Gold Standard for the Global Goals
Key Project Information & Project Design Document (PDD)

Version 1.1 – August 2017

KEY PROJECT INFORMATION

Title of Project:	Sah Wind Power Plant
Brief description of Project:	Galata Wind Enerji A.S. has installed Sah WPP with 105 MWm/105 MWe installed capacity in Bandirma district of Balikesir province and Karacabey district of Bursa province, Turkey. Sah WPP have 35 turbines of which 24 turbines are in Balikesir province, and 11 turbines are in Bursa province, each having an output of 3.0 MW. The license of the project was issused by Energy Market Regulatory Authority (EMRA) in 10/04/2008[1]. The electricity feds to the grid at 154 kV Gobel Transmission Line. The electricity generation is 306,566 MWh per year.[2] The electricity generation result 171,828 tCO_2 and total emission reduction will be 1,202,795 tCO_2e for the second crediting period. The project operational lifetime is 49 years.[3]
Implemetation Date: Duration of Project:	19/05/2011[4] 25 Years and 00 Months
Project Developer:	Galata Wind Enerji A.Ş.
Project Representative:	Rüzgar Danışmanlık-Çağla Balcı Eriş
Project Participants and any communities involved:	Galata Wind Enerji A.Ş.
Version of PDD: Date of Version:	11 18/03/2013 And for revalidation v0.5.1 and 06/11/2018
Host Country / Location:	TURKEY / Bandirma district of Balikesir and Karacabey district of Bursa, Turkey

Deleted: 23

Deleted: 0

[1] EMRA Generation License – 10/04/2008

[2] Average electricity generation amount of last three years

[3] EMRA Generation License – 10/04/2008

[4] First Acceptance Protocol

Certification Pathway (Project Certificatin/Impact Statements & Products	Project Certification
Activity Requirements applied: (mark GS4GG if none relevant)	GS4GG
Methodologies applied:	ACM0002 Version 18.0.0
Product Requirements applied:	1 (Energy industries (renewable - / non-renewable sources)
Regular/Retroactive:	Regular
SDG Impacts:	1 – SDG 7 Affordable and Clean Energy 2 –SGD 8 Decent Work and Economic Growth 3 – SDG 13 Climate Action
Estimated amount of SDG Impact Certified	171,828 tCO_2e

SECTION A. Description of project

A.1. Purpose and general description of project

The main purpose of this project activity is to generate electricity from a Wind Power Plant and supply of power generated to the Turkey national grid. Galata Wind Enerji A.S. has installed Sah WPP with 105 MWm/105 MWe installed capacity in Bandirma district of Balikesir and Karacabey district of Bursa, Turkey. Sah Wind Power Plant has 35 turbines of which 24 turbines are in Balikesir province, and 11 turbines are in Bursa province, each having an output of 3.0 MW. The total electricity production of the project is estimated as 306,566 MWh/year.[5]

The connection of the project to the National Electricity System is done via 35 km transmission line to the 154 kV Gobel Transformer Station. The project operational lifetime is 49 years.

The project replaces anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 171,828 tCO_2e per annum for the second crediting period, thereon displacing 306,566 MWh/year amount of electricity from the generation- mix of power plants connected to the electricity grid, which is mainly dominated by thermal/fossil fuel based power plant. The project leads to reduction in GHGs and achieve sustainable development of the host country.

In the beginning phase, 31 turbines were fully commissioned. After the completion of the construction works and commissioning, the project was taken over by Doğan Enerji Yatırımları San. ve Tic. A.Ş. in June 2012. In the further stages of the project, the company decided to increase the total installed capacity of the project to 105 MWm/105 MWe with additional 4 Vestas V90 / 3000 kWe type wind turbines. The total estimation annual electricity generation of the project is calculated as 341,275 MWh/yr with 35 turbines-105 MWe according to Wind Assesment Report.
But in the years between 2011 and 2017, the average annual net electricity export to the grid was only approximately 293,479 MWh/yr. And the same WPP had produced annual average of 306,566 MWh between years 2015 and 2017 with 35 turbines. So the PP uses the amount of 306,566 MWh as annual average for the second crediting period. (15/11/2018-15/11/2025). And expected total of reduction of 1,202,795 tCO_2-eq over the 7 year crediting period

PLF of the project is calculated as follows:

PLF: = 306,566 MW/ (105 MW *8760) *100=%33,33

The project helps Turkey to stimulate and commercialise the use of grid connected renewable energy technologies and markets. It demonstrates the viability of wind power plants which

[5] This value is average amount of the last three years. The full capacity electricity generation has started since Februray 2014.

support improved energy security, improved air quality, alternative sustainable energy futures, improved local livelihoods and sustainable renewable energy industry development.

This electricity amount have contributed to the following goals:

- Reducing greenhouse gas emissions in Turkey compared to business-as-usual scenario,
- Helping to stimulate the growth of wind power industry in Turkey,
- Creating local employment during the operation phase of the plant,
- Helping to reduce Turkey's increasing energy deficit and
- Diversifying the electricity generation mix and reducing import dependency.

A.2. Eligibility of the project under Gold Standard

The project activity meets the eligibility criteria as per section 3.1.1 of GS4GG Principles & Requirements document as described below.

- The project applies methodology ACM0002 Version 18.0, which is an approved methodology under Gold Standard.
- The project type is wind which is an eligible project type as it is in accordance with 1.1.1 a) and 1.1.1 b) of the Eligible Project Types & Scope under Renewable Energy Activity Requirements.
- The project activity results in displacement of electricity from thermal power stations while contributing to sustainable development of Turkey. Hence, the project contributes to the Gold Standard Vision and Mission.
- Wind is an approved project type and does not require approval from Gold Standard.
- This project activity is not associated with geo-engineering or energy generated from fossil fuel or nuclear, fossil fuel switch, nor does it enhances or prolongs such energy generation.

General Eligibility Criteria under Renewable Energy Activity Requirements

Project Type: Wind, As discussed above, the project type is eligible.

Project Location: The project is located in in Bandirma district of Balikesir and Karacabey district of Bursa, Turkey. Thus, the project is eligible.

Project scale: The project activity is a 105 MWm/105 MWe Wind power plant and thus qualifies under large scale projects.

A.3. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

The project participant Galata Wind Enerji A.Ş. is the legal owner of the project and has the legal rights for the credits.
Galata Wind Enerji A.Ş. belongs to Dogan Enerji Yatırımları San. ve Tic. A.Ş.

A.4. Location of project

A.4.1. Host Country

Turkey

A.4.2. Region/State/Province etc.

Marmara Region, Balıkesir ve Bursa province

A.4.3. City/Town/Community etc.

The project site is located at Bandirma district of Balikesir province and Karacabey district of Bursa province. The nearest small village are Sahmelek Village and Dedeoba Village.

A.4.4. Physical/Geographical location

Please see below the maps showing the location of the project activity in Turkey and the locations of the project area:

Figure 1: The location of the project activity in Marmara Region, Turkey

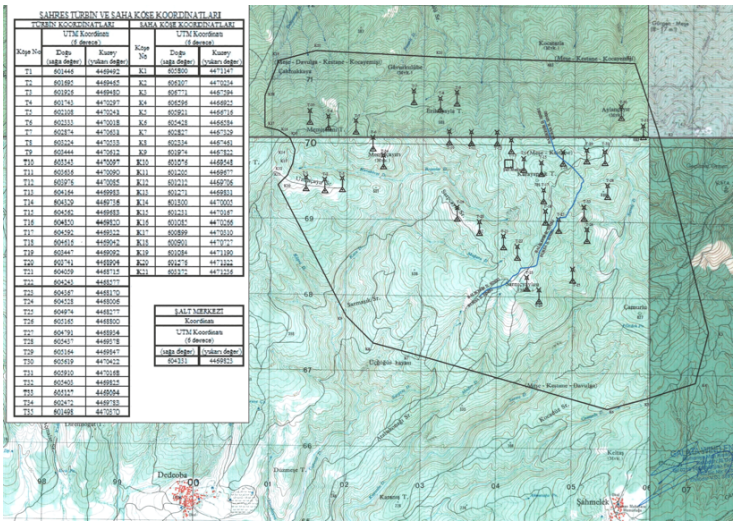


Figure 2: Site Layout showing the location of the 35 turbines

Turbine #	E	N
T1	601446	4469492
T2	601695	4469465
T3	601926	4469480
T4	601743	4470297
T5	602108	4470241
T6	602333	4470018
T7	602874	4470631
T8	603224	4470533
T9	603444	4470612
T10	603343	4470097
T11	603636	4470090
T12	603976	4470085
T13	604164	4469983
T14	604329	4469736
T15	604562	4469683
T16	604850	4469820

T17	604592	4469322
T18	604616	4469042
T19	603447	4469092
T20	603741	4468904
T21	604059	4468715
T22	604243	4468577
T23	604367	4468170
T24	604528	4468006
T25	604974	4468277
T26	605165	4468800
T27	604791	4468934
T28	605437	4469378
T29	605164	4469847
T30	605619	4470422
T31	605910	4470168
T32	605403	4469825
T33	605127	4469094
T34	602472	4469783
T35	601498	4470370

Table 1: Turbine Coordinates[6]

[6] Generation License

A.5. Technologies and/or measures

Wind power is one of the most commonly used environment friendly technologies in energy sector all over the world. Within the scope of the project, all precautions have been taken for the environment during the design phase and the project has been implemented in line with the environmental law and related regulations

The Sah WPP consists of 35 wind turbines of 3.0 MWm/3.0 MWe each and generating electricity with capacity 105 MWm/105 MWe. The first-hand turbines which is used in the project is Vestas V90 type with 80 m hub height and 90 m rotor diameter as you can see in table 2. [7]The wind turbines of the plant are to be supplied from Vestas which is the world's leading company in wind power technologies. The technology used in the plant includes first wind turbines and its auxiliary equipments with extensive automatization.

Parameter	Value
Rated Power	3,000 kW
Rotor Diameter	90 m
Gearbox Type	2 Helical stages ,1 Plenatary stage
Number of blades	3
Swept Area	6.362 m2
Hub Height	80 m
Cut out wind speed	25 m/s

Table 2: Technical specifications of V90 turbines

The project must ensure that the metering devices are in line with the technical requirements which are set out by the Communiqué for Metering Devices to be used in the Electricity Market, which describes the minimum accuracy requirement the metering devices have to fulfil, which are categorized according to the installed capacity.

The Project reduces GHG emissions by substituting fossil fuel generated electricity. The Project annual avarege emission reduction is 171,828 tCO_2e by producing 306,566 MWh/year electricity. Totally 1,202,795 tCO_2 emission reduction is expected over the period of 7 years.

The electricity generation is mainly done by fossil fuel fired power plants in Turkey. The share of resources in the electricity generation in Turkey[8] has been shown in the Figure as below;

[7] The relavan Vestas brochure has been provided to the DOE

[8] https://www.teias.gov.tr/tr/i-kurulu-guc

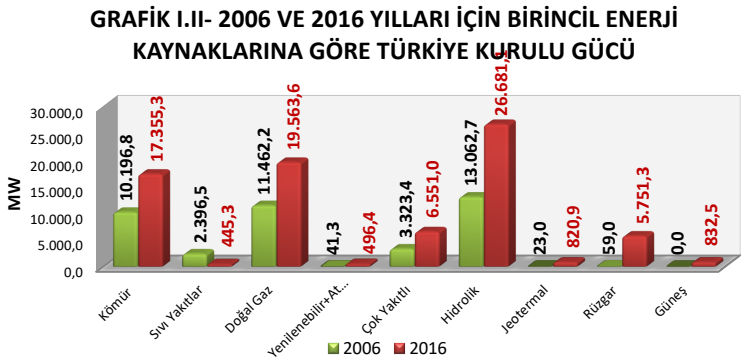


Figure 3: Turkey Total Capacity (2006-2016)

Total capacity is 78.497,4 MW in Turkey and Wind Power Projects have 5,751.3 MW capacities.

The Baseline Scenario discussed in more detail in B.4 below. As detailed in Section B.3, the greenhouse gas that is reduced is carbon dioxide. In the baseline scenario, the electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants. Since Turkey's grid mainly consists of thermal power plants, this would have resulted in GHG emissions. However, in the project scenario, the project generates electricity from wind power and result in emission reductions in parallel with its electricity generation figures. Briefly, in the absence of the project activity, the electrical energy would have been delivered to the grid through a mix of existing power generation resources, as described in more detail in section B.4.

The Sah WPP provides production of pillar and other related equipment in Turkey indirectly cause the know-how transfer, empower the local industry. The project does not need extensive initial training and maintenance efforts in order to work as presumed during the first crediting period. Necessary trainings to the plant staff is delivered by the supplier in line with the agreement between the project owner and the supplier.

A.6. Scale of the project

Large Scale

A.7. Funding sources of project

The project activity does not have any public funding or Official Development Assistance (ODA) funding.

A.8. Assessment that project complies with 'gender sensitive' requirements

(https://globalgoals.goldstandard.org/101-1-g-gold-standard-gender-equality-requirements-guidelines/)

Question 1: Does the project reflect the key issues and requirements of Gender Sensitive design and implementation as outlined in the Gender Policy? Explain how.

Response: As per Gold Standard Gender Policy (https://globalgoals.goldstandard.org/101-1-g-gold-standard-gender-policy/), p. 10 "Foundational gender-sensitive requirement - This strengthens Gold Standard's 'do no harm' approach and addresses safeguards to prevent or mitigate adverse impacts on women or men and girls and boys. Such action is mandatory for all projects seeking Gold Standard certification and includes compliance with the gender 'do no harm' safeguards, gender gap analysis and gender sensitive stakeholder consultations."

The project being a renewable energy project is not gender sensitive project. The project does not adversely impact women or men.

Question 2: Does the project align with existing country policies, strategies and best practices? Explain how.

Response: The project does not involve and is not complicit in any form of discrimination based on gender, race, religion, sexual orientation or any other basis. Turkey is party to Convention on Discrimination since 1972 to prevent any form of discrimination. (https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=IV-2&chapter=4&lang=en)

Question 3: Does the project address the questions raised in the Gold Standard Safeguarding Principles & Requirements document? Explain how.

Response: The Project shall complete the following gender assessment questions (https://globalgoals.goldstandard.org/101-4-gold-standard-for-the-global-goals-safeguarding-principles-requirements/) below:

1. Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits? No, the Project being a wind power project does not reduce access to or control of resources for women.

2. Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)? No, the Project beneficiaries in terms of employment and social upliftment of the

area are common for both the gender. The project does not involve in any form discrimination in any kind of form.

3. Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)? No, The project does not involve in any form discrimination in any kind of form.

4. Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)? Yes the project takes into account gender roles and abilities of women/men. Job profile is allocated based on the type of work to be carried out.

5. Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities? No, on the contrary the project leads to increased availability of electricity in the regional grid thereby uplifiting the living standards.

6. Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits? No, since the project is a renewable electiricity generation project, thus it will not have discriminated against women.

7. Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services? No, in fact, the project leads to improved electricity in the regional grid.

Question 4: Does the project apply the Gold Standard Stakeholder Consultation & Engagement Procedure Requirements? Explain how.

Response: In order to develop the project as a Gold Standard VER project a Local Stakeholder Consultation Meeting which is in line with Gold Standard Requirements was held on June 18th 2010. The general outcome of the stakeholder consultation interview was positive verbally. And the project is currently applying for renewal crediting period of GS registration as GS4GG now. As required by the Gold Standard complementary stakeholder consultation process has been undertaken by the project owner in order to involve stakeholders participation to the project for a renewal crediting period of Sah Wind Power Plant project. There is no need to make local

stakeholder consultation physical meeting. The documents including the non-technical project summary for renewal crediting period and the Enviromental and Social Impact questionnaire related with the Sustainable Development Indicators (SD Assestment) have been delivered to the stakeholders who have been selected as stakeholders to the project activity. The main communication method has been through e-mails and delivery of hard copies of the mentioned documents for those who don't have an email address (specifically the locals) to the mukhtars of the Dedeoba and Sahmelek villages.
The feedback request for renewal crediting period has started on 04/05/2018 with sending out the documents to the stakeholders and verbally on the same day via mukhtars of the Dedeoba and Sahmelek villages and no feedback has been received until now. The beginning of Complemantary Stakeholder Feedback Round has be announced from the muckhtar's offices, mosques and coffe houses of the Dedeoba and Sahmelek villages. This public announcement, emails and documents contain information such as location of available these documents, the procedure to commit comments, timing and the contact's details.

The mukhtar has said that the PP can change the monitoring plan and only will monitor 3 or 4 sustainable development indicators and has given comment verbally and writtenly with a letter. (These letter has provided to the DOE for re-validation process) The stakeholders stated that they are in favour of the project and underlined the significant contribution of the project to regions sustainable image and stressed the importance of renewable and clean energy.

Furthermore, the GS continuous input mechanism was explained and discussed that whenever they have a complaint or a request, they can be able to fill in the grievance book which can be located at a convenient place. The project owner has also explained that would be regularly checked by the project manager. The local stakeholders agreed on this mechanism and the book was given to the mukhtar of Dedeoba and Sahmelek villages with a protocol.[9]

Figure 4: Complemantary Stakeholder Feedback Round Annoucements in Dedeoba and Sahmelek villages

[9] The protocols have been provided to the DOE.

SECTION B. Application of selected approved Gold Standard methodology

B.1. Reference of approved methodology

According to the Appendix B to the simplified modalities and procedures for large-scale CDM project activities, the proposed project activity falls under the following type and category:

Project type: Type I – Renewable Energy Projects

Category: D – Electricity generation for a system

Methodology: ACM0002. Grid connected electricity generation from renewable sources / Version 18.0[10];

Sectoral Scope: 01 Energy industries (renewable - / non-renewable sources)

The methodology refers to:

- Tool to calculate the emission factor for an electricity system, Version 06.0.0[11]
- Combined tool to identify the baseline scenario and demonstrate additionality,Version 06.0.0[12]
- Tool for demonstration and assessment of additionality, Version 07.0.0[13]
- Tool to determine the remaining lifetime of equipment, Version 01[14]

B.2. Applicability of methodology

- The methodology ACM0002 "Large scale Consolidated baseline methodology for grid - connected electricity generation from renewable sources" is applicable to grid-connected renewable power generation project activities that a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield); b) involve a capacity addition c) involve a retrofit of (an) existing plant(s); or d) involve a replacement of (an) existing plant(s).

[10] https://cdm.unfccc.int/methodologies/DB/5725LCHYPYM4I1V8OD9SFYVAMFFWNP

[11] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v1.1.pdf/history_view

[12] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v6.0.pdf

[13] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf

[14] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf/history_view

- Since the proposed project activit install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield), ACM0002 "Large scale Consolidated baseline methodology for grid ‐ connected electricity generation from renewable sources " version 18.0.0 is applicable. The applicability criteria and conditions may be seen in more detail as below:

The choice of methodology ACM0002/Version 18.0. is justified as the proposed project activity meets relevant applicability criteria

Table 3: Applicability of ACM0002 Version 18

Applicability Condition	Justification
This methodology is applicable to project activities that: *a)* Install a Greenfield power plant; *b)* Involve a capacity addition to (an) existing plant(s); *c)* Involve a retrofit of (an) existing operating plants/units; *d)* Involve a rehabilitation of (an) existing plant(s)/unit(s); or *e)* Involve a replacement of (an) existing plant(s)/unit(s).	The project activity involves installation of a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity. The proposed project activity is a greenfield project activity . [15]
The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, wind power plant/unit, wave power plant/unit or tidal power plant/unit.	The project activity is the installation of 35 wind turbine generators (WTGs). Hence, meets this criterion.
In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, wind, wave or tidal power capacity addition projects the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline	The project activity does not involve capacity additions, retrofits, rehabilitations or replacements. Hence this criterion is not applicable to the project activity.

[15] EMRA Generation License – 10/04/2008

emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	
In case of hydro power plants, one of the following conditions shall apply: a)The project activity is implemented in an existing reservoir, with no change in the volume of reservoir; b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (3), is greater than 4 W/m2; or (c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than 4 W/m2; or (d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m2, all of the following conditions shall apply: (i) The power density calculated using the total installed capacity of the integrated project, as per equation (4),is greater than 4 W/m2; (ii) Water flow between reservoirs is not used by	This condition is not applicable to the project activity as it does not involve the installation of a hydro power plant.[16]

[16] The Generation License for 49 years obtained for WPP from Electricity Market Regulation Authority (EMRA)

any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m2 shall be: a. Lower than or equal to 15 MW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project.	
In the case of integrated hydro power projects, project proponent shall: (a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or (a) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.	The project activity is not a hydro power plant. Hence this applicability criterion is not relevant to the project activity.

The methodology is not applicable to: (a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; (b) Biomass fired power plants/units	Project activity does not involve: • Switching from fossil fuels to renewable energy sources at the site of the project activity. • Biomass fired plants. Hence this criterion is not applicable.
In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance."	The project is not a retrofit, rehabilitations, replacements or capacity addition; hence this applicability criterion is not relevant.
In addition, the applicability conditions included in the tools referred to above apply.	Applicability conditions of the applied tool are justified.

Based on the above arguments it could be concluded that the methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" version 18.0. is applicable to the proposed project activity

B.3. Project boundary

The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system. The greenhouse gasses and emission sources are defined for the project activity and the baseline scenario. As a result, the project boundary for Sah WPP is as demonstrated in the figure below:

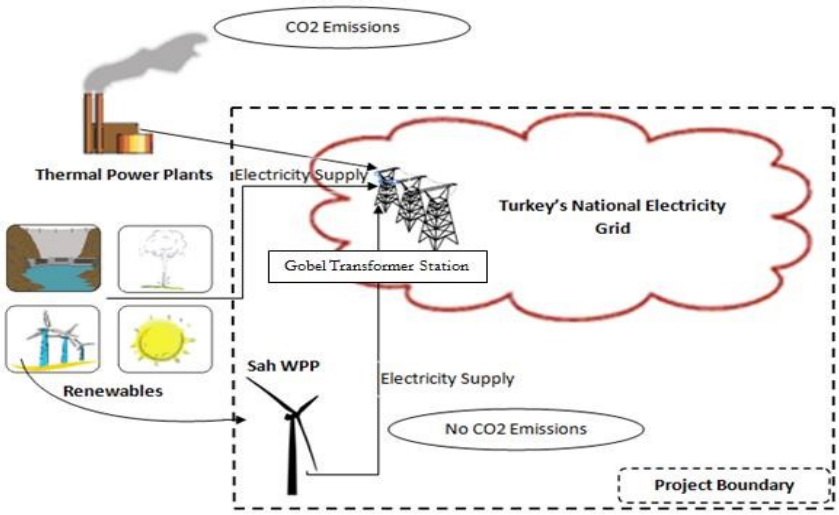


Figure 5 : Project Boundary

In addition, please see the justification of the given project boundary in the table below:

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	CO_2 emissions from electricity generation in fossil fuel fired power plants that are replaced due to the project activity	CO_2	Yes	Main emission source. The dominant emissions from power plants are in the form of CO_2, therefore CO_2 emissions from fossil fuel fired power plants connected to the grid is considered in baseline calculations.
		CH_4	No	Minor emission sources
		N_2O	No	Minor emission sources
Project scenario	Construction and operation of the project activity	CO_2	No	Minor emission source. The project activity will have a diesel generator, however the use of fossil fuels for the back up or emergency purposes (e.g. diesel generators) can be neglected as per the applicable methodology As suggested by the baseline methodology, project emissions (PEy) are assumed to be 0 and will not be considered
		CH_4	No	
		N_2O	No	

Table 4: The greenhouse gases and emission sources

Potential leakage emissions in the context of power sector projects are emissions that arise from the project activities such as power plant construction, fuel handling and land inundation. According to ACM0002 / Version 18.0, such emissions do not need to be taken into account.

The following figure represents the line diagram of the project activity, including metering points:

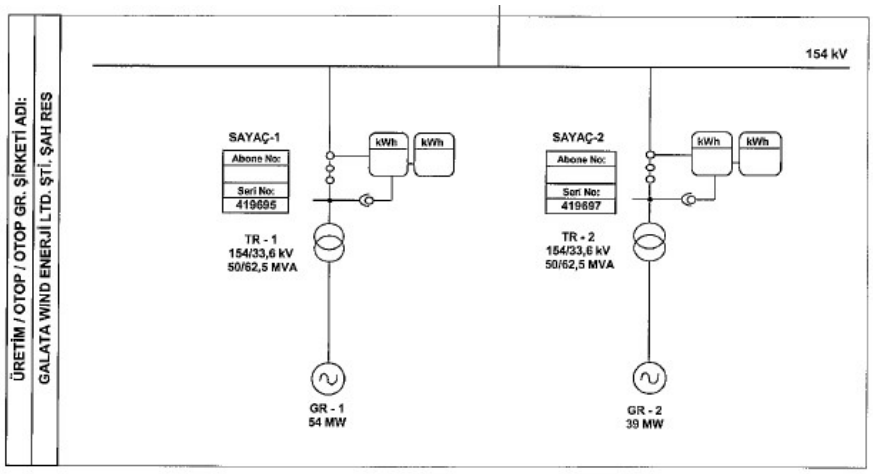


Figure 6: Single Line Diagram

The scheme shows the connection points of Sah Wind Power Plant with the national grid. The Sah Wind Power Plant has to be connected to the national grid via 154 kV Gobel TM.

B.4. Establishment and description of baseline scenario

The proposed project activity is the installation of a grid-connected renewable power plant/unit. The baseline scenario in accordance with ACM0002 v18.0.0 is defined as followed

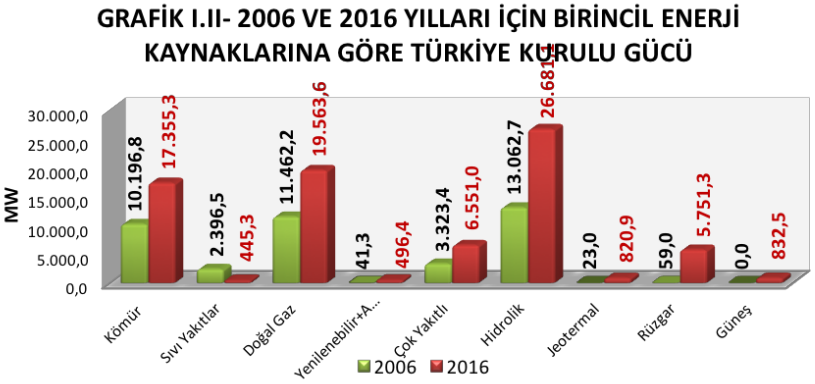
Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the tool to calculate the emission factor for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

According to the "Baseline Methodology Procedure" in "Tool to calculate the emission factor for an electricity system, Version 06.0.0" baseline emissions are calculated under Section B.6.3.

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

Installed electricity generation capacity in Turkey has reached 78.497,4 megawatts (MW) as of 2016. Wind Power projects have totally have 5751,3 MW.

The electricity generation is predominantly composed by fossil fuel fired power plants in Turkey. The share of resources in the electricity generation in Turkey may be seen in Figure 7. The



contribution to annual electricity generation from wind energy was only 1,06 % in 2016.

Figure 7: Projected Electricity Generation Mix[17]

According to the 5-year projection it is clear that fossil fuels will remain the main sources for electricity generation (71.5 % in 2019). Natural gas will continue to dominate the market. Hydro will account for 22.1% of the mix whereas all non-hydro renewable combined (geothermal/biogas/waste/wind/wind) will only account for 6.4% of all electricity generation. This projection is consistent with continuing fossil fuel dependent characteristics of Turkish electricity sector.

[17] https://www.teias.gov.tr/tr/i-kurulu-guc

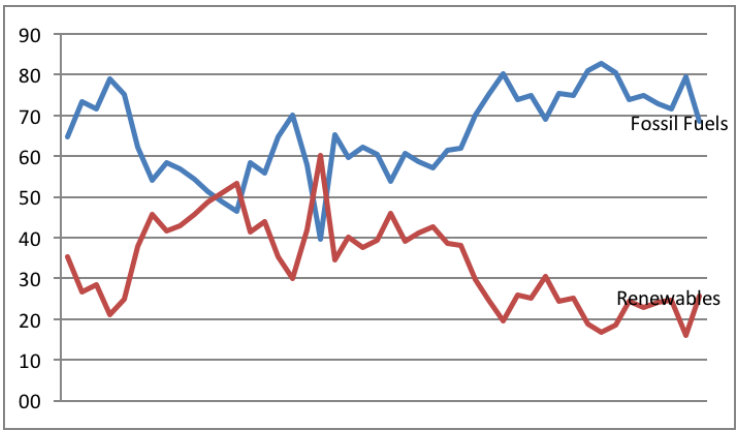


Figure 8: Fossil Fuels and Renewable in Turkish Electricity Mix (1970-2015)[18]

B.5. Demonstration of additionality

Referred by the Baseline Methodology, the "Tool for the Demonstration and Assessment of Additionality" outlines a step by step approach for the assessment of additionality or in other words the emission reductions that would have occurred in the absence of the project.

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

Sub-step 1a: Define alternatives to the project activity
In the absence of the proposed project activity, plausible and credible project activities to the proposed project activity are as follows:

Alternative 1 : Construction of a thermal power plant with the same annual power output
Alternative 2 : The proposed project activity not undertaken as a VER project activity
Alternative 3 : The same service of power supply is provided from the grid (Sah WPP is not built)

Although the coal and natural gas reserves in Turkey is very limited, there are many thermal power plants that have been being commissioned in recent years and Turkey's grid mainly consists of thermal power plants. As they have become common practice in the energy sector due to off-take agreements provided by the government, these projects face easier

[18] http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/istatistik2014.htm

circumstances in terms of financing and realisation. In addition, these projects use imported coal, so they can be realized regardless of their geographic proximity to coal supply. Therefore, construction of a thermal plant with the same annual electricity output is a realistic alternative.

As mentioned above, the Turkish Electricity Sector is heavily dependent on fossil fuel plants. According to a new bill that passed in 2001(Electricity Market Law, Law No: 4628, Enactment Date: 20/02/2001) 19, the public funding in energy investments have stopped. The new bill allows incentives for private sector participation in energy investments. In addition to rehabilitation of existing plants, new capacities to be added to meet the increasing demand require mass amount of investments. Because the public funding of energy investments is no more legitimate, the new projects need to be accomplished by private sector. Yet, Sah WPP cannot influence the future fuel mix in the energy market, but can only decide to invest on the project because Sah WPP has no influence on the domestic energy policy of the decision makers.

Under these circumstances, analyzing these three alternatives, it is seen that all scenarios are consistent with the baseline definition of ACM0002 / Version 18.0 where it defines the baseline scenario as the amount of electricity that would be delivered to the grid by the project activity, generated by the operation of existing grid-connected power plants and by the addition new generation sources, as reflected by the combined margin.

Sub-step 1b: Consistency with mandatory laws and regulations
The following applicable mandatory laws and regulations have been identified:

1. Electricity Market Law [20]
2. Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy[21]
3. Forest Law[22]
4. Environment Law [23]
5. Regulation on procedures and principles of signing the agreement of utilization of water resources for the purpose of electricity production in the electricity market[24]
6. Regulation on Environmental Impact Assessment[25]

[19] http://www.epdk.gov.tr/mevzuat/kanun/elektrik/elektrik_piyasalari_kanunu.pdf
[20] Law number 4628, enactment date 03/03/2001, http://www.epdk.gov.tr/english/regulations/electricity.htm

[21] Law number 5346, enactment date 18/05/2005, http://www.eie.gov.tr/duyurular/YEK/LawonRenewableEnergyReources.pdf

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

[23] Law number 2872. Published in Official Gazette No. 18132 on 11/08/"83.

[24] National Gazette number 25150, 06/06/2003

[25] National Gazette number 26939, 17/07/2008

All energy projects are in compliance with the mandatory laws and regulations listed above except 2nd and 6th one. "Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy" is only applicable for renewable energy projects. Also, "Regulation on procedures and principles of signing the agreement of utilization of water resources for the purpose of electricity production in the electricity market" is only applicable for hydropower projects. The electricity Market Law structures the market in general. Therefore, it is applicable for all projects in the electricity market. On the other hand, Forest Law, Environment Law, energy efficiency Law and the Regulation on EIA are also applicable for all alternatives.

Outcome of Sub-Step b

The alternatives discussed above are in line with applicable legal and regulatory requirements.

Step 2: Investment Analysis

The purpose of investment analysis is to determine whether the proposed project activity is economically or financially less attractive without carbon revenues than the remaining alternatives. To conduct the investment analysis, the following sub-steps are adhered to:

Sub-step 2a: Determine appropriate analysis method

The „Tool for the Demonstration and Assessment of Additionality', version 05.2, from EB39, lists three possible analysis methods:

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

Since the proposed project generates financial and economic benefits via the sales of electricity other than carbon revenues, Option I cannot be used.

Option II is only applicable to projects where alternatives should be similar investment projects in terms of generation capacity. Between Option II and Option III, benchmark financial analysis (Option III) is selected as the analysis method.

As a result Option III: Benchmark Analysis is selected as the analysis method and the Equity IRR is selected as the financial indicator for the demonstration of the additionality of the project.

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

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

The relevant benchmark rate is calculated in line with the suggestion in "Tool for the demonstration and assessment of additionality" which suggests using the government bond rates, increased by a suitable risk premium. In relation to this, the benchmark rate is calculated in line with the Capital Asset Pricing Model (CAPM)26. The CAPM suggests below formula to calculate the discount rate (in other words benchmark rate).

$$E(R_i) = R_f + \beta_i(E(R_m) - R_f)$$

$E(R_i)$ is the expected return on the capital asset

R_f is the risk-free rate of interest such as interest arising from government bonds

β_i (the beta coefficient) is the sensitivity of the asset returns to market returns, or

, also $\beta_i = \frac{\mathrm{Cov}(R_i, R_m)}{\mathrm{Var}(R_m)}$

$E(R_m)$ is the expected return of t he market

$E(R_m) - R_f$ is sometimes known as the market premium or risk premium (the difference between the expected market rate of return and the risk-free rate of return

Risk Free Rate (R_f)

As the Turkish Eurobonds represent a risk-free rate, it must be increased by a suitable risk premium, which reflects the premium that investors demand for an average risk investment. The interest rate for Eurobond with longest duration of 10 years which XS0285127329 - 02.04.2019 was 5.66% at the time of decision (End of August 2009, please see http://www.ziraat.com.tr/tr/bankamiz/faiz-ve-ucretler/aspx/eurobond.aspx for 31 of August 2009). However the maturity of this bond does not match with the investment analysis duration which is 25 years (technical life of the equipment). Therefore the yield of a synthetic bond with 27 years maturity at the time of decision was calculated using the yield curve derived from http://www.ziraat.com.tr/tr/bankamiz/faiz-ve-ucretler/aspx/eurobond.aspx was used. Please see Annex 7 to see the yield curve. According to this calculation the synthetic bond's yield should be around 7.883%.

[26] Please see http://en.wikipedia.org/wiki/Capital_asset_pricing_model for the definition of CAPM

The Beta Coefficient (β_i)

The Beta coefficient of securities with values close to 1 determines the company securities as being of average risk. There are four power generating and trading companies under trade in the Istanbul Stock Exchange (ISE). The βi for the Electricity Index is calculated as 0.939 by Bloomberg which is one of the prominent data suppliers in financial markets. (Please see Annex 8 for Betas of these companies)

Market risk premium ($E(R_m) - R_f$)

To estimate the "Market risk premium" of Turkey, the independent study of Aswath Damodaran – Stern School of Business (New York University) was used. The study offers an assessment of the market risk for different countries according to their credit ratings as the determined market risk premium for Turkey is 12.88%, calculated on the basis of the credit rating Ba3 with positive perspective given to Turkey by Stern School of Business.[27]
All in all, the relevant discount rate is calculated as:

$$7.88\% + 12.88\% * 0.939 = 19.97\ \%$$

The above discount rate can easily be assumed as conservative as the above benchmark assumes that the benchmark and the project have same natures in terms of risk. However, the Beta of the index includes lower risk compared to the project, as the index includes already established companies (which are up and running). However, it is obvious that the project includes more risk compared to already established companies as there are extra construction risks and inexperienced operational risks for the project. Therefore, the Beta of the project should be significantly higher than the index Beta. All in all, we can say that the CAPM derived benchmark rate is conservative and also in consistency with the benchmark rates received from local bankers mentioned above.

IRR Calculation of the Project

The below IRR calculations of the project reveal the fact that the project is not financially attractive. Therefore, carbon revenues are crucial for the project and the company considered potential carbon revenues in its financial feasibilities shared with the top management before the project activity start date. In the further stages of the project (before the construction start), the company took necessary actions to develop this project as a Gold Standard VER project.

Aiming to show that the income of the GS VER is important for the financial performance of the project, two scenarios are presented in this section, one which excludes revenues from the sale of GS VERs and the second which includes the revenues from the sale of GS VERs. The assumptions used for this analysis are outlined as follows:

[27] http://www.stern.nyu.edu/~adamodar/pc/archives/ctryprem08.xls

- The project lifetime is defined as 25 years, which is the technical lifetime for the project.
- The financial analysis is performed over the 27 years period. This therefore includes the investments made by the project owner during the construction phase and the operational costs along the financial analysis period.
- The Equity IRR (Internal Rate of Return) of the project cash flow has been calculated.
- A tax rate of 20% is applied to the project in line with Turkish tax laws.
- The depreciation period of turbines was assumed as 10 years, depreciation period of machinery and equipment was assumed as 15 years.(Please see http://www.gib.gov.tr/fileadmin/user_upload/Tebligler/VergiUsul_Kanunu/verusulteb365ek.htm). In the meantime, the other fixed assets' (buildings etc) depreciation life is assumed as 40 years.
- The annual power generation figure is assumed as 341,275,000 kWh. (306,566,000 kWh for second crediting period)
- The power purchase price for the project is assumed to be 5.5 Euro cents per kWh which is the purchase guarantee offered by the State as an incentive to the investment (Please refer to Turkish Renewable Energy Law No: 5346 Article 6.c.)

The revenues from GS VERs are excluded from scenario 1, and included in scenario 2. The volume of GS VERs generated by the project is calculated by multiplying the annual electricity output of the project by the emission factor. For sensitivity analysis, the revenues related to the sale of the GS VERs are applied by multiplying the volume of GS VERs by the €5, €6 and €7 price. The GS VERs are generated and sold for the first 7 years of the operational lifetime of the project. (Unfortunately this is not realized because of the market condition. The price and every related condition of this market has changed)

Results

The cash flow analysis has been performed on two project scenarios;

- Scenario 1 – excludes revenues from the sale of GS VER
- Scenario 2 – includes revenues from the sale of GS VERs

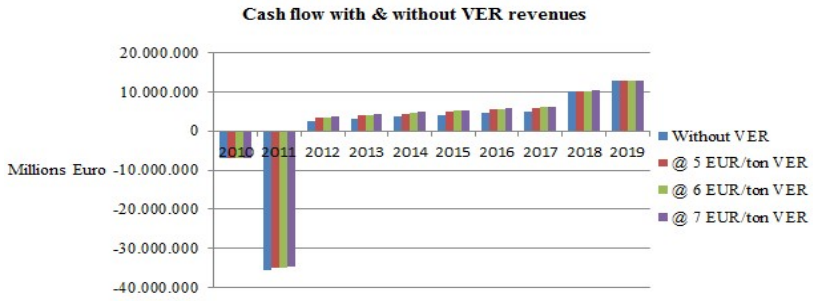


Figure 9 : Project Cumulative Cash Flow Comparison, with and without GS VERs.

Sub-step 2c: Calculation and Comparison of Financial Indicators

1. Parameters required for calculation of key financial indicators

The parameters required for the calculation of key financial indicators are in Table 5:

Parameter	Value
Basic parameters	
Installed Capacity	105 MWm
Annual Electricity Production	341,275MWh/year
Electricity Sales Price	5.5 Euro cent
Income tax rate	20%
Project lifetime – (years)	25.0
Annual Costs	
Turbine Repair, Maintenance & Spare Parts	2,170,000 Euro
Personnel	240,000 Euro
Energy Transfer Fee (System Usage Fee)	344,299 Euro
Insurance	0.1% of total investment
Investment Items	
Project Development Costs	14,415,000
Costs for Turbines	82,080,000

Construction	7,571,186
Electromechnical Installments	5,000,000
Financing	
Loan Amount	65% of total investment
Interest	8%
Tenor	10

Table 5: Basic Parameters for Financial Analysis

2. Results of the Financial Analysis

Table 6 includes the results of the financial analysis for the Project, at the time that the decision to go ahead was made, both with and without VER financing. The IRR of the Project without VER financing was lower than the applicable benchmark rate of return. This therefore indicates that in comparison to alternative investments, the Project was financially unattractive in the absence of VER financing.

	Without VER	@ 5 Eur/ton VER	@ 6 Eur/ton VER	@ 7 Eur /ton VER
Equity IRR (%)	15.43 %	16.48 %	16.70 %	16.92

Table 6: Summary of Project investment analysis without and with VER financing

3. Comparison of IRR for the proposed project to the financial benchmark

In accordance with benchmark analysis (Option III), if the financial indicators of the proposed project, such as the project IRR[28], are lower than the benchmark, the proposed project is not considered financially attractive.
Table 6 highlights the project IRR with and without carbon revenues. Without the additional income to the project developer resulting from VER sales, the Equity IRR is 15.43 %, which is lower than the financial benchmark. Thus, the proposed project is not financially attractive. However, taking VER revenues into consideration, the Equity IRR increases to 16.92 % (with 7 EUR/ton VER price).
While the IRR with VERs remains lower than the financial benchmark of 19.97%, the Project Developer will also benefit from the following intangible benefits that VERs provide:

[28] For Benchmark Analysis, the IRR shall be calculated as equity IRR, according to the "Tool for the demonstration and assessment of additionality", version 05, from EB39.

A third party review of project documents will give extra confidence to both investors and financiers.

-Enhanced corporate green image of the project developer through its contribution to a clean source of electricity and the diversification of electricity sources in Turkey, which broadens stakeholder confidence.

Sub-step 2d: Sensitivity Analysis

Sensitivity analysis was applied to Investment Costs, Energy Production, Electricity Sales Price and O&M Cost. Applying variations on investment costs, the range was considered to be in a bandwidth of +10% and –10% as advised in "Tool for the demonstration and assessment of additionality"
The sensitivity in the investment amount was applied to the investment items which represent equal or above 20% of the total investment amount (namely, "Regulator, tunnel & canals construction" and "Electromechanical Installments") as suggested by "Tool for the demonstration and assessment of additionality."

	IRR Sensitivity with Investment Costs				
Change in %	**-10%**	**-5%**	**0%**	**5%**	**10%**
Without VER	17,79%	16,52%	15,43%	14,48%	13,64%
IRR @ 5 Eur/ton VER	19,14%	17,70%	16,48%	15,43%	14,51%
IRR @ 6 Eur/ton VER	19,42%	17,95%	16,70%	15,63%	14,69%
IRR @ 7 Eur/ton VER	19,71%	18,20%	16,92%	15,83%	14,87%

Table 7: Sensitivity to Variation in Investment Costs

Variation on energy production was also applied in a bandwidth of +10% and –10%.

	IRR Sensitivity with Electricity Production				
Change in %	-10,0%	-5,0%	0,0%	5,0%	10,0%
Without VER	12,67%	14,04%	15,43%	16,84%	18,28%
IRR @ 5 Eur/ton VER	13,51%	14,98%	16,48%	18,01%	19,58%
IRR @ 6 Eur/ton VER	13,68%	15,18%	16,70%	18,26%	19,85%
IRR @ 7 Eur/ton VER	13,86%	15,38%	16,92%	18,50%	20,13%

Table 8: Sensitivity to Variation in Energy Production

Due to the fact that the feed in guaranteed tariff prices are fixed in Turkey, the unit energy price is not considered to be an exogenous variable. However, sensitivity on the upward side was also applied to see the effect of price changes.

	IRR Sensitivity with Electricity Price				
Change in %	**-10,0%**	**-5,0%**	**0,0%**	**5,0%**	**10,0%**
Without VER	12,67%	11,68%	15,43%	16,84%	18,28%
IRR @ 5 Eur/ton VER	13,60%	12,49%	16,48%	17,95%	19,46%
IRR @ 6 Eur/ton VER	13,80%	12,65%	16,70%	18,19%	19,70%
IRR @ 7 Eur/ton VER	14,00%	12,82%	16,92%	18,42%	19,95%

Table 9: Sensitivity to Variation in Energy Price

Last, the Operating & Maintenance costs are also included to the Sensitivity Analysis. The results are as shown in the table below:

	IRR Sensitivity with O&M Cost				
Change in %	-10,0%	-5,0%	0,0%	5,0%	10,0%
Without VER	13,58%	13,42%	15,43%	13,09%	12,92%
IRR @ 5 Eur/ton VER	14,44%	14,27%	16,48%	13,93%	13,76%
IRR @ 6 Eur/ton VER	14,62%	14,45%	16,70%	14,10%	13,93%
IRR @ 7 Eur/ton VER	14,80%	14,63%	16,92%	14,28%	14,11%

Table 10: Sensitivity to Variation in Operating and Maintenance Costs

The above benchmark and accompanying sensitivity analyses reveal the fact that no alternative scenario, with or without VER revenues, can make the project pass the benchmark IRR expectation. The equity IRR without VER revenues of the project, even with a increase of 10% in the electricity price/production, cannot exceed 19.97% which is much lower than the benchmark rate. On the other hand, in case of a 10% decrease in the investment amount, the equity IRR with VER revenues approaches the benchmark rate, but not exceeds. Therefore, the project is not financially attractive without VER revenues. Consequently, the project has a strong additionality argument according to the results of investment analysis.

In addition to the assessment of chosen parameters for Sensitivity analysis, the impact of design change of the project (increase of installed capacity with add 4 turbines) is assessed to demonstrate that the project is additional in line with the "Gold Standard Procedures for

Approval of Design Changes"[29] The cost of additional 4 wind turbines is 8,580,000 Euros + VAT based on the agreement made with VESTAS. In addition, the most up-to-date electricity generation estimation after the implementation of the additional turbines is used for the calculation of electricity sales revenues. (341,275 MWh/yr) Last, the "Turbine Repair, Maintenance and Spare Parts" cost is increased to 35/31 of the cost used in the investment analysis, since this cost is based on the number of WTGs and additional costs for construction works of the 4 turbines is used (271,186.44 Euros)

In the light of these values, the equity IRR of the project is recalculated and the result is 13.25 %, which is also much lower than the benchmark rate. The Sah WPP with 35 turbines still strong additionality argument according to the results of investment analysis.

	Equity IRR without VER				
Sensitivity Parameter /Change Rate	-10%	-5%	0%	5%	10%
Investment Cost	17,79%	16,52%	15,43%	14,48%	13,64%
Energy Production	12,67%	14,04%	15,43%	16,84%	18,28%
Electricity Sales Price	12,67%	11,68 %	15,43%	16,84%	18,28%
O&M Cost	13,58%	13,42%	15,43%	13,09%	12,92%

Table 11: Sensitivity of Equity IRR (without VER revenues) to variations on different parameters

Ongoing Financial Need

The expected emission reductions amount is 185,636 tCO_2 from the Sah Wind Farm Project during the first crediting period and 171,828 tCO2 during the second crediting period. The carbon credit selling price depends on the market status and changes for each purchase agreement (VERPA). The carbon revenues are very important for the PP. But the carbon trade was not good for them in the first crediting period. The electricity generation result 171,828 tCO_2 and total emission reduction will be 1,202,795 tCO_2e for the second crediting period.

Outcome of Step 2

The sensitivity analysis shows that the equity IRR of the proposed project does not overcome the financial benchmark despite favourable conditions.

The sensitivity analysis further substantiates that the project activity is not a feasible alternative and so additional.

[29] http://www.cdmgoldstandard.org/wp-content/uploads/2012/05/v2.2_ANNEX-AA.pdf

Step 3: Barrier Analysis

The analysis is not applied.

Step 4: Common Practice Analysis

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

As mentioned above sections, participation of private sector in the electricity generation from wind power plants is a very new concept in Turkey. Facing the growing demand for electricity and lacking the capital to realize wind investment, the State outsourced the construction of those plants through licenses. As seen in the table below, among the projects under construction, the number of projects that are close to completion is very low (only 8 projects out of 66 were completed more than 50% as of now)[30]

Completion Ratio (%)	Number of Facilities
<10% Completed	40
>10% Completed	26
>20% Completed	18
>30% Completed	12
>40% Completed	10
>50% Completed	8
>60% Completed	8
>70% Completed	8
>80% Completed	7
>90% Completed	5

Table 12: Number of WPP facilities completed over a certain completion ratio

In addition, there were not any electricity generation activities from wind power plants in Turkey until 1998. In 1998, total installed capacity of wind power plants in Turkey was just 8.7 MW. As of

[30] http://www2.epdk.org.tr/lisans/elektrik/ilerleme_proje.htm (Accessed on November 22, 2010)

end of 2009, the total installed capacity of wind power plants reached 791.6 MW , but still this amount is at negligible level. The share of wind power plants in Turkey's total installed capacity is only 1.8%.[31]

Sub-step 4b: Discuss any similar options that are occurring

As seen in the above explanations, the electricity generation from wind power is not a common practice in Turkey. In addition to this, it can be easily said that currently operational power plants have been commenced by benefitting from carbon revenues. The table below shows the names and installed capacities of all the wind power plants which are operational as of end of 2008[32] and if they benefit from carbon revenues or not.

Project Name	Installed Capacity (MW)	Benefit from carbon revenues?
ARES (ALAÇATI)*	7.2	N
BORES (BOZCAADA)*	10.2	N

[31] http://www.teias.gov.tr/istatistik2009/3.xls

* ARES and BORES projects are Turkey's first wind power plant projects and at the time of these investments made, the existence of VER revenues was not known in the country.

32 The table is obtained from the Annex 1 of the TEIAS Capacity Projection Report for 2009-2010. (http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2009.pdf)Since the plant based data for 2009 has not been published by TEIAS yet, the currently operational power plants as of end of 2008 is evaluated regarding their status of benefiting from carbon revenues.

SUNJÜT	1.2	N
ALIZE ENERJI (Delta Plastik)	1.5	N
ERTÜRK ELEKTRIK (TEPE)	0.9	N
ANEMON ENERJI (INTEPE)	30.4	Y
BARES (BANDIRMA)	30	Y
DOGAL ENERJI (BURGAZ)	14.9	Y
DENIZLI ELEKTRIK (Karakurt-Akhisar)	10.8	Y
MARE MANASTIR	39.2	Y
BAKI ELEKTRIK ŞAMLI RÜZGAR	21	Y
DATÇA RES	8.1	Y
ERTÜRK ELEKTRIK (ÇATALCA)	60	Y
INNORES ELEKTRIK (YUNTDAG)	42.5	Y
LODOS RES (TAŞOLUK)	24	Y
SAYALAR RÜZGAR (DOGAL ENERJI)	30.6	Y
SEBENOBA (DENIZ ELEKTRIK-SAMANDAG)	31,2 .	Y

Table 13: Currently operational (as of end of 2008) WPP and their status of benefiting from carbon revenues

On the other hand, it is impossible to compare all similar projects if they benefit from carbon revenues or not, since there is no registration authority in the host country to apply for this information. However, the accessible information shows that there are a lot projects which benefit from carbon revenues.[33] This proves that it is not a common practice to develop wind power plant projects without VER revenues.

In addition, the most recently commissioned power plants (commissioned in 2009) are considered in the context of the subject project. The below table also shows that constructing the proposed project activity not undertaking as a VER project activity is not a common practice.

Company	Installed Capacity (MW)	Commissioning Date	Benefit from Carbon revenues?
AK ENERJİ (AYYILDIZ RES)	15	2009	N
ALİZE ENERJİ (ÇAMSEKİ RES)	20.8	2009	Y
ALİZE ENERJİ (KELTEPE RES)	18.9	2009	Y
ALİZE ENERJİ (SARIKAYA RES) (Şarköy)	28.8	2009	Y
AYEN ENERJİ A.Ş. AKBÜK RÜZGAR	31.5	2009	Y
BAKİ ELEKTRİK ŞAMLI RÜZGAR	69	2009	Y
BELEN ELEKTRİK BELEN RÜZGAR - HATAY	30	2009	Y
BORASCO ENERJİ (BANDIRMA RES)	45	2009	Y
DATÇA RES (Datça)	21.5	2009	Y
KORES KOCADAĞ RES (Urla/İZMİR)	15	2009	Y
MAZI-3 RES ELEKT. ÜR. A.Ş. (MAZI-3 RES)	22.5	2009	Y
ROTOR ELEKTRİK (OSMANİYE RES)	57.5	2009	Y
SAYALAR RÜZGAR	3.6	2009	Y
SOMA ENERJİ ÜRETİM (SOMA RES)	45	2009	Y
ÜTOPYA ELEKTRİK (DÜZOVA RES)	15	2009	Y

Table 14: Most recently commissioned (2009) WPPs and their status of benefiting from carbon revenues

Last, the operational wind power plants (as of end of 2009) in Marmara region have also been considered. As can be seen in the table below, the WPP business is a common practice neither in the host country nor in the Marmara region in which the Sah WPP exists.

[33] Please see the Gold Standard (https://gs1.apx.com/myModule/rpt/myrpt.asp?r=111) and VCS (https://vcsprojectdatabase1.apx.com/myModule/rpt/myrpt.asp) Registry web sites

"

Company - Project	Installed Capacity (MW)	Location	Benefit from Carbon revenues?
AK ENERJİ (AYYILDIZ RES)	15.0	Balıkesir	Y
ALİZE ENERJİ (ÇAMSEKİ RES)	20.8	Çanakkale	Y
ALİZE ENERJİ (KELTEPE RES)	18.9	Balıkesir	Y
ALİZE ENERJİ (SARIKAYA ŞARKÖY)	28.8	Tekirdağ	Y
BAKİ ELEKTRİK ŞAMLI RÜZGAR	90.0	Balıkesir	Y
BORASCO ENERJİ (BANDIRMA RES)	45.0	Balıkesir	Y
SOMA ENERJİ ÜRETİM (SOMA RES)	45.0	Manisa-Balıkesir	Y
BORES (BOZCAADA)	10.2	Çanakkale	N
SUNJÜT	1.2	İstanbul	N
ERTÜRK ELEKTRİK (TEPE)	0.9	İstanbul	N
ANEMON ENERJİ (İNTEPE)	30.4	Çanakkale	Y
BARES (BANDIRMA)	30.0	Balıkesir	Y
DOĞAL ENERJİ (BURGAZ)	14.9	Çanakkale	Y
ERTÜRK ELEKTRİK (ÇATALCA)	60.0	İstanbul	Y
LODOS RES (TAŞOLUK)	24.0	İstanbul	Y

Table 15: Operational WPPs (as of end of 2009) in Marmara Region

In conclusion, the low rate of completion of the projects, the low rate of license grants for wind projects and the similar WPP projects which benefit from VER revenues in Marmara region and host country prove that the electricity generation from WPP business is not a common practice, especially without VER revenues. Therefore Step 4 is satisfied.

Milestones of the project activity is listed as below:

Milestones	Dates
EIA not required decision by the Ministry of Environment and Forestry for Balikesir region	March 21st, 2008
License obtained from EMRA	April 10th, 2008
Board's Decision on application to carbon finance (prior consideration)	October 14th, 2008
Wind and Energy Yield Estimation Report	December 1st, 2008
Acquisition of GALATA by Agaoglu Group	April 2nd, 2009
Agreement with turbine supplier	December 31st, 2009
EIA not required decision by the Ministry of Environment and Forestry for Bursa region	March 23rd, 2010
System Connection Agreement with TEIAS	May 14th, 2010
Agreement with the PDD Consultant	May 21st, 2010
Construction agreement with the contractor	May 27th, 2010
Loan agreement with the bank	June 4th, 2010
Local Stakeholder Consultation Meeting	June 18th, 2010
GALATA's declaration of non-use of ODA funding	June 21st, 2010
Permission granted by Ministry of Environment and Forestry for the use of forestry are in the project area	July 9th, 2010
Land delivery to the company for construction (Start Date of the Construction)	August 6th, 2010
Agreement with the DOE	October, 2010
System Usage Agreement with TEIAS	January 17th, 2011
Start of VER validation	January 24th, 2011
Commissioning date of the first phase of the plant (21 x 3 = 63 MW)	May 19th, 2011
Commissioning of the second phase (9 x 3 = 27 MW)	June 3rd, 2011
Commissioning of the last phase (1 x 3= 3 MW)	July 29th, 2011
Additional Protocol signed with VESTAS for the capacity addition	February 10th, 2012
License Amendment (Increase in number of turbines)	April 4th, 2012
License Amendment (Change of corporate name to Galata Wind Enerji A.Ş.)	June 11th, 2012
Galata Wind Enerji A.Ş. is taken over by Doğan Enerji	June 20th, 2012
Commissioning date of additional 4 turbines	May 24th , 2013

License Amendment (Change of capacity to 105 MWe/105 MWm.)	September 26th, 2013
Gold Standard Project Registration	November 6th, 2013
First Monitoring Period	Between November 15th of 2011 and 31th of October 2013
Second Monitoring Period	Between 1th June of 2015 and 31th of May 2018
Second Crediting Period	November 14th ,2018

B.6. Sustainable Development Goals (SDG) outcomes

B.6.1. Relevant target for each of the three SDGs

a) SDG13 : Climate Action : The project would lead to reduction of approx. 171,828 tCO_2 per annum.

b) SDG 7 : Affordable and Clean Energy : The project is expected to generate 306,566 MWh of clean energy per annum

c) SDG 8 : Decent Work and Economic Growth : The project provides between 20 and 25 employment to people.

No	SDGs	Target ("T") and Indicators ("I")
1	Goal 7. Affordable and Clean Energy	T: 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix I: 7.2.1 "Renewable energy share in the total final energy consumption
2	Goal 8. **Decent Work and Economic Growth**	T: 8.5 By 2030 achieve full and productive employment and decent work for all women and men I: 8.5.2 Unemployment rate, by sex, age and persons with disabilities
3	Goal 13. Climate Action	T:13.3. Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning I:13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions

B.6.2.Explanation of methodological choices/approaches for estimating the SDG outcome

SDG 7 : Affordable and Clean Energy

The baseline for the project is no project, thus leading to generation in the relevant grid which is dominated by fossil fuel. The clean energy generated by the project is calculated based on the amount of electricity generated by the project per annum. The project is expected to generate 306,566 MWh of clean energy per annum.

The project contributes to the following indicators 7.2.1 "Renewable energy share in the total final energy consumption" and following target: 7.2 ''By 2030, increase substantially the share of renewable energy in the global energy mix."

The electricity generation is predominantly composed by fossil fuel fired power plants in Turkey. Natural gas will continue to dominate the market. Hydro will account for 22.1% of the mix whereas all non-hydro renewable combined (geothermal /biogas/waste/wind/solar) will only account for 6.4% of all electricity generation. But this project increases the renewable energy sharing of global energy mix and contribute to improved air quality by reducing air pollution.

SDG 8 : Decent Work and Economic Growth

The project leads to employment opportunities which would not have been possible in the baseline scenario. The project provides employment to between 20 and 25 people during the opration phase.

The project contributes to the following indicators 8.5.2 "Unemployment rate, by sex, age and persons with disabilities" and following target: "8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value"

The target will be monitored by the number of full-time employees (between 20 and 25 employee) full time employees with the SGK records during the verification process. Because of the social conditions of the project area, employment of woman and persons with disabilities is not possible.

Furthermore, number of people are trained on health and safety issues during per each monitoring period. This will help to achieve "the project labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment." Training records or certificates will be provided during each monitoring period.

SDG13 : Climate Action :

The project leads to mitigation of 171,828 tCO_2 per annum.

The project contributes to the following indicators 13.3.2 "Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions" and following target 13.3 "Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning"

The project's contribution is done through training and awareness raising of local people and setting good example by investing to the climate friendly technology.

As developing the baseline and calculation of the emission reductions for the proposed project activity are calculated according to "Tool to calculate the emission factor of an electricity system" version 06.0.0.

Emission Reductions
The emission reductions are calculated based on the below formula:

$$ER_y = BE_Y - PE_Y - LE_y$$

Where:

ER_y = Emission reductions in year y (tCO_2e/yr)
BE_y = Baseline emissions in year y (tCO_2/yr)
PE_y = Project emissions in year y (tCO_2e/yr)
LE_y = Leakage emissions in year *y* (t CO2/y)

Project Emissions
As the proposed project activity is a new grid-connected wind power plant. For this reason, PE_y is considered as "0" in line with ACM0002 Version 18.
$PE_y=0$

Leakage
Leakage emission (LEy) is considered as "0" as suggested in ACM0002 Version 18

Baseline Emissions
The baseline emissions are calculated as follows:

$$BE_y = EGBL,y * EF_{CO2,grid,y}$$

Where:

BE_y = Baseline emissions in year *y* (tCO_2/yr)
EG_{BLy} = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y* (MWh)

$EF_{CO2grid\ y}$ = CO2 emission factor of the grid in year *y* (t CO2/MWh)

Calculation of $EG_{PJ,y}$

The calculation of $EG_{PJ,y}$ is different for (a) greenfield plants; (b) retrofits and replacements and; (c) capacity additions. Since the proposed project activity falls under the description greenfield plants, the following method has been adopted:

Greenfield renewable energy power plants

$$EG_{PJ,y} = EG_{facility,y}$$

Where:
$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a

result of the implementation of the CDM project activity in year *y* (MWh/yr)

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

Calculation of $EF_{grid,CM}$

$EF_{grid,CM}$ is calculated according to the "Tool to calculate the emission factor for an electricity system" version 06.0.0.
This tool provides the following steps to calculate combined margin (CM) emission factor:

Step 1. Identify the relevant electric systems;
Step 2. Choose whether to include off-grid power plants in the project electricity system (optional);
Step 3. Select a method to determine the operating margin (OM);
Step 4. Calculate the operating margin emission factor according to the selected method;
Step 5. Calculate the build margin (BM) emission factor;
Step 6. Calculate the combined margin (CM) emissions factor

Step 1. Identify the relevant electric systems

According to the "Tool to calculate the emission factor for an electricity system" (version 06.0.0), 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.
Similarly, a connected electricity system, e.g. national or international, is defined as an electricity system that is connected by transmission lines to the project electricity system. Power plants within the connected electricity system can be dispatched without significant transmission constraints but transmission to the project electricity system has significant transmission constraint.
The transmission lines in Turkey are operated by TEİAŞ (Turkish Electricity Transmission Co), which is a state owned company. The grid is 56.744 km long and constitutes of 701 transformer stations with a total transformer capacity of 138,951 MVA and 10 interconnections to neighbour countries.[34]
The interconnected grid system is operated continuously and there are no electricity price differences throughout the regions. For this reason, the relevant electric power system is defined as the national grid system of Turkey.

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

According to the applicable tool, Project Participants may choose between the following two options to calculate the operating margin and build margin emission factor:

Option I : Only grid power plants are included in the calculation.
Option II: Both grid power plants and off-grid power plants are included in the calculation.

[34] http://www.teias.gov.tr/FaaliyetRaporlari/faaliyet2015/teias%20ing_2015.pdf The emission factor from neighbouring countries is taken as 0 tCO2eq/MWh for determining the OM.

Option I has been chosen for the project activity and therefore only grid power plants are considered
in the calculation.

Step 3. Selection of an operating margin (OM) method

According to "Tool to calculate the emission factor for an electricity system" (version 06.0.0), the calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods:

(a) Simple OM; or
(b) Simple adjusted OM; or
(c) Dispatch data analysis OM; or
(d) Average OM.
The data specific to the power plants connected to the grid, such as the dispatch order for each power plant in the system and the amount of power dispatched from all plants in the system during each hour, are not available. Therefore, Simple OM has been selected as the methodology.

Option (a) Simple OM method has been selected for calculation of the operating margin emission factor. This choice is applicable since low-cost/must-run resources constitute less than 50% of total grid generation in:

1)average of the five most recent years or
2)based on long-term averages for hydroelectricity production

The low-cost/must-run resources include hydro, geothermal, wind, low-cost biomass, nuclear and wind power generation.

The share of the installed capacity of renewable energy sources excluding hydro power is 2.9% of the total electricity generation and is therefore not taken into consideration. There is no indication that coal is used as a must-run and no nuclear energy plants are located in Turkey. This makes wind power as the only relevant low-cost must run source for electricity. The requirements for the use of the Simple OM calculations are satisfied.

Table 16. Below shows the share of hydro and renewable resources in generation for the five most recent years (2012-2016) and it is below %50 of the total grid generation.

YEAR							
	THERMAL (GWh)	THERMAL Ratio	HYDRO (GWh)	HYDRO Ratio	GEOTHERM + WIND + WİND (GWh)	GEOTHERM + WIND + WİND Ratio	TOTAL (GWh)
2012	174871.7	73.0%	57865	24.2%	6760.1	2.8%	239496.8
2013	171812.5	71.6%	59420,5	24.7%	8921	3.7%	240154
2014	200416.6	79.5%	40644,7	16.1%	10901.5	4.3%	251962.8

2015	179366.4	68.5%	67145.8	25.6%	15271	5.8%	261783.3
2016	185798.1	67.7%	67230.9	24.5%	21378.7	7.8%	274407.7

Table 16: Share of primary sources in electricity generation 2012-2016[35]

Generation Shares							
Years	Coal Total	Liquid Total	Natural Gas	Wastes	Hydro	Geothermal +Wind + Wind	Total (GWh)
2012	13.9%	0.7%	43.6%	0.3%	24.2%	2.8%	239496.8
2013	26.6%	0.7%	43.8%	0.5%	24.7%	3.7%	240154
2014	30.2%	0.9%	47.9%	0.6%	16.1%	4.3%	251962.8
2015	29.1%	0.9%	37.9%	0.7%	25.6%	5.8%	261783.3
2016	33.6%	0.7%	32.5%	0.9%	24.5%	7.8%	274407.7

Table 17: Breakdown of shares by sources of the electricity generation from the Turkish grid

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

- Ex ante option: If the ex ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. For grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM PDD to the DOE for validation.

- Ex post option: If the ex post option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

The ex ante option has been selected for the proposed project activity. Data from the period 2014-2016 has been obtained for calculating the three year average. This period is standing for the most recent data available at the time of submission of the PDD to 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_2e/MWh) of all generating power plants serving the system, not including low-cost / must-run power plants / units. The simple OM emission factor might be calculated as follows:

Option A: Based on the net electricity generation and a CO_2 emission factor of each power unit;

[35] http://www.teias.gov.tr/sites/default/files/2017-10/59%282000-2016%29.xls (Annual Development of Turkey's Gross Electricity Generation by Share of Primary Energy Sources 1970-2016)

Option B: Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

Since the fuel consumption and the average efficiency data for each power plant/unit are not available Option B is used for simple OM calculation.

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

$$EF_{grid,OMsimple,y} \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO_2,i,y}}{EG_y} \qquad \text{Equation (9)}$$

Where:

$EF_{grid,OMsimple}$ = Simple operating margin CO2 emission factor in year *y* (t CO_2/MWh)
$FC_{i,y}$ = Amount of 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 fuel type *i* in year *y* (GJ/mass or volume unit)
$EF_{CO2,i,y}$ = CO_2 emission factor of fuel type *i* in year *y* (t CO_2/GJ)
EG_y = Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year y (MWh)
i = All fuel types combusted in power sources in the project electricity system in year y
y = The three most recent years for which data is available at the time of submission of the PDD to the DOE for validation (ex-ante option)

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

The Build Margin have been calculated for the year 2016.

There are two main information sources for the Turkish electricity system: TEİAŞ(www.teias.com.tr) and Ministry of Energy and Natural Resources (www.etkb.gov.tr).

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

Option 2: For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex ante, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

Project Proponent chooses Option 1 in terms of vintage of data for the proposed project activity.

Data from the period 2014-2016 has been obtained for this calculating. This period is standing for the most recent data available at the time of submission of the PDD to DOE.

Step 6: Calculate the combined margin emissions factor

According to the applicable methodological tool, the calculation of the combined margin (CM) emission factor (EFgrid, CM) is based on one of the following methods:

(a) Weighted average CM; or
(b) Simplified CM.

The Project Participant chooses option (a), weighted average CM.

The combined margin emissions factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \cdot w_{OM} + EF_{grid,BM,y} \cdot w_{BM} \qquad \text{Equation (16)}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO2 emission factor in year y (t CO_2/MWh)
$EF_{grid,OM,y}$ = Operating margin CO2 emission factor in year y (t CO_2/MWh)
w_{OM} = Weighting of operating margin emissions factor (per cent)
w_{BM} = Weighting of build margin emissions factor (per cent)

According to the "Tool to calculate the emission factor for an electricity system" (version 06.0.0), the default weights for the operating margin and build margin emission factors for wind power generation is defined as:

w_{OM}=0.75
w_{BM}=0.25

for the second crediting period.

B.6.3 Data and parameters fixed ex ante for monitoring contribution to each of the three SDGs

a. SDG 7 : Affordable and Clean Energy : The project is expected to generate 306,566 MWh of clean energy per annum.The project contributes to the following indicators 7.2.1 "Renewable

energy share in the total final energy consumption" and following target: 7.2 ''By 2030, increase substantially the share of renewable energy in the global energy mix."

b. SDG 8 : Decent Work and Economic Growth : The project provides employment to between 20 and 25 people.

The project contributes to the following indicators 8.5.2 Unemployment rate, by sex, age and persons with disabilities and following target 8.5 'By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value'.

This will also help to achieve "the project labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment." Training records or certificates will be provided during each monitoring period.

c.SDG13 : Climate Action : The project would lead to reduction of approx. 171,828 tCO2 per annum. The project contributes to the following indicators 13.3.2 "Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions" and following target 13.3 "Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning"

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions" and following target
Data/parameter	EGgross
Unit	MWh
Description	Gross electricity production by fossil fuel power sources (2014-2016)
Source of data	TEIAS (Turkish Electricity Transmission Company) www.teias.gov.tr. The distribution of gross electricity generation by primary energy resources and the electricity utilities in Turkey (2014, 2015, 2016).
Value(s) applied	Please see calculations of emission factor (Section B.6.1.) See table 21
Choice of data or Measurement methods and procedures	TEIAS, the Turkish Electricity Transmission Company is the official source for the related data, thus providing the most up-to-date and accurate information available.
Purpose of data	Calculation of baseline emissions- to demonstrate contribution to SDG13- 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
Additional comment	-

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions" and following target
Data/parameter	FCi,y
Unit	tonnes (m3 for gaseous fuels)
Description	Amount of fossil fuel type i consumed in the project electricity system by generation sources in year y (2014-2016)
Source of data	TEIAS (Turkish Electricity Transmission Company) www.teias.gov.tr . Fuels consumed in thermal power plants in Turkey by the electricity utilities (2014-2016) See table 19
Value(s) applied	Please see calculations of emission factor (Section B.6.1)
Choice of data or Measurement methods and procedures	TEIAS, the Turkish Electricity Transmission Company is the official source for the related data, thus providing the most up-to-date and accurate information available.
Purpose of data	Calculation of baseline emissions to demonstrate contribution to SDG13- 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
Additional comment	

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions" and following target
Data/parameter	NCVi,y
Unit	TJ/kt (106 m3 for gaseous fuels)
Description	Net calorific value (energy content) of fossil fuel type i in year y
Source of data	Calculated based on TEIAS (Turkish Electricity Transmission Company) www.teias.gov.tr Heating values of fuels consumed in thermal plants in Turkey by the electricity utilities (2014-2016)
Value(s) applied	Please see calculations of emission factor (Section B.6.1) See table 20
Choice of data or Measurement methods and procedures	TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Purpose of data	Calculation of baseline emissions to demonstrate contribution to SDG13- 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

Additional comment	-

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions" and following target
Data/parameter	$EFCO_{2},i,y$
Unit	tCO2/TJ
Description	CO_2 emission factor of fossil fuel type i used in power unit m in year y
Source of data	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter 1 of Volume 2 (Energy) of the 2006 IPCC Guidelines for National Greenhouse Gas Inventory (There is no information on the fuel specific default emission factor in Turkey, hence, IPCC values has been used as referred in the "Tool to calculate the emission factor for an electricity system.)
Value(s) applied	http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.htm
Choice of data or Measurement methods and procedures	Please see calculations of emission factor (Section B.6.1) See table 20
Purpose of data	Calculation of baseline emissions to demonstrate contribution to SDG13- 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
Additional comment	

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions" and following target
Data/parameter	$\eta m,y$
Unit	%
Description	Average net energy conversion efficiency of power unit m in year y
Source of data	"Appendix 1, Default efficiency factors for power plants" of "Tool to calculate the emission factor for an electricity system" version 06.0.0.
Value(s) applied	See calculations of emission factor (Section B.6.4)
Choice of data or Measurement methods and procedures	The average values of thermal plants in Turkey are taken from "Tool to calculate the emission factor for an electricity system" 06.0.0.

Purpose of data	Calculation of baseline emissions to demonstrate contribution to SDG13- 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
Additional comment	-

B.6.4. Ex ante estimation of outcomes linked to each of the three SDGs

Calculation of the operating margin emission factor

For the calculation of the OM the consumption amount and heating values of the fuels for each sources used for the years 2014, 2015 and 2016, is taken from the TEIAŞ annual statistics, which holds data on annual fuel consumption by fuel types as well as electricity generation amounts by sources and electricity imports. All the data needed for the calculation, including the emission factors and net calorific values (NCVs). Total CO2 emission due to electricity generation in Turkey for the years of 2013, 2014 and 2015 are given in:

tCO2 (tonnes)	2014	2015	2016
Hard Coal+Imported Coal+Asphaltite	31,054,429	35,832,091	42,322,566
Lignite	37,264,883	32,508,012	39,388,444
Fuel Oil	2,353,074	1,725,608	1,686,704
Diesel Oil	378,432	757,776	983,254
Natural Gas	51,754,461	42,970,146	39,120,876
Total CO2-Emissions	**122,805,280**	**113,793,634**	123,501,844

Table 18: CO2 emission from electricity production (2014-2016)(tCO2)

The amount of fuel consumption (FCi,y) is taken from website of TEIAS for the calculation of the Simple OM.

The fuel consumption values for 2014-2016 may be seen in Table 19:

	Units	2014	2015	2016	Total
Natural Gas	1000m3	25,426,014	20,914,868	18,954,093	65,294,975
Lignite	tonnes	57,696,139	49,940,131	60,213,772	167,850,042
Coal	tonnes	14,501,934	16,629,492	19,642,410	50,773,836
Fuel Oil	tonnes	754,283	516,912	526,674	1,797,869
Diesel Oil	tonnes	119,988	238,388	306,393	664,769
Lpg	tonnes	0	0	0	0
Naphta	tonnes	0	0	0	0

Table 19: Fuel consumption of generation sources connected to the grid (2014-2016[136]

Annual heating values for each fuel type are directly related with the fuel consumption and are used to calculate Net Calorific Values (TJ/kt) for each year (Table.20). The annual heating values are converted to TJ and divided by the fossil fuel consumption(kt) for that year.

Turkish specific net calorific values (NCVi,y) values for fossil fuel types have been calculated, using data from the IPCC Guidelines for National Greenhouse Gas Inventory for the emission factor of the fossil fuel types (EFCO2,i,y).

	NCVi(TJ/kt)			EFCO2,i (tonnes/TJ)[37]
	2014	2015	2016	
Natural Gas	37.49	37.837	38.011	54,3
Lignite	7.11	7.161	7.196	90,9
Hard Coal + Imported Coal	23.93	24.075	24.074	89.5
Fuel Oil	41.32	44.216	42.418	75.5
Diesel Oil	43.44	43.784	44.203	72.6
Lpg	0	0.000	0.000	61.6
Naphta	0	0.000	0.000	69.3

Table 20: NCV and emission factor of fossil fuel type[38]

The electricity delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units (EGgross,y) is obtained from TEIAS (Turkish Electricity Transmission Company).

Table 21 shows the gross electricity production for 2014-2016 produced by fossil fuel power sources:

	EGgross,y (MWh)			
	2014	2015	2016	Total
Natural Gas	120,576,031	99,218,742	89,227,100	309,021,873
Lignite	36,615,369	31,335,735	38,569,900	106,521,004
Hard Coal + Import Coal	39,647,313	44,829,872	53,703,200	138,180,385
Fuel Oil	1,662,854	980,378	969,100	3,612,332
Diesel Oil	482,435	1,243,561	957,200	2,683,196
Lpg	0	0	0	0
Naphta	0	0	0	0

[36]Annual Development of Fuels Consumed in Thermal Power Plants in Turkey by the Electric Utilities

http://www.teias.gov.tr/sites/default/files/2017-10/73_1.xls

[37] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf

[38] http://www.teias.gov.tr/sites/default/files/2017-10/75.xls

Table 21: Gross electricity generation by fossil fuel power sources 2014-2016[39]

To calculate the net electricity fed into the grid by specific fuel sources, relation between overall gross/net electricity generation data is calculated. The electricity consumption of the power plants is included in the gross electricity production. This relation is derived in in Table 22:

	2014	2015	2016
Gross generation (MWh)	251,962,800	261,783,300	274,407,700
Net generation (MWh)	239,448,800	249,899,500	261,950,900
Relation	95,03%	95,5%	95.5%

Table 22: Relation between net and gross electricity generation 2014-2016[40]

The net electricity delivered to the grid by the fossil fuel plants (EGnet,y) is calculated in Table 23:

	2014	2015	2016	Total
Gross electricity generation (GWh)	198,984	177,608	183,426.50	376,592
Net electricity generation EGnet,y (GWh)	189,101	169,546	175,099.800	358,647
Electricity imports (GWh)	7,953.3	7,135.5	6,330	15,089
Electricity supplied to grid EGy (GWh)	197,055	176,681	175,099.80	373,736

Table 23: Net electricity generation fossil fuel power plants and electricity imports 2014- 2016[41]

The calculation of EFgrid,OM,y requires the inclusion of electricity imports with an emission factor of 0 tCO2/MWh. Therefore, the imports in the electricity production has been added.

The last step is to calculate EFgrid,OMsimple,y:

	2014	2015	2016
CO2-Emmissions (tCO_2)	122,805,280	113,793,634	123,501,844
Net Electricity Supplied to Grid by relevant sources (GWh)	197,055	176,681	181,430
EFgrid,OMsimple,y (tCO_2/MWh)	0,6232	0,6441	0,6807

[39] http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2015/uretim%20tuketim(34-64)/48(2006-2015).xls and http://www.teias.gov.tr/sites/default/files/2017-10/37.docx

[40] http://www.teias.gov.tr/sites/default/files/2017-10/46.xls

[41] http://www.teias.gov.tr/sites/default/files/2017-10/46.xls

3-year Generation Weighted Average EFgrid,OMsimple,y (tCO_2/MWh)	0,6486

Table 24: Operating Margin

Based on the above values, the simple operating margin CO_2 grid emission factor (EFgrid,OMsimple,y) calculated through equation is **0.6486 tCO_2/MWh.**

Calculation of the build margin emission factor

The Build Margin have been calculated for the year 2016.

There are two main information sources for the Turkish electricity system: TEİAŞ (www.teias.com.tr) and Ministry of Energy and Natural Resources (www.etkb.gov.tr).

Step 5.1 Select the option regarding the vintage:

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

Option 2: For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex ante, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

Project Proponent chooses Option 1 in terms of vintage of data for the proposed project activity:

Step 5.2 The Identification of Power Units to Be Used in Calculation of BM

The sample group of power units m used to calculate the build margin should be determined as per the following procedure, consistent with the data vintage selected above:

The recent added power units (SET5 Units) list can be obtained from the Ministry of Energy and Natural Resources web site[42]

[42]http://www.etkb.gov.tr/tr-TR/AramaSonuclari?k=2015+enerji+yat%u0131r%u0131mlar%u0131&page=2

Company Name	Plant Name	Place	Fuel Type	Power Capacity MWe	Temporary Acceptance Date
BEŞTEPELER ENERJİ ÜRETİM SAN. VE TİC. A.Ş.	KUBİLAY JES	Aydın	Jeotermal	23	31/12/16
OLGU ENERJİ YATIRIM ÜRETİM VE TİC. A.Ş.	DİNAR RES	Afyonkarahisar	RES	7,4	30/12/16
TAN ELEKTRİK ÜRETİM A.Ş.	ALİAĞA RES	İzmir	RES	9,6	30/12/16
BEREKET ENERJİ ÜRETİM A.Ş.	GÖKTAŞ HES (GÖKTAŞ-1 HES)	Adana	HES	122,2	29/12/16
BEREKET ENERJİ ÜRETİM A.Ş.	ÇİĞDEM REG. VE HES (ÇİĞDEM 3 HES)	Sinop	HES	4.8	29/12/16

Table 25: The 5 most recent power plants (accordingly year 2016)(excluding VERs)

Important Note: (The Rationale for Usage of Power Capacities instead of Annual Electricity Production Data)

There is no data available for annual electricity production of each power plant belonging to years 2014, 2015 and 2016. The data available for the annual energy production for specific power station belongs to year 2012. To update the BM to the year 2015, the only data that we can use to estimate the annual production is the power capacity. We can make calculations as if every power plant had operated with full capacity all around the year.

The usage of capacity is a CDM Executive Board approved deviation from the methodology AM005 for a similar situation[43]. According to the board-approved deviation, as the annual production data is absent, we will "use of weights estimated using installed capacity in place of annual electricity generation" (cited from the link given in footnote43).

The CDM registered projects are excluded from the five power plants given in Table 6. The sum of power capacities of these plants is 167 MW. AEGSET 5 Units: 167 MW * year.

(b) Determine the annual electricity generation of the project electricity system, excluding power units registered as VER project activities

Total capacity at the end of the year 2016 is 78497.4 [44] (which is AEGTotal). The 20 percent of total capacity is 15699.5MW so AEGSET≥20 per cent > AEGSET 5 Units.

(c) Selection of The SETsample

[43]http://cdm.unfccc.int/UserManagement/FileStorage/AM_CLAR_QEJWJEF3CFBP1OZAK6V5YXPQKK7WYJ

[44]

AEGSET≥20 per cent > AEGSET 5 Units so the set AEGSET≥20 per cent is selected. None of them has started to produce electricity more than 10 years ago, so the steps (d), (e) and (f) are ignored.
SETsample (AEGSET≥20 per cent)

The 20 percent of total power is 15700 MW.

Period	Capacity Addition (MW)	CDM Registered (MW)	Addition (Excluding CMD Projects) (MW)	Thermal (MW)
02/10/2013 – 31/12/2013	2602.64	254.42	2348.22	1735.57
2014	6305.2	570,435	5734.7	3882.31
2015	4287.571	1252,299	3035,27	930.836
2016	5919.10	1329.77	4589.33	2121.44
Total	19114.514	2077.2	15707.52	8670.15

Table 26: SET-Sample Periods

The sum of 2016, 2015 and 2014 projects (excluding VER registered) is 13359.3 MW. We need to include more projects from 2013 to exceed 15,700 MW (we need 2340.7 MW more). As we include the projects between dates 21.06.2013 and 31.12.2013, we sum up to 15875,2 MW. Here we get the SETSample.

SETSample List

You can find the list of SETSample below in Table 27, yellow rows indicate that the project is VER registered and they are excluded from the SET.

Table 27: SET-Sample List

SANTRAL ADI	YAKIT CİNSİ	İLAVE KURULU GÜÇ MWe	GEÇİCİ KABUL TARİHİ
SARPINCIK RES	RES	6.90	31/12/16
KUBİLAY JES	JEOTERMAL	23.00	31/12/16
DİNAR RES	RES	7.432	30/12/16
ALİAĞA RES	RES	9.60	30/12/16
ÇATALCA RES	RES	16.50	29/12/16
GÖKTAŞ HES (GÖKTAŞ-1 HES)	HES	122.20	29/12/16

ÇİĞDEM REG. VE HES (ÇİĞDEM 3 HES)	HES	4.80	29/12/16
OVARES RES	RES	0.00	28/12/16
SAMATLAR REGÜLATÖRÜ VE HES	HES	5.783	27/12/16
YAHYALI RES	RES	23.10	24/12/16
KIRKAĞAÇ RES	RES	17.100	23/12/16
FATMA RES	RES	11.200	23/12/16
MELİKOM REGÜLATÖRÜ VE HES	HES	6.750	23/12/16
MEHMETHAN JES	JEOTERMAL	22.80	22/12/16
TOPÇAM HES	HES	20.450	21/12/16
KEBAN DERESİ HES	HES	0.325	18/12/16
KELTEPE RES	RES	9.20	18/12/16
AKNİŞASTA TERMİK KOJENERASYON SANTRALİ	DG	2.30	17/12/16
KURTEKS ÜRETİM TESİSİ	DG	2.00	16/12/16
SOMA RES	RES	9.00	16/12/16
OMMER OTEL TRİJENERASYON TESİSİ	DG	1.286	16/12/16
ÇATALCA RES	RES	16.50	16/12/16
YALOVA RES	RES	10.50	15/12/16
SAYALAR RES	RES	3.00	15/12/16
ERAK GİYİM KOJENERASYON SANTRALİ	DG	-0.165	15/12/16
SARPINCIK RES	RES	11.50	09/12/16
BANDIRMA-3 RES	RES	7.20	09/12/16
KOCAELİ ÇÖP BİYOGAZ SANTRALİ	BİYOKÜTLE (ÇÖP GAZI)	1.415	09/12/16

SEYİTALİ RES	RES	4.00	08/12/16
URLA RES	RES	7.50	08/12/16
FATMA RES	RES	16.80	08/12/16
BALIKLI I-II-III HES	HES	3.237	07/12/16
YAHYALI RES	RES	23.10	07/12/16
KARACABEY RES	RES	10.00	07/12/16
KARADAĞ RES	RES	13.542	07/12/16
SENKRON EFELER BİYOGAZ SANTRALİ	BİYOKÜTLE	1.20	07/12/16
ZELİHA RES	RES	9.00	07/12/16
SUSURLUK RES	RES	0.000	06/12/16
DİNAR RES	RES	31.586	06/12/16
İNCESU RES	RES	14.00	06/12/16
SEFERİHİSAR RES	RES	9.00	06/12/16
KINIK RES	RES	48.00	05/12/16
MAZI I RES	RES	17.00	05/12/16
MEŞELİ HES	HES	3.10	08/11/16
EDİNCİK RES	RES	21.00	06/11/16
FUATRES RES	RES	10.20	05/11/16
SOMA RES	RES	21.00	05/11/16
KOZBÜKÜ HES	HES	60.810	05/11/16
ELMALI RES	RES	18.00	05/11/16
KONAKPINAR RES	RES	5.70	04/11/16

YAHYALI RES	RES	19.80	04/11/16
ERİK REGÜLATÖRÜ VE HES	HES	9.012	04/11/16
URLA RES	RES	5.00	04/11/16
KUBİLAY JES	JEOTERMAL	1.00	31/10/16
MEHMETHAN JES	JEOTERMAL	2.00	31/10/16
AHMETLİ HES	HES	11.640	31/10/16
ATLAS İNŞAAT OSMANİYE ÇÖP GAZI ELEKTRİK ÜRETİM TESİSİ	BİYOKÜTLE (ÇÖP GAZI)	3.120	31/10/16
KEN 3 JES	JEOTERMAL	9.8	31/10/16
SULTANHİSAR JES	JEOTERMAL	1.10	31/10/16
YUMRUTEPE REGÜLATÖRÜ VE HES	HES	9.958	31/10/16
DEREİÇİ HES	HES	6.770	30/10/16
SARPINCIK RES	RES	4.60	30/10/16
HALK ENERJİ ERZURUM GES	GES	4.90	30/10/16
MELİKOM REGÜLATÖRÜ VE HES	HES	0.85	29/10/16
UMURLU-2 JES	JEOTERMAL	12.00	28/10/16
KARGI REGÜLATÖRÜ VE HES	HES	0.97	28/10/16
KIRKAĞAÇ RES	RES	5.70	28/10/16
KASIMLAR BARAJI VE HES	HES	25.00	28/10/16
MUTLULAR BES	BİYOKÜTLE (ORMAN ATIĞI)	30.00	28/10/16
MALATYA-1 ÇÖP GAZ ELEKTRİK ÜRETİM TESİSİ	BİYOKÜTLE (ÇÖP GAZI)	1.20	28/10/16
HATAY GÖKÇEGÖZ ÇÖP SANTRALİ	BİYOKÜTLE (ÇÖP GAZI)	4.239	28/10/16

MEŞELİ HES	HES	3.10	25/10/16
KILCAN HES	HES	2.39	22/10/16
MAS 1 YENİLENEBİLİR ENERJİ ÜRETİM TESİSİ	BİYOKÜTLE (ÇÖP GAZI)	0.835	22/10/16
ZEUS BİYOKÜTLE ENERJİSİNE DAYALI ELK. ÜRT. TESİSİ	BİYOKÜTLE	12.00	22/10/16
SEFERİHİSAR RES	RES	3.00	22/10/16
MARAŞ BİYOKÜTLE TESİSİ	BİYOKÜTLE (ÇÖP GAZI)	1.20	21/10/16
FATMA RES	RES	5.60	21/10/16
GÜVERCİN REG. VE HES	HES	16.372	21/10/16
AFYONKARAHİSAR SANDIKLI BİYOKÜTLE ÜRETİM TESİSİ	BİYOKÜTLE	1.40	21/10/16
ERİK REGÜLATÖRÜ VE HES	HES	6.010	21/10/16
KARACABEY RES	RES	15.00	21/10/16
URLA RES	RES	2.50	20/10/16
NAZAR ÜRETİM TESİSİ	DG	4.50	15/10/16
BURSA ÇİMENTO KOJENERASYON TESİSİ	ATIK ISI	9.00	14/10/16
TİRE BİYOGAZ TESİSİ	BİYOKÜTLE	4.268	14/10/16
SOLENTEGRE GES	GES	8.00	14/10/16
OKKAYASI REG. VE ŞEHİTLİK HES	HES	22.708	13/10/16
İZMİT RAFİNERİ TERMİK-KOJENERASYON	DG/FO	35.00	08/10/16
NAMNAM HES	HES	3.720	07/10/16
BANDIRMA-3 RES	RES	9.60	07/10/16
KARABEL RES	RES	3.00	06/10/16
KUZEY I-II REG. VE HES	HES	5.55	06/10/16

TÜFEKÇİKONAĞI HES	HES	5.18	04/10/16
AKYURT RES	RES	4.40	02/10/16
AREL YENİLENEBİLİR ENERJİ ISPARTA BİYOKÜTLE TESİSİ	BİYOKÜTLE (ÇÖP GAZI)	2.826	01/10/16
BOZYAKA RES	RES	2.40	01/10/16
KARAÇAYIR RES	RES	1.60	01/10/16
ALAŞEHİR JES 2	JEOTERMAL	24.000	01/10/16
GREENECO JES	JEOTERMAL	12.800	30/09/16
OVARES RES	RES	3.00	29/09/16
KONAKPINAR RES	RES	6.30	29/09/16
YAHYALI RES	RES	13.20	24/09/16
KANDİL REG. VE HES	HES	6.192	23/09/16
ELMALI RES	RES	9.00	23/09/16
SİVAS ÇÖP GAZ ELEKTRİK ÜRETİM TESİSİ	BİYOKÜTLE (ÇÖP GAZI)	1.41	22/09/16
BALKODU II HES	HES	6.492	10/09/16
DEMİRCİLİ RES	RES	10.00	09/09/16
AKYURT RES	RES	8.40	09/09/16
ÜNDOĞDU RES	RES	6.750	08/09/16
OVARES RES	RES	8.00	08/09/16
ITC-KA ÇARŞAMBA ÜRETİM TESİSİ	BİYOKÜTLE (ÇÖP GAZI)	1.415	08/0G9/16
ATİLLA REGÜLATÖRÜ VE HES	HES	10.43	08/09/16
KARAÇAYIR RES	RES	8.40	08/09/16
BALIKLI I-II-III HES	HES	6.55	02/09/16

KOZBÜKÜ HES	HES	20.27	02/09/16
ALİAĞA RES	RES	6.00	02/09/16
ÇARIKLI HES	HES	8.96	02/09/16
DEMİRCİLİ RES	RES	10.00	26/08/16
DEMİRCİLER RES	RES	14.75	26/08/16
OVARES RES	RES	4.00	26/08/16
SARITEPE RES	RES	5.000	25/08/16
TERMİK-KOJENERASYON SANTRALİ	DG	2.022	19/08/16
ALİAĞA RES	RES	18.00	12/08/16
YALOVA RES	RES	12.00	12/08/16
ZONGULDAK EREN ENERJİ ELEKTRİK ÜR. A.Ş. ÜRETİM TESİSİ (ZETES III)	YERLİ/İTHAL TAŞKÖMÜRÜ VEYA LİNYİT	700.00	11/08/16
GEYCEK RES	RES	18.00	05/08/16
BOREAS I ENEZ RES	RES	2.50	31/07/16
KARADAĞ RES	RES	2.70833	30/07/16
BEREKETLİ RES	RES	30.00	29/07/16
DEMİR REGÜLATÖRÜ VE HES	HES	0.705	29/07/16
DEMİRCİLİ RES	RES	10.00	29/07/16
AFYON-I BİYOGAZ SANTRALİ	BİYOKÜTLE (HAYVANSAL ATIK)	1.20	29/07/16
ZİNCİRLİ RES	RES	2.40	24/07/16
DEMİRCİLER RES	RES	8.55	22/07/16
ULUBORLU RES	RES	19.992	22/07/16

SARITEPE RES	RES	10.00	22/07/16
EBRU REG. VE HES	HES	15.310	22/07/16
İNTEPE RES	RES	2.30	21/07/16
İÇ ANADOLU DGKÇS	DG	280.000	21/07/16
AMASYA RES	RES	15.000	15/07/16
GEP KARAMAN OSB KOJENERASYON SANTRALİ	DG	4.200	15/07/16
ZELİHA RES	RES	6.00	04/07/16
ALİAĞA RES	RES	6.00	01/07/16
DEMİRCİLİ RES	RES	10.00	01/07/16
DORA-4 JES	JEOTERMAL	17.00	30/06/16
GEBZE KOJENERASYON TESİSİ	DG	11.85	30/06/16
ZONGULDAK EREN ENERJİ ELEKTRİK ÜR. A.Ş. ÜRETİM TESİSİ (ZETES III)	YERLİ/İTHAL TAŞKÖMÜRÜ VEYA LİNYİT	700.00	30/06/16
YANIKKÖPRÜ HES	HES	9.20	30/06/16
İÇ ANADOLU DGKÇS	DG	280.00	29/06/16
ÇERÇİKAYA RES	RES	4.00	24/06/16
ABALIOĞLU KOJENERASYON TESİSİ	DG	6.066	24/06/16
ZİNCİRLİ RES	RES	9.60	24/06/16
SEFERİHİSAR RES	RES	2.00	24/06/16
ÇAYALTI REGÜLATÖRÜ VE HES (2. SANTRAL)	HES	2.16	24/06/16
POYRAZ RES	RES	21.00	24/06/16
MORDOĞAN RES	RES	13.80	24/06/16

İÇ ANADOLU DGKÇS	DG	280.00	23/06/16
DEMİR REGÜLATÖRÜ VE HES	HES	1.895	18/06/16
AMASYA RES	RES	12.00	17/06/16
BOZYAKA RES	RES	0.50	17/06/16
POYRAZ RES	RES	12.00	17/06/16
ODAYERİ BİYOGAZ	BİYOKÜTLE (ÇÖP GAZI)	5.660	17/06/16
SARITEPE RES	RES	35.00	17/06/16
TAHA DGKÇS	DG	68.00	10/06/16
ULUBORLU RES	RES	16.67	10/06/16
ÇATALTEPE RES	RES	2.50	10/06/16
TERMİK (KOJENERASYON) SANTRALİ	İTHAL KÖMÜR	9.70	09/06/16
BOZYAKA RES	RES	4.80	09/06/16
GARZAN BARAJI VE HES	HES	1.34	03/06/16
ALAÇATI RES	RES	16.00	03/06/16
SEFERİHİSAR RES	RES	12.00	03/06/16
YALOVA RES	RES	13.50	03/06/16
AMASYA RES	RES	15.00	30/05/16
POYRAZ RES	RES	9.00	27/05/16
İNTEPE RES	RES	13.80	27/05/16
TEKAS ELEKTRİK ÜRETİM SANTRALİ	DG	0.80	27/05/16
URLA RES	RES	13.00	27/05/16
GERES RES	RES	2.500	27/05/16

PAMUKÖREN JES 3	JEOTERMAL	22.51	20/05/16
ENERJEO KEMALİYE SANTRALİ	JEOTERMAL	24.90	20/05/16
ÇATALTEPE RES	RES	7.50	20/05/16
TAHA DGKÇS	DG	68.00	20/05/16
AKPINAR HES	HES	9.010	19/05/16
MARTEKS ÜRETİM TESİSİ	DG	4.300	14/05/16
KURTKAYASI RES	RES	9.000	13/05/16
KANİJE RES	RES	0.000	13/05/16
İNEGÖL-CERRAH HES	HES	1.181	13/05/16
İKİLER HES	HES	6.120	13/05/16
DOĞANŞAR REG. VE HES	HES	6.770	13/05/16
BANDIRMA II DGKÇS	DG	205.600	13/05/16
İNTEPE RES	RES	9.200	06/05/16
GERMİYAN RES	RES	10.800	06/05/16
ULUBORLU RES	RES	15.003	06/05/16
VANAZİT HES	HES	3.089	06/05/16
ŞENBÜK RES	RES	9.160	06/05/16
HAYMEANA I-II HES (HAYMEANA I HES)	HES	3.200	05/05/16
ÇAYALTI REGÜLATÖRÜ VE HES (2. SANTRAL)	HES	3.120	29/04/16
UMUTLU HES	HES	6.780	29/04/16
KANİJE RES	RES	12.800	22/04/16
PAŞALI REGÜLATÖRÜ VE HES	HES	3.500	22/04/16

TAV EGE ADNAN MENDERES HAVALİMANI OTOPRODÜKTÖR TESİSİ	DG	9.780	18/04/16
ÇAY REGÜLATÖRÜ VE HES	HES	4.143	15/04/16
KARACABEY-2 BİYOGAZ TESİSİ	BİYOKÜTLE	1.067	15/04/16
KURTKAYASI RES	RES	14.400	15/04/16
KOJENERASYON TESİSİ	DG	4.300	14/04/16
ARISU REGÜLATÖRÜ VE HES	HES	0.863	14/04/16
BANDIRMA II DGKÇS	DG	401.600	14/04/16
UMUTLU HES	HES	13.560	08/04/16
ÇANDIR-1 REG. VE HES	HES	1.710	08/04/16
TOROS TARIM SAMSUN SANTRALİ	ATIK ISI	30.600	08/04/16
YAMANLI II HES (1. KADEME ÜNİTE 3)	HES	11.781	07/04/16
KANİJE RES	RES	19.200	01/04/16
ULUBORLU RES	RES	8.335	01/04/16
ARIKAN ÜRETİM TESİSİ	DG	9.000	01/04/16
GREENECO JES	JEOTERMAL	12.800	31/03/16
YAYLAKÖY RES	RES	15.000	25/03/16
BAYRA HES	HES	9.046	25/03/16
GÖKBÖĞET HES	HES	3.176	25/03/16
TUFANBEYLİ ÜRETİM TESİSİ	LİNYİT	150.000	25/03/16
AKSARAY OSB BİYOGAZ SANTRALİ	BİYOKÜTLE	3.201	18/03/16
ANI BİSKÜVİ KOJENERASYON SANTRALİ	DG	1.200	11/03/16
KURTKAYASI RES	RES	12.000	11/03/16

KANİJE RES	RES	12.800	04/03/16
SUSUZ REGÜLATÖRÜ VE HES	HES	7.100	03/03/16
ITC-KA BİYOKÜTLE GAZLAŞTIRMA TESİSİ	BİYOKÜTLE (ÇÖP GAZI)	5.425	03/03/16
YUNUS EMRE TERMİK SANTRALİ	LİNYİT	145.000	25/02/16
ÇİLEHANE HES	HES	5.664	19/02/16
AKBÜK II RES	RES	20.000	12/02/16
YAMANLI II HES (1. KADEME ÜNİTE 1 VE 2)	HES	47.628	11/02/16
TERMİK-KOJENERASYON SANTRALİ	DG	4.300	06/02/16
ARTVİN BARAJI VE HES	HES	166.090	03/02/16
KURTKAYASI RES	RES	9.600	29/01/16
BOLU-GÖYNÜK ENERJİ SANTRALİ	LİNYİT	135.000	29/01/16
YAHYALI RES	RES	16.800	29/01/16
KÖROĞLU BARAJI VE KOTANLI HES	HES	50.000	29/01/2016
İÇDAŞ BİGA RES	RES	8.800	22/01/16
BEYPİ A.Ş. BOLU YEM FABRİKASI KOJEN. SAN.	DG	4.300	22/01/16
ALAŞEHİR JES	JEOTERMAL	11.270	15/01/2016
TARABYA OTELİ KOJENERASYON	DG	1.200	01/01/2016
İÇDAŞ BİGA RES	RES	12.800	31/12/15
UMURLU JES	JEOTERMAL	9.720	30/12/15
ITC-KA ELAZIĞ ÜRETİM TESİSİ	BİYOKÜTLE (ÇÖP GAZI)	2.830	30/12/15
HANAK HES	HES	5.139	29/12/15
ALPERTEKS SANTRALİ	DG	4.290	25/12/15
KALEKÖY HES	HES	2.740	25/12/15
BANDIRMA RES	RES	15.000	25/12/15
FUATRES RES	RES	16.500	25/12/15

TUĞRA REG. VE HES	HES	2.120	25/12/15
YAHYALI RES	RES	18.900	25/12/15
SİLOPİ TERMİK SANTRALİ	YERLİ ASFALTİT	135.000	22/12/15
BAĞBAŞI REG. VE HES	HES	13.600	19/12/15
İSKENDERUN ÇÖP GAZ ELEKTRİK ÜRETİM TESİSİ	BİYOKÜTLE (ÇÖP GAZI)	2.830	18/12/15
ATAKÖY HES	HES	5.000	17/12/15
ŞANLIURFA BİYOKÜTLE ENERJİ SANTRALİ	BİYOKÜTLE (ÇÖP GAZI)	3.120	17/12/15
SÖKE RES	RES	45.000	14/12/15
TÜPRAŞ İZMİT RAFİNERİSİ TERMİK KOJENERASYON SANTRALİ	DG	41.280	11/12/15
ARTVİN BARAJI VE HES	HES	166.090	10/12/15
HASANLAR HES	HES	0.000	09/12/15
SARES RES	RES	2.750	04/12/15
TUFANBEYLİ ÜRETİM TESİSİ	LİNYİT	300.000	02/12/15
İÇDAŞ BİGA RES	RES	22.400	02/12/15
FLORANCE NIGHTINGALE HASTANESİ KOJENERASYON SANTRALİ	DG	0.800	02/12/15
İNCESU RES	RES	3.200	26/11/15
TEKİRDAĞ ENERJİ ÜRETİM SANTRALİ	DG	4.240	26/11/15
KANGAL RES	RES	14.000	26/11/15
YAHYALI RES	RES	7.200	20/11/15
ŞANLIURFA OSB ENERJİ SANTRALİ	DG	18.310	18/11/15
KOÇAK REG. VE HES	HES	1.344	17/11/15
KANDİL REG. VE HES	HES	6.192	16/11/15
OSB ÜRETİM SANTRALİ	DG	21.750	13/11/15
SÜLOĞLU RES	RES	24.000	13/11/15
KANİJE RES	RES	3.200	13/11/15
AKBÜK RES	RES	4.800	12/11/15
KIYIKÖY RES	RES	11.000	12/11/15
ASLAN ÇİMENTO ATIK ISIDAN ENERJİ ÜRETİM TESİSİ	ATIK ISI	7.500	06/11/15
DÜZOVA RES	RES	1.500	06/11/15
TEPEKIŞLA BARAJI VE HES	HES	32.993	05/11/15
ÇİLEHANE HES	HES	1.536	02/11/15
ŞANLIURFA BİYOKÜTLE ENERJİ SANTRALİ	BİYOKÜTLE (ÇÖP GAZI)	3.120	31/10/15
UMURLU JES	JEOTERMAL	2.280	31/10/15
KANGAL RES	RES	20.000	30/10/15
PAMUKÖREN JES 2	JEOTERMAL	22.510	29/10/15
HIZIR REGÜLATÖRÜ VE HES	HES	1.955	29/10/15
KANDİL REG. VE HES	HES	2.616	29/10/15
BAĞARASI RES	RES	24.400	29/10/15
HAYMEANA I-II HES (HAYMEANA I HES)	HES	3.200	29/10/15

KARAMAN BİYOGAZ TESİSİ	BİYOKÜTLE	1.414	29/10/15
ÇAY REGÜLATÖRÜ VE HES	HES	4.143	28/10/15
OVACIK BİYOGAZ ENERJİ SANTRALİ	BİYOKÜTLE	4.800	28/10/15
FUATRES RES	RES	3.300	28/10/15
KANİJE RES	RES	3.200	28/10/15
PAKMİL BİYOKÜTLE SANTRALİ	BİYOKÜTLE	1.763	27/10/15
AKBÜK RES	RES	2.400	27/10/15
KARAKAYA REG. VE HES	HES	9.010	26/10/15
KARADUVAR ATIKSU ARITMA TESİSİ BİYOGAZ SANTRALİ	BİYOKÜTLE	1.900	26/10/15
TRABZON RİZE ÇÖP GAZI SANTRALİ	BİYOKÜTLE (ÇÖP GAZI)	2.826	25/10/15
PAŞALI REGÜLATÖRÜ VE HES	HES	3.500	25/10/15
BABADERE JES	JEOTERMAL	8.000	24/10/15
DİLOVASI ÇÖP BİYOGAZ SANTRALİ	BİYOKÜTLE (ÇÖP GAZI)	1.063	24/10/15
SERHAT REGÜLATÖRÜ VE HES	HES	8.840	24/10/15
SİVAS BİYOKÜTLEDEN (ÇÖP GAZI) ELEKTRİK ENERJİSİ ÜRETİM TESİSİ	BİYOKÜTLE (ÇÖP GAZI)	1.410	24/10/15
SEBİL REG. VE HES	HES	22.636	24/10/15
POYRAZGÖLÜ RES	RES	14.000	24/10/15
HİLAL-2 RES	RES	7.000	23/10/15
KIYIKÖY RES	RES	12.000	23/10/15
YAHYALI RES	RES	9.600	23/10/15
ATAKÖY HES	HES	2.500	22/10/15
ADA 2 RES	RES	3.200	21/10/15
GÜNAYŞE REG. VE HES	HES	0.800	19/10/15
ANGUTLU HES	HES	14.400	19/10/15
DEMİRCİ REG. VE HES	HES	12.600	17/10/15
AKBÜK RES	RES	2.400	16/10/15
İÇDAŞ BİGA RES	RES	16.000	16/10/15
EGE RES	RES	7.000	16/10/15
ARPACIK REGÜLATÖRÜ VE HES	HES	3.770	15/10/15
ÇİLEKLİTEPE HES	HES	23.625	15/10/15
SÜLOĞLU RES	RES	18.000	11/10/15
TERMİK-KOJENERASYON SANTRALİ	DG	4.000	10/10/15
ADARES RES	RES	10.000	10/10/15
GERES RES	RES	0.000	03/10/15
KÖPRÜBAŞI HES	HES	7.949	02/10/15
GÖKTAŞ HES (GÖKTAŞ-2 HES)	HES	153.400	02/10/15
BAĞARASI RES	RES	21.600	29/09/15
POYRAZGÖLÜ RES	RES	16.000	18/09/15
KARACABEY-2 BİYOGAZ TESİSİ	BİYOKÜTLE	1.067	18/09/15
SÜLOĞLU RES	RES	18.000	18/09/15
HANAK HES	HES	3.690	17/09/15
KEN KİPAŞ JES	JEOTERMAL	24.000	17/09/15

KIYIKÖY RES	RES	9.000	17/09/15
İZNİK DEREKÖY HES	HES	0.715	15/09/15
DİLEK RES	RES	9.600	15/09/15
KUYUCAK RES	RES	15.100	12/09/15
ALAŞEHİR JES	JEOTERMAL	33.730	12/09/15
ORİON ÜRETİM SANTRALİ	DG	1.200	11/09/15
TERMİK-KOJENERASYON SANTRALİ	DG	2.000	10/09/15
TERMİK-KOJENERASYON SANTRALİ	DG	1.200	09/09/15
TEPEKIŞLA BARAJI VE HES	HES	32.993	04/09/15
EĞERCİ REGÜLATÖRÜ VE HES	HES	1.3436	03/09/15
AYVALI (ÇORUH) BARAJI VE HES	HES	121.654	03/09/15
TERMİK-KOJENERASYON SANTRALİ	DG	4.044	02/09/15
KOCADAĞ 2 RES	RES	2.500	02/09/15
DİLEK RES	RES	7.200	27/08/15
SEKİYAKA II HES	HES	1.090	27/08/15
EFELER JES	JEOTERMAL	47.400	26/08/15
SUÇATI-I HES	HES	8.316	20/08/15
TEPEKIŞLA BARAJI VE HES	HES	3.641	13/08/15
KIYIKÖY RES	RES	12.000	13/08/15
PAMUKÖREN JES	JEOTERMAL	16.006	07/08/15
AKÇAKOYUN HES	HES	6.790	06/08/15
ZİYARET RES	RES	1.000	04/08/15
MUT RES	RES	0.500	31/07/15
AKINCI (KAYABEYİ) HES	HES	10.175	30/07/15
GÖKSU HES	HES	17.177	25/07/15
DİLEK RES	RES	7.200	24/07/15
PAMUKÖREN JES	JEOTERMAL	6.504	21/07/15
BOLU-GÖYNÜK ENERJİ SANTRALİ	LİNYİT	135.000	15/07/15
DOĞU HES	HES	5.985	08/07/15
KARAKUZ BARAJI VE HES	HES	76.000	08/07/15
MANAHOZ HES	HES	1.120	05/07/15
TELLİ 1-2 HES	HES	0.000	03/07/15
EFELER JES	JEOTERMAL	22.500	03/07/15
AVANOS REGÜLATÖRÜ VE CEMEL HES	HES	6.000	03/07/15
ALÇE HES	HES	5.140	02/07/15
SOMA RES	RES	8.000	26/06/15
SÖĞÜTLÜ HES	HES	9.160	26/06/15
MANAHOZ HES	HES	5.960	25/06/15
ÖDEMİŞ RES	RES	8.000	25/06/15
ÇEŞME RES	RES	7.000	20/06/15
MUT RES	RES	13.200	19/06/15
TOSUNLAR-1 JES	JEOTERMAL	3.807	12/06/15
ÇAYKARA HES	HES	10.560	11/06/15
BOLU ÇİMENTO ATIK ISIDAN ENERJİ ÜRETME TESİSİ	ATIK ISI	6.000	05/06/15

MUT RES	RES	16.500	05/06/15
HAVVA HES	HES	4.780	04/06/15
ÖDEMİŞ RES	RES	12.000	29/05/15
EKOTEN TEKSTİL SAN. VE TİC. A.Ş. KOJEN. SANTRALİ	DG	0.008	29/05/15
SEBENOBA RES	RES	9.000	28/05/15
BEYHAN I BARAJI VE HES	HES	31.600	26/05/15
ANGUTLU 2 HES	HES	8.898	25/05/15
EDİNCİK RES	RES	26.400	23/05/15
KORU RES	RES	10.400	22/05/15
MUT RES	RES	19.800	22/05/15
POLATLI BES	BİYOKÜTLE	0.637	22/05/15
ÇEŞME RES	RES	9.000	22/05/15
GÜNEYYAKA HES	HES	6.630	21/05/15
SEMA REGÜLATÖRÜ VE HES	HES	17.000	21/05/15
KARGI (KIZILIRMAK) HES	HES	101.720	20/05/15
AKSARAY OSB BİYOGAZ SANTRALİ	BİYOKÜTLE	1.067	15/05/15
YALNIZARDIÇ HES	HES	0.530	08/05/15
KORU RES	RES	19.800	08/05/15
ORTAMANDIRA RES	RES	10.000	08/05/15
SİLOPİ TERMİK SANTRALİ	YERLİ ASFALTİT	135.000	08/05/15
ÇAĞLAYAN REGÜLATÖRÜ VE HES	HES	3.978	07/05/15
HARMANLIK RES	RES	10.400	06/05/15
KIZILÇAM REGÜLATÖRÜ VE HES	HES	1.320	05/05/15
AKINCI (KAYABEYİ) HES	HES	74.506	03/05/15
KİPAŞ KAĞIT SANAYİ İŞLETMELERİ A.Ş. TERMİK-KOJENERASYON SANTRALİ	KÖMÜR	7.600	01/05/15
YANBOLU HES	HES	6.21	30/04/15
DURKAR 1 TERMİK-KOJENERASYON SANTRALİ	DG	2.433	30/04/15
STS-1 HES	HES	11.243	30/04/15
YUNUSLAR HES	HES	7.960	28/04/15
HARMANLIK RES	RES	13.200	24/04/15
KORU RES	RES	19.800	22/04/15
BARAN REGÜLATÖRÜ VE HES (BARAN-I)	HES	8.865	17/04/15
BOREAS I ENEZ RES	RES	2.500	17/04/15
BEYHAN I BARAJI VE HES	HES	183.500	17/04/15
YANBOLU HES	HES	2.870	16/04/15
GARZAN BARAJI VE HES	HES	3.210	15/04/15
HARMANLIK RES	RES	26.400	11/04/15
İNCEBEL HES	HES	6.930	09/04/15
SOMA RES	RES	12.000	09/04/15
YALNIZARDIÇ HES	HES	15.930	08/04/15
SEYİTALİ RES	RES	2.000	07/04/15
BAĞIŞTAŞ I BARAJI VE HES	HES	89.540	03/04/15

ÇAKMAK REGÜLATÖRÜ VE HES	HES	8.630	03/04/15
ONUR REGÜLATÖRÜ VE HES	HES	19.568	02/04/15
BEYHAN I BARAJI VE HES	HES	183.500	29/03/15
ÇERÇİKAYA RES	RES	11.15795	20/03/15
SOMA RES	RES	18.000	20/03/15
SÜTLÜCE HES VE REGÜLATÖRÜ	HES	5.640	19/03/15
YALNIZARDIÇ HES	HES	15.930	19/03/15
ALAKÖPRÜ BARAJI VE HES	HES	28.890	18/03/15
PEMBELİK BARAJI VE HES	HES	63.670	13/03/15
KIYIKÖY RES	RES	3.000	13/03/15
MODERN ENERJİ TERMİK SANTRALİ	DG+ORMAN ÜRÜN.	27.600	12/03/15
BEYHAN I BARAJI VE HES	HES	183.500	12/03/15
SÖĞÜTLÜ HES	HES	9.160	12/03/15
ÇAKMAK REGÜLATÖRÜ VE HES	HES	18.750	10/03/15
EFELER JES	JEOTERMAL	22.500	06/03/15
BÜYÜKBAHÇE REGÜLATÖRÜ VE HES	HES	11.700	06/03/15
BANDIRMA RES	RES	0.600	27/02/15
TÜPRAŞ İZMİT RAFİNERİSİ TERMİK KOJENERASYON SANTRALI	DG	79.080	27/02/15
BAĞIŞTAŞ I BARAJI VE HES	HES	51.090	27/02/15
ÇERÇİKAYA RES	RES	13.94735	19/02/15
YAMANLI II HES	HES	11.222	19/02/15
PEMBELİK BARAJI VE HES	HES	63.670	18/02/15
SEBENOBA RES	RES	8.000	13/02/15
SİNCAN ÇADIRTEPE BİYOKÜTLE ENERJİ SANTRALİ	BİYOKÜTLE (ÇÖP GAZI)	5.664	13/02/15
MEREK REGÜLATÖRÜ VE HES	HES	9.180	12/02/15
DEMİRER KOJENERASYON TESİSİ	DG	2.476	11/02/15
PİTANE RES	RES	4.800	09/02/15
KADAHOR REGÜLATÖRÜ VE HES	HES	9.362	07/02/2015
SOMA RES	RES	6.000	07/02/2015
KOCADAĞ 2 RES	RES	7.500	06/02/2015
KÖPRÜYANI REGÜLATÖRÜ VE HES	HES	11.900	04/02/2015
YAMANLI II HES	HES	11.222	31/01/2015
ADIGÜZEL II HES	HES	30.09	24/01/2015
TEKİRDAĞ ENERJİ ÜRETİM SANTRALİ	DG	1.125	23/01/2015
MMK METALURJİ SAN. TİC. VE LİMAN İŞLETMECİLİĞİ A.Ş KOJENERASYON TESİSİ	DG	15.000	17/01/2015
HAYAT BİYOKÜTLE PROJESİ	BİYOKÜTLE	0.955	16/01/2015
ÇAYKARA HES	HES	15.360	16/01/2015
KARDEMİR KARABÜK DEMİR ÇELİK SAN. VE TİC. A.Ş. TERMİK-KOJENERASYON SANTRALI	KÖMÜR+DİĞER	15.000	10/01/2015
ÇERÇİKAYA RES	RES	27.8947	10/01/2015
BUCAKKIŞLA HES	HES	41.000	08/01/2015
PET CİPS RESİN VE KOJ. TESİSİ	DG	8.600	31/12/2014

M.KEMALPAŞA-SUUÇTU HES	HES	2.304	31/12/2014
TEKİRDAĞ ENERJİ ÜRETİM SANTRALİ	DG	13.075	31/12/2014
HAMZABEY HES	HES	8.820	31/12/2014
TERMİK KOJENERASYON SANTRALİ	LİNYİT	1.640	31/12/2014
TEKSMAK TERMİK KOJENERASYON SANTRALİ	DG	2.677	30/12/2014
YEŞİLKÖY REG. VE HES	HES	3.720	30/12/2014
GÜNAYDIN RES	RES	2.500	26/12/2014
YAZILI I-II-III HES	HES	6.620	25/12/2014
SOMA RES	RES	24.000	25/12/2014
SEBENOBA RES	RES	13.000	20/12/2014
GÜNAYDIN RES	RES	5.000	20/12/2014
ÇAĞLAYAN REGÜLATÖRÜ VE HES	HES	7.956	19/12/2014
ATLAS TERMİK SANTRALİ	İTHAL KÖMÜR	600.000	19/12/2014
BANDIRMA RES	RES	26.400	14/12/2014
ARAKLI 3 HES	HES	0.631	12/12/2014
ŞADILLI RES	RES	11.000	06/12/2014
CENGİZ 240MW DGKÇS	DG	208.670	05/12/2014
EREN HES	HES	35.186	04/12/2014
MURAT HES	HES	11.089	01/12/2014
BİLECİK DOĞALGAZ ÇEVRİM SANTRALİ	DG	13.050	28/11/2014
MENTAŞ HES	HES	9.600	28/11/2014
SOMA RES	RES	32.000	26/11/2014
KELTEPE RES	RES	0.000	21/11/2014
EKİNCİK HES	HES	7.520	20/11/2014
YAKINCA REGÜLATÖRÜ VE HES	HES	11.700	14/11/2014
YÜCE HES	HES	5.283	14/11/2014
PİRİNÇLİK HES	HES	21.315	14/11/2014
GÖNEN BİYOGAZ TESİSİ PROJESİ	BİYOKÜTLE	1.487	14/11/2014
ŞADILLI RES	RES	13.750	14/11/2014
ÜÇGEN HES	HES	3.388	07/11/2014
MERNİOS HALI KOJENERASYON SANTRALİ	DG	9.730	01/11/2014
BEYPAZARI BİYOGAZ TESİSİ BİYOKÜTLE PROJESİ	BİYOKÜTLE	0.7936	31/10/2014
CANAN TEKSTİL KOJENERASYON SANTRALI	DG	2.000	31/10/2014
GÖKBOYUN REGÜLATÖRÜ VE HES	HES	5.000	29/10/2014
AMASYA ÇÖP GAZ ELEKTRİK ÜRETİM TESİSİ	BİYOKÜTLE (ÇÖP GAZI)	1.200	29/10/2014
TUĞRA REGÜLATÖRÜ VE HES	HES	11.480	28/10/2014
ŞADILLI RES	RES	8.250	26/10/2014
TERMİK-KOJENERASYON SANTRALI	DG	15.000	25/10/2014
KOCABEY-2 BİYOGAZ SANTRALİ	BİYOKÜTLE	2.134	25/10/2014
AFYON BİYOGAZ ENERJİ SANTRALİ BİYOKÜTLE PROJESİ	BİYOKÜTLE	4.017	24/10/2014

TURKOL OTEL SANTRALİ (TERMİK KOJENERASYON)	DG	1.000	24/10/2014
ADANA DOĞU ATIKSU SANTRALİ	BİYOKÜTLE	0.800	24/10/2014
TUANA HES	HES	3.695	24/10/2014
ALBE-I BİYOGAZ SANTRALİ	BİYOKÜTLE	1.813	24/10/2014
POLATLI BES	BİYOKÜTLE	0.834	24/10/2014
CENGİZ 240MW DGKÇS	DG	401.330	22/10/2014
İNCESU RES	RES	10.000	22/10/2014
SİGMA SULUOVA BİYOGAZ TESİSİ	BİYOKÜTLE	1.000	20/10/2014
ZEKERE HES	HES	3.978	17/10/2014
BURDUR ŞEKER FABRİKASI ÜRETİM TESİSİ (TERMİK KOJENERASYON)	DG/FO/LİNYİT	4.750	17/10/2014
KEREM JES	JEOTERMAL	24.000	16/10/2014
GÜRGEN REGÜLATÖRÜ VE HES	HES	2.360	15/10/2014
ALİAĞA RES	RES	2.400	10/10/2014
EFELER JES	JEOTERMAL	22.500	01/10/2014
PİRO REGÜLATÖRÜ VE HES	HES	4.060	01/10/2014
MODERN BİYOKÜTLE ENERJİ SANTRALİ	BİYOKÜTLE	6.000	30/09/2014
UMURLAR RES	RES	10.000	30/09/2014
SAMSUN AVDAN BİYOGAZ TESİSİ BİYOKÜTLE PROJESİ	BİYOKÜTLE (ÇÖP GAZI)	2.400	27/09/2014
KOJEN	DG	1.189	26/09/2014
ALAŞEHİR JES	JEOTERMAL	24.000	25/09/2014
KAVAKLI RES	RES	13.700	25/09/2014
ASLANCIK HES	HES	46.500	19/09/2014
GARZAN HES	HES	5.420	19/09/2014
SİLİVRİ RES	RES	7.500	19/09/2014
DORUK HES	HES	28.278	19/09/2014
AYVASIL REGÜLATÖRÜ VE HES	HES	2.976	19/09/2014
KANGAL RES	RES	2.000	19/09/2014
SERAP HES	HES	28.960	19/09/2014
ALİAĞA RES	RES	7.200	12/09/2014
DOĞANÇAY HES	HES	20.160	12/09/2014
HAYAT KİMYA KOJENERASYON SANTRALİ	DG	15.040	12/09/2014
KAYSERİ KATI ATIK DEPONİ SAHASI ELEKTRİK ÜRETİM SANTRALİ	BİYOKÜTLE (ÇÖP GAZI)	1.560	11/09/2014
ATİK RES	RES	2.000	09/09/2014
KANGAL RES	RES	42.000	05/09/2014
KORKMAZ RES	RES	14.000	04/09/2014
SİLİVRİ RES	RES	12.500	03/09/2014
DOĞANÇAY HES	HES	10.080	29/08/2014
KÖRFEZ ENERJİ SAN. VE TİC. A.Ş. TERMİK KOJENERASYON SANTRALİ	BİYOKÜTLE (ÇÖP GAZI)	2.830	29/08/2014
AK NİŞASTA SAN. VE TİC. A.Ş. KOJENERASYON SANTRALİ	DG	2.000	22/08/2014

DİNAR RES	RES	36.800	22/08/2014
KAVAKLI RES	RES	36.300	21/08/2014
SİLİVRİ RES	RES	25.000	20/08/2014
ALADEREÇAM HES	HES	7.350	19/08/2014
SAMURLU RES	RES	4.500	16/08/2014
KORKMAZ RES	RES	10.000	15/08/2014
GÖKRES-2 RES	RES	24.000	15/08/2014
TERMİK-AKIŞKAN YATAKLI KOJENERASYON SANTRALİ	LİNYİT	5.500	15/08/2014
KIYIKÖY RES	RES	24.000	15/08/2014
ŞENKÖY RES	RES	9.000	15/08/2014
GENERAL REGÜLATÖRÜ VE HES	HES	5.950	08/08/2014
ATLAS TERMİK SANTRALİ	İTHAL KÖMÜR	600.000	08/08/2014
ÇANTA RES	RES	12.500	24/07/2014
ÜÇGEN 2 REGÜLATÖRÜ VE HES	HES	10.319	17/07/2014
SARAY REGÜLATÖRÜ VE HES	HES	13.500	16/07/2014
PANER KOJENERASYON SANTRALİ	DG	2.800	16/07/2014
AKDERE HES	HES	7.480	12/07/2014
HASANBEYLİ RES	RES	7.500	11/07/2014
BALABANLI RES	RES	16.100	11/07/2014
AŞKALE ÇİMENTO TERMİK KOJENERASYON SANTRALİ	ATIK ISI	5.500	10/07/2014
KOÇLU HES	HES	36.260	10/07/2014
BEKİRLİ TERMİK SANTRALİ	İTHAL KÖMÜR	600.000	10/07/2014
KARADERE RES	RES	4.800	04/07/2014
UŞAK RES	RES	28.500	04/07/2014
ÇANTA RES	RES	20.000	28/06/2014
SUSURLUK RES	RES	15.000	28/06/2014
ALTINSU TEKSTİL KOJENERASYON TESİSİ	DG	1.189	27/06/2014
GÜNAYDIN RES	RES	2.500	27/06/2014
HASANBEYLİ RES	RES	7.500	26/06/2014
KARADERE RES	RES	11.200	21/06/2014
GÖKRES 2 RES	RES	11.000	20/06/2014
KÖROĞLU HES	HES	9.060	20/06/2014
BERKE REGÜLATÖRÜ VE HES	HES	3.127	20/06/2014
ITC AKSARAY ÜRETİM TESİSİ	BİYOKÜTLE (ÇÖP GAZI)	1.415	17/06/2014
KAVŞAK BENDİ HES	HES	5.430	17/06/2014
BÜKOR II HES	HES	12.597	13/06/2014
SENTETİK-2 KOJENERASYON TESİSİ	DG	3.349	13/06/2014
GÖKBEL I-II HES	HES	4.282	13/06/2014
EDİNCİK BES	BİYOGAZ	2.126	12/06/2014
ARKUN BARAJI VE HES	HES	88.819	12/06/2014
TOKMADİN HES	HES	3.430	12/06/2014

SALMAN RES	RES	2.000	06/06/2014
ÇİNE HES	HES	46.600	06/06/2014
ERZİN DGKÇS	DG	319.820	05/06/2014
DORA 3 JES	JEOTERMAL	17.000	03/06/2014
ZİYARET RES	RES	10.000	31/05/2014
DERHAN TEKSTİL TERMİK KOJENERASYON SANTRALİ	DG	1.189	31/05/2014
ÇANTA RES	RES	15.000	31/05/2014
ARKUN BARAJI VE HES	HES	156.010	30/05/2014
SALMAN RES	RES	6.000	30/05/2014
HASANBEYLİ RES	RES	7.500	29/05/2014
GÜLLE TEKSTİL TERMİK KOJENERASYON SANTRALİ	DG	4.300	27/05/2014
ŞENBÜK RES	RES	13.940	25/05/2014
BALABANLI RES	RES	23.000	17/05/2014
UŞAK RES	RES	25.500	17/05/2014
ZALA REGÜLATÖRÜ VE HES	HES	5.422	16/05/2014
KİRAZLIK REGÜLATÖRÜ VE HES	HES	2.500	16/05/2014
SALMAN RES	RES	12.000	14/05/2014
TUANA HES	HES	3.695	13/05/2014
PROKOM PİROLİTİK YAĞ VE GAZ TAKITLI ELEKTRİK ÜRETİM TESİSİ	PİROLİTİK YAĞ	7.040	11/05/2014
GÜVEN GIDA TETMİK KOJENERASYON SANTRALİ	DG	2.006	10/05/2014
TONYA I-II HES	HES	2.500	09/05/2014
ASLANCIK HES	HES	12.800	09/05/2014
HASANBEYLİ RES	RES	10.000	09/05/2014
KAYAKÖPRÜ HES	HES	14.200	08/05/2014
GERES RES	RES	27.500	08/05/2014
EROĞLU GİYİM TERMİK KOJENERASYON SANTRALİ	DG	1.165	08/05/2014
ÇAMLICA II HES	HES	17.580	02/05/2014
AYVASIL REGÜLATÖRÜ VE HES	HES	1.466	30/04/2014
ERZİN DGKÇS	DG	292.090	28/04/2014
CANAN TEKSTİL TERMİK KOJENERASYON SANTRALİ	DG	2.000	27/04/2014
KALEALTI II HES	HES	9.977	26/04/2014
BOYAR KİMYA TERMİK KOJENERASYON SANTRALİ	DG	2.000	26/04/2014
DÜZCE-AKSU HES	HES	46.200	25/04/2014
SÖLPEREN REGÜLÂTÖRÜ VE HES	HES	9.762	25/04/2014
HAVVA HES	HES	2.390	22/04/2014
YEŞİLYURT ENERJİ SAMSUN DGKÇ SANTRALİ	DG	18.321	18/04/2014
GEYCEK RES	RES	14.000	18/04/2014

GÖKBEL 2 HES	HES	14.504	18/04/2014
MELİKE İPLİK TERMİK KOJENERASYON SANTRALİ	DG	9.730	18/04/2014
UZUNDERE II REGÜLATÖRÜ VE HES	HES	7.020	18/04/2014
SİNCİK RES	RES	2.500	17/04/2014
ERZİN DGKÇS	DG	292.090	12/04/2014
ARSAN DOKUMA TERMİK KOJENERASYON SANTRALİ	DG	4.300	12/04/2014
KAMER REGÜLATÖRÜ VE HES	HES	3.750	11/04/2014
DAĞBAŞI HES	HES	10.433	11/04/2014
MANYAS BARAJI VE HES	HES	20.250	08/04/2014
POLAT ENERJİ KÜTAHYA TERMİK SANTRALİ	LİNYİT	51.000	05/04/2014
İZDEMİR ENERJİ ELEKTRİK ÜRETİM TESİSİ	İTHAL KÖMÜR	350.000	04/04/2014
GÜMÜŞKÖY JES	JEOTERMAL	6.600	04/04/2014
BALABANLI RES	RES	11.500	04/04/2014
KALEALTI II HES	HES	3.837	04/04/2014
KALE HES	HES	17.100	28/03/2014
GEYCEK RES	RES	14.000	28/03/2014
KOJENERASYON SANTRALİ	DG	2.000	26/03/2014
DÜZOVA RES	RES	10.000	21/03/2014
AKSU REGÜLATÖRÜ VE HİDROELEKTRİK SANTRALİ	HES	5.770	21/03/2014
BOĞAZKÖY HES	HES	10.000	19/03/2014
KOJENERASYON SANTRALİ	ATIK ISI	9.560	14/03/2014
KİRAZLIK REGÜLATÖRÜ VE HES	HES	14.537	14/03/2014
DEĞİRMEN REGÜLATÖRÜ HE HİDROELEKTRİK SANTRALİ	HES	6.840	13/03/2014
SARES RES	RES	2.250	08/03/2014
ASLANCIK BARAJI VE HES	HES	46.500	07/03/2014
EKİNÖZÜ 1-2 HES	HES	5.660	06/03/2014
KOZBEYLİ RES	RES	4.200	28/02/2014
HASANBEYLİ RES	RES	7.500	28/02/2014
SAF I HES	HES	7.490	28/02/2014
ITC-KA BİYOKÜTLE GAZLAŞTIRMA TESİSİ	BİYOKÜTLE (ÇÖP GAZI)	5.425	27/02/2014
BARAN REGÜLATÖRÜ VE HES (BARAN-I)	HES	12.410	27/02/2014
AÇMA REGÜLATÖRÜ VE HES	HES	2.400	27/02/2014
GÖNEN BİYOGAZ SANTRALİ	BİYOKÜTLE	2.134	26/02/2014
ZİYARET RES	RES	7.500	22/02/2014
BİFA BİSKÜVİ VE GIDA SAN. A.Ş. KOJENERASYON SANTRALİ	DG	2.145	21/02/2014
UMUT REGÜLATÖRÜ VE HES	HES	24.450	21/02/2014
KAVŞAK BENDİ HES	HES	61.950	20/02/2014

ARISU HES	HES	3.821	17/02/2014
ATİK RES	RES	12.000	15/02/2014
KOJENERASYON SANTRALİ	DG	2.145	14/02/2014
GEYCEK RES	RES	23.000	14/02/2014
KOJENERASYON SANTRALİ	DG	4.300	14/02/2014
KIY HİDROELEKTRİK SANTRALİ	HES	11.900	13/02/2014
BERKE REGÜLATÖRÜ VE HES	HES	6.254	08/02/2014
İNTEPE RES	RES	0.000	07/02/2014
ÖZLÜCE HES	HES	18.190	07/02/2014
SIRIMTAŞ HİDROELEKTRİK SANTRALİ	HES	13.617	31/01/2014
DİYOBAN HES	HES	10.520	31/01/2014
KORES KOCADAĞ RÜZGAR ENERJİ SANTRALİ	RES	2.500	31/01/2014
ÇORAKLI HİDROELEKTRİK SANTRALİ	HES	2.600	30/01/2014
YUNTDAĞ RES	RES	2.500	29/01/2014
YAHYABEY HES	HES	0.310	24/01/14
SİNCİK RES	RES	25.000	24/01/2014
HASANBEYLİ RES	RES	10.000	24/01/2014
KANDİL BARAJI VE HES	HES	4.720	24/01/2014
KAVŞAK BENDİ HES	HES	61.950	24/01/2014
KIY HİDROELEKTRİK SANTRALİ	HES	11.900	23/01/2014
GEYCEK RES	RES	16.000	17/01/2014
ALKUMRU BARAJI VE HES	HES	14.250	17/01/2014
SEKİYAKA II HES	HES	2.300	17/01/2014
KİRAZLIK REGÜLATÖRÜ VE HES	HES	14.537	15/01/2014
ZAFER TEKSTİL SAN. VE TİC. A.Ş. KOJENERASYON SANTRALİ	DG	1.450	10/01/2014
DERELİ REGÜLATÖRÜ VE HES	HES	49.200	10/01/2014
MAKYOL ETİLER TİCARET MERKEZİ KOJENERASYON SANTRALİ	DG	0.6000	10/01/2014
MERCEDES BENZ TÜRK KOJENERASYON TESİSİ	DG	2.020	10/01/2014
KOJENERASYON	DG/FO	9.800	09/01/2014
AĞAOĞLU DGKÇS	DG	12.900	08/01/2014
ORDU HES	HES	21.000	04/01/2014

ÖZLÜCE HES	HES	18.190	27/12/13
KOJENERASYON	DG	2.022	27/12/13
UZUNDERE II HES	HES	7.020	27/12/13
GEYCEK RES	RES	12.000	27/12/13
KOJENERASYON	ATIK ISI	12.930	26/12/13
YEŞİLYURT DGKÇS	DG	11.396	26/12/13
BURÇAK HES 2. KADEME	HES	26.260	26/12/13
SAYALAR RES	RES	20.000	25/12/13

MİDİLLİ HES	HES	11.577	24/12/13
YENİ ELEKTRİK ÜRETİM A.Ş. DGKÇS	DG	575.909	20/12/13
KALECİK I HES	HES	7.757	20/12/13
ÇAMBAŞI REGÜLATÖRÜ VE HES	HES	44.100	20/12/13
ÇİĞDEM REGÜLATÖRÜ VE HES	HES	17.700	20/12/13
KAVŞAK BENDİ HES	HES	61.950	19/12/13
SUKENARI REGÜLATÖRÜ VE HES	HES	8.566	19/12/13
BOZTEPE HES	HES	18.150	17/12/13
ADACAMİ HİDROELEKTRİK SANTRALİ	HES	14.652	16/12/13
SARIGÜZEL BARAJI HES	HES	3.660	14/12/13
TATAR HİDROELEKTRİK SANTRALİ	HES	64.110	13/12/13
ORDU HES	HES	21.000	13/12/13
AKBAŞ HİDROELEKTRİK SANTRALİ	HES	12.502	12/12/13
ÇERMİKLER BARAJI VE HES	HES	22.000	12/12/13
KAYA BELEK TERMİK KOJENERASYON SANTRALİ	DG	1.286	08/12/13
SIRIMTAŞ HİDROELEKTRİK SANTRALİ	HES	13.617	07/12/13
ORTADOĞU RULMAN SANAYİ TERMİK KOJENERASYON SANTRALİ	DG	7.744	06/12/13
YENİ ELEKTRİK ÜRETİM A.Ş. DGKÇS	DG	289.091	06/12/13
GEYCEK RES	RES	33.000	05/12/13
KİRAZLIK REGÜLATÖRÜ VE HES	HES	14.537	05/12/13
DARAN HİDROELEKTRİK SANTRALİ	HES	23.870	05/12/13
DURU REGÜLATÖRÜ VE HES	HES	1.630	04/12/13
OYLAT HES	HES	1.900	03/12/13
DİNAR RES	RES	0.000	29/11/2013
ISPARTA MENSUCAT SAN. VE TİC. A.Ş. KOJENERASYON SANTRALİ	DG	0.000	29/11/13
KARAKÖY HİDROELEKTRİK SANTRALİ	HES	3.000	28/11/13
ADASU HİDROELEKTRİK SANTRALİ	HES	9.600	28/11/13
AĞKOLU HES	HES	4.380	28/11/13
PAŞALİMANI RES	RES	0.800	25/11/2013
EREM HİDROELEKTRİK SANTRALİ	HES	3.050	23/11/13
YAZYURDU REGÜLATÖRÜ VE HES	HES	14.900	22/11/13
AKKENT CALKUYUCAK HES	HES	13.813	22/11/13
AMBARLI TERMİK SANTRALİ	DG	516.000	21/11/13
SOĞUKPINAR HİDROELEKTRİK SANTRALİ	HES	8.900	15/11/13
H.G. ENERJİ GEDİZ SANTRALİ	DG	5.350	15/11/13
TATAR HİDROELEKTRİK SANTRALİ	HES	64.11	14/11/13
KÖPRÜBAŞI HİDROELEKTRİK SANTRALİ	HES	14.660	08/11/2013
LUTUF MENSUCAT KOJENERASYON SANTRALİ	DG	2.000	08/11/13
KIZILDERE II JES	JEOTERMAL	20.000	31/10/2013
SENKRON EFELER BİYOGAZ SANTRALİ	BİYOGAZ	2.400	31/10/2013

PAMUKÖREN JES	JEOTERMAL	45.020	31/10/2013
ORTAÇAĞ REGÜLATÖRÜ VE HİDROELEKTRİK SANTRALİ	HES	12.944	24/10/2013
ÇERMİKLER BARAJI VE HES	HES	3.000	24/10/2013
ODAŞ I DOĞALGAZ KOMBİNE ÇEVRİM SANTRALİ	DG	12.000	23/10/2013
BATIÇİM BATI ANADOLU ÇİMENTO SANAYİİ A.Ş. TERMİK KOJENERASYON SANTRALİ	ATIK ISI	9.000	12/10/2013
NAKSAN ENERJİ SANTRALİ 2	DG	1.100	11/10/2013
GEYCEK RÜZGAR ENERJİ SANTRALİ	RES	12.000	11/10/2013
KANDİL BARAJI VE HES	HES	203.200	10/10/2013
PİRİNÇLİ REGÜLATÖRÜ VE HİDROELEKTRİK SANTRALİ	HES	9.340	10/10/2013
İPEKSAN ELEKTRİK ÜRETİM A.Ş. TERMİK KOJENERASYON SANTRALİ	DG	8.600	10/10/2013
AVANOS REGÜLATÖRÜ VE CEMEL HİDROELEKTRİK SANTRALİ	HES	7.200	04/10/2013
GOREN-2 TERMİK KOJENERASYON SANTRALİ	DG	48.650	04/10/2013
DERİNER HİDROELEKTRİK SANTRALİ	HES	167.500	02/10/2013

Step 5.3 The Calculation of Build Margin Emission Factor

The TOOL Formula for BM Calculation

TOOL07 Methodological tool: (Tool to calculate the emission factor for an electricity system Version 06.0)[45] gives the following formula for BM emission factor calculation.

The build margin emissions factor is the generation-weighted average emission factor (t CO2/MWh) of all power units m during the most recent year y for which electricity generation data is available, calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}} \qquad \text{Equation 15}$$

Where:
EFgrid,BM,y = Build margin CO2 emission factor in year y (t CO2/MWh)
EGm,y = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
EFEL,m,y = CO2 emission factor of power unit m in year y (t CO2/MWh)
m = Power units included in the build margin
y = Most recent historical year for which electricity generation data is available

According to, "Tool to calculate the emission factor for an electricity system" (version 06.0.0)[46], the CO2 emission factor of each power unit m (EF_{EL},m,y) should be determined as per the guidance

[45] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v6.pdf

[46] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v6.pdf

from the tool in step 4 for simple OM, using options A1, A2 or A3, using for y the most recent historical year for which power generation data is available, where m is the power units included in the build margin.
As plant specific fuel consumption data is not available for Turkey, option A2 has been selected for the calculation (since only fuel type and electricity generation are known) of the CO2 emission factor of each power unit m (EFEL,m,y) as follows:

$$EF_{EL,m,y} = \frac{EF_{CO_{2,m,i,y}} \times 3.6}{\eta_{m,y}} \qquad \text{Equation 5}$$

Where:

EFELm,y	= CO2 emission factor of the power unit m in year y (tCO2/MWh)
EFCO2,m,i,y	= Average CO2 emission factor of fuel type i used in power unit m in year y (tCO_2/GJ)
ηm,y	= Average net energy conversion efficiency of power unit m in year y (ratio)
M	= All power units serving the grid in year y except low-cost/must-run power units
Y	= The relevant year as per the data vintage chosen in Step 3

Where several fuel types are used in the power unit, the lowest CO_2 emission factor for $EFCO_2$,m,i,y has been used.

(a) Identification of Average CO_2 Emission Factor of Fuel Type i in Power Unit m in Year y (EFCO2,m,i,y)

The fuel types used in Set Sample are

- Natural Gas
- Import Coal
- Lignite

Fuels Used in SET Sample	$EFCO_2$ Values (t CO_2/GJ)
Natural Gas	0.0543
Import Coal	0.0895
Lignite	0.0909

Table 28: EF-$C0_2$ Values of Fuels Used in Set Sample

$EFCO_2$ values are taken from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2 Energy, Chapter 1 Introduction, Table 9[47]. It is noted that $EFCO_2$ values for hydro, geothermal, wind, wind, biogas and renew. + wastes are given as zero so they are taken into calculation.

(b) Average net energy conversion efficiency of power unit m in year y (ηm,y)

There is no available data for the plant and year specific efficiency data. So we take efficiency level of best technology available complying the board approved deviation given in footnote 2. Quotation from the board-approved deviation is given below:

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

"(ii) Use the efficiency level of the best technology commercially available in the provincial/regional or national grid of China, as a conservative proxy, for each fuel type in estimating the fuel consumption to estimate the build margin (BM). For the estimation of the operating margin (OM) the average emission factor for the grid for each fuel type can be used."

Fuels Used in SET Sample	η Values (Ratio)
Natural Gas	0.60
Import Coal	0.39
Lignite	0.39

Table 29: Efficiency Ratios for Fuels and Used in Set Sample

Efficiency values are taken from Tool to calculate the emission factors for an electricity system , Annex 1: Default efficiency factors for power plants[48].

(c) Calculation of CO2 emission factor of power unit m in year y (t CO_2/MWh)

Using the above formula we obtain EFEL values for the different fuel types.

Fuels Used in SET Sample	EFEL (t CO_2 MWh)
Natural Gas	0.3258
Import Coal	0.8262
Lignite	0.8391

Table 30: EF_{EL} Values for Fuel Types in Set Sample

(d) Calculation of CO_2 Build Margin emission factor (t CO_2/MWh)

	Total NG Capacity Addition (MWe)	Emission Addition of NG (MW * tCO_2/MWh)	Total Import Coal Capacity Addition (MWe)	Emission Addition of Coal (MW * tCO_2/MWh)	Total Lignite Capacity Addition (MWe)	Emission Addition of Lignite (MW * tCO_2/MWh)	Total Emission Coefficient (MW * tCO_2/MWh)
2016	1691,44	551,07	0.000	0.00	430.00	360.80	911.87
2015	203.24	66.21	292.600	241.73	435.00	365.00	672.95
2014	1674.17	545.44	2150	1776.23	58.14	48.78	2370.46
2013	1481.15	482.56	0	0.00	0.00	0.00	482.56
Total	5049.99	1645.29	2442.60	2017.96	923.14	774.59	4437.84

Table 31: Total Capacities and Emission Contributions by Fuel Type

	2016
Gross Electricity Production (GWh)	274,407.7
Net Electricity Production (GWh)	261,950.9

[48] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v6.pdf

Net/Gross	0.955

Table 32: Net - Gross Electricity Production Ratios

By using the below formula

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}}$$ Equation (15)

We don't have the exact annual electricity production values for each power plant. Thus we assume production of each power plant is proportional to its capacity. Each production value will be then capacity multiplied by 365 days * 24 hours. Since 365 days * 24 hours will be at both the Numerator and Denominator of the formula, we just don't add up to the formula.

We also do correction to reflect Gross/Net Electricity Generation difference so we multiply the total capacity by 0.955. Calculation becomes

$$EF_{BM,2016} = \frac{5049.99\ MW \times 0.3258\ {}^{tCO_2}/_{MWh} + 2442.6 MW \times 0.8262\ {}^{tCO_2}/_{MWh} + 923.14\ MW \times 0.8391\ {}^{tCO_2}/_{MWh}}{15707.56\ \text{MW} * 0.955}$$

$EF_{BM,2016}$ =0.2961 t CO_2/MWh

The build margin emission factor EFgrid,BM,y calculated through equation is **0.2961 tCO_2/MWh.**

Calculating the combined margin emission factor

The combined margin emission is calculated using following formula:

Equation 16

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM}$$

Where w_{OM} is 0.75 and w_{BM} is 0.25.

The combined margin emission factor EFgrid,CM,y calculated through equation is

EFgrid, CM, y = 0.75 * 0.649 + 0.25 * 0.2961= **0.5605 tCO_2/MWh**

Baseline emissions

As per ACM0002 , the baseline emissions are calculated as the net electricity generated by the project activity, multiplied with the baseline emission factor for the project grid.
Baseline emissions calculated as explained in section B.6.1 above are summarized as below.

BEy = EGy * EFy
Where,
EGy = the net electricity exported to the grid system during the year y (306,566 MWh/annum)
EFy = the emission factor of the grid to which the project exports electricity (0.5605 tCO2/MWh)
Hence,

BEy = 306,566 MWh/annum * 0.5605 tCO_2/MWh
BEy = 171,828tCO_2 per annum

Project emissions

The proposed project activity involves the generation of electricity by development of a small scale wind power project. The generation of electricity does not result in greenhouse gas emissions and therefore:
PEy = 0 tCO_2/year

Leakage
The energy generating equipment is not transferred from or to another activity. Therefore leakage does not have to be taken into account, and:

LEy = 0 tCO_2/year

Emission reductions
ERy = BEy - PEy ERy = 171,828 – 0
ERy = 171,828 tCO_2 (ERy = BEy)

B.6.5. Summary of ex ante estimates of each SDG outcome

SDG 7 : Affordable and Clean Energy

Year	Baseline estimate	Project estimate	Net benefit (MW)
15/11/2018-31/12/2018	38,636	0	38,636
2019	306,566	0	306,566
2020	306,566	0	306,566
2021	306,566	0	306,566
2022	306,566	0	306,566
2023	306,566	0	306,566
2024	306,566	0	306,566
01/01/2025-15/11/2025	297,930	0	297,930
Total	2,145,962	0	2,145,962

Total number of crediting years	7		
Annual average over the crediting period	306,566	0	306,566

SDG 8 : Decent Work and Economic Growth

The project leads to employment opportunities which would not have been possiblein the baseline scenario. The project provides employment to between 20 and 25 people.

This will help to achieve SDG 8 with indicators 8.5.2 "Unemployment rate, by sex, age and persons with disabilities" and following target: 8.5 "By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value" There is no opportunity to employ woman. So "equal pay for work of equal value" does not apply.

Furthermore, number of people (between 20 and 25 people employees) are trained on health and safety issues during per each monitoring period. This will help to achieve "the project labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment." Training records or certificates will be provided during each monitoring period.

SDG 13 Climate Action

Year	**Baseline estimate**	**Project estimate**	**Net benefit (tCO_2)**
15/11/2018-31/12/2018	21,655	0	21,655
2019	171,828	0	171,828
2020	171,828	0	171,828
2021	171,828	0	171,828
2022	171,828	0	171,828
2023	171,828	0	171,828
2024	171,828	0	171,828
01/01/2025-14/11/2025	150,172	0	150,172
Total	1,202,795	0	1,202,795
Total number of crediting years	7		
Annual average over the crediting period	171,828	0	171,828

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Relevant SDG Indicator	7.2.1 "Renewable energy share in the total final energy consumption"
Data / Parameter	$EG_{facility,y}$
Unit	MWh/yr
Description	Quantity of net electricity supplied to the grid in year y
Source of data	EPIAS records (Meter reading records or OSF forms of main meters (00419695 and 00419697) are cross-checked)
Value(s) applied	306,566 MWh[49]
Measurement methods and procedures	EPIAS records provides the exact electricity generation of the facility and the imports from the grid. The electricity meters are controlled and maintained by the grid owner. The quantity of net electricity delivered to the grid is cross checked with the meter reading records (OSF forms-OSOS) provided to the company by TEIAS.[50] Please see B.7.3. for more detailed description of the monitoring plan.

[49] EMRA Generation License – 10/04/2008

[50] All production figures which are subject to sales to the grid are agreed with EPIAS ("Market Financial Settlement Center"). These figures can be accesses from EPIAS's web site by the seller. Therefore, net electricity production figures announced by EPIAS is used to calculate the emission reductions.

<table>
<tr><td>Monitoring frequency</td><td>
Continuous measurement and at least monthly recording.

Information of the meters are listed as followed:

<table>
<tr><td></td><td>Electricity Meter (Primary)</td><td>Electricity Meter (Secondary)</td></tr>
<tr><td>Manufacturer</td><td>ELSTER</td><td>ELSTER</td></tr>
<tr><td>Model</td><td>A1500</td><td>A1500</td></tr>
<tr><td>Serial number</td><td>419695</td><td>419696</td></tr>
<tr><td>Date of installation</td><td>13/04/2011</td><td>13/04/2011</td></tr>
<tr><td>Date of initial calibration</td><td>28/04/2011</td><td>28/04/2011</td></tr>
</table>

TR-2 Transformer
<table>
<tr><td></td><td>Electricity Meter (Primary)</td><td>Electricity Meter (Spare)</td></tr>
<tr><td>Manufacturer</td><td>ELSTER</td><td>ELSTER</td></tr>
<tr><td>Model</td><td>A1500</td><td>A1500</td></tr>
<tr><td>Serial number</td><td>419697</td><td>419698</td></tr>
<tr><td>Date of installation</td><td>13/04/2011</td><td>13/04/2011</td></tr>
<tr><td>Date of initial calibration</td><td>28/04/2011</td><td>28/04/2011</td></tr>
<tr><td>Date of last test by TEIAS</td><td>04/10/2017</td><td>04/10/2017</td></tr>
</table>

The accuracy of meters is given as 0.5s class
</td></tr>
<tr><td>QA/QC procedures</td><td>

Measurements are undertaken using energy meters.
Concerning metering system accuracy, project participants have to comply with relevant national legislation. The project must ensure that the metering devices are in line with the technical requirements which are set out by the Communiqué for Metering Devices to be used in the Electricity Market, which describes the minimum accuracy requirement the metering devices have to fulfil, which are categorized according to the installed capacity. Maintenance and calibration of TEİAŞ meters are carried out according to the System Usage Agreement. The periodical calibration or maintenance is under the responsibility of TEIAS and has been fixed as once in 10 years. Since TEİAŞ meters are sealed by TEİAŞ, the project proponent cannot intervene with the devices.
The net electricity export/supplied to a grid is the difference between the measured quantities of the grid electricity export and the import. EPIAS record is crosschecked with the data measured protocol by meters (OSOS-OSF forms)

</td></tr>
<tr><td>Purpose of data</td><td>Calculation of baseline emissions</td></tr>
</table>

Additional comment	-

Relevant SDG Indicator	SDG 8 : Decent Work and Economic Growth
Data / Parameter	Number of employment
Unit	Number
Description	Number of people employed directly due to the project activity
Source of data	SGK Records
Value(s) applied	The project provides permanent between 20 and 25 skilled employment
Measurement methods and procedures	The total number of persons working in the plant would be calculated based on the SGK Records
Monitoring frequency	Once for each monitoring period
QA/QC procedures	Social insurance registries of employees are provided during each monitoring period . After first verification, only changes in employees will be reported. Because of the social conditions of the project area, employment of woman and persons with disabilities is not possible
Purpose of data	8.5 "By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value'
Additional comment	-

Relevant SDG Indicator	8.8.2 Increase in national compliance of labour rights (freedom of association and collective bargaining) based on International Labour Organization (ILO) textual sources and national legislation, by sex and migrant status.
Data / Parameter	Health and Safety Training Records
Unit	Number of people per monitoring period
Description	Number of people trained on health and safety issues during per monitoring period
Source of data	Training Records or Certificates
Value(s) applied	The project will provide health and safety training to employees at each monitoring period
Measurement methods and procedures	The total number of Health and Safety training based on Training Records or Certificastes
Monitoring frequency	Once for period each monitoring
QA/QC procedures	Training records or certificates will be provided

Purpose of data	Monitoring the health and safety trainings of employees to demonstrate contribution to SDG8-8.8 Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment
Additional comment	n.a

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions" and following
Data / Parameter	ERy
Unit	tCO_2/y
Description	Emission Reductions in year y (t CO_2/yr) As per ACM0002 V 18.0, the baseline emissions (emission reductions) are calculated as the net electricity generated by the project activity, multiplied with the baseline emission factor for the project grid.
Source of data	Measured and Calculated. (The emission reduction value the emission factor of the grid to which the project exports electricity (0.5605 tCO2/MWh) and net electricity generated)
Value(s) applied	171,828 tCO_2[51]
Measurement methods and procedures	Please see B.6.2-B.6.4 and B.7.3 for more detailed description of the monitoring plan.
Monitoring frequency	Once for each monitoring period
QA/QC procedures	Please see B.7.3. for more detailed description of the monitoring plan.
Purpose of data	Calculation of baseline emissions (Baseline emissions calculated as explained in section B.6.2-B.6.4) to demonstrate contribution to SDG13-13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
Additional comment	-

B.7.2. Sampling plan

Not Applicable

[51] This value will be changed accordig to net electicity generation value.

B.7.3. Other elements of monitoring plan

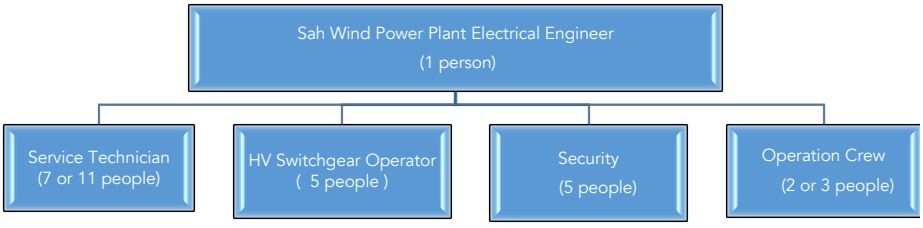
According to the Turkish Law and Regulations, the methods of monitoring the net electricity fed to the grid and quality control and assures are explained below:

Monitoring data is collected in accordance with the agreement done between the project owner and Turkish Electricity Distribution Company (TEIAS) which provides the infrastructure for the connection to the national grid. Connection Agreement has signed on 03/02/2017 with TEIAS Turkish Electricity Distribution Company. The metering system is defined in the agreement as two groups: main meter and spare meter. The design of the metering system is checked and approved by TEIAS before commissioning of the plant. The technical specifications of the power meters should be in line with Measure and Metering Devices Regulation by Ministry of Industry and Trade. In addition, the Communiqué for Power Meters announced by Energy Market Regulations Authority (EMRA) requires all meters to be in line with either Turkish Standards Institution or International Electrotechnical Commissions Standards. The meters are placed at the point the electricity is fed to the grid and sealed on behalf of the both parties. This prevents any intervention and assures the accuracy and quality of the measurements. All requirements and specifications of the meters will be done according to Communique on the counter to be used in the Electricity Market by Energy Market Regulatory Authority on 22.04.2011.

Data will be stored electronically, during the crediting period and at least two years after the last issuance of credits for the wind power project activity in the concerning crediting period. The Project Participant will be responsible for storage of data received from the measuring devices.

The main and spare meter readings are recorded monthly and cross-checked whether calibration is required. The capacity of the transmission line connected is 154 kVA, the accuracy class for power meters have been defined in the Communiqué for Power Meters as 0.5_S class. The calibration is implemented in accordance with the related standard procedures. The periodical maintenance is under the responsibility of TEIAS and has been fixed as once in 10 years.

The Project aims to create employment opportunities in the project region in a sustainable way. The Project proponent prefers to prioritize personnel from the project region, which is defined as a Gold Standard indicator to be verified for each monitoring period. It is between 20 or 25 employees permanent during the operation of the plant. Roles and responsibilities have been summarized in the following chart:



SECTION C. Duration and crediting period

C.1. Duration of project

C.1.1. Start date of project

15/05/2011[52]

C.1.2. Expected operational lifetime of project

25 years and 0 months[53]

C.2. Crediting period of project

Renewable crediting period is chosen for the Sah project activity.

C.2.1. Start date of crediting period

Starting date of the first crediting period: 15/11/2011

Starting date of the second crediting period: 15/11/2018

C.2.2. Total length of crediting period

7 years and 0 months, which is planned to be renewed twice. (21 years) The crediting period will be renewed once more after the end of the second crediting period.

Date of the second crediting period: 15/11/2018-14/11/2025

SECTION D. Safeguarding principles assessment

D.1. Analysis of social, economic and environmental impacts

https://globalgoals.goldstandard.org/101-4-gold-standard-for-the-global-goals-safeguarding-principles-requirements/

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes/potentially/no)	Justification	Mitigation measure (if required)

[52] The commissioning date of the first phase of project activity

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

SOCIAL &ECONOMIC SAFEGUARDING PRINCIPLES				
Principle 1- Human Rights	1. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights. 2. The Project shall not discriminate with regards to participation and inclusion.	No	1. The Project is not in conflict with the economic livelihood or other issue of the local community. Thus, the Project does not cause any human rights abuse and respects internationally proclaimed human rights issue. 2.Project activities are not expected to cause any human rights abuse. As a member of United Nations and part of UN Agreement on Human Rights, it is ensured by law in Turkey that no action can be taken against human rights.[54]	Not Required

54 http://www.resmigazete.gov.tr/main.aspx?home=http://www.resmigazete.gov.tr/arsiv/7217.pdf&main=http://www.resmigazete.gov.tr/arsiv/7217.pdf

Principle 2- Gender Equality and Women's Rights	The Project shall complete the following gender assessment questions in order to inform Requirements, below: 1. Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits? 2. Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)? 3. Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)? 4. Does the Project take into account gender roles and the abilities of	No	1. The project does not decrease women´s access to or control of resources. 2. No, there is no possibility of adverse effect. 3. No, the Project does not disconsider gender roles and in fact actively engages both women and men. Community meetings are scheduled considering participation by both Men and Women. 4. The project does no discriminate on basis of gender, caste or religion. 5. No the Project was not designed to increase women´s workload nor add	Not Required

	women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)? 5. Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities? 6. Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits? 7. Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing		care responsibilities. 6. There is no place for discrimination against women in this Project. The project does nto discriminate on basis of gender, caste or religion. 7. The Project is not limit women´s ability regarding natural resources. The project being run-of-river hydro project thus does not have any major impact on natural resources of the region. 8. No the Project isl not expose women and girls to further risks or hazards. 1. The project proponent has a grievance cell which would look into compalints. 2. There is no such risk for the project.	

	environmental goods and services? 8. Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards? The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women. 1. Sexual harassment and/or any forms of violence against women - address the multiple risks of gender-based violence, including sexual exploitation or human trafficking. 2. Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls. 3. Restriction of women's rights or access to resources (natural or economic). 4. Recognise women's ownership rights regardless of marital status - adopt project measures where possible to support to women's access to inherit and own land,		Participation in the project is 100% voluntary. The project proponent has a grievance cell which would look into compalints. 3. The Project is not restrict women´s rights or access regarding natural resources. The project proponent does not discriminate on gender, caste, religion etc. 4. Marital status is completely irrelevant to the Project. This project does not discriminate on gender, caste, religion etc 1. Yes, the Project has not equal opportunity for women and men to contribute both in volunteer and working positions because the social condition of project area. 2. The project proponent has a	

Deleted: .

	homes, and other assets or natural resources. Projects shall apply the principles of nondiscrimination, equal treatment, and equal pay for equal work, specifically: 1. Where appropriate for the implementation of a Project, paid, volunteer work or community contributions will be organised to provide the conditions for equitable participation of men and women in the identified tasks/activities. 2. Introduce conditions that ensure the participation of women or men in Project activities and benefits based on pregnancy, maternity/paternity leave, or marital status. 3. Ensure that these conditions do not limit the access of women or men, as the case may be, to Project participation and benefits.		stipulated HR policy that takes into account participation by both men and women. 3. There is no limit on the access to Project participation and benefits from either of these conditions. Sah Wind Power Plant project does not involve in any form discrimination in any kind of form. Turkey ratified ILO 100 Equal Remuneration Convention and 111 Discrimination (Employment and Occupation) Convention[55]	

[55] http://www.ilo.org/dyn/normlex/en/f?p=1000:11200:0::NO::P11200_COUNTRY_ID:102893

	The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks.			
Principle 3- Community Health, Safety and Working Conditions	The project is a WPP. So the project during its entire life-cycle does not have any adverse healt and safety effect on any local or remote community. The project provides workers with a safe and	No	The project owner is committed to the safe and healthy working conditions during all phases of the project. All employees will attend trainings health & safety.	All the employees are trained about health and safety issues during operation phase of the

	healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments.		This issue is protected by Labor Law and regulations [56] and UN Agreement on Human Rights.[57]	project but this is not required.
Principle 4-Cultural Heritage, Indigenous Peoples, Displacement and Resettlement	Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g., knowledge,innovations, or practices)? Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)? Does the Project require any change to land tenure arrangements and/or other rights? For Projects involving land-use tenure, are there any uncertainties with regards land	No	During the operation of the Sah Wind Power plant project does not do any damage, alteration or removal to the critical cultural heritage. Cultural and environmental heritage is protected against alteration, damage or removal by the law[58]. The project does not involve any settlement areas. Thus, this project does not cause the physical or economic relocation of	Not Required

[56] http://www.mevzuat.adalet.gov.tr/html/1243.html

[57] https://www.unicef.org/turkey/udhr/_gi17.html

[58] Reference: "Law on Protection of Cultural and Environmental Assets"
http://mevzuat.basbakanlik.gov.tr/Metin.Aspx?MevzuatKod=1.5.2863&MevzuatIliski=0&sourceXmlSearch=

	tenure, access rights, usage rights or land ownership? Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?		peoples. The project's area is forest area and all of them belongs to Ministry of Forestry. All official permit had realized by Forestry Directorate of Bursa and Balikesir provinces. [59] The project does not require any changes to land tenure arrangements or other rights. And this Sah Wind Power Plant is not involving land-use tenure. Furthermore there is not any uncertainties with regards land tenure, access rights, usage rights or land ownership.The land of the project had approved by the several local Authorities.	

[59] Project Introduction File of Bursa and Balıkesir. These documents and related the other official documents are provided to the DOE.

			No cultural heritage/ indigenous people are displaced due to the project.	
Principle 5- Corruption	The project does not involve and is not complicit in corruption.	No	Sah Wind Power Plant does not involve and is not complicit in any kind of corruption Turkey has ratified UN Convention against Corruption and the OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions.[60]	Not Required
Principle 6- Economic Impacts	1. The project does not employ and is not complicit in any form of child labor. 2. The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments.	No	1 The project owner and their subcontractors complying with all relevant national laws. Galata Wind Enerji A.Ş. does not employ children in any shape or form for their works.	Not Required

[60] http://treaties.un.org/Pages/ViewDetails.aspx?mtdsg_no=XVIII-14&chapter=18&lang=en

	3. The project does not involve and is not complicit in any form of forced or compulsory labor. 4. The project has financial sustainability through its lifecycle. 5. The project does not have negative impact on local economy or on any local group.		Turkey has ratified ILO 138 Minumum Age Conventions and 182 Worst Forms of Child Labour Convention[61] 2. The project owner is committed to the safe and healthy working conditions all phases of the project. All employees have been attend trainings health & safety. This issue is protected by Labor Law and regulations [62] and UN Agreement on Human Rights[63] 3. Galata Wind Enerji A.Ş. and appointed subcontractors does not involve in any form forced or compulsory labour Turkey has ratified ILO 29	

[61] http://www.ilo.org/dyn/normlex/en/f?p=1000:11200:0::NO::P11200_COUNTRY_ID:102893

[62] http://www.mevzuat.adalet.gov.tr/html/1243.html

[63] https://www.unicef.org/turkey/udhr/_gi17.html

			Forced Labour Convention[64] 4. The project produces electricity from wind energy during its lifetime, so it preserves its financial sustainability after certification period. 5. The project has only one activity and it is producing electricity using wind energy. It provides the produced energy to the national grid. Other than providing clean energy to the nation, it has no negative impact on local economy. Furthermore it has positive impact by providing employment to local people.	
ENVIRONMENTAL & ECOLOGICAL SAFEGUARDING PRINCIPLES				
Principle 1-Climate and Energy	Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	The project reduces greenhouse gas emissions and	Not Required

[64] http://www.ilo.org/dyn/normlex/en/f?p=1000:11200:0::NO::P11200_COUNTRY_ID:102893

	Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?		fossil fuel use compared to the baseline scenario. On the contrary the project generates renewable energy and supplies to the grid.	
Principle 2-Water	Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No	The project is wind power project thus there is no impact of water resources due to the project. In project site there is no area defined in the water pollution control regulation.[65]	Not Required
Principle 3-Environment, ecology and land use	1. Does the Project involve the use of land and soil for production of crops or other products? 2. Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	No	1. The Land for the project has been approved by the all relevant local Authorities. 2. The project is susceptible to decreased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other	Not Required

[65] Project Introduction Files_page 48 of Balikesir one and page 56 of Bursa one.

	3. Could the Project be negatively impacted by the use of genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development)? 4. Could the Project potentially result in the release of pollutants to the environment? 5. Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials? 6. Will the Project involve the application of pesticides and/or fertilisers?		extreme conditions. 3. Wind power project systems not affects the herbal life negatively. Furthermore, the project area and project does not effect negatively organism, flora, fauna or GMOs. [66] (also breeding or feeding areas and migration routes and the bats) 4. The project takes a precautionary approach in regard to environmental challenges and is not complicit in practices contrary to the precautionary principle. The environment is protected by several Laws and Regulations in Turkey. The purpose of the	

[66] Project Introduction Files_page 78 of Balikesir one and pages 68-70 of Bursa one.

			"Law on Environmental Protection" is to protect the environment with principles of sustainable development and environment. The project owner also follows necessary procedures for environmental safety at the project site at international standard (such as Bern Convention) as explained in the PIF)[67] 5. The all wastes are disposed of according to related regulations. The methods are categorized for all materials.[68] Waste oil produced have been collected in an oil-proof container and disposed via accredited	

[67] Project Introduction File_page 70 of Bursa

[68] Project Introduction File_pages 85-86 of Balıkesir one and Project Introduction File_pages 77-78 of Bursa one

			abatement companies. [69] 6.Not applicable for Wind Power Plant Systems.	

Assessments regarding Safeguarding Principles and Requirements paragraph 4.3.7 to 4.3.11 are briefly given below. EIA report also addresses the following items as mandated by Turkish law and regulations.[70]

4.3.7 Harvesting of Forests

Question: Will the Project involve the harvesting of forests?

This is wind power project so the project does not involve the harvesting of forests.

4.3.8 Food

Question: Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?

The project area does not involve agricultural land so the project activity does not have any negatively impact to access and availability of food for people.

4.3.9 Animal husbandry

Question: Will the Project involve animal husbandry?

This wind power project does not involve any animal husbandry.

4.3.10 High Conservation Value Areas and Critical Habitats

Question: Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites[71] identified?

The project does not affect or alter High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or cultural sites.

[69] Official record will be provided by accredited abatement companies for regular transfer of waste oil from power plant during the each monitoring period.

[70] Project Introduction File of Balıkesir and Project Introduction File of Bursa have already provided to the DOE and GS

[71] Charter of the United Nations, Article 1, para 3. http://www.un.org/en/sections/un-charter/chapter-i/index.html

4.3.11 Endangered Species

Questions: 1. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)?

2. Does the Project potentially impact other areas where endangered species may be present through transboundary affects?

There are no endangered species identified as potentially being present within the Project boundary (including those that may route through the area). The project is not within the vicinity of area that contains endangered species.

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from stakeholders

The stakeholders to the project activity was defined jointly by the project owner and Rüzgar Danışmanlık (Cagla Balci Eris) , who is the consultant to the GS project cycle, taking into account the characteristics and possible impacts of the project activity.

Complementary Stakeholder Consultation

The documents including the non-technical project summary for renewal crediting period and the Environmental and Social Impact questionnaire related with the Sustainable Development Indicators (SD Assessment) (according to GS4GG requirements) have been delivered to the stakeholders who have been selected as stakeholders to the project activity. The main communication method has been through e-mails and delivery of hard copies of the mentioned documents for those who don't have an email address (specifically the locals) to the mukhtar of Dedeoba and Sahmelek villages.

The feedback request for renewal crediting period has started on 04/05/2018 with sending out the documents to the stakeholders officially, and verbally on the same day the mukhtar of Dedeoba and Sahmelek villages and no feedback has been received until now. The beginning of Complemantary Stakeholder Feedback Round has be announced from the muckhtar's offices, mosques and coffe houses of the Dedeoba and Sahmelek villages. This public leaflet announcement, emails and documents contain information such as location of available these documents, the procedure to commit comments, timing and the contact's details.
The mukhtar has said that the PP can change the monitoring plan and only will monitor 3 or 4 sustainable development indicators and has given comment with a letter. (These letter has provided to the DOE for re-validation process) The stakeholders stated that they are in favour of the project and underlined the significant contribution of the project to regions sustainable image and stressed the importance of renewable and clean energy.

List of stakeholders invited to the Complementary stakeholder consultation for the renewal of crediting period:

Category code	Organisation (if relevant)	Name of invitee	Way of invitation	Date of invitation	Confirmation received? Y/N
C	Ministry of Environment and Urbanization	Mehrali Ecer	Via E-mail and phone mecer@cob.gov.tr 0 312 5863052	04/05/2018	Y
C	Ministry of Environment and Urbanization	Tuba Seyyah	Via E-mail and phone tuba.seyyah@csb.gov.tr 0 312 5863167	04/05/2018	Y
B	Balıkesir and Bursa Regional Directorates of Forestry	General	Via E-mail bandirmaisl@ogm.gov.tr bursaobm@ogm.gov.tr	04/05/2018	Y
B	Balıkesir Asistant Governor	İsmail Demirhan	Via E-mail balikesir@icisleri.gov.tr	04/05/2018	Y
B	Bandırma District Governor	General	Via E-mail bandirma@icisleri.gov.tr	04/05/2018	Y
A	Mayor of Bandirma	General	Via E-mail belediye@bandirma.bel.tr	04/05/2018	Y
D	Bursa Chamber of Commerce and Endustry	General	Via E-mail and phone btso@btso.org.tr +90 (224) 275 16 00	04/05/2018	Y
D	Balıkesir Chamber of Commerce	General	Via E-mail and phone info@bato.org.tr (0266) 244 67 81	04/05/2018	Y
D	Balıkesir Chamber of Endustry	General	Via E-mail and phone bso@bso.org.tr +90 266 281 11 80	04/05/2018	Y
D	Balıkesir and Bursa Chamber of Electrical Engineers	Nazmi Kaçar and General	Via E-mail nazmi.kacar@emo.org.tr bursa@emo.org.tr	04/05/2018	Y
D	REC Regional Environmental Centre	Rıfat Unal Sayman	Via E-mail info@rec.org.tr/ unal.sayman@rec.org.tr	04/05/2018	N
B	Bursa and Balıkesir Provincial Directorate of Convervation of Cultural Assets	General	Via E-mail bursakurul@kultur.gov.tr balıkesirkurul@kultur.gov.tr	04/05/2018	Y

B	Bursa and Balıkesir Province Environment and Urban Director	İsmail Alaca and Günnur Berk	Via E-mail bursa@csb.gov.tr ismail.alaca@csb.gov.tr gunnur.berk@csb.gov.tr balikesir@csb.gov.tr	04/05/2018	Y
A	Balıkesir and Bursa F En management directorate	General	Via E-mail bandirmaisl@ogm.gov.tr	04/05/2018	Y
B	Balıkesir and Bursa Provincial Directorate of Food Agriculture and Livestock	General	Via E-mail balikesir@tarim.gov.tr bursa@tarim.gov.tr	04/05/2018	Y
A	Headman of Sahmelek Village	Ziya Aydemir	Via face to face	04/05/2018	Y
A	Headman of Dedeoba Village	Ali Yağdı	Via face to face	04/05/2018	Y
F	TEMA	Vedat Kırbaş	Via E-mail ve2003k@hotmail.com	04/05/2018	Y
F	Greenpeace	Hilal Atıcı	Via E-mail and phone hatici@greenpeace.org 0 212 292 76 19	04/05/2018	Y
F	WWF	Asli Pasinli	Via E-mail apasinli@wwf.org.tr/ info@wwf.org.tr 0212 528 20 30	04/05/2018	Y
E	Gold Standard Foundation	Neha Rao	Via E-mail neha.rao@goldstandard.org	04/05/2018	N
F	REEP	Info	Via E-mail info@reeep.org	04/05/2018	N
F	MERCY CORPS	Dorothy Mcintosh	Via E-Mail dmcintosh@uk.mercycorps.org	04/05/2018	N

E.2. Summary of comments received

For simplification, all comments received during the complimentary stakeholder consultation are summarized here:

Complementary Stakeholder Consultation for Renewal Crediting Period:

The general outcome of the stakeholder consultation interview was positive verbally and mukhtar of the 2 villages have given their comment with a letter. (These letters have been provided to the DOE for re-validation process.) That's why there is no need to make physical local stakeholder consultation meeting. The stakeholders stated that they are in favour of the project and underlined the significant contribution of the project to regions sustainable image and stressed the importance of renewable and clean energy everytime.

The feedback request for renewal crediting period has started on 04/05/2018 with sending out the documents to the stakeholders officially, and verbally on the same day the mukhtar of Dedeoba and Sahmelek villages and no feedback has been received until now. The beginning of Complemantary Stakeholder Feedback Round has be announced from the muckhtar's offices, mosques and coffe houses of the Dedeoba and Sahmelek villages. This public leaflet announcement, emails and documents contain information such as location of available these documents, the procedure to commit comments, timing and the contact's details.

During the Complementary Stakeholder Consultation process for Renewal Crediting Period no negative comments have been received regarding the Sah Wind Power Project and no indicator in the sustainability matrix was scored negative, and no significant environmental impacts were identified.

As a general summary, the character of the comments received during complimentary stakeholder process is positive verbally and written. The perception of the predominance of expected positive effects is clearly shown. The stakeholders stated, that the proposed GS VER project activity have not only contributed to a clean and climate friendly path of expanding electricity supply in Turkey but that it has also significantly contributed to sustainable development in Turkey and particularly in the area of the project site.

E.3. Report on consideration of comments received

Comments apart from the meetings

Until the GS registration of the project activity on 2011, no comments from the invited stakeholders apart from the meeting have been received, neither by phone calls, by e-mail, by post nor by fax during the seven operational years.

In addition, all these documents has been made available under the GS registry webpage (www.markit.com) as required by GS4GG

Appendix 1. Contact information of project participants

Organization name	Galata Wind Enerji A.Ş.
Registration number with relevant authority	
Street/P.O. Box	Burhaniye Mah. Kısıklı Cad.
Building	No:65 Üsküdar
City	İstanbul
State/Region	n.a.
Postcode	34664
Country	Turkey
Telephone	+90 216 556 94 24
Fax	+90 216 556 93 27
E-mail	n.a.
Website	http://www.galatawindenerji.com
Contact person	
Title	Vice General Manager
Salutation	Mr.
Last name	Levent
Middle name	Çağrı
First name	Cem
Department	Trading & Operation
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	cagril@doganenerji.com.tr
Organization name	Rüzgar Danışmanlık
Registration number with relevant authority	
Street/P.O. Box	Göztepe Mah. Avcı Sok.
Building	Nursaray Apt.No:1 D:22
City	Kadıköy Istanbul
State/Region	n.a.
Postcode	34720
Country	Turkey
Telephone	+90 216 3550968
Fax	+90 216 3327679
E-mail	cagla@ruzgardanismanlik.net
Website	www.ruzgardanismanlik.net

Contact person	
Title	Managing Consultant
Salutation	Mrs.
Last name	Balcı Eriş
Middle name	-
First name	Çağla
Department	Management
Mobile	-
Direct fax	+90 216 33327679
Direct tel.	+90 216 32176 77
Personal e-mail	cagla@ruzgardanismanlik.net

Appendix 2. Summary of post registration design changes

Revision History

Version	Date	Remarks
1.1	24 August 2017	Updated to include section A.8 on 'gender sensitive' requirements
1	10 July 2017	Initial adoption