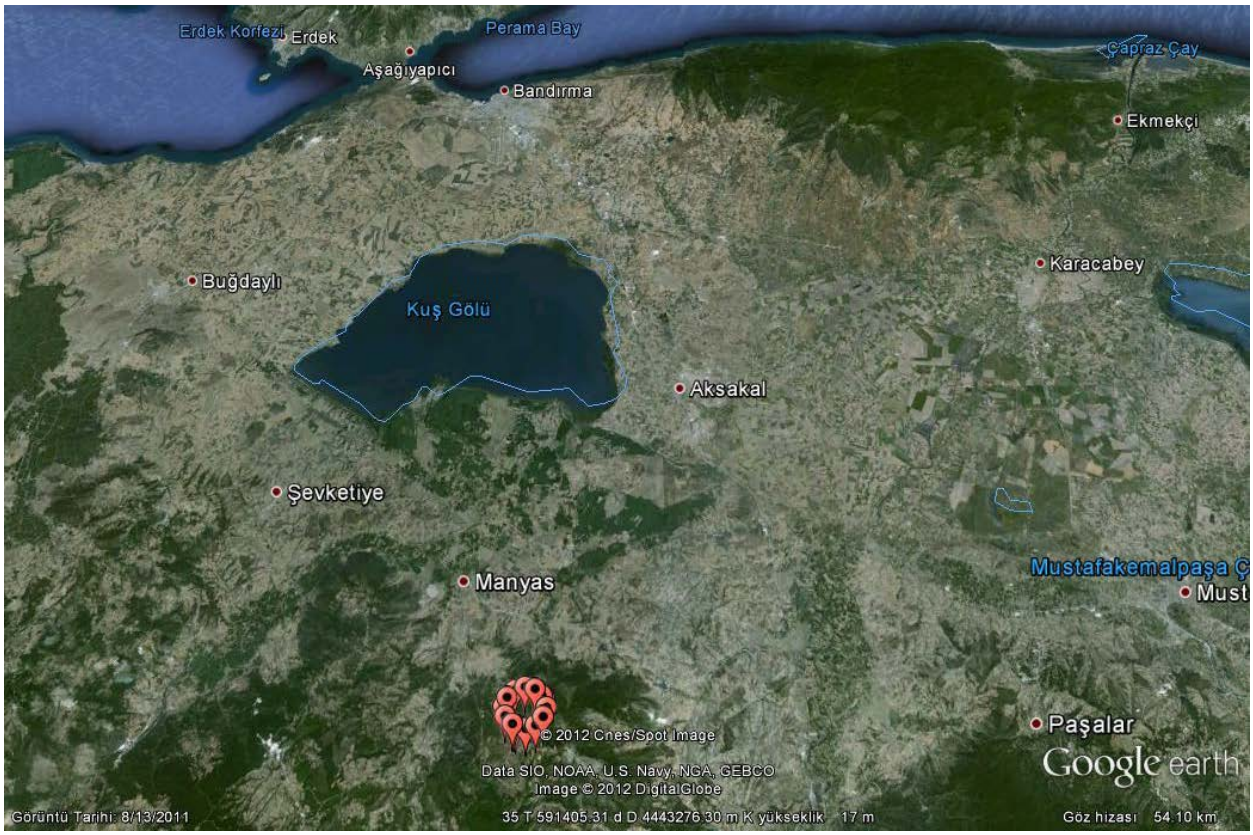
25
50 km



A.3. Technologies and/or measures

Wind Power Plants use wind energy converters (WEC), called wind turbines to convert the wind energy into electrical energy. Average annual wind speeds measured at the project site at 85 meters hub height is 8.2 meters per second[10]. The project uses 5 WEC's of GE 2.5-100 MW and 3 GE 2.75-100 generators[11] with total electrical output will be limited to 20MWe. The annual electricity generation from these turbines are estimated to be 55.5 GWh. This energy is converted to 34.5 kV at the site switchyard and connected to the national grid.

Fina Energi built a 10MWe wind farm in Manyas District of Balikesir Province in Turkey in 2012. Günaydın WPP has started to operate in November 2012. With the proposed extension project Fina Enerji proposed to expand the capacity of the wind farm to 20MWe.

[10] FSR page 15

[11] http://www.ge-renewable-energy.com/uploads/tx_spdownloads/GE_Onshore__2.75-100_2.75-103.pdf

Design Limits	
Rotor Diameter	100 m
Cut-in Wind Speed	3.0 m/s
Cut-out Wind Speed	25 m/s
Rated Power Output	2.5 MW
Minimum ambient temperature operation	-15 °C / -20°C
Maximum ambient temperature operation	+ 40 °C
Minimum Humidity	5 g/m^3
Maximum number of grid-induced disconnections per year	30
Maximum altitude with no deareting	1000 m
Tower	
Type	Tubular Steel Tower
Hub Height	85 m
Yaw System	
Yaw rate	0.5 °/sec
Rotor	
Diameter	100 m
Number of rotor blades	3
Swept area	7854 m^2
Rotor speed range	5-14 min^{-1}
Rotational Direction	Clockwise looking downwind
Maximum speed of the blade tips	73.6 m/s
Orientation	Upwind
Speed regulation	Pitch-controlled
Aerodynamic brake	Blades in feathering position
Cone angle	3°
Inclination angle of rotor axis	4°
Rotor Blades	
Length (blade root – tip)	48.7 m
Pitch System	
Principle	Single blade pitch control
Main Gearbox	
Rated Power	2750 kW
Type	Multi-stage system
Lubrication	1 mechanical and 1 electrical pump
Brake System	
Primary brake system	Single blade pitch control
Secondary brake system	Single blade pitch control
Holding brake	Hydraulically driven brake caliper on high-speed shaft
Generator	
Type	Permanent magnet generator
Rated output	2640 KW
Rated speed	1650 min^{-1}
Rated voltage	710 V
Apparent Power	2808 kVA
Frequency at rated output	110 Hz
Protection Class	IP54
Insulation Class	F
Function type	S1
Standard	EN 60034-1
Converter System	
Type	Voltage source converter
Rated voltage, line slide	690 V +/-10 %
Rated frequency	50 Hz / 60 Hz
Protection class of the electronics	IP54

Table 3. Characteristics of the 2.5MW turbines used.

A.4. Parties and project participants

Party involved (host) indicates a 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)	MANRES Elektrik Üretim A.Ş. - (Project Owner-Private Entity) GTE CARBON (Project Developer-Private Entity)	**No**

A.5. Public funding of project activity

No public funding is used for the project.

A.6. Debundling for project activity
Project is not a debundled component of a large scale project activity

SECTION B. Application of selected approved baseline and monitoring methodology
B.1. Reference of methodology

The UNFCCC approved baseline and monitoring methodology ACM0002, version 14.0.0[12] valid from 04/10/2013 was applied for the project activity.

ACM0002 refers to the following tools:

- "Tool for the demonstration and assessment of additionality", Version 07.0.0[13] and,
- ''Tool to calculate the emission factor for an electricity system'', Version 4.0 [14]

However ''Tool to calculate the emission factor for an electricity system'', Version 02.2.1 was applied to the project in the initial phase and since the emission factor will remain fixed during the first crediting period, no changes have been applied for the capacity addition.

B.2. Project activity eligibility

The project activity was initially classified as a small-scale activity however after capacity extension, it has exceed the small scale limit and became a large scale project. Project is a Type I activity and complies with eligibility rules during the full crediting period.

The choice of methodology ACM0002, is justified as the project activity meets its applicability criteria:

- The proposed project activity is a greenfield, grid connected renewable electricity generation project,
- The project activity is the installation of wind power plant

[12] http://cdm.unfccc.int/UserManagement/FileStorage/A04BWNRKLUEP6O1QX75YVTH28JDICZ
[13] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf/history_view
[14] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf

- The project does not involve capacity addition, a retrofit of (an) existing plant(s) or a replacement of (an) existing plant(s)Project activity does not involve switching from fossil fuels to renewable energy sources at the site of project activity

- The project does not involve combined heat and power generation activity

- The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available.

Since there exists no delineation of project electricity system or connected electricity systems by DNA, following criteria has been used to determine the existence of significant transmission constraints:

- In case of electricity systems with spot markets for electricity: there are differences in electricity prices (without transmission and distribution costs) of more than 5 percent between the systems during 60 percent or more of the hours of the year.

- The transmission line is operated at 90% or more of its rated capacity during 90% percent or more of the hours of the year.

Since the project output is fed to the Turkish electricity grid which does not involve any distinct electricity systems that applies different price, first criteria defined above is not applicable. Also, since the transmission line between the proposed projects and nearest substation is built within the scope of the project and there exist no information on grid capacity utilization, second criteria is also inapplicable. Based on assessment above, it is difficult to conclude with a significant transmission constraint or grid boundary. Since there is no dispatch grid system in Turkey, the project boundary is considered as the National Electricity Grid of Turkey according to applied tool. The geographical and physical boundaries of the Turkish grid and location of the power plants are well identified as given diagram below.

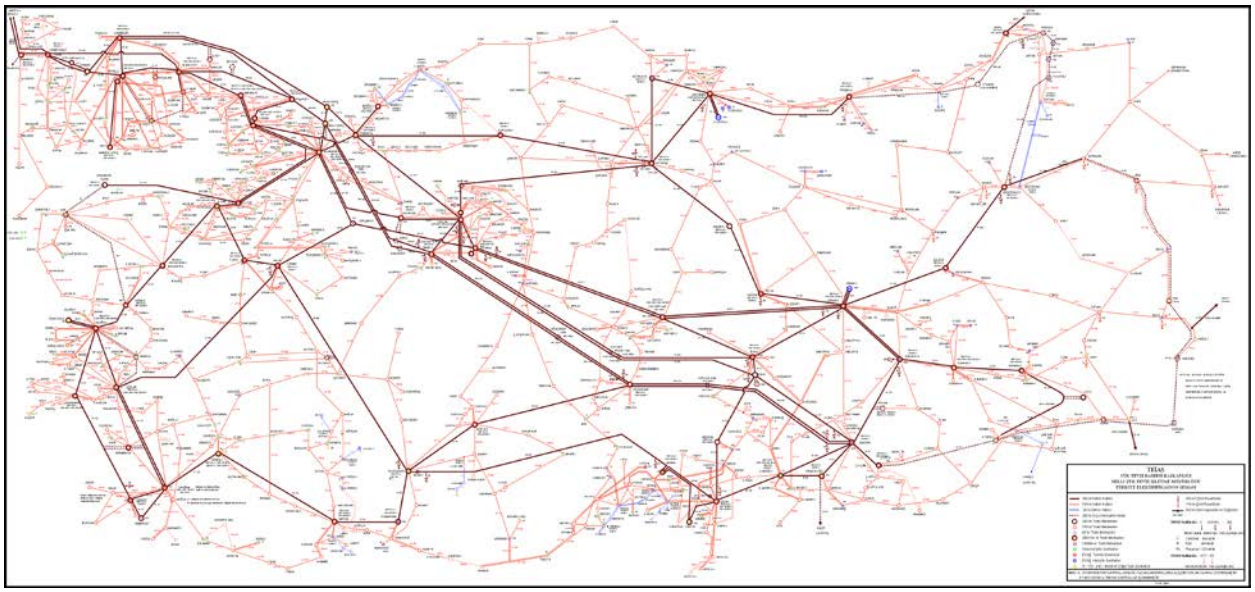


Figure 1. Turkish Electricity Grid

B.3. Project boundary

The project boundary is considered as the National Electricity Grid of Turkey according to applied tool. The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the power plant is connected to.

The flow diagram of the project boundary is illustrated below:

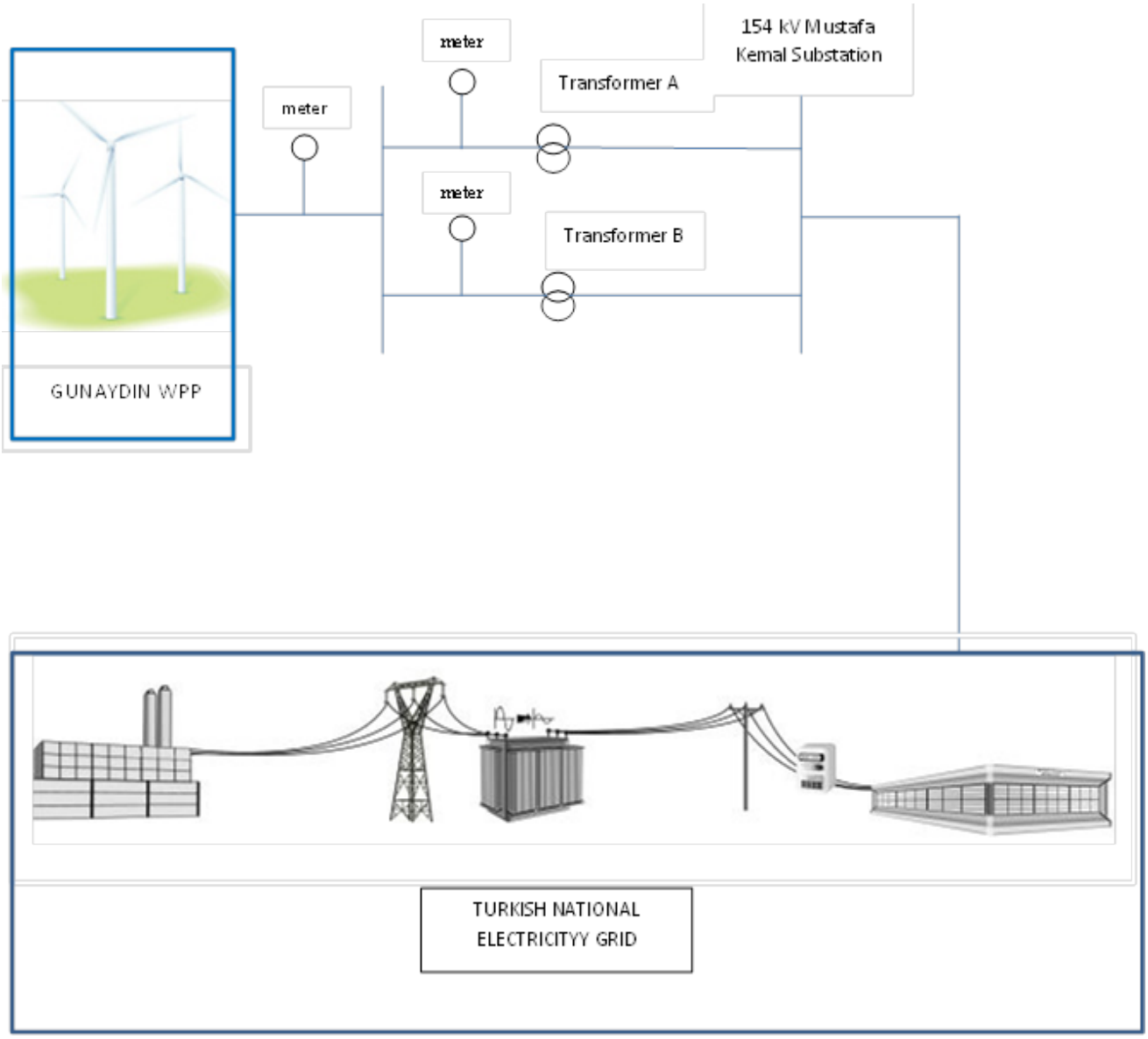


Figure 2. The Flow Diagram of the Project Boundary

The greenhouse gases and emission sources included in or excluded from the project boundary are shown in table

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Electricity Generation by the grid connected power plants	CO_2	Yes	Major emission Source
		CH_4	No	Minor emission Source. Excluded for simplification
		N_2O	No	Minor emission Source. Excluded for simplification
Project scenario	Project Scenario	CO_2	No	Zero emission electricity generation from renewable resources. Emissions from diesel generator are excluded for simplification as it is a minor emission source.
		CH_4	No	Zero emission electricity generation from renewable resources.
		N_2O	No	Zero emission electricity generation from renewable resources.

Table 4. Emission sources included in or excluded from the project boundary.

B.4. Establishment and description of baseline scenario

According to the methodology baseline scenario has been identified as "*the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources*".

Turkish electricity generation is mainly composed of thermal power plants and the share of renewable resources; especially hydroelectric power plants have decreased significantly in recent years whereas share of wind power plants are still very low. Since Turkey is an advanced developing country, there is an increasing demand for electricity which is fully expected to continue in the foreseeable future.

The trend in Turkey to date and given historically slow development of alternative energy resources is to build an increasing number of thermal power plants in the future to satisfy the annual growth in energy consumption demand. Turkey as an advanced developing nation has looked at dealing with energy security by developing and constructing high capacity coal and natural gas power plants. The development of thermal power plants has been also encouraged by the large natural resource availability in Turkey, especially the abundance of economically accessible lignite.

In the absence of the proposed project activity, the same amount of electricity is required to be supplied via either the current power plants or by increasing the number of thermal power plants thus increasing GHG emissions.

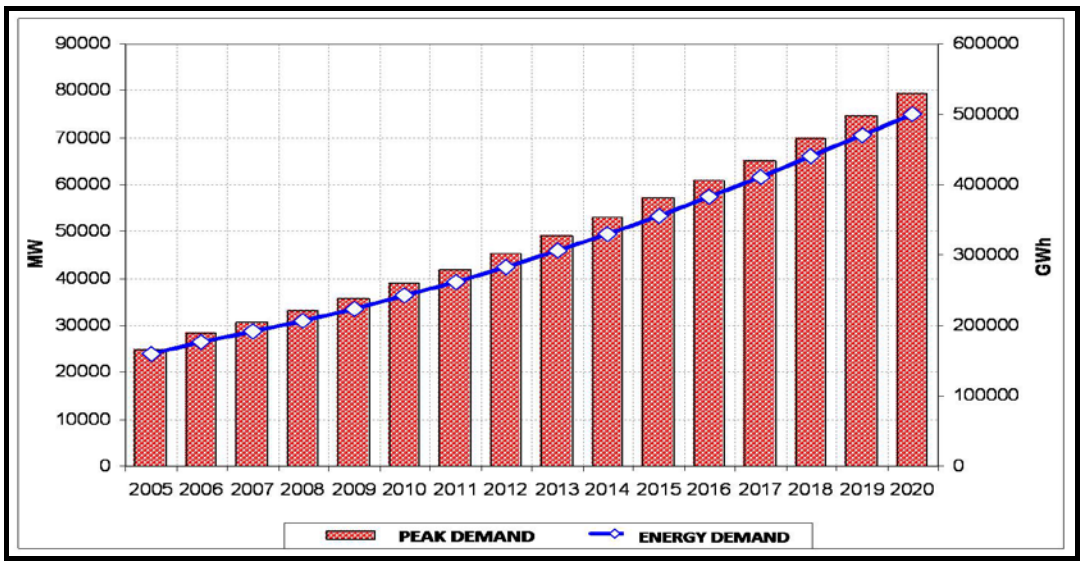


Figure 3. Peak Load and consumption projection for Turkish electricity system between 2005-2020[15]

According to the TEIAS statistics[16], share of WPPs together with geothermal power plants could hardly reach 1.68% in 2010 whereas share of thermal power plants is around 74-80% in recent years. When we look at the annual development of Turkey's gross generation in recent years we see that grid is dominated by thermal power plants and which is boosted by increasing energy demand in parallel to increase population and per capita income. Hence, baseline of Turkey's electricity grid will continue to be dominated by fossil fuel power plants which is seen as the quickest solution in short term to meet the demand and enable energy security in supply side.

15 http://www.teias.gov.tr/apkuretimplani/veriler.htm

16 http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/uretim%20tuketim(22-45)/36.xls

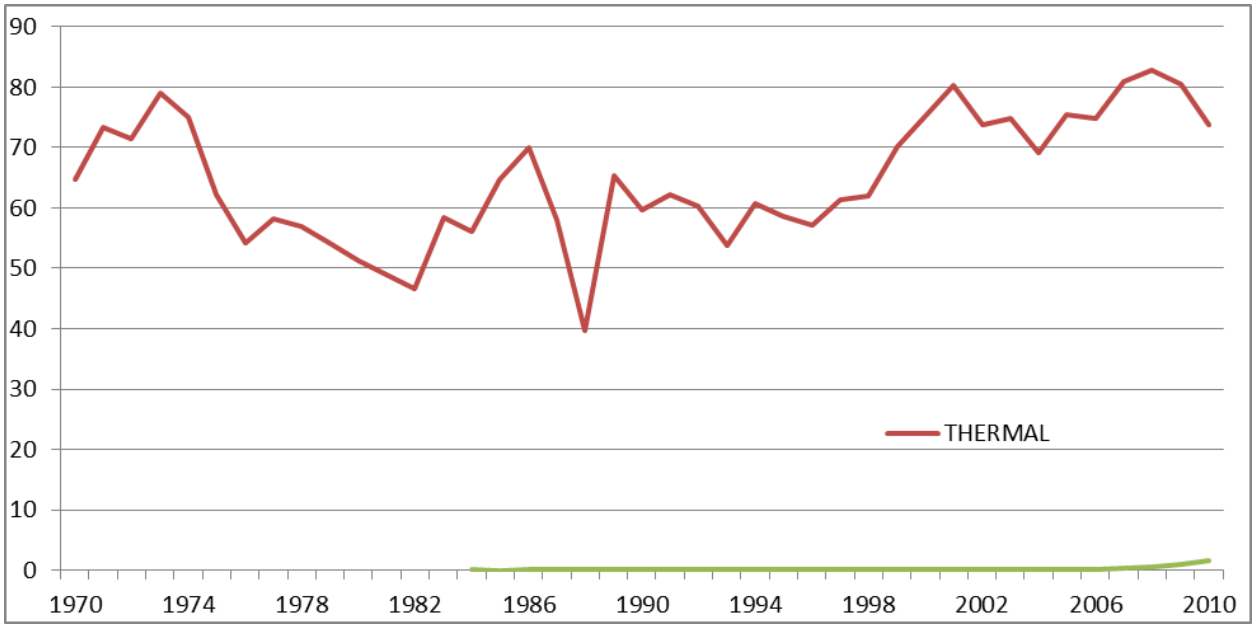


Figure 4. Annual Development of Turkey's Gross Generation Capacity[16]

B.5. Demonstration of additionality

According to the applied methodology (ACM0002) the baseline scenario for the project has been defined as "generation of equal amount of electricity by the power plants connected to the grid". Emission factor for the baseline scenario has been calculated according to the combined margin approach as defined by the selected methodology. Within this framework, after capacity extension the project is expected to generate about 55.5 GWh of electricity and reduce about 33,300 tCO_2 emissions through replacing the electricity that would need to be supplied via the National grid in the absence of the project activity. Additionality of the proposed project has been assessed according to the applied tool for demonstration of additionality as shown in following steps.

Step 1 - Identification of Alternatives to the project activity consistent with current laws and regulations

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

The most realistic and reliable alternatives to the project activity are:

1. Proposed project not undertaken as a VER project activity
2. Continuation of the current situation-supply of equal amount of electricity by the newly built grid connected power plants

The first alternative, which is the implementation of the project without carbon revenue is not financially attractive as discussed in investment analysis section below. The Second alternative (Scenario 2) is the baseline scenario and implementation of the proposed project as a VER activity would be additional to this scenario.

Outcome of Step 1a

Continuation of the current situation is not considered as a realistic alternative due to increasing electricity demand therefore new power plants should be constructed which includes mainly thermal power plants. Implementation of the project is additional to the baseline scenario which is alternative 2 above and therefore reduces the emissions.

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

The following applicable mandatory laws and regulations have been identified:

1. Electricity Market Law[17]
2. Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy[18]
3. Energy Efficiency Law [19]
4. Forest Law[20]
5. Environment Law[21]

The resultant alternatives to the project as outlined in Step (1a) are in compliance with the 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 not the only alternative amongst the project participants that is in compliance with mandatory regulations. Therefore, the proposed VER project activity is considered as additional.

Step 2 - Investment analysis

The investment analysis has been done in order to make an economic and financial evaluation of the project. No public funding or ODA are available in Turkey for finance of this type of projects. Proposed project has been financed through company own resources. Loans may be utilized in next steps of the investment depending on the market conditions and availability of financial resources. For investment analysis, loan conditions have been determined considering the proposals submitted by financiers and market rates.

***Sub-step 2a* - Determine appropriate analysis method**

There are three options for the determination of analysis method which are:

- Simple Cost Analysis
- Investment Comparison Analysis and
- Benchmark Analysis

[17] Law number 4628, enactment date 03/03/2001 http://www.epdk.gov.tr/english/regulations/electricity.htm

[18] Law number 5346, enactment date 18/05/2005 http://www.epdk.gov.tr/documents/10157/4b360128-53aa-4174-8104-a6c10434ac9c

[19] Law number 5627, enactment date 02/05/2007 http://www.eie.gov.tr/english/announcements/EV_kanunu/EnVer_kanunu_tercume_revize2707.doc

[20] Law number 6831, enactment date 31/08/1956

[21] Law number 2872. Published in official gazette No. 18132 on 11/08/'83

Since Project generates economic benefits from sales of electricity, the simple cost analysis is not applicable. Also, since the baseline of the project is generation of electricity by the grid, no alternative investment is considered at issue. So, it has been decided to use benchmark analysis for evaluation of the project investment.

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

For benchmark analysis, figure defined by World Bank for similar project types have been used which has been given as 15% [22] (pre-tax)by a report generated in May 2009. For the proposed project, in order to reach this equity IRR values, average electricity tariff must be above 8.1 $c/kWh in the absence of carbon revenue and assuming that initial investment figures are realized so that the investment will become reasonable.

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

Parameters	Unit	Initial Project	Final Design
Installed Capacity	MWe	12.5	20.0[23]
Grid Connected output	MWh	36.7	55.5[24]
Capital Investment	Million $	18.6	27.9[25]
Income tax rate	%	20	20[26]
Expected Tariff	$ Cents/kWh	7.3	7.3[27]
Expected VERs price	$/ tons CO_2e	6.5	6.5[28]
Operation&Maintenance Cost	$/Year	680	897[29]
Equity IRR	%	11.57	12.00

Table 5. Main financial parameters used for investment analysis

Equity IRR has been calculated according to the tool as stated in the applied methodology and using pre-tax IRR as the benchmark used is also real pre-tax equity IRR. Electricity tariff has been used as $7.3 Cent/kWh. Annual generation has been taken as 55.5 GWh based on P90 value of 10 year average as per the Energy Assessment Report prepared for the final project design. Investment decision date has been identified as the date of additional turbine agreement. For depreciation calculations, expected life of construction and electromechanical equipment are determined as 40 year and 25 year, respectively.[30] Calculation and estimations have been made conservatively therefore equity IRR value represents the most optimistic scenario in terms of capital investment and electricity generation. On the other hand electricity tariff is expected to increase so that the investment becomes attractive however as given below, expectations have not been realized yet due to the market conditions.

[22] Project Appraisal Document for a proposed IBRD Loan (page 81)
[23] Energy Assessment Report (10 year average P90)
[24] Amended Generation License
[25] Investment Model submitted to DOE
[26] http://www.mmmb.org.tr/default.aspx?pid=24826&nid=16297
[27] http://www.epdk.gov.tr/documents/10157/4b360128-53aa-4174-8104-a6c10434ac9c
[28] Tulletprebon newsletter
[29] Gunaydin WPP Financial Model
[30] http://www.gib.gov.tr/fileadmin/mevzuatek/eski/verusulteb333ek.html

Expected return on investment for these types of projects should be above 15% as per WB document however, expectation of many investors is returns around 25% for successful investments for some investment funds. Even if we consider the minimum benchmark equity IRR which is 15%, for proposed project, in order to reach this equity IRR values, average electricity tariff must be above 8.1 $c/kWh in the absence of carbon revenue and assuming that initial investment figures are realized so that the investment will become reasonable.

For proposed project, equity IRR has been initially calculated as 11.57% in the absence of carbon revenues whereas equity IRR as per final design (20MWe) has been calculated as 12.00% which is still below the benchmark. When the carbon revenues are included in the cash flow, equity IRR increases to 13.39% and the project becomes more attractive and viable for the investors as coupled with the view that energy sale prices that can be achieved from the project will likely increase in future years. Expectation that the electricity prices will increase is the risk for investors whereas realization of this expectation will the premium. Carbon revenue has a significant affect in this respect in terms of decreasing the period for return on investment and risk of investment decision.

Following figure is given in order to reflect the actual electricity prices realized obtained from monthly reports of Market Settling and Balancing Center [31] between 01/12/2009-01/01/2012. It should be considered that these prices are highest prices obtained and power plants which sell electricity through bilateral agreements have lower income. Figure shows that the actual prices have even been lower than guaranteed price in some cases therefore assumption of 7.3 $cents per kWh (or 73 $/MWh) is a realistic scenario as demonstrated below.

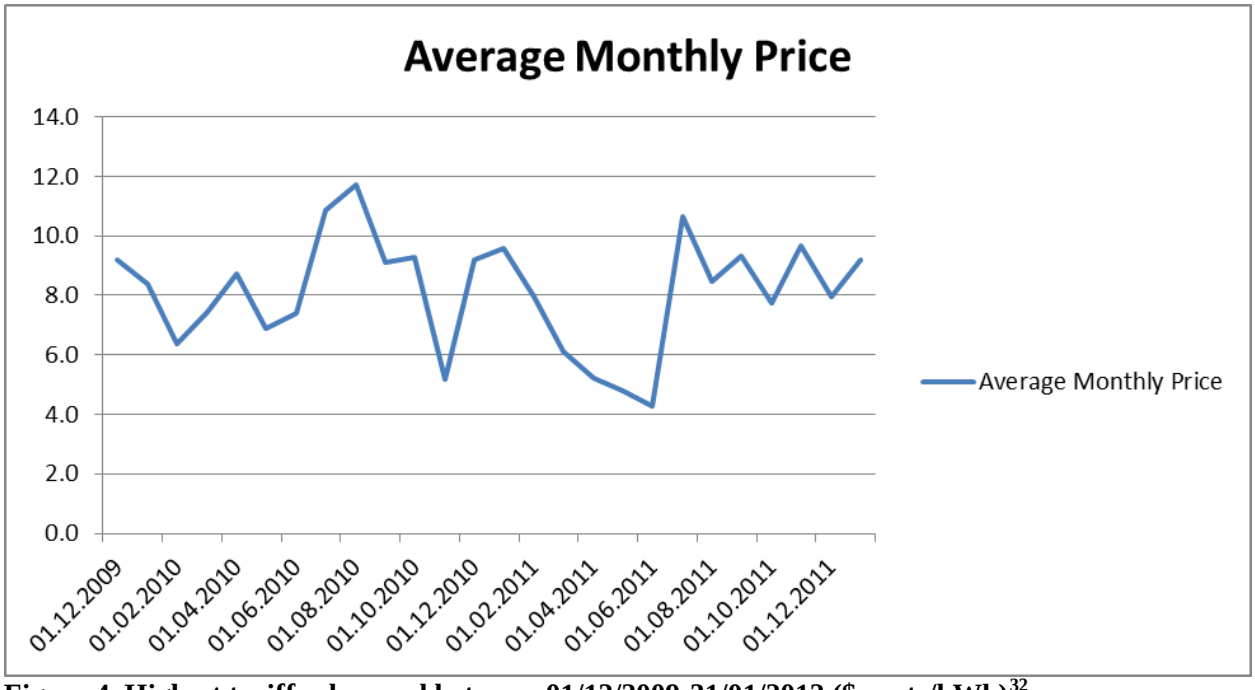


Figure 4. Highest tariffs observed between 01/12/2009-31/01/2012 ($ cents/kWh)[32]

This equity IRR value represents the most optimistic scenario in terms of capital investment and electricity generation whereas electricity tariff is expected to increase due to increasing electricity demand so that the investment becomes attractive.

[31] http://pmum.teias.gov.tr/UzlasmaWeb/
[32] http://dgpys.teias.gov.tr/dgpys

For the proposed project, in order to reach the benchmark equity IRR values, average electricity tariff must be above 8.1$ c/kWh so that the investment will become reasonable. Considering that control wind power plants on generation period is limited, expectation that the floor electricity prices will increase is the risk for investors whereas realization of this expectation will increase the premium. Carbon revenue has a significant affect in this respect in terms of decreasing the period for return on investment and minimizing investment risk.

Sub-step 2d - Sensitivity Analysis

Sensitivity analysis has been carried out for three main parameters identified which constitute all income and expenses of project effecting project return;

- Investment Cost
- Operating Cost
- Electricity Sales revenue

For a range of ±10% fluctuations in parameters investment and operational cost ±15% fluctuation in electricity income, table below has been obtained.

% Fluctuation	**-10**	**-5**	**-2.5**	**0**	**2.5**	**5**	**10**
Investment Cost	13.89	12.65	12.09	11.57	11.09	10.63	9.81
Operating Cost	12.25	11.91	11.74	11.57	11.40	11.23	10.90
% Fluctuation	**-15**	**-10**	**-5**	**0**	**5**	**10**	**15**
Electricity Income	7.79	9.03	10.29	11.57	12.88	14.23	15.61

Table 6. Sensitivity analysis for proposed project (before extension)without carbon revenue

In a range of ±15% fluctuations in parameters investment cost, operational cost and electricity income, table below has been obtained for the final design of the project with the capacity addition (20 MWe)

% Fluctuation	**-15**	**-10**	**-5**	**0**	**5**	**10**	**15**
Investment Cost	15.85	14.37	13.09	12.00	11.04	10.20	9.45
Operating Cost	12.86	12.57	12.28	12.00	11.71	11.43	11.14
% Fluctuation	**-15**	**-10**	**-5**	**0**	**5**	**10**	**15**
Electricity Income	8.33	9.53	10.75	12.00	13.27	14.58	15.91

Table 7: Sensitivity analysis for proposed project (after extension) without carbon revenue

Moreover to reach the benchmark Equity IRR stated as 15% as per WB Report, there should be some fluctuations on parameters, namely, investment cost, operation cost and electricity sales revenue.
These fluctuations are tabulated below:

	% Fluctuation
Investment cost	**-12.2**
Operating cost	**-51.0**
Electricity income	**11.6**

Table 8. Percentage changes to reach the benchmark equity IRR after capacity addition

Sensitivity analysis has been carried out according to the conditions when the investment decision is given hence for 55.5 GWh generation and 7.3$ c/kWh guaranteed price.

Outcome of Step 2:
The investment and sensitivity analysis shows that the VER revenues will improve the financial indicators of the Project remarkably. Considering that figures above are based on a higher price rather than the government guaranteed floor price, optimistic estimations for yearly generation and that those figures do not reflect the risk for investment, role of carbon income is a most significant number to enable the project to proceed.

According to local regulations, electricity price is determined daily according to Market Financial Settlement Center (MFSC) as defined in the regulations and there exists three tariffs during day, peak and night hours. Thermal power plants and HEPPs with storage facilities have flexibility to schedule their generation at peak hours when the tariff is high. However, Wind power plants do not have storage facility therefore may not be able to benefit from high prices realized at when demand is high. According to MFSC figures, electricity tariff fluctuated between 4.3 $c/kWh and 10.2 $c/kWh between 01/12/2009 and 31/01/2012 whereas the weighted average of the tariff has been calculated as 8.1$c/kWh in this period[33]. Since this value shows the spot price at the time of selected investment decision date, it does not provide any guarantee about the actual selling price as the control on generation period and tariff is limited and it may not be possible to generate and sell electricity during peak tariff periods. Also, considering that fluctuation in water resources is high and fact that a part of the electricity can be sold through bilateral agreements to free consumers with a discount rate over market price, guarantee price has been taken as reference in investment analysis which also provides input for evaluation of financing institutions.

Another important parameter affecting equity IRR is investment cost. However, since the agreements have been made and costs are realized as given in financial model, there is no chance to expect a decrease in the investment cost. Operating costs can also affect the equity IRR however, its impact is not significant and does not cause any significant change in equity IRR and the fluctuation percentage to reach the benchmark is very high and not likely.

Based on the above information, it is seen that project is not the most attractive option. Therefore project is considered as additional to the baseline scenario.

Step 3. Barrier analysis

This step is not applied as the additionality is demonstrated in previous steps.

Step 4. Common Practice Analysis

According to the “Tool for the demonstration and assessment of additionality”, Version 07.0.0”, the common practice shall provide an analysis of any other activities that are similar to the Project Activity. Projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing etc.

[33] https://pmum.teias.gov.tr/UzlasmaWeb/

Currently there are 1401 generation licenses issued by EMRA[34]. However, according to latest statistics published by TEIAS (National Energy Transmission Comapany) in January 2014, there are only 61 operational wind power projects with a total capacity of 2260.7MW[35]. Among the 61 operational plants, except the first a few plants which have been built according to Build-Operate-Transfer or Autoproducer system, all recent wind power plants are developed as VER projects.

Annex-8 , Guidelines on Common Practice version 02.0 has been followed.[36]

Step 1: calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity.

The total capacity of the proposed project is 20.0 MWe. Therefore, the applicable output range is from 10.0 MW to 30.0 MW

Step 2: identify similar projects (both CDM and non-CDM) which fulfil all of the following conditions:
(a)The projects are located in the applicable geographical area;
(b)The projects apply the same measure as the proposed project activity;
(c)The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity;
(d)The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant;
(e)The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1;
(f)The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

Applicable geographical area has been selected as the whole host country as per paragraph 1 of Guidelines on Common Practice version 02.0.[37] Projects which apply the same measure as the proposed project have been determined and wind energy projects are selected as the same energy source type of projects. All of the selected plants deliver the same service which is the electricity generation. Applicable output range has been determined and all of the power plants are taken from the latest available year 2013 Capacity Report. Therefore all of the compared power plants have been operational before the implementation of the project activity.

Below is a list of operational wind power plants as given by the TEIAS 2013 Capacity Report:
Power plants which are in the applicable range of Gunaydin WPP (i.e. 10MWe-30MWe) are highlighted.

	No	Plant	Installed Capacity (MWe)	Design Capacity (GWh)	Firm Capacity (GWh)
BOTAŞ WPP	1	ARES (ALAÇATI)	7.2	19	19

[34] http://lisans.epdk.org.tr/epvys-web/faces/pages/lisans/elektrikUretim/elektrikUretimOzetSorgula.xhtml (See total records)
[35] TEIAS Turkey Capacity Projection Report 2013 , Appendix I
[36] http://cdm.unfccc.int/Reference/Guidclarif/meth/meth_guid44.pdf
[37] http://cdm.unfccc.int/Reference/Guidclarif/meth/meth_guid44.pdf

	2	BORES (BOZCAADA)	10.2	30	30
AUTOP WPP	3	SUNJÜT	1.2	2	2
GENERATION COMPANY WPP	4	ALİZE ENERJİ (DELTA PLASTİK)	1.5	5	4
	5	ALİZE ENERJİ (ÇAMSEKİ)	20.8	82	70
	6	ALİZE ENERJİ (KELTEPE)	20.7	73	62
	7	ALİZE ENERJİ (SARIKAYA ŞARKÖY)	28.8	96	82
	8	AK ENERJİ AYYILDIZ (BANDIRMA)	15.0	51	44
	9	AKDENİZ ELEK. MERSİN RES	33.0	100	50
	10	AKRES (AKHİSAR RÜZGAR)	43.8	165	141
	11	AKSU RES (AKSU TEMİZ EN.)	72.0	216	144
	12	ANEMON ENERJİ (İNTEPE)	30.4	92	83
	13	ASMAKİNSAN (BANDIRMA-3 RES)	24.0	85	45
	14	AYEN ENERJİ (AKBÜK)	31.5	123	104
	15	AYVACIK (AYRES)	5.0	17	15
	16	BAKRAS ELEK.ŞENBÜK RES	15.0	47	40
	17	BALIKESİR RES	112.8	434	370
	18	BARES (BANDIRMA)	35.0	123	105
	19	BELEN HATAY	36.0	114	70
	20	BERGAMA RES (ALİAĞA RES)	90.0	355	302
	21	BANDIRMA RES (BORASKO)	60.0	240	155
	22	BOREAS EN.(ENEZ RES)	15.0	49	42
	23	BOZYAKA RES (KARDEMİR)	12.0	38	32
	24	ÇANAKKALE RES (ENERJİ-SA)	29.9	92	78
	25	ÇATALTEPE (ALİZE EN.)	16.0	52	44
	26	DOĞAL ENERJİ (BURGAZ)	14.9	48	43
	27	DAĞPAZARI RES (ENERJİ SA)	39.0	120	102
	28	DENİZLİ ELEKT. (Karakurt-Akhisar)	10.8	28	24
	29	DİNAR RES (OLGU EN.)	16.1	60	51
	30	ERTÜRK ELEKT. (TEPE)	0.9	3	2
	31	GÜNAYDIN RES (MANRES EL.)	10.0	40	34
	32	MARE MANASTIR	39.2	129	129
	33	MAZI 3	30.0	105	80
	34	KARADAĞ RES (GARET EN.)	10.0	34	29
	35	KAYADÜZÜ RES (BAKTEPE EN.)	39.0	129	110
	36	KİLLİK RES (PEM EN.)	40.0	86	73
	37	KORES KOCADAĞ	15.0	56	48
	38	KOZBEYLİ RES (DOĞAL EN.)	20.0	70	60

	39	KUYUCAK (ALİZE ENER.)	25.6	110	94
	40	METRİSTEPE (CAN EN.)	39.0	85	73
	41	POYRAZ RES	50.0	230	196
	42	ROTOR (OSMANİYE RES-GÖKÇEDAĞ RES)	135.0	510	435
	43	BAKİ ELEKTRİK ŞAMLI RÜZGAR	114.0	440	375
	44	DATÇA RES	29.6	84	71
	45	ERTÜRK ELEKT. (ÇATALCA)	60.0	210	180
	46	İNNORES ELEK. YUNTDAĞ	57.5	233	159
	47	LODOS RES (TAŞOLUK)KEMERBURGAZ	24.0	85	69
	48	SAMURLU RES(DOĞAL EN.)	22.0	70	60
	49	SARES (GARET ENER.)	22.5	91	51
	50	SAYALAR RÜZGAR (DOĞAL ENERJİ)	34.2	108	100
	51	SEBENOBA (DENİZ ELEK.)SAMANDAĞ	30.0	110	96
	52	SEYİTALİ RES (DORUK EN.)	30.0	110	94
	53	SOMA RES	140.1	480	390
	54	SOMA RES (BİLGİN ELEK.)	90.0	307	261
	55	SÖKE ÇATALBÜK RES (ABK EN.)	30.0	110	93
	56	SUSURLUK (ALANTEK EN.)	45.0	112	96
	57	ŞAH RES (GALATA WIND)	93.0	400	341
	58	ŞENKÖY RES (EOLOS RÜZ.)	26.0	87	74
	59	TURGUTTEPE RES (SABAŞ ELEK.)	24.0	70	55
	60	ÜTOPYA ELEKTRİK	30.0	92	60
	61	**ZİYARET RES**	**57.5**	210	182
		Total	**2260.7**		

Step 3: within the projects identified in Step2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number N_{all}

All power plants that have same capacity, within the range 10.0 MW to 30.0 MW has been listed in common practice excel sheet. Properties of the power plants are also indicated in this excel sheet. After excluding the VER projects, there exists only 1 power plant being operated in Turkey. (BORES-BOZCAADA)

Therefore;

$N_{all} = 1$

Wind Power Plant	Installed Capacity (MWe)	License Type	Project Status as of 18/04/2014
BORES (BOZCAADA)	10.20	BOT	Different Investment Model
ALİZE ENERJİ (ÇAMSEKİ)	20.80	GENERATION COMPANY	GS Issued

ALİZE ENERJİ (KELTEPE)	20.70	GENERATION COMPANY	GS Issued
ALİZE ENERJİ (SARIKAYA ŞARKÖY)	28.80	GENERATION COMPANY	GS Issued
AK ENERJİ AYYILDIZ (BANDIRMA)	15.00	GENERATION COMPANY	GS Issued
ASMAKİNSAN (BANDIRMA-3 RES)	24.00	GENERATION COMPANY	GS Issued
BAKRAS ELEK.ŞENBÜK RES	15.00	GENERATION COMPANY	GS Issued
BOREAS EN.(ENEZ RES)	15.00	GENERATION COMPANY	GS Issued
BOZYAKA RES (KARDEMİR)	12.00	GENERATION COMPANY	GS Issued
ÇANAKKALE RES (ENERJİ-SA)	29.90	GENERATION COMPANY	GS Issued
ÇATALTEPE (ALİZE EN.)	16.00	GENERATION COMPANY	GS Issued
DOĞAL ENERJİ (BURGAZ)	14.90	GENERATION COMPANY	GS Issued
DENİZLİ ELEKT. (Karakurt-Akhisar)	10.80	GENERATION COMPANY	VCS Registered
DİNAR RES (OLGU EN.)	16.10	GENERATION COMPANY	GS Listed
MAZI 3	30.00	GENERATION COMPANY	GS Issued
KARADAĞ RES (GARET EN.)	10.00	GENERATION COMPANY	GS Listed
KORES KOCADAĞ	15.00	GENERATION COMPANY	GS Issued
KOZBEYLİ RES (DOĞAL EN.)	20.00	GENERATION COMPANY	GS Registered
KUYUCAK (ALİZE ENER.)	25.60	GENERATION COMPANY	GS Issued
DATÇA RES	29.60	GENERATION COMPANY	GS Issued
LODOS RES (TAŞOLUK)KEMERBURGAZ	24.00	GENERATION COMPANY	GS Issued
SAMURLU RES(DOĞAL EN.)	22.00	GENERATION COMPANY	GS Registered
SARES (GARET ENER.)	22.50	GENERATION COMPANY	GS Registered
SEBENOBA (DENİZ ELEK.)SAMANDAĞ	30.00	GENERATION COMPANY	VCS Registered
SEYİTALİ RES (DORUK EN.)	30.00	GENERATION COMPANY	GS Issued
SÖKE ÇATALBÜK RES (ABK EN.)	30.00	GENERATION COMPANY	GS Issued
ŞENKÖY RES (EOLOS RÜZ.)	26.00	GENERATION COMPANY	GS Listed
TURGUTTEPE RES (SABAŞ ELEK.)	24.00	GENERATION COMPANY	GS Registered
ÜTOPYA ELEKTRİK	30.00	GENERATION COMPANY	GS Issued

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

It has been determined that, all wind power plants within the applicable range except BORES-WPP are either validated or undergoing validation within CDM framework. Among the power plants taken into consideration, for example in BOT (build-operate-transfer) type of projects, project owner receives a concession from public to finance, construct, operate, and they have a different financial model. BORES is a BOT type of power plant and also with its capacity of 10.2 MWe, it is considered as a different scale project.
Therefore;
$N_{diff} = 1$

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

$F=1-N_{diff}/N_{all}=1-(1/1) = 0.000$ (< 0.200)

$N_{all} – N_{diff} = 1 – 1 = 0$ (< 3)

According to "Tool for the demonstration and assessment of additionality", Version 07.0.0, if the factor F is greater than 0.2 and N_{all}-N_{diff} is greater than 3, then the proposed project is a "common practice".

For the proposed project, F=0 and Nall-Ndiff=0, therefore, the proposed project is not a common practice within the applicable geographical area. Hence, the proposed project is additional.

Given the fact that all there is no plants similar to the proposed project and built without carbon revenue, the proposed type of project should not be considered as a common practice in Turkey.

B.6. Emission reductions

B.6.1. Explanation of methodological choices

Emission factor has been calculated in a conservative as requested by the methodology. Basic assumptions made are;

- Emission factor will remain same over the crediting period,
- Emission factor of fuels sources is "0" or the lowest value in the references when there is no information.

For calculation of the emission factor of Turkish Grid, "Tool to Calculate the Emission Factor for an Electricity System", has been used.

Since the share of low-cost / must-run sources is below 50%, method (d) is eliminated. Also due to insufficient data available, methods (b) and (c) are not considered and thus (a) simple OM method is used in calculations. The following table is used for demonstrating the share of low cost/must run resources.

ANNUAL DEVELOPMENT OF GENERATION IN TURKEY					
	GENERATION				
YEARS	***THERMAL***	***HYDRO***	***GEOTHERM.WIND***	***TOTAL(GWh)***	**% Low Cost Must Run**
1970	5590.2	3032.8	0	8623.0	35%
1971	7170.9	2610.2	0	9781.1	27%
1972	8037.7	3204.2	0	11241.9	29%
1973	9821.8	2603.4	0	12425.2	21%
1974	10121.2	3355.8	0	13477.0	25%
1975	9719.2	5903.6	0	15622.8	38%
1976	9908.0	8374.8	0	18282.8	46%
1977	11972.3	8592.3	0	20564.6	42%
1978	12391.3	9334.8	0	21726.1	43%
1979	12218.3	10303.6	0	22521.9	46%

1980	11927.2	11348.2	0	23275.4	49%
1981	12056.7	12616.1	0	24672.8	51%
1982	12384.8	14166.7	0	26551.5	53%
1983	16004.1	11342.7	0	27346.8	41%
1984	17165.1	13426.3	22.1	30613.5	44%
1985	22168.0	12044.9	6.0	34218.9	35%
1986	27778.6	11872.6	43.6	39694.8	30%
1987	25677.2	18617.8	57.9	44352.9	42%
1988	19030.8	28949.6	68.4	48048.8	60%
1989	34041.0	17939.6	62.6	52043.2	35%
1990	34314.9	23148.0	80.1	57543.0	40%
1991	37481.7	22683.3	81.3	60246.3	38%
1992	40704.6	26568.0	69.6	67342.2	40%
1993	39779.0	33950.9	77.6	73807.5	46%
1994	47656.7	30585.9	79.1	78321.7	39%
1995	50620.5	35540.9	86.0	86247.4	41%
1996	54302.8	40475.2	83.7	94861.7	43%
1997	63396.9	39816.1	82.8	103295.8	39%
1998	68702.9	42229.0	90.5	111022.4	38%
1999	81661.0	34677.5	101.4	116439.9	30%
2000	93934.2	30878.5	108.9	124921.6	25%
2001	98562.8	24009.9	152.0	122724.7	20%
2002	95563.1	33683.8	152.6	129399.5	26%
2003	105101.0	35329.5	150.0	140580.5	25%
2004	104463.7	46083.7	150.9	150698.3	31%
2005	122242.3	39560.5	153.4	161956.2	25%
2006	131835.1	44244.2	220.5	176299.8	25%
2007	155196.2	35850.8	511.1	191558.1	19%
2008	164139.3	33269.8	1008.9	198418.0	17%
2009	156923.4	35958.4	1931.1	194812.9	19%
2010	155827.6	51795.5	3584.6	211207.7	26%

Table 9. Breakdown by source of the electricity generation[38,]

The methodology has been applied in a conservative manner. Tools addressed by the applied methodology have been used to calculate baseline, project and leakage emissions. The equations used are ;

[38] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/kgucunkullan%C4%B1m(13-21)/13.xls

• $EF_{grid,OMsimple,y} = \frac{\sum_{i,m} FC_{i,y} * NCV_{i,y} * EF_{CO_2,i.y}}{EG_y}$
• $\mathbf{EF_{grid,\ BM,\ y} = \sum EG_{m,y} . EF_{EL,m,y} / \sum EG_{m,y}}$
• $\mathbf{EF_{grid,\ CM,\ y} = w_{OM} * EF_{grid,\ OM,\ y} + w_{BM} * EF_{grid,\ BM,\ y}}$
• $ERy = BEy - PEy - LEy \quad (4)$
• $BE_y = EG_y \times EF_y$
• $PD = \underline{Cap_{PJ} - Cap_{BL}} / \quad (A_{PJ} - A_{BL})$

Table 10. Equations used for baseline calculations

B.6.2. Data and parameters fixed ex ante

Data / Parameter	$FC_{i,y}$
Unit	Tons or 1000 m^3 for gases
Description	Amount of fuels consumed by thermal power plants for electricity generation in terms of fossil fuel type i in year y
Source of data	TEIAS Statistics[39]
Value(s) applied	See Appendix 4
Choice of data or Measurement methods and procedures	Data from Grid Operator has been used
Purpose of data	Data used for OM calculation
Additional comment	-

[39] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/yak%C4%B1t46-49/47.xls

Data / Parameter	$EG_{y,}$
Unit	GWh
Description	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must run power plants in year y
Source of data	For gross generation electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must run power plants in year y : http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/kgucunkullan%C4%B1m(13-21)/13.xls For net generation and imported electricity http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/uretim%20tuketim(22-45)/33(84-10).xls
Value(s) applied	157,706.6 in 2008 151,144.7 in 2009 150,894,2 in 2010 459,745.428 GWh between 2008-2010
Choice of data or Measurement methods and procedures	Data from Grid Operator has been used
Purpose of data	Data used for emission reduction calculation (for calculation of OM, Net-to-Gross electricity ratio and share of low-cost must-run sources)
Additional comment	-

Data / Parameter	$EF_{CO2, i, y i}$
Unit	tCO_2/TJ
Description	CO_2 emission factor of fossil fuel type "i" in year "y"
Source of data	-For EF of fossil fuels, IPCC values at the lower limit have been used.
Value(s) applied	**Fuel Source** / **EF(tCO2/Tj)** Coal 89,5 Lignite 90.9 Fuel Oil 75.5 Diesel 72.6 LPG 61.6 Naphtha 69.3 Natural Gas 54.3
Choice of data or Measurement methods and procedures	According to the applied tool, IPCC default values at lower limit of 95% confidence interval can be used. Although, the actual emission reduction is expected to be higher due to high EF of fuels consumed in existing power plants, IPCC values have been used for conservativeness as requested by the methodology.
Purpose of data	EF calculations
Additional comment	-

Data / Parameter	$\eta_{m,y}$
Unit	-
Description	Average net energy efficiency of power unit m in year y
Source of data	Default values provided in Annex I of the "Tool to calculate the emission factor for an electricity system".
Value(s) applied	See Appendix 4
Choice of data or Measurement methods and procedures	Data source is selected as per the applied tool.
Purpose of data	Data used for BM calculation
Additional comment	-

Data / Parameter	$NCV_{i,y}$
Unit	Tj/kt
Description	Net calorific value (energy content) of fossil fuel type i in year y
Source of data	TEIAS web page (http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/yak%C4%B1t46-49/49.xls)
Value(s) applied	See Appendix 4
Choice of data or Measurement methods and procedures	Data has been calculated from Grid Operator's(TEIAS) statistics
Purpose of data	Data used for OM and BM calculation
Additional comment	-

B.6.3. Ex-ante calculation of emission reductions

As per the tool, the following six steps for calculation of emission reductions have been applied:

Step 1. Identify the relevant electricity systems

According to the ''Tool to calculate the emission factor for an electricity system'', Version 02.2.1, a project electricity system has to be defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity, and that can be dispatched without significant transmission constraints. Therefore, in this project activity the project electricity system includes the project site and all power plants attached to the Interconnected Turkish National Grid, which has an installed capacity of 49,524.1 MW and gross generation about 211,207.7 by 2010[40,41].

For imports from connected electricity systems located in another host country (ies), the emission factor is taken as "0" tCO_2/MWh as requested by the methodology.

Step 2. Choose whether to include off-grid power plants in the project electricity system (optional)
Option I has been chosen by the project developer hence only grid power plants are included in calculations.

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

The Simple Operating Margin (OM) emission factor ($\mathbf{EF}_{grid,\ OM,\ y}$) is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all the generating plants serving the system, excluding low-cost/must-run power plants. As electricity generation from solar

40 http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/kguc(1-12)/1.xls

41 http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/kgucunkullan%C4%B1m(13-21)/13.xls

and low cost biomass facilities is insignificant and there are no nuclear plants in Turkey, the only low cost /must run plants considered are hydroelectric, wind and geothermal facilities.

The tool gives two options for the calculation of $\mathbf{EF}_{grid, OM, y}$;

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

For this project the ex-ante approach is selected. Data for calculating the three year average is obtained from the period 2008 – 2010, the most recent data available at the time of PDD submission to the DOE.

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 plants / units. The Simple OM has been calculated using option B which is based on 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 has been selected since;

- Generation and CO_2 data for individual power units are not available
- Only renewable are considered as low cost/must run resources
- Off-Grid power plants are not included in calculations.

As fuel consumption and average efficiency data for each power plant / unit are not available, Option B is used for simple OM calculation. 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, as follows:

$$EF_{Grid,OM\ simple,y} = \sum FC_{i,y} * NCV_{i,y} * EF_{CO2,i,y} / EG_y \quad \textbf{(1)}$$

where:

$EF_{grid, OM, y}$	Simple operating margin CO_2 emission factor in year "y" (tCO_2/GWh)
$FC_{i, y}$	Amount of fossil fuel type "i" consumed in the project electricity system in year "y" (mass or volume unit)
$NCV_{i, y}$	Net calorific value (energy content) of fossil fuel type "i" in year "y" (GJ / mass or volume unit)
$EF_{CO2, i,}$	CO_2 emission factor of fossil fuel type "i" in year "y" (tCO_2/GJ)
EGy	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	Either the 3 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) or the applicable year during monitoring (ex post option), following the guidance on data vintage in step 2

For the calculation of the Simple OM, the amount of fuel consumption ($FC_{i,y}$) and heating values of fuels are taken from website of TEIAS[42,43], the official source of related data. Fuel consumption values for the relevant years are given in table below:

	$FC_{i,y}$ unit [Ton, except for Natural Gas (NG) (1000 m^3)]			
Fuel Type	**2008**	**2009**	**2010**	**Total**
Hard Coal	6,270,008	6,621,177	7,419,703	20,310,888
Lignite	66,374,120	63,620,518	56,689,392	186,684,030
Fuel Oil	2,173,371	1,594,321	891,782	4,659,474
Diesel Oil	131,206	180,857	20,354	332,417
LPG	0	111	0	111
Naphtha	10,606	8,077	13,140	31,823
Natural Gas	21,607,635	20,978,040	21,783,414	64,369,089

Table 11. Fuel Consumption in thermal power plants

The NCV of the fuels consumed have been calculated using data from the TEIAS web page. The emission factors required for calculation of CO_2 emission coefficient have been obtained through IPCC 2006 guidelines for GHG inventories for fuels.

	COEF (tCO_2/kt)	**Consumption (2008 - 2010)** (tons or $1000m^3$)	**Total Emission (2008 - 2010) (tCO_2)**
Coal	1,992	20,310,888	40,464,455
Lignite	617	186,684,030	115,098,675
Fuel Oil	3,008	4,659,474	14,014,770
Diesel Oil	3,079	332,417	1,023,654
LPG	2,863	111	318
Naphtha	2,756	31,823	87,719
Natural Gas	2,012	64,369,089	129,542,466
Total Emissions			300,232,056

Table 12. Calculation of emission factors for fuels

Net electricity generated and supplied to the Grid by thermal plants has been calculated using data obtained from the TEIAS web page[44]. The ratio between gross and net generation has been calculated

[42] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/yak%C4%B1t46-49/47.xls

[43] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/yak%C4%B1t46-49/49.xls

first, and assuming that the same ratio is valid for thermal plants; gross generation by thermal power plants has been multiplied by this ratio in order to find net generation by thermal plants. The calculation of $EF_{grid,OM,\ y}$ requires the inclusion of electricity imports with an emission factor of 0 tCO_2/GWh. By including the imports in the electricity production this requirement is fulfilled. Summing up this with the imported electricity, total supply excluding low cost / must run sources are determined as given in table below.

Year	Internal Consumption rate[45]	Gross Gen. Thermal[46]	Net Gen. Thermal	Import[45]	Total Supply to the Grid (GWh)
2008	4.4%	164,139	15,917.2	789	157,706.6
2009	4.2%	156,923	150,333.7	812	151,144.7
2010	3.9%	155,828	149,750.3	1,144	150,894.2
		Total Net Thermal Gen.	457,000.2	2,745	459,745.428

Table 13Gross/Net electricity generation by Turkish Grid

Having calculated the total fuels emissions and net generation by thermal power plants as given in previous two tables, The $EF_{grid,\ OM\ ,y}$, is calculated by simply dividing total emission by total net thermal electricity generation as defined in equation **(1)** above;

$\mathbf{EF}_{grid,\ OM,\ y}$ = **300,232,056** tCO_2 / 459,745,428 MWh
= 0.653 tCO_2/MWh.

In calculating the $EF_{grid,\ OM\ ,y}$, data for NCV has been calculated using weighted average values for each fuel.

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

In terms of vintage of data, project participants can choose between one of the following two options to calculate EFgrid,BM,y:
Option 1. For the first crediting period, calculate the build margin emission factor ex-ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

Option 2. For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of the project activity or, if information up

[44] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/uretim%20tuketim(22-45)/33(84-10).xls
[45] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/uretim%20tuketim(22-45)/33(84-10).xls
[46] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/uretim%20tuketim(22-45)/35(75-10).xls

to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex ante, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

In this PDD, **Option1** is chosen to calculate the build margin emission factor. The sample group of power units m used to calculate the build margin should be determined as per the following procedure, consistent with the data vintage selected above:

(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);

Five Power Unit started the supply electricity to the grid most recently has been tabulated below[47]:

Name of Plant	Type of Fuel	Commissioning Date	Generation Capacity (MWh)
INTERNATIONAL HOSPITAL İSTANBUL AŞ.	Natural Gas	31.12.2010	6000
POLYPLEX EUROPA POLYESTER FİLM	DOĞALGAZ	16.12.2010	61000
UMUT III REG. VE HES (NİSAN ELEKTR.)	HES (AKARSU)	13.12.2010	26000
YEDİGÖZE HES (YEDİGÖZE ELEKTRİK)	HES (BARAJLI)	02.12.2010	474000
SABUNSUYU II HES (ANG ENERJİ ELK.)	HES (AKARSU)	28.10.2010	21000
			588000

(b) Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEGtotal, 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 AEGtotal (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) (SET≥20%) and determine their annual electricity generation (AEGSET-≥20%, in MWh);

The list of the most recent capacity additions to the grid and their average and actual generation capacities are available at the TEİAŞ web page [48,49]. For determination of plants that comprise 20% of the system's generation, gross generation in year 2010 which is 211,207.7 GWh has been taken as reference and its 20% has been determined as about 42,242 GWh. Since 20% of the most recent year's generation falls partly on capacity of a plant, this plant was fully included in the calculations as requested by the methodological tool applied. Thus, total capacity included in BM calculation has increased to 48,096 GWh which reduces to 40,629 GWh after excluding plants benefitting from VER revenue.

(c) From SET5-units and SET≥20% select the set of power units that comprises the larger annual electricity generation (SETsample); Identify the date when the power units in SETsample started to

[47] http://212.175.131.171/projeksiyon/KAPASITEPROJEKSIYONU2011.pdf
[48] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/kguc(1-12)/8.xls
[49] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2009/8.xls

supply electricity to the grid. If none of the power units in SETsample started to supply electricity to the grid more than 10 years ago, then use SETsample to calculate the build margin. In this case ignore steps (d), (e) and (f).

SET≥20% is selected as (SETsample) because the set of power units that comprises the larger annual electricity generation. There is no power units in SETsample started to supply electricity to the grid more than 10 years ago. Therefore the steps (d), (e) and (f) are ignored.

The Build Margin emission factor $\mathbf{EF}_{grid,\ BMs,\ y}$ is calculated as the generation-weighted average emission factor of a sample of power plants "m" for a specific year, as follows:

$$\mathbf{EF}_{grid,\ BM,\ y} = \sum \mathbf{EG}_{,m,y} \cdot \mathbf{EF}_{EL,m,y} / \sum \mathbf{EG}_{,m,y} \qquad \textbf{(2)}$$

Where:

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

"Tool to Calculate the Emission Factor for an Electricity System" has been used for plant efficiency data although this approach is very conservative. Since tool does not contain any specific data for plants with LPG, Naphtha etc. all of the plants consuming liquid fuels have been considered as open cycle plants. Plants using lignite and coal have been assumed as using subcritical technology, whereas natural gas plants have been assumed as combined cycle plants. The assumptions have been based on TEIAS statistics which gives heating values of fuels consumed in thermal power plants[50] and corresponding electricity generation which shows that values used are very conservative compared to actual situation.

	EF CO_2 (tCO2/Tj)	**Generation Efficiency**	**EF (tCO_2/MWh)**
Coal	89.50	39.0%	0.826
Lignite	90.90	39.0%	0.839
Fuel Oil	75.50	39.5%	0.688
Diesel	72.60	39.5%	0.662
LPG	61,60	39.5%	0.561
Naphtha	69,30	39.5%	0.632
Natural Gas	54,30	60.0%	0.326

Table 14 Calculation of emission factor from most recent power plants

The build margin emission factor has been determined for the most recent capacity additions as shown in table below. The Build margin emission factor in the last column has been determined by multiplying

[50] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/yak%C4%B1t46-49/49.xls

each EF value with the corresponding electricity generation value for that fuel and dividing it by the total generation by the most recent capacity additions.

Fuel Source	Generation (MWh)	Percent Generation	EF	Emission by Source
Coal	9,080	18.9%	0.826	7,501
Lignite	144	0.3%	0.839	121
Fuel Oil	0	0.0%	0.688	-
Diesel oil	0	0.0%	0.662	-
LPG	0	0.0%	0.561	-
Naphtha	0	0.0%	0.000	-
Natural Gas	31,557	65.6%	0.326	10,281
Renewable and wastes	0	0.0%	0.000	-
Solid	0	0.0%	0.000	-
Total Renewable	7,315	15.2%	0.000	-
TOTAL	48,096.4	100.0%		17,904
Capacity Built by VER Revenue	7,467			
Net Capacity Addition	40,629(Exc VERs)			

Table 15 Most recent capacity additions corresponding to 20% by fuel source

List of Plants built using VER revenue (those excluded in BM calculation) are submitted to DOE.

Finally, by summing up the weighted EF values, overall build margin emission factor have been calculated as:

$$EF_{grid,\ BM,\ y} = 17{,}904\ tCO_2 / (40{,}629)\ MWh$$
$$= \mathbf{0.441\ tCO_2/MWh}$$

STEP 6 - Calculate the combined margin (CM) emission factor

As per the , weighted average baseline emission factor is calculated as follows;

$$EF_{grid,\ CM,\ y} = w_{OM} * EF_{grid,\ OM,\ y} + w_{BM} * EF_{grid,\ BM,\ y} \quad (3)$$

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year "y" (tCO_2/MWh) as calculated from equation (2) above.

$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year "y" (tCO_2/MWh) as calculated from equation (1) above.

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

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

The default values of the weights, w_{OM} and $w_{BM,}$ as recommended by the selected methodology are 0.5 for both components. These default values have been used in calculating CM emission factor together without rounding the values of EF_{OM} and EF_{BM}.

Based on the formula above (**3**), baseline emission factor is calculated as;

$$\mathbf{EF}_{grid,\,CM,\,y} = 0.75 * 0.653 + 0.25 * 0.441 = \mathbf{0.600}$$

The combined margin emission factor is therefore **0.600 tCO_2/MWh.** Emission factor will remain same during the first crediting period as recommended by the methodology.

The *ex-ante* emission reductions (*ERy*) are calculated as follows:

$$ERy = BEy - PEy - LEy \qquad (4)$$

Where:

ERy = Emission reductions in year *y* (tCO_2)
BEy = Baseline emissions in year *y* (tCO_2)
PEy = Project Emissions in year *y* (tCO_2)
LEy = Leakage emissions in year *y* (tCO_2)

Baseline emissions

Baseline emission is calculated according to the formula

$$BE_y = EG_y \times EF_y$$

Where:

EGy = Net electricity delivered to the grid by the project activity in year y excluding transmission losses of the grid.

EFy = Emission factor calculated according to selected methodology

BEy = 55,500 MWh × 0.600 tCO2e/MWh = 33,300 tCO2e

Project emissions

The proposed project activity involves the generation of electricity by a wind power plant which does not cause any significant emissions. Therefore project emissions are considered as "0".

$$PEy = 0$$

Leakage

The energy generating equipment is not transferred from or to another activity. Therefore leakage is also considered as "0".

$$LE_y = 0$$

As a result: Total Emission Reduction is;

$$ERy = BE\ y$$

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)
2012(01/12/2012-31/12/2012)	1,835	0	0	1,835
2013	22,020	0	0	22,020
2014	22,020	0	0	22,020
2015	33,300	0	0	33,300
2016	33,300	0	0	33,300
2017	33,300	0	0	33,300
2018	33,300	0	0	33,300
2019(01/01/2019-30/11/2019)	30,525	0	0	30,525
Total	209,600	0	0	29,600
Total number of crediting years	7			
Annual average over the crediting period	29,942	0	0	29,942

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Data / Parameter	$EG_{facility, y}$
Unit	GWh
Description	Net Electricity generated and delivered to the grid by the proposed project in year y
Source of data	Metering devices used in power plants, monthly generation records will be used.
Value(s) applied	Estimated annual generation forming the basis for emission reduction calculation is 55.5 GWh
Measurement methods and procedures	Generation data will be recorded by two metering devices continuously. These records will provide the data for the monthly invoicing to TEIAS. Generation will be recorded via remote reading system. The quantity of electricity supplied by the project plant/unit to the grid(ISVM) and The quantity of electricity delivered to the project plant/unit from the grid (EUCM) will be measured. Net generation will be calculated via subtracting energy delivered by the project activity to the grid for internal consumption from electricity fed to the grid.
Monitoring frequency	Continuous measuring, monthly recording
QA/QC procedures	Two calibrated ammeters will backup each other. Maintenance and calibration of the metering devices will be made by TEIAS. If there is a significant difference between the readings of two devices, maintenance and tests of the metering devices and the associated equipment will be done before waiting for the periodical maintenance. The meters should comply with EPDK regulations which define the accuracy class of the meters as 0.2 or 0.5 depending on the capacity of the circuit as given in document in link (http://www.epdk.gov.tr/web/elektrik-piyasasi-dairesi/44). Generation of the plant will be cross checked from TEIAS – PMUM web site (http://pmum.teias.gov.tr) which is accessible using a password provided to electricity generation companies. ISVM (Electricity fed to the grid)and UECM(Electricity consumed from the grid) data given in PMUM records will be used for emission reduction calculations. For the proposed projects, initial test have been made on 01/08/2009. Installation of meters has been made on 13/07/2012.
Purpose of data	Emission Reduction calculations
Additional comment	Meter Brand Name: ITRON Main Meter Serial No: 65000752. Spare Meter Serial No: 65000753

B.7.2. Sampling plan

No sampling plan will be necessary

B.7.3. Other elements of monitoring plan

Monitoring is a key procedure to verify the real and measurable emission reductions from the proposed project. To guarantee the proposed project's real, measurable and long-term GHG emission reductions, the monitoring plan is established.

Net electricity generation will be measured and recorded via meters sealed by TEIAS for billing purposes therefore no new additional protocol will be needed for monitoring emission reduction. Power Plant Manager, will be responsible for the electricity generated, gathering all relevant data and keeping the records.

Generation data collected during crediting period will be submitted to Global Tan Energy 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 vintage from the project activity. These reports will be submitted to the duly authorized and appointed Designated Operational Entity 'DOE' before each verification period.

VER Team Members is expected to include the following staff :
Plant Manager: Responsibility for running the plant and compliance with VER monitoring plan
Accounting Manager: Responsible for keeping data about generation and consumption.
and
Global Tan Energy: Responsible for emission reduction calculations, preparing monitoring report and periodical verification process.

Installation of meter and data monitoring will be carried out according to the regulations by TEIAS. Two metering devices (one of them used as spare) will be used for monitoring the electricity generated by the power plant. Readings will be done using main metering devices and spare metering device will be used for comparison only. Data from metering devices will be recorded by TEIAS monthly (through remote reading). In addition to the two metering devices, generation of the plant can be cross checked from TEIAS – PMUM web site (http://pmum.teias.gov.tr) which is accessible using a password provided to electricity generation companies. ISVM (Electricity fed to the grid)and UECM(Electricity consumed from the grid) data given in PMUM records will be used for emission reduction calculations.

All data will be kept for at least two years after the crediting period for QA/QC purposes.

Calibration of the metering devices will be made by TEIAS and sealed before the commissioning of the power plant. The meters will be calibrated by TEIAS when there is an inconsistency between two devices.

SECTION C. Duration and crediting period

C.1. Duration of project activity

C.1.1. Start date of project activity

Start date of project activity is determined as 20/12/2011 for first part, date of turbine agreement. For the extension part, start date is determined as and 18/03/2014 which is also the agreement date of extension turbines.

C.1.2. Expected operational lifetime of project activity

The operational lifetime of the project is about 49 years as per the license issued. According to the technical lifetime of turbines which is given as 25 years as per the tool[51] and also estimated as 20-25 years by experts, turbines will be renovated or replaced and project will continue to be operated by the project owner until end of the license period. Project will be delivered to government authority at no cost at the end of license period.

C.2. Crediting period of project activity

C.2.1. Type of crediting period

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

Project will use two times renewable crediting period, and this is the first crediting period.

C.2.2. Start date of crediting period
The first crediting period has started in 01/12/2012.

C.2.3. Length of crediting period

First crediting period will be valid for 7 years and 0 month.
01/12/2012 – 30/11/2019

SECTION D. Environmental impacts
D.1. Analysis of environmental impacts

A Project Identification File has been prepared for proposed project by ENVY Enerji ve Çevre Yatırımları A.Ş. on February 2009 considering initial project design and for 20MW installed capacity for compliance with national regulations. Also, a more detailed environmental and social impact analysis (ESIA) study has been conducted for the project by AECOM Turkey in line with international standard on January 2012 which also involves a detailed monitoring plan. As per the capacity extension part, since the project is still below the limit for full EIA requirement and since the initial project introductory file has already been prepared for 20MW, Balıkesir Governorship has not required further EIA assessment however, investor has preferred to prepare an ESIA for extension part also.

In order to assess the environmental impacts of the project, including its location, its characteristics, capacity, interaction with other plants in the vicinity, utilization of natural resources, waste management, social and economic impacts, any natural and historical protected areas within the project boundaries, assessment of geological and seismic aspects of the project site has been considered.

SECTION E. Local stakeholder consultation
E.1. Solicitation of comments from local stakeholders

Local Stakeholder Meeting for first phase of Günaydın Wind Power Plant (WPP) project was held at Yaylaköy Village Room on 21/02/2012 in Manyas District at Balıkesir Province in Turkey. The meeting was organized in line with the Gold Standard requirements. The stakeholders and the list of invitation are identified accordingly. The meeting covered all agenda items recommended by the Gold Standard.

Agenda

14:30-14:45 Opening and Introduction of the Günaydın Wind Power Plant Project
14:45 -15:00 Climate Change and Carbon Markets, Global Tan Energy
15:00 -15:20 Explanation of Grievance Mechanisms and Blind SD Exercise and discussion on monitoring
15:20-15:50 Q &A
15:50- 16:00 Evaluation and feedback session
Closure

As no females attended the meeting, we gathered together with females in the village mosque right after the regular meeting.

For the extension activities a second meeting was held in Yaylaköy meeting hall on 31/10/2013 and the following agenda was followed:

11:00 – 11:05 Opening and Brief Introduction
11:05 – 11:20 Introduction of the Extension Project
11:20 – 11:30 Explanation of Certification Process
11:30 – 11:45 Question and Answer Session
11:45 – 12:00 Explanation of Continuous Grievance Mechanism and Closure.

It has been understood that the locals were quite aware of the project activities and they were well informed about the meeting. Villagers collected the comments and requests from the people who were not able to attend the meeting. An elder spokesman was chosen to describe their expectations from the project. Questions and comments raised during the meeting are summarized in the sections below.

E.2. Summary of comments received

Meeting was organized at the village room on 21/02/2012 with 15 villager attendance. As there was no attendance of females another meeting was organized at village mosque. In that meeting there were three adult females and one child.

To start with, GTE gave a brief opening speech explaining the aim of the meeting and introduced project representatives Mr Emre Tasan and Mr Çağdaş Duran from Fina Enerji Üretim A.Ş. Mr Emre Tasan briefed the locals about the about project's environmental and social impact and new job opportunities will come with the project. After that GTE gave information about climate change and its effects, carbon certification and the Gold Standard process. After that the questions from villagers were answered. Questions and answers are below.
Villager: Livestock is the only means of living for this village. The high voltage transmission line route will pass through the forest where we let the animals to feed. This directly affects our livestock. Is there any chance to make alternative routes for the transmission lines?
Mr. Emre Tasan: High voltage lines means the line carries 154kV energy of which the route is determined by TEİAS and needs clearing of the whole trees below and around it. This project only requires 34.5 kV voltage lines. For those types of lines, there is no need to do any clearing. We will only need to clear where the poles will be erected. Thus, the present forest will not be destroyed. In other words, none of the trees will be cut between the poles. If that was a high voltage line, then we would have to cut all the present trees between the poles in order to prevent the possibility of wildfire due to the electrical jumps between the lines. Also, if it is needed, we can shorten some of the trees' heights to prevent any connection with the lines. The other tree cut can be happen due to the construction of road. Other then these, we are not going to have any effect on present forest. For the 27.5 km of transmission line calculations were done carefully in detailed by experts.
Ms. Zeren Erik: Since this area is forest area, in order to take any actions, permission needs to be taken from the province forestry department.
Villager: If you can move the transmission line for 200m, then you don't need to shorten any trees or cut any trees, because you are going to be out of forest area.
Mr. Emre Tasan: As we said before, the calculations were done so carefully and the most feasible route is decided. But we can still consider your opinion; consequently we are going to be neighbours for 49 years. We are not here to give any disturbance. After the construction is completed, none of the living conditions or daily routines will be changed. The only change will be the new road for the construction activities.
Villager: How about noise problem? There is another wind energy plant closeby and we have noise problem due to that plant. Since this project is going to be nearer, is that going to affect us more?
Mr. Emre Tasan: This is not our first project on wind turbines. Therefore we are experienced on wind technology. As we first start working on wind turbines, this problem was the only problem that we worry

about but it didn't end as we expected. Because of the technology of the turbines, height of the turbines and the dynamic of the turbines' wings, there is minimum noise due to the turbines. We can say that it is less than a noise due to a refrigerator. We operate another wind farm in Bergama which almost in the village and there is no noise problem. If you want to see, we can arrange a picnic and go there to see. The technology that we are going to use is transferred from Germany which has proved oneself in that area.
Villager: The only things that we consider are forest and noise problem. Consequently nowhere should be damaged as a new one is constructed.
Villager: What if the pole points are located on our land? Is there going to be any expropriation? It will be so difficult to find all the land owners; there are lots of it for just one piece of land.
Mr. Emre Tasan: The pole points have not been decided yet. If there is a need for expropriation, then we have a special team for that in Istanbul.
Ms. Zeren Erik: EMRA is responsible government body about expropriation process where the project owner has no say. EMRA, according to the project, takes a decision about the locations to the expropriated and identifies the value of land. Sometime, the land owners and the company can agree a value bilaterally as well. If not, the procedure follows the regulations and the issue is handled via courts.

Villager: As the information that one of my friend gave, first the project owner makes the agreement with the locals and if they cannot agreed then government makes the resettlement.
Mr. Çağdaş Duran: Our company pays more than its actual title worth. In other words you will get paid by our company and also by the government.
Villager: You have talked about new job opportunities in the plant. What are the minimum qualities you are looking for, for example to become security staff? If we know what you will ask for, we can see who meets the requirements of if there are any certificates we need to obtain. We can do these. The former project did not prioritise use in terms of employment.
Mr. Emre Tasan: For our project, your village will be the priority in terms of employment. Towards the end of construction, we will start the hiring process. If there is workforce that qualifies the requirement, we would give priority. But at least, we can say a security guard needs to be graduated from middle school.
Villager: You are not going to cover the pole area with fences, are you?
Mr. Emre Tasan: According to the safety requirements, particular pole points will be fenced, but other than that we are not going to cover all area with fences

Summary of Comments in the Extension Meeting

Fourteen stakeholders were present in the capacity addition information meeting. Villagers had been living for over a year close to the project activities and they were content with the conditions. A spokesman summarized their expectations and the locals were quite aware of the importance of such investments both for the regional and national economy. After the presentations explaining both the capacity addition project and carbon certification process, locals were reminded of the continuous grievance mechanism. Within this prospect locals listed their comments and requests. Below is a summary of comments received. All of the comments were recorded and archived for future referral.

E.3. Report on consideration of comments received

Stakeholder comment	Was comment taken into account (Yes/ No)?	Explanation (Why? How?)
Is there any chance to make alternative routes for the transmission lines?	Yes	The concern was about high voltage lines but it has been explained that transmission line is not high voltage and only impact will be on pole

		basements. The most feasible transmission line route has been planned according to optimised studies by the experts and engineers but the alternative routes according to locals will still under consideration however the route should be decided the TEIAS.
How the present forest will be affected from the construction activities?	Yes	The planned construction activities are road construction and turbine basements which are not on forest area. Only impact can be on pole locations and access road(if necessary). Route for road construction path has not been decided yet. Impact will be minimized and routes and pole location will be selected accordingly. If road passes through the forest area, then the reforesting costs will be paid in order to compensate the new foresting activities.
Is there going to be any expropriation due to the project?	Yes	There is going to be expropriation. Project is mainly planned to be located on treasury land. EMRA is responsible about expropriation. The project owner has no right about the organization of resettlements.
What are the minimum qualifications required be hired as a security guard for the plant?	Yes	At least, needs to be graduated from middle school and have certificate.
Is there going to be any fences around the project area?	Yes	According to the safety requirements, particular pole points will be fenced, but other than that all area will not be covered with fences.
Is there going to be any noise problem due to the turbines?	Yes	The technology which will be deployed by the project is very new which minimizes the noise.
Ext. Comment 1: Operating noise of T2 can sometimes be heard in the village therefore we would like the extensions to be placed further away. Besides the proposed point for turbine EX2 is very close to the cemetery which is sacred for us.	Yes	Even though the noise level estimations have been performed and legal limits were applied, considering the complaints of the locals, position of the turbine EX2 has been changed.
Ext. Comment 2: Transmission line could	Yes	Construction of ETLs falls within the responsibilities of TEIAS (National

have been built on a shorter distance requiring less construction. What was the reason of choice?		Energy Transmission Company) and project owners have no right to choose alternatives.
Ext. Comment 3: Most of the people in the village are economically struggling. We would like Fina Enerji to pay electricity bills for the whole village.	Yes	This is against company ethics and financial management. Instead the project owners will give their best effort to help the village with construction works and renovations.
Ext Comment 4: There are being water shortages during summer within the village. We are expecting some help on this issue.	Yes	Fina Enerji cannot develop such projects but the top management will consider supporting concrete projects for the local welfare.
Ext Comment 5: Extension turbines shouldn't be very close and construction site must be limited	Yes	Positions of the turbines are altered and the project will use the same site.
Ext Comment 6: We would like our roads to be improved.	Yes	Such services are within the responsibility of the municipality but since we are sharing the same routes company will try to look for options to improve roads.

SECTION F. Approval and authorization

Project is developed as a VER project. Since turkey does not have a cap and trade system or issue approval letter, no authorization or approval is needed.

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Appendix 1: Contact information of project participants

Organization	MANRES Elektrik Üretim A.Ş
Street/P.O. Box	Kısıklı Caddesi
Building	Sarkuysan–Ak İş Merkezi No:4 A-Blok Kat:1
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Contact person	
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Salutation	Ms
Last name	Çolak
Middle name	-
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State/Region:	-
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Country:	Turkey
Telephone:	(0090) 312 472 35 00
Fax:	(0090) 312 472 33 66
E-Mail:	gte@gtecarbon.com
URL:	www.gtecarbon.com
Represented by:	
Title:	Director
Salutation:	Mr.
Last name:	Demirkol
Middle name:	Kemal
First name:	Mehmet
Department:	Management
Direct fax:	(0090) 312 472 35 00
Direct tel:	(0090) 312 472 33 66
Personal e-mail:	kemal@gtecarbon.com

Appendix 2: Affirmation regarding public funding

No public funding is used for the project activity

Appendix 3: Applicability of selected methodology

Information on applicability of project activity is given in Section B.2

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

Data Used in calculation of OM for Turkish Electricity Grid

	NCV (Tj/kt) (1000m^3 for gas)	EF (tCO_2/Tj)	COEF (tCO2/kt)
Coal	*22.26*	89.5	1,992
Lignite	*6.78*	90.9	617
Fuel Oil	*39.84*	75.5	3,008
Diesel Oil	*42.42*	72.6	3,079
LPG	*46.47*	61.6	2,863
Naphtha	*39.78*	69.3	2,756
Natural Gas	*37.06*	54.3	2,012

Table 16. Values used in calculation of OM [52]

	2008	2009	2010	Total Fuel Consumption 2005-2007	Total Emission 2008-2010
Hard Coal	6,270,008	6,621,177	7,419,703	20,310,888	40,464,455
Lignite	66,374,120	63,620,518	56,689,392	186,684,030	115,098,675
Fuel Oil	2,173,371	1,594,321	891,782	4,659,474	14,014,770
Diesel Oil	131,206	180,857	20,354	332,417	1,023,654
LPG	0	111	0	111	318
Naphtha	10,606	8,077	13,140	31,823	87,719
Natural Gas	21,607,635	20,978,040	21,783,414	64,369,089	129,542,466

Table 17.Amount of fuels used for electricity generation [53]

[52] 2006 IPCC Guidelines for National Greenhouse Inventories

[53] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/yak%C4%B1t46-49/49.xls

Data Used in calculation of BM for Turkish Electricity Grid

	A NCV (Tj/kt or m^3 for gas)	B EF $_{CO2}$ (tCO_2/Tj)	D Generation Efficiency	E (=3.6/D/1000*B) EF [54] tCO_2/MWh
Coal	22.26	89.50	39.0%	0.826
Lignite	6.78	90.90	39.0%	0.839
Fuel Oil	39.84	75.50	39.5%	0.688
Diesel	42.42	72.60	39.5%	0.662
LPG	46.47	61.60	39.5%	0.561
Naphtha	0.00	69.30	39.5%	0.632
Natural Gas	0.00	54.30	60.0%	0.326

Table 18Net calorific values, generation efficiency and emission factor data used in calculations

Fuel Source	Electricity Generated (MWh)	EF	Share in Total Generation
Coal	9,080	0.826	18,9%
Lignite	144	0.839	0.3%
Fuel Oil	0	0.688	0.0%
Diesel oil	0	0.662	0.0%
LPG	0	0.561	0.0%
Naphtha	0	0.000	0.0%
Natural Gas	31,557	0.326	65.6%
Renewable and wastes	0	0.000	0.0%
Solid	0	0.000	0.0%
Total Renewable	7,315	0.000	15.2%
TURKEY'S TOTAL	48,096.4		100%

Table 19.Most recent capacity additions corresponding to 20%.[55,56]

54 IPPC Reference Document on Best Available Techniques for Large Combustion Plants

55 http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/kguc(1-12)/8.xls

56 http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2009/8.xls

Appendix 5: Further background information on monitoring plan

Information about monitoring plan is given in section B.7

Appendix 6: Summary of post registration changes

GS1178-10 MW Gunaydin WPP Capacity Extension Memo

MANRES Elektrik Üretim A.Ş. (subsidiary of Fina Enerji Holding A.Ş.) built 12.5MWm and 10MWe capacity wind farm in Balikesir Province of Turkey in 2012. Gunaydin WPP has been commissioned in November 2012. Fina Enerji now proposes to expand the capacity of Gunaydin WPP by building an additional 10MWe capacity, using 3 new wind turbines. Total installed capacity of the project will be 20MWe and the project is expected to generate a net electrical energy of 55.5 GWh annually. The generated electricity will be fed to the Mustafa Kemal Pasa transmission center through a 34.5 kV overhead transmission line. Fina Enerji has acquired a "49-year electric power generation license" for the Gunaydin WPP.(License No. EÜ/3490-17/2141, dated November 11, 2011) from the Energy Market Regulatory Authority (EMRA). Fina Enerji has applied to EMRA on November 29, 2012 for the revision of the existing generation license for the proposed extension project.

A project description report, as required by the Turkish EIA Regulation was prepared and submitted to Balıkesir Provincial Directorate of Environment and Urbanization and the project had secured an "EIA not required" decision on March, 2009 for the initial phase of the project. Since the extension project is below the limits applied by the regulations in terms of total added capacity and number of turbines, it is also not subject to EIA procedures as per the decision taken by the same authority (decision dated March 05, 2014).

An Environmental and Social Impact Assessment (ESIA) report is prepared to identify the potential environmental and social impacts of the Project on the local environment and community during construction, operation and decommissioning of the turbines. The ESIA also aims to provide mitigation measures to eliminate potential adverse impacts and propose a management and monitoring plan. As per the GS requirements, this memo has been prepared to indicate the changes in design and discuss their impacts on relevant aspects of the project.

a. **Additionality:** The project uses the same project site with the initial phase. Additionality has to be re-assessed for the proposed project as the design change involves capacity addition and an increase in total energy generation. In the registered project investment analysis was used to demonstrate additionality. For the initial phase of the project the equity IRR was calculated as 11.57%. In order to demonstrate the additionality after the capacity addition same method was used and updated version of the additionality tool was applied (Tool for the demonstration and assessment of additionality", Version 07.0.0). The analysis has been performed using the references and data obtained from the Energy Assessment Report prepared by "GL Garrad Hassan". The analysis yielded an overall equity IRR of 12.00% for the whole project after the capacity edition which is still below the benchmark equity of 15.00% determined by the World Bank for similar projects. Below is a summary of financial indicators.

Parameters	Unit	Initial Project	Final Design

Installed Capacity	MWe	12.5	20.0[57]
Grid Connected output	MWh	36.7	55.5[58]
Capital Investment	Million $	18.6	27.9[59]
Income tax rate	%	20	20[60]
Expected Tariff	$ Cents/kWh	7.3	7.3[61]
Expected VERs price	$/ tons CO_2e	6.5	6.5[62]
Operation & Maintenance Cost	$/Year	680	897[63]
Equity IRR	%	11.57	12.00

Table 20: Comparison of financial indicators

b. **Scale of the project:** Project capacity is extended to 20MWe from 10MWe. Therefore, as per the GS Requirements the scale of the project is changed to "Large" from "Small". In the final design (after the capacity addition) the project is classified as a large scale project as the total installed capacity exceeds 15MWe threshold.

c. **Applicability of methodology:** The project was registered using a large scale methodology (ACM0002: Grid-connected electricity generation from renewable sources), therefore no change in the applied methodology is required. Applied tools that the methodology refers and the version of the methodology is updated to the most recent versions available in the GS PDD and GS Passport which are prepared after the design change. Emission factor is assumed to remain the same over the first crediting period, therefore no changes are made.

d. **Stakeholder feedback on design change:** Proposed project is a WPP capacity addition by means of numbering up the wind turbines. Three additional wind turbines are planned to be commissioned however the project will use the same site which is already designated for the project activities. Even though the extension project does not involve spreading into new sites, a physical stakeholder feedback meeting was arranged on 31/10/2013 in the Yaylakoy Village, where is the closest settlement to the project site. The meeting was held as per the GS Requirements and concluded positively since the locals were content with the project activities and their comments were taken into account by the project owner.

e. **Sustainable Development Assessment:** As the scale of the project changes; 12 Sustainable Development (SD) and 11 Safeguarding principles were re-assessed after the capacity addition project. The extension activities involve the implementation of the same technology with an increased number of turbines within the same project site. An Environmental and Social Impact Assessment (ESIA) report is prepared to identify the potential environmental and social impacts

[57] GL Garrad Hassan Energy Assessment Report (10 year average P90)
[58] Amended Generation License
[59] Investment Model submitted to DOE
[60] http://www.mmmb.org.tr/default.aspx?pid=24826&nid=16297
[61] http://www.epdk.gov.tr/documents/10157/4b360128-53aa-4174-8104-a6c10434ac9c
[62] Tulletprebon newsletter
[63] Gunaydin WPP Financial Model

of the Project on the local environment and community during construction, operation and decommissioning of the turbines. As indicated in the executive summary of the report, project does not expected to have any adverse effects on the society or environment. Therefore no change in the scoring of parameters is required. Also the extension project is below the limits applied by the regulations in terms of total added capacity and number of turbines; hence it is not subject to EIA procedures as per the decision taken by the Balıkesir Provincial Directorate of Environment and Urbanization (decision dated March 05, 2014).

f. **Sustainable Development Monitoring Plan:** The extension project is the implementation of the same technology with an increased capacity; therefore no change is required in terms of monitoring plan. Same procedures will be applied in order to monitor the outputs of the extension turbines (i.e. same electrical meters, same transmission line) Stakeholder feedbacks revealed that the locals are happy with the project activities and they are aware of the importance of such investments both for the regional and national economy. Stakeholder comments and discussion of SD indicators are given in the relevant sections of GS PDD and GS Passport which are prepared after the capacity addition proposal.

g. **Legislation:** Since the proposed project involves a change in capacity and output energy associated with it, the company had to apply for a revision in the legal generation license. Fina Enerji has applied to EMRA on November 29, 2012 for the revision of the existing generation license for the proposed extension project. The application was concluded positively and the amended license has been issued. Balıkesir Provincial Directorate of Environment and Urbanization had issued an “EIA not required” decision on March, 2009 for the initial phase of the project. Since the extension project is below the limits applied by the regulations in terms of total added capacity and number of turbines, it is also not subject to EIA procedures as per the decision taken by the same authority (decision dated March 05, 2014).

Appendix 7: Generation Licence

EPDK

T.C.ENERJİ PİYASASI
DÜZENLEME KURUMU

ÜRETİM LİSANSI

Bu Lisans kapsamındaki üretim tesisi Yenilenebilir Enerji Kaynağı kullanmaktadır.

Lisans No : EÜ/3490-17/2141

Tarih : 11/11/2011

Bu Lisans; **Manres Elektrik Üretim Anonim Şirketi'**ne, Balıkesir ili, Manyas ilçesinde rüzgar enerjisine dayalı **Günaydın RES** projesi kapsamında 11/11/2011 tarihinden itibaren 49 yıl süreyle üretim faaliyeti göstermek üzere 4628 sayılı Elektrik Piyasası Kanunu ve ilgili mevzuat uyarınca Enerji Piyasası Düzenleme Kurulu'nun 11/11/2011 tarihli ve 3490-17 sayılı Kararı ile verilmiştir.

Hasan KÖKTAŞ
Başkan

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

Appendix 8: EIA-Exemption Letter

(GÜNAYDIN RES)

T.C.
Çevre ve Orman
Bakanlığı

T.C.
BALIKESİR VALİLİĞİ
İl Çevre ve Orman Müdürlüğü

Karar Tarihi: 20./.3../2009
Karar No : 85

ÇEVRESEL ETKİ DEĞERLENDİRME BELGESİ

17 Temmuz 2008 tarih ve 26939 sayılı Resmi Gazetede yayımlanarak yürürlüğe giren Çevresel Etki Değerlendirmesi Yönetmeliğinin Ek-II listesinde yer alan "Rüzgar Enerji Santrali" projesi ile ilgili olarak inceleme-değerlendirme yapılmış ve Proje Tanıtım Dosyasında çevresel etkilere karşı alınması öngörülen önlemler yeterli görülmüştür. Ayrıca ÇED Raporu hazırlanmasına gerek bulunmadığı tespit edilmiş olup, söz konusu projeye ÇED Yönetmeliğinin 17. maddesi gereğince Valiliğimizce "Çevresel Etki Değerlendirmesi Gerekli Değildir Kararı" verilmiştir.

Sebahattin KAPUCU
Vali a.
Vali Yardımcısı

Proje Sahibi : MANRES Elektrik Üretim A.Ş.
Projenin Yeri : Balıkesir İli, Manyas ve Susurluk ilçeleri, Günaydın ve İclaliye Köyleri Mevkiileri

T.C
BALIKESİR VALİLİĞİ
Çevre ve Şehircilik İl Müdürlüğü

05 -03- 2014

SAYI : 92416932-220-02 -1387

KONU: Günaydın RES

MANRES ELEKTRİK ÜRETİM A.Ş.
Kısıklı Cad. Sarkuysan –Ak İş Merkezi No:4 A-Blok Altunizade

Üsküdar /İSTANBUL

İLGİ: a)08/02/2014 tarijh ve 1840 sayılı ÇED İzin Den. Gen. Müd.'nün yazısı.

b) 24/02/2014 tarih ve BV/ÇŞ-240214 sayılı yazınız.

İlgi yazınızda; İlimiz, Manyas İlçesi, sınırları içerisinde tarafınızdan yapılması planlanan ve toplam 50 MW (25x2 MW) için Valiliğimizce 20.03.2009 tarih ve 85 Karar no'lu "ÇED Gerekli Değildir" Kararı verilen proje için değişiklik yapılarak EPDK tarafından 2,5 MW gücünde toplam 5 adet türbin kurulması Kararı alındığı, bunlara ilave olarak, 3 adet daha türbin ilave edilmesinin planlandığı belirtilerek Müdürlüğümüzden görüş alınması gerektiği bildirilmiştir.

Sözkonusu RES projesi ile ilgili yapılan incelemede ; Santral Köşe Koordinatları dahilinde EPDK tarafından 2,5 MW gücünde toplam 5 adet türbin kurulması Kararı verilmiş olup, projeye 3 adet daha türbin ilave edilmesi, 03.10.2013 tarih ve 28784 sayılı R.G.'de yayımlanarak yürürlüğe giren ÇED Yönetmeliği EK-II Uygulanacak projeler Listesi 48. sırasında belirtilen 5-20 türbin arası RES kapsamında olan projeler için verilen eşik değer altında kalması nedeniyle ÇED Yönetmeliği hükümleri uygulanmayacak olup, EPDK Lisans tadil yazısının Müdürlüğümüze gönderilmesi gerekmektedir.

Bilgilerinizi ve gereğini rica ederim.

İlyas ÇAKMAK
Çevre ve Şehircilik İl Müdür V.

İlave 3 adet Türbin Koordinatları

T6	586.582,00	4.426.185,00
T7	586.879,00	4.425.115,00
T8	586.960,00	4.425.720,00

Kuvayi Milliye Mah. Karanfil Sk.No:1 10030 BALIKESİR
Tel : 0266 224 48 16-17 -Fax: 0266 224 03 19 Aytıntılı Bilgi için irtibat:K.BOZATAY

History of the document

Version	Date	Nature of revision
04.1	11 April 2012	Editorial revision to change history box by adding EB meeting and annex numbers in the Date column.
04.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the project design document form for small-scale CDM project activities" (EB 66, Annex 9).
03	EB 28, Annex 34 15 December 2006	• The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.
02	EB 20, Annex 14 08 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
01	EB 07, Annex 05 21 January 2003	Initial adoption.
Decision Class: Regulatory **Document Type:** Form **Business Function:** Registration		