Ulu WPP

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Project holder	*Sekans Enerji Limited ŞTİ.*
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Version	*06*
Date	*04/10/2024*
Project type	*GHG Project*
Grouped project	*The project is not a grouped project.*
Applied Methodology	*CDM Approved ACM0002 Grid-connected electricity generation from renewable sources, version 22.0*
Project location (City, Region, Country)	*İnegöl and Keleş districts of Bursa Province, in the Southern Marmara Region of Türkiye*
Starting date	19/12/2020
Quantification period of GHG emissions reduction	19/12/2020 – 18/12/2027 renewable 2 times
Estimated total and average annual GHG emission reduction/removals amount	266,490 tCO_2/year – 1,865,429 tCO2/total
Sustainable Development Goals	***SDG7:*** *Ensure access to affordable, reliable, sustainable and modern energy for all*

	SDG8: *Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all* ***SDG13:*** *Take urgent action to combat climate change and its impacts*
Special category, related to co-benefits	***Target 7.2:*** *By 2030, increase substantially the share of renewable energy in the global energy mix* ***Target 8.5:*** *By 2030, achieve full and productive employment and decent work for all women and men* ***Target 8.8:*** *Protect labor rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.* ***Target 13.3:*** *Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning*

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1 Project type and eligibility

1.1 Scope in the BCR Standard

Ulu WPP is a wind power plant, located in Bursa Province, Türkiye.

The purpose of the Project is to produce renewable electricity using wind as the power source and to contribute to Türkiye's growing electricity demand through a sustainable and low carbon technology. The project will displace the same amount of electricity generated by the grid dominated by fossil fired power plants.

The project is eligible under the scope of the BCR Standard by meeting one of the conditions stated below:

The scope of the BCR Standard is limited to:	
The following greenhouse gases, included in the Kyoto Protocol: Carbon Dioxide (CO_2), Methane (CH_4) and Nitrous Oxide (N_2O).	x
GHG projects using a methodology developed or approved by BioCarbon, applicable to GHG removal activities and REDD+ activities (AFOLU Sector).	
Quantifiable GHG emission reductions and/or removals generated through implementation of GHG removal activities and/or REDD+ activities (AFOLU Sector).	
GHG projects using a methodology developed or approved by BioCarbon, applicable to activities in the energy, transportation and waste sectors.	x
Quantifiable GHG emission reductions generated through implementation of activities in the energy, transportation and waste sectors.	x

Ulu WPP is eligible according to the BCR standard, as it is a project that provides quantifiable CO_2 emission reduction from the electricity generated within the renewable wind power plant project activity, using the ACM0002 v22.0 methodology approved by BCR.

1.2 Project type

Activities in the AFOLU sector, other than REDD+	
REDD+ Activities	
Activities in the energy sector	x
Activities in the transportation sector	
Activities related to Handling and disposing of waste	

1.3 Project scale

The project activity is large-scale as it has an installed power of more than 15 MW.

2 General description of the project

The Ulu WPP (hereafter referred as "Project") is a new built wind power plant, located in Bursa Province, Türkiye owned by Ulu Yenilenebilir Enerji Üretim A.Ş. The generation license of the project was issued by the Energy Market Regulatory Authority (EMRA) on 22/12/2011 for 49 years. The project has an installed capacity of 120.4 MWm/120 MWe and the annual generation is estimated to be 420,000 MWh.

As the electricity generated by the project displaces the electricity generated by Turkish National Grid, the baseline boundary is defined as the Turkish National Grid. This includes the project site and all power plants connected physically to the national grid and excludes the off-grid power plants.

The baseline scenario has been defined as the generation of the same amount of electricity by the national grid which is dominated by thermal power plants. The main emission source of electricity generation in fossil fuel fired power plants that are connected to Turkish National Grid is CO_2 as in baseline scenario. Compared to that baseline scenario, the project activity has positive influences on sustainable development in Türkiye.

The purpose of the Project is to produce renewable electricity using wind as the power source and to contribute to Türkiye's growing electricity demand through a sustainable and low carbon technology. The project will displace the same amount of electricity

generated by the grid dominated by fossil fired power plants. The annual emission reduction estimated by the project is 266,490 tonnes of CO_2. During the crediting period, 1,865,429 tonnes of CO_2 are expected to be reduced.

Project has been developed to have 29 turbines in total. 2 of them are Enercon E-138 EP3 turbines, each having a capacity of 3.5 MWm/3.5 MWe and 27 of them are Enercon E-138 EP3 E2 turbines; 26 of them having a capacity of 4.2 MWm/4.2 MWe and 1 of them having a capacity of 4.2 MWm/3.8 MWe. The electricity is transmitted to substation Orhaneli Transformer Station – İnegöl Transformer Station via a 0.2 km, 154 kV transmission line.

The Project started its commercial operation through the ministry acceptance of 2 turbines with the total installed capacity of 7.0 MWm/7.0 MWe on 19/12/2020[1]. Commissioning dates and powers of the turbines have been shown in the table below:

Table 1. Turbine Specifications

Turbine No.	Type of the Turbine	Power	Commissioning Date
T1	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	02/12/2021
T2	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	12/11/2021
T3	Enercon E-138 EP3	3.5 MW_m / 3.5 MW_e	19/12/2020
T4	Enercon E-138 EP3	3.5 MW_m / 3.5 MW_e	19/12/2020
T5	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	12/11/2021
T6	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	02/12/2021

[1] Ministry Acceptance Protocols

T7	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	02/12/2021
T8	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	25/12/2021
T9	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	14/01/2022
T10	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	25/12/2021
T11	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	14/01/2022
T12	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	25/08/2022
T13	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	22/09/2022
T14	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	25/08/2022
T15	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	13/10/2022
T16	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	13/10/2022
T17	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	30/06/2022
T18	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	30/06/2022
T19	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	28/07/2022

T20	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	28/07/2022
T21	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	28/07/2022
T22	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	22/09/2022
T23	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	24/11/2022
T24	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	24/11/2022
T25	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	01/12/2022
T26	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	01/12/2022
T27	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	03/11/2022
T28	Enercon E-138 EP3 E2	4.2 MW_m / 4.2 MW_e	03/11/2022
T29	Enercon E-138 EP3 E2	4.2 MW_m / 3.8 MW_e	24/11/2022

The project will produce positive environmental and economic benefits through the following aspects:

- Displacing the electricity generated by fossil fuel fired power plants by utilizing the renewable resources so as to avoid environmental pollution and GHG emissions,
- Contributing the economic development of the region by providing sustainable energy resources,

- Increasing the income and local standard of living by providing job opportunities for the local people

The project is expected to contribute SDG 7, 8 and 13[2].

- **Goal 7 Affordable and Clean Energy**

The project produces electricity from renewable energy sources using wind as the power source and to contribute to Türkiye's growing electricity demand through a sustainable and low carbon technology. The project displaces the same amount of electricity generated by the grid dominated with fossil fired power plants.

The project contributes to the following target 7.2. and following indicator 7.2.1.

- **Goal 8 Decent Work and Economic Growth**

During construction and operational period, the project has created employment opportunities for the local community. The project contributes to the economic development of the region by providing sustainable energy resources.

The positions at the wind projects require skilled workers, which will be achieved by adequate training. The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe work environments.

The project contributes to the following targets 8.5.; 8.8.and following indicators 8.5.2.; 8.8.1.

- **Goal 13 Climate Action**

The project contributes to improve the environmental situation in the region and in the country as avoiding fossil fuel-based electricity will enhance the air quality and help to reduce the adverse effects on the climate. Through renewable technologies and wind-based electricity sustainable and climate friendly development is promoted. While

[2] For further information, please see BCR_SDG-Tool_UluWPP.

emission reduction is realized, technology transfer is also realized as benefitting from wind energy.

The project contributes to the following target 13.3. and following indicator 13.3.2.

For the calculation of the emission reductions of the project activity, "Tool to calculate the emission factor of an electricity system" version 07.0.0. is taken into consideration.

2.1 GHG project name

Ulu WPP

2.2 Objectives

Main economic and social benefits of the project includes:

- Displacing the electricity generated by fossil fuel fired power plants by utilizing the renewable resources so as to avoid environmental pollution and GHG emissions,

- Contributing the economic development of the region by providing sustainable energy resources,

- Increasing the income and local standard of living by providing job opportunities for the local people.

2.3 Project activities

Ulu WPP provides electrical energy to the Turkish National Grid by converting wind energy into electrical energy. The Project Scenario entails the installation of 2 Enercon E-138 EP3 turbines, each having a capacity of 3.5 MWm/3.5 MWe, 27 Enercon E-138 EP3 E2 turbines; 26 of them having a capacity of 4.2 MWm/4.2 MWe and 1 of them having a capacity of 4.2 MWm/3.8 Mwe, with total installed capacity of 120 MWe. The reason for reducing the electrical power of the T29 turbine, which is 3.8 MWe, by 0.4 MWe is to avoid exceeding the 120 MWe capacity granted in the license. There are 29 turbines in total in the project activity. The turbines are 3 bladed with a horizontal axis. The turbine blades have the ability to change angles according to wind direction. Turbines are connected to substation Orhaneli Transformer Station – İnegöl Transformer Station via a 0.2 km, 154 kV transmission line to the Turkish National Grid. The metering has been done at Orhaneli TM – İnegöl TM before electricity is fed into the grid.

Table 1 - Key technical specifications of wind turbines[3]

Parameter	**Values**		
Type No	Type 1 turbine	Type 2 turbine	Type 3 turbine
Brand	Enercon	Enercon	Enercon
Model	E-138 EP3	E-138 EP3 E2	E-138 EP3 E2
Number of units	2	26	1
Rated power of a unit	3.5 MWm/3.5 MWe	4.2 MWm/4.2 MWe	4.2 MWm/3.8 MWe
Rotor diameter	138.25 m	138.25 m	138.25 m
Number of blades	3	3	3
Hub Height	111 m	111 m	111 m
Average Lifetime	25 years[4]		

The measurements will be performed by two measuring devices, which are the main (primary) measuring device and the backup (secondary) measuring device. The measuring frequency of both devices is continuous. The meters are placed at the Powerhouse. Technical specifications and serial numbers of the meter are presented in table below:

[3] Ministry Acceptance Protocol (page 5-6)
[4] Default value of on-shore wind turbines according to Tool 10 V1.0

Table 2. Technical details of monitoring equipment

Parameter	Main Meter	Spare Meter
Brand	EMH	EMH
Type	LZQJ-XC-P2FB-BB 1A	LZQJ-XC-P2FB-BB 1A
Accuracy	0.2s	0.5s
Location	At powerhouse	At powerhouse
Serial number	9276687	9276688
Calibration frequency	Every 10 year	Every 10 year
Date of Calibration	28/10/2020	28/10/2020
Calibration Status	Calibrated	Calibrated

The baseline scenario has been defined as the generation of the same amount of electricity by the national grid which is dominated by thermal power plants. The main emission source of electricity generation in fossil fuel fired power plants that are connected to Turkish National Grid is CO_2 as in baseline scenario. Compared to that baseline scenario, the project activity has positive influences on sustainable development in Türkiye.

The project activity utilizes long-term potential of wind energy, efficient technology to reduce GHG emissions as well as to diversify and increasing security of the local energy supply and contributing to a sustainable development. The project contributes to technology and know-how transfer from Germany since the electricity generation technologies in Türkiye are currently dominated by fossil fuel power plants.

Milestones of the project activity can be shown in the table below:

Table 3. Milestones of the project

Milestone	Date
Generation License	22/12/2011
EIA Positive Decision	13/07/2020
Connection Agreement	29/06/2020
System Usage Agreement	19/02/2021
Construction Agreement	03/02/2020
Investment Decision	02/10/2019
Commissioning Date	19/12/2020[5]
Date when the power plant started operating at full capacity	24/11/2022

[5] Earliest commissioning date of the turbines. The commissioning date of all turbines is shown in Section 2 Table 1.

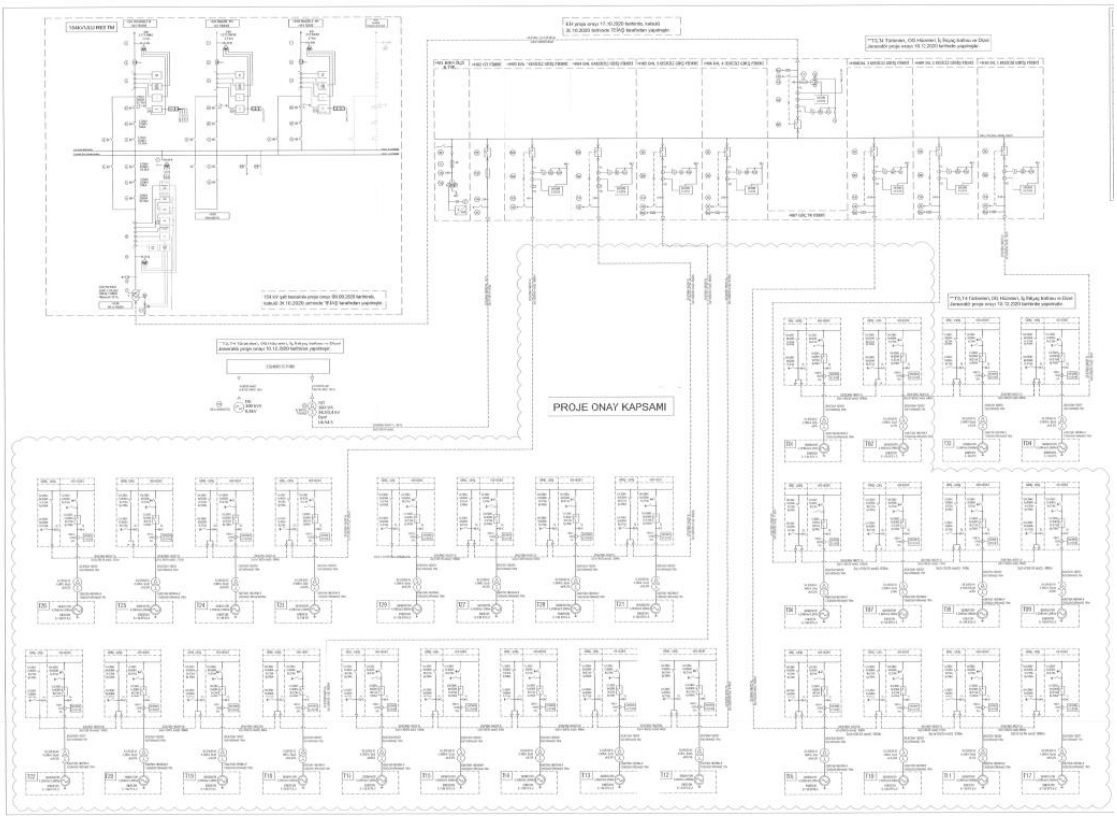

Figure 1. Single Line Diagram of the project activity

Plant Load Factor of the project

According to EB 48 Annex 11; the plant load factor shall be defined ex-ante according to one of the following options:

(a) The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval;

(b) The plant load factor determined by a third party contracted by the project participants.

Since the data used in the PLF calculation are the data taken from the generation license prepared by the government, option (a) is chosen. According to the generation license, the total annual generation of the power plants is 420,000 MWh. Using this value, the PLF is as follows:

PLF = (Annual Generation / 365 days) / (Installed Power x 24 hours)

= (420,000 MWh / 365 days) / (120 MW * 24 hours)

= 1,151 / 2,880 = **40%**

2.4 Project location

The project activity is located within the borders of İnegöl and Keleş Districts of Bursa Province, Türkiye. Coordinates of turbines in DD format is shown in the table below.

Turbine No.	**Latitude**	**Longitude**
T1	39.9097° N	29.3576° E
T2	39.9133° N	29.3675° E
T3	39.9142° N	29.3726° E
T4	39.9150° N	29.3774° E
T5	39.9115° N	29.3789° E
T6	39.9043° N	29.3756° E

T7	39.9093° N	29.3828° E
T8	39.9070° N	29.3857° E
T9	39.9053° N	29.3890° E
T10	39.9106° N	29.3955° E
T11	39.9132° N	29.4035° E
T12	39.9157° N	29.4258° E
T13	39.9186° N	29.4330° E
T14	39.9160° N	29.4364° E
T15	39.9125° N	29.4394° E
T16	39.9111° N	29.4432° E
T17	39.9103° N	29.4088° E
T18	39.9094° N	29.4127° E
T19	39.9076° N	29.4160° E
T20	39.9031° N	29.4170° E
T21	39.9014° N	29.4202° E
T22	39.8982° N	29.4227° E
T23	39.8942° N	29.4242° E

T24	39.8902° N	29.4265° E
T25	39.8848° N	29.4285° E
T26	39.8820° N	29.4315° E
T27	39.8913° N	29.3958° E
T28	39.8907° N	29.4015° E
T29	39.8827° N	29.4075° E

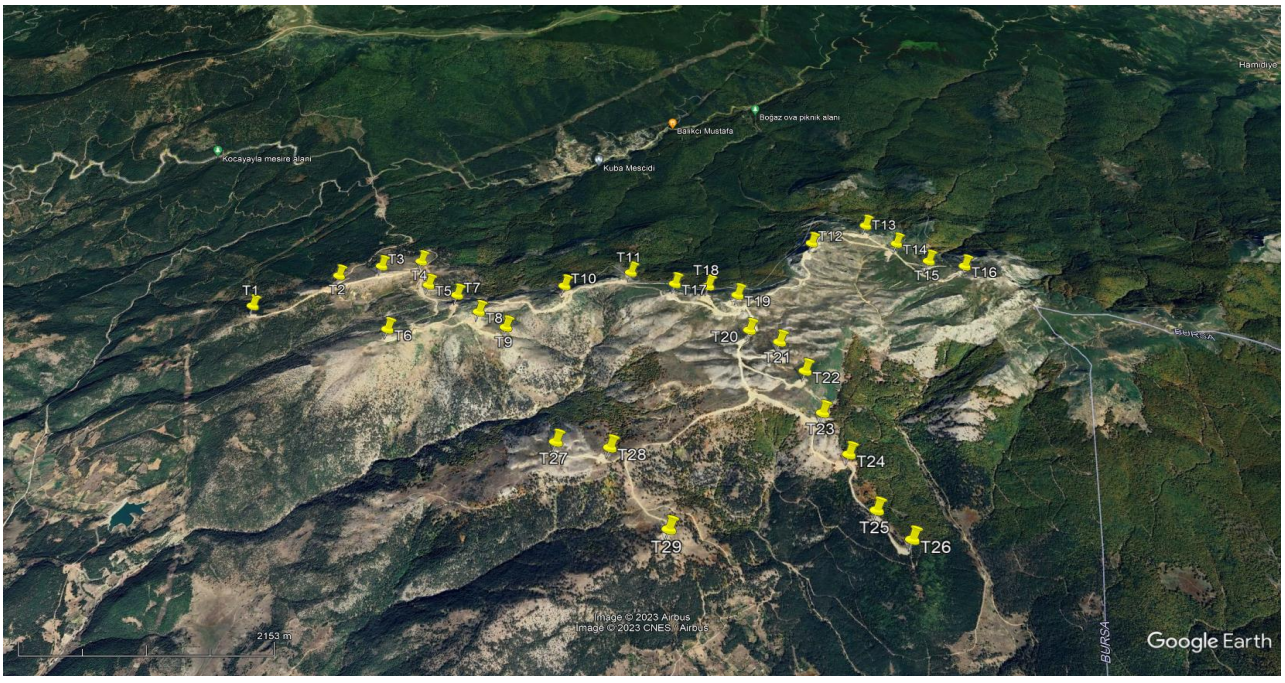

Figure 2. Location of Turbines of Ulu WPP

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2.5 Additional information about the GHG Project

N/A

3 Quantification of GHG emissions reduction

3.1 Quantification methodology

The United Nations approved consolidated baseline methodology applicable to this project is ACM0002: Grid-connected electricity generation from renewable sources --- Version 22.0[6] .

ACM0002 refers to the following tools:

- TOOL 01: Tool for the demonstration and assessment of additionality, version 07.0.0 [7]
- TOOL 07: Tool to calculate the emission factor for an electricity system, version 07.0[8]
- TOOL 10: Tool to determine the remaining lifetime of equipment, version 1.0[9]
- TOOL 24: Common Practice, version 03.1[10]
- TOOL 27: Investment Analysis, version 14.0[11]

Type (methodology, tool, module)	Reference ID	Version	Title
Methodology	ACM0002	22.0	Grid-connected electricity generation from renewable sources
Tool	TOOL01	07.0.0	Tool for the demonstration and assessment of additionality

6 https://cdm.unfccc.int/UserManagement/FileStorage/R0IJ1X9LQ7W2GOYHSMBFCPE3VKZ685
7 https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf
8 https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf
9 https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf
10 https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-24-v1.pdf
11 https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v14.pdf

Tool	TOOL07	07.0	Tool to calculate the emission factor for an electricity system
Tool	TOOL24	03.1	Common Practice
Tool	TOOL27	14.0	Investment Analysis

3.1.1 Applicability conditions of the methodology

The 120.4 MWm / 120 MWe Ulu WPP is a wind power type, greenfield, renewable, grid connected electricity generation project. Since the total installed capacity is above 15 MW,large scale methodology "ACM0002: Grid-connected electricity generation from renewable sources --- Version 22.0" has been used. Applicability criterias and how the project meets these criterias are given in below:

Methodology ID	Applicability condition	Justification
ACM0002	This methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Install a Greenfield power plant; (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plants/units; (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s)	The project activity involves a new installation of a wind power plant. Hence, the methodology is applicable.

	(f) Install a Greenfield power plant together with a grid-connected Greenfield pumped storage power plant. The greenfield power plant may be directly connected to the PSP or connected to the PSP through the grid.	
ACM0002	In case the project activity involves the integration of a BESS, the methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Integrate BESS with a Greenfield power plant; (b) Integrate a BESS together with implementing a capacity addition to (an) existing solar photovoltaic1 or wind power plant(s)/unit(s); (c) Integrate a BESS to (an) existing solar photovoltaic or wind power plant(s)/unit(s) without implementing any other changes to the existing plant(s); (d) Integrate a BESS together with implementing a retrofit of (an) existing solar photovoltaic or wind power plant(s)/unit(s). (e) Integrate a BESS together with a Greenfield power plant that is operating in coordination with a	The project does not involve the integration of a BESS.

	PSP. The BESS is located at site of the greenfield renewable power plant	
ACM0002	The methodology is applicable under the following conditions: (a) Hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit; (b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects) the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity. (c) In case of Greenfield project activities applicable under paragraph 7(a) above, the project participants shall demonstrate that the BESS was an integral part	a) The project is a wind power plant. b) The project does not involve capacity additions, retrofits, rehabilitations or replacements. c) The project does not involve the integration of BESS. d) The project does not involve the integration of BESS. e) The project does not involve the integration of PSP.

	of the design of the renewable energy project activity (e.g., by referring to feasibility studies or investment decision documents); (d) The BESS should be charged with electricity generated from the associated renewable energy power plant(s). Only during exigencies 2 may the BESS be charged with electricity from the grid or a fossil fuel electricity generator. In such cases, the corresponding GHG emissions shall be accounted for as project emissions following the requirements under section 5.4.4 below. The charging using the grid or using fossil fuel electricity generator should not amount to more than 2 per cent of the electricity generated by the project renewable energy plant during a monitoring period. During the time periods (e.g., week(s), months(s)) when the BESS consumes more than 2 per cent of the electricity for charging, the project participant shall not be entitled to issuance of the certified emission reductions for the concerned periods of the monitoring period. (e) In case the project activity involves PSP, the PSP shall utilize the electricity generated from the renewable energy power plant(s) that is operating in coordination	

	with the PSP during pumping mode.	
ACM0002	In case of hydro power plants, one of the following conditions shall apply: (a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or (b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density, calculated using equation (3), is greater than 4 W/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. (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 (7), is lower than or equal to 4 W/m2, all of the following conditions shall	The project is a wind power plant; hence this condition is not applicable.

	apply: (i) The power density calculated using the total installed capacity of the integrated project, as per equation (8), is greater than 4 W/m2 ; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m2 shall be: a. Lower than or equal to 15 MW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project.	
ACM0002	In the case of integrated hydro power projects, project participants shall: (a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or (b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to	The project is a wind power plant; hence this condition is not applicable.

	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 of five years prior to the implementation of the CDM project activity.	
ACM0002	In the case of PSP, the project participants shall demonstrate in the PDD that the project is not using water which would have been used to generate electricity in the baseline.	The project does not involve the integration of PSP.
ACM0002	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;	The project does not involve switching from fossil fuels to renewable energy sources and is not a biomass fired power plant.

	(b) Biomass fired power plants/units.	
ACM0002	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, that is 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 does not involve retrofits, rehabilitations, replacements, and it's not a capacity addition.

For the applicability of "Tool to calculate the emission factor for an electricity system, ver 07.0", following conditions are met:

Tool ID	Applicability condition	Justification
07	This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	The project is a wind power plant providing clean energy to the Turkish National Grid.

07	Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in "Appendix 1: Procedures related to off-grid power generation" should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	The project is a grid connected power plant.
07	In case of CDM projects, the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	As the project is not a CDM project and the BCR program accepts projects from worldwide, this condition is not applicable.

07	Under this tool, the value applied to the CO_2 emission factor of biofuels is zero.	As the project does not involve biofuels, this condition is not applicable.

For the applicability of "Tool for the demonstration and assessment of additionality, Version 07", following conditions are met:

Tool ID	Applicability condition	Justification
01	The use of the "Tool for the demonstration and assessment of additionality" is not mandatory for project participants when proposing new methodologies. Project participants may propose alternative methods to demonstrate additionality for consideration by the Executive Board. They may also submit revisions to approved methodologies using the additionality tool.	Since this tools application is required in the approved methodology, it is used in this project
01	Once the additionally tool is included in an approved methodology, its application by project participants using this methodology is mandatory.	Since this tools application is required in the approved methodology, it is used in this project

For the applicability of "Common Practice, Version 03.1", following conditions are met:

Tool ID	Applicability condition	Justification

24	This methodological tool is applicable to project activities that apply the methodological tool "Tool for the demonstration and assessment of additionality", the methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality", or baseline and monitoring methodologies that use the common practice test for the demonstration of additionality.	Since this tools application is required in the approved methodology, it is used in this project
24	In case the applied approved baseline and monitoring methodology defines approaches for the conduction of the common practice test that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	Since this tools application is required in the approved methodology, it is used in this project

For the applicability of "Investment analysis, Version 14.0", following conditions are met:

Tool ID	Applicability condition	Justification
27	This methodological tool is applicable to project activities that apply the methodological tool "Tool for the demonstration and assessment of additionality", the methodological tool "Combined tool to identify the baseline	Since this tools application is required in the "Tool for the demonstration and assessment of additionality", it is used in this project.

	scenario and demonstrate additionality", the guidelines "Non-binding best practice examples to demonstrate additionality for SSC project activities", or baseline and monitoring methodologies that use the investment analysis for the demonstration of additionality and/or the identification of the baseline scenario.	
27	In case the applied approved baseline and monitoring methodology contains requirements for the investment analysis that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	Applied methodologies in this project does not contain requirements that are different from TOOL 27.

For the applicability of "Tool to determine the remaining lifetime of equipment, Version 1.0", following conditions are met:

Tool ID	Applicability condition	Justification
10	The tool provides guidance to determine the remaining lifetime of baseline or project equipment. The tool may, for example, be used for project activities which involve the replacement of existing equipment with new equipment or which retrofit existing equipment as part of	Since this tools application is referred in the applied methodology, it is used in this project.

	energy efficiency improvement activities. Methodologies referring to this tool should clearly specify for which equipment the remaining lifetime should be determined. The remaining lifetime of relevant equipment shall be determined prior to the implementation of the project activity. Project participants using this tool shall document transparently in the CDM-PDD how the remaining lifetime of applicable equipment has been determined, including (references to) all documentation used. Under this tool, impacts on the lifetime of the equipment due to policies and regulations (e.g. environmental regulations) or changes in the services needed (e.g. increased energy demand) are not considered. Methodologies referring to this tool shall, where applicable, provide specific guidance on how regulations that warrant the replacement of the equipment before it has reached the end of its technical lifetime should be addressed.	

3.1.2 Methodology deviations (if applicable)

There are no deviations from proposed methodologies.

3.2 Project boundaries, sources and GHGs

3.2.1 Spatial limits of the project

"ACM0002: Grid-connected electricity generation from renewable sources --- Version 22.0", a large-scale UNFCCC methodology has been used in this project, along with the "Tool for the demonstration and assessment of additionality, version 07.0.0", "Tool to calculate the emission factor for an electricity system, version 07.0", "Common Practice, version 03.1", "Investment Analysis, version 14.0" methodologies.

The project boundary encompasses the physical, geographical site of the renewable generation source. The wind power plant with all installation is the project boundary.

As the electricity generated by the project displaces the electricity generated by Turkish National Grid, the baseline boundary is defined as the Turkish National Grid. This includes the project site and all power plants connected physically to the national grid and excludes the off-grid power plants. Please see the diagram below:

The figure below provides an overview of the emissions sources included or excluded from the project boundary for determination of baseline and project emissions.

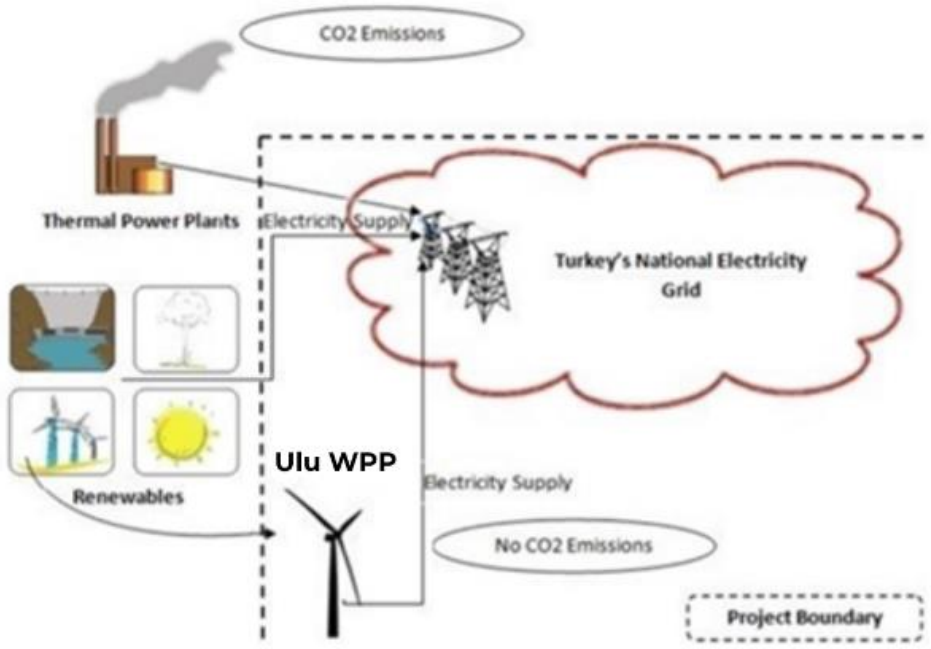

Figure 3. Project Boundary

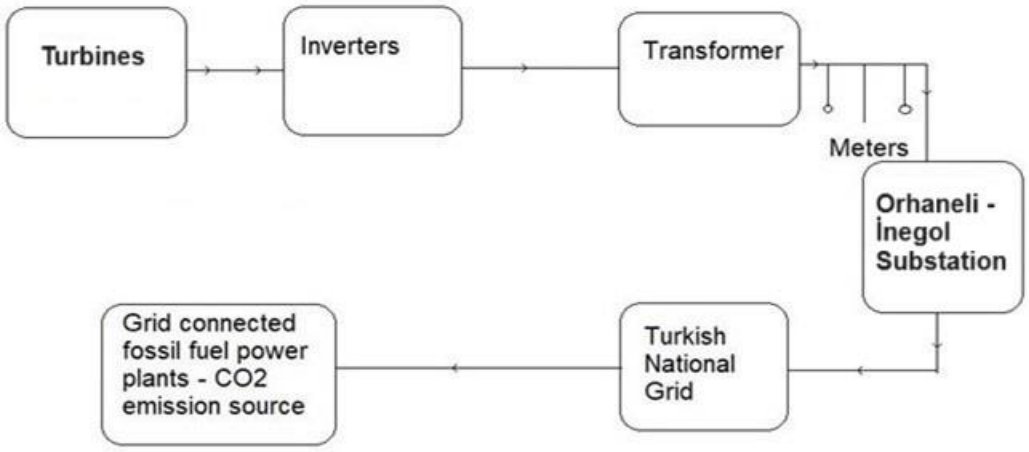

Figure 4. Simple flow diagram of project activity

The table below provides an overview of the emissions sources included or excluded from the project boundary for determination of baseline and project emissions.

3.2.2 Carbon reservoirs and GHG sources

Source or reservoir	GHG	Included (Yes/No/Optional)	Justification
Baseline CO2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.	CO_2	Yes	Main source. The dominant emissions from power plants are in the form of CO2, therefore CO2 emissions from fossil fuel fired power plants connected to the grid will be accounted for in baseline calculations.
	CH_4	No	Minor emission source. Excluded for simplification.
	N_2O	No	Minor emission source. Excluded for simplification.
Project Emissions as a	CO_2	No	Minor emission source. Excluded for simplification.

result of Project Activity	CH_4	No	Minor emission source. Excluded for simplification.
	N_2O	No	Minor emission source. Excluded for simplification.

3.2.3 Time limits and analysis periods

As per BCR Standard v3.4 Section 11.5, "renewable quantification period may be at most seven years and shall be renewed two, for a maximum total length of 21 years". As a result, the project timeframe corresponds to a 7-year period for quantifying GHG emission reductions.

3.2.3.1 Project start date

The start date of the project activity is 19/12/2020, which is the commissioning date of the first turbine that result in reductions/removals of GHG emission begins.

3.2.3.2 Quantification period of GHG emission reductions/removals

The first quantification period is for 7 years, from 19.12.2020 to 18.12.2027, including both dates.

3.2.3.3 Monitoring periods

The first monitoring period of the project will cover the dates between 19.12.2020 to 30.04.2024. Subsequent monitoring periods are planned to occur every 2 years.

3.3 Identification and description of the baseline or reference scenario

According to ACM0002 (Version 22.0), if the project activity is the installation of a new grid-connected renewable power plant, the baseline scenario is the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources.

As it may be seen in Figure 4., The development of Türkiye's installed capacity by primary energy resources between the years, 2009-2019[12] , the electricity generation has mainly been done by fossil fuel fired power plants in Türkiye. Total Installed electricity generation

[12] Turkish Electricity Transmission Corporation, 2020: https://www.teias.gov.tr/tr-TR/turkiye-elektrik-uretim-iletim-istatistikleri

capacity in Türkiye has reached 91,267 megawatts (MW) as of 2019. As having a share of 8.32%, wind power projects have an installed capacity of 7,591.2 MW.

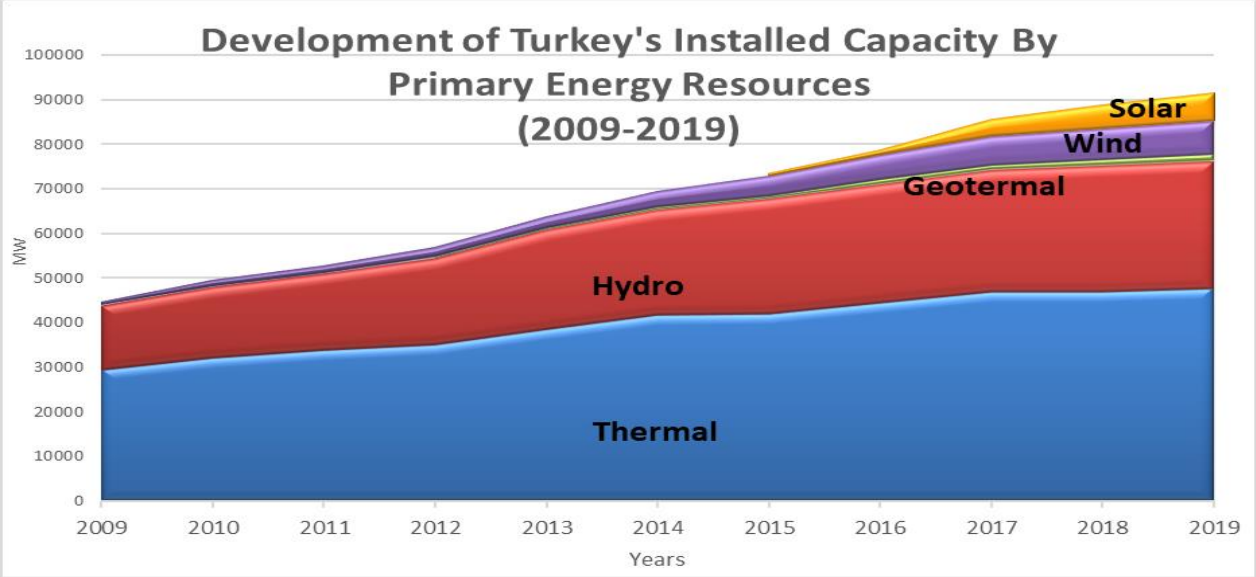

Figure 5. The development of Türkiye's installed capacity by primary energy resources, 2009-2019

Table-4 shows the comparison of renewable electricity generation share in Türkiye total electricity generation and the distribution of the renewable energy resources within this share between the years of 2009 and 2019. It's obvious that the renewable electricity generation has doubled during this period. Hydro has still the biggest share with 67.15%, whereas solar and wind have the portions of 6.99% and 16.43%, respectively. Geothermal and biomass have the smallest portions with 6.77% and 2.66%, respectively.

Table 4. Comparison of Renewable Electricity Generation Share in Türkiye Total Electricity Generation, 2009-2019

YEARS	HYDRO	GEOTERMAL	WIND	SOLAR	BİOMASS	RENEWABLE SHARE IN TOTAL GENERATION %
2009	94.25%	1.14%	3.92%	-	0.69%	19.6%
2019	67.15%	6.77%	16.43%	6.99%	2.66%	43.5%

In reference to 5-year capacity projection[13], it is clear that fossil fuels will remain the main sources for electricity generation through until 2024. Fossil fuels will continue to dominate the market. Hydro will account for 15% of the mix whereas all non-hydro renewable combined (geothermal/ biomass/ solar/ wind) will only account for 11% of all electricity generation capacity. This projection is consistent with continuing fossil fuel dependent characteristics of Turkish electricity sector.

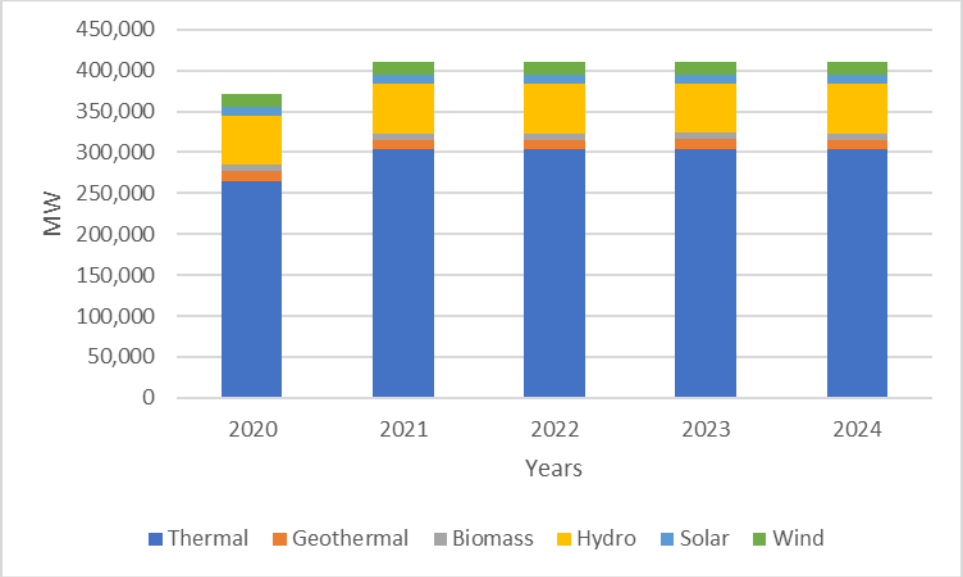

Figure 6. 5-year capacity projection

The latest updated data for Operating, Build and Combined Margin Emission Factors have been published by the Ministry of Energy and Natural resources on 18/03/2024. The Ministry has calculated the factors using the "Tool to calculate the emission factor for an electricity system version 07.0". Since it's the latest available data, published by the Ministry, these factors have been considered.

Calculation of the Operating Margin Emission Factor

[13] https://webapi.teias.gov.tr/file/abeac87d-3abc-4532-9cf4-d6f3a9d34c17?download

It's been published as 0.7279 tCO_2/MWh by the Ministry of Energy and Natural Resources.[14].

Calculation of the Build Margin Emission Factor

It's been published as 0.3541 tCO_2/MWh by the Ministry of Energy and Natural Resources.[15].

Calculating of the Combined Margin Emission Factor

It's been published as 0.6345 tCO_2/MWh by the Ministry of Energy and Natural Resources.[16]

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

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year y (tCO_2/MWh)

$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year y (tCO_2/MWh)

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

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

According to the Tool, for wind power generation project activities;

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

Then:

[14] https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%Boklim/%C4%BoklimDe%C4%9Fi%C5%9Fikli%C4%9Fi/TUESEmisyonFktr/Belgeler/TUESEF_Bilgi_Formu.pdf

[15] https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%Boklim/%C4%BoklimDe%C4%9Fi%C5%9Fikli%C4%9Fi/TUESEmisyonFktr/Belgeler/TUESEF_Bilgi_Formu.pdf

[16] https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%Boklim/%C4%BoklimDe%C4%9Fi%C5%9Fikli%C4%9Fi/TUESEmisyonFktr/Belgeler/TUESEF_Bilgi_Formu.pdf

$EF_{grid,CM,y}$ = 0.7279 tCO_2/MWh * 0.75 + 0.3541 tCO_2/MWh * 0.25 = 0.6345 tCO_2/MWh

3.4 Additionality

According to Biocarbon's "Additionality Guidelines v1.3", "Project holders in sectors other than AFOLU, such as energy, transport, and waste, shall use the Tool provided by the Executive Board of the Clean Development Mechanism (CDM – UNFCCC)."

For demonstrating the additionality of the project, CDM Methodological Tool "Tool for the demonstration and assessment of additionality, v07.0.0" is used.

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

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

The project owner is a well-known company in the power sector and active in generation, wholesale and trading and distribution of electricity. The alternatives are defined related to the investor as per footnote 7 of the version 7.0.0 of the additionality tool:

1) The project activity taken without ACR: The investment is not financially attractive and comprises potential risks as described below. Therefore, this alternative is not realistic.
2) Building a new power plant utilizing other renewable resource: The Electricity Market License Regulation gives priority to local resources with low environmental impact to generate electricity and therefore other renewable resources are considered as alternatives to the proposed project.
3) No activity: In case no project activity is taken, the same amount of electricity will be generated by the existing grid to supply the increasing demand of the country. This alternative is the same as baseline scenario, which is described above as electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

Outcome of Step 1a) The only realistic and credible scenario is that the same amount of electricity will be generated by the existing grid, which is the same as baseline scenario.

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

All alternatives to the project activity are in compliance with the existing laws and regulations which are described below in Table 5

Table 5. Relevant laws and regulations

Relevant Laws	Number/ Enactment Date	Aim and Scope
Environmental Law[17]	Nr. 2872 / 11/08/1983	The approval is requested for power plants from Ministry of Environment and Forest as Electricity License Regulation requests project to be in line with the environmental law.
Electricity Market Law[18]	Nr. 4628 / 03/03/2001	Regulating procedures of electricity generation, transmission, distribution, wholesale, retail for legal entities. Two regulations issued under the law; one for generation licence and the other for market price balancing and conciliation.
Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy[19]	Nr. 5346 / 18/05/2005	Aims to extend the utilization of renewable energy for electricity generation and identifies method and principles for power generation from renewable resources in an economical and conservative manner as well as certification of the electricity generated from renewable resources.
Energy Efficiency Law[20]	Nr. 5627 / 02/05/2007	Identifies method and principles for industry, power plants, residential buildings and transport to imply necessary measures for energy efficiency during electricity generation, transmission, distribution and

[17] https://www.mevzuat.gov.tr/MevzuatMetin/1.5.2872.pdf
[18] https://www.mevzuat.gov.tr/MevzuatMetin/1.5.4628.pdf
[19] https://www.mevzuat.gov.tr/MevzuatMetin/1.5.5346.pdf
[20] https://www.resmigazete.gov.tr/eskiler/2007/05/20070502-2.htm

		consumption.

Outcome of Step1b: The only realistic scenario is the supply of the same amount of electricity from the existing grid, which is in compliance with the laws and regulations.

Step 2 - Investment analysis

The investment analysis below aims to show that "the project activity is not (a) the most economically and financially attractive".

Sub-step 2a - Determine appropriate analysis method

There are three options for investment analysis method:

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

As the project gains revenue from the sale of generated electricity, Simple Cost Analysis is not applicable. Investment Comparison Analysis is also not applicable as no alternative investment is point at issue. Therefore, Benchmark Analysis will be used for the evaluation of the project investment.

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

For the purpose of benchmark analysis Project IRR after tax has been chosen as the indicator.

There are no available benchmarks for wind power plant projects in Türkiye. The credibility of a particular project is evaluated on the basis of several factors including cost recovery period, risk of postponed commissioning and credibility of the project owner.

Local Commercial Lending Rates

As the tool implies local commercial lending rate is appropriate benchmarks for a project IRR after tax, therefore it could be chosen as a benchmark.

The lending rates for medium term investments are provided by Turkish Development Bank (TKB) to State Planning Organization.

State Planning Organization publishes "Main Economic Indicators" on a monthly basis. The lending rates for January-December 2019 have been given in Table-6.

. The lending rates for January-June 2019 have been given in Table-6.

Table 6. Loan Interest rates for medium term investment loans[21]

Turkish Development Bank (TKB) Interest rates for credits		
Date	Month	Medium Term Investment Rate (%)
2019	1	26.3
	2	26.3
	3	26.3
	4	26.3
	5	26.3
	6	26.3

[21] Lending And Deposit Interest Rates by Development Investment Bank of Türkiye (https://www.sbb.gov.tr/wp-content/uploads/2020/07/13-faiz_orani-1.xls)

	7	26.3
	8	26.3
	9	21.5
	10	19.0
	11	16.5
	12	14.5

The investment decision was taken on 2nd October 2019. Therefore, the interest rate for October is 19.0%, which reflects the banker's expectations for a similar investment.

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

The following table summarizes the financial figures for the project operation:

Table 7. Summary of financial data

Parameter used for financial analysis	**Unit**	**Value**	**Source**
Installed Capacity	MWe	120	Generation License
Technical Lifetime	Years	10	TOOL 10 v1.0: https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf
Expected Annual	MWh	420,000	Generation License

Electricity Generation			
Annual Degradation Factor	%	0.6	Renewable Energy Report – Elsevier: https://www.researchgate.net/publication/261600738_How_does_wind_farm_performance_decline_with_age
Transmission Loss	%	1.9	Development of Türkiye's Electricity Production, Consumption and Losses by Years (1993-2019): https://webim.teias.gov.tr/file/512cbf1d-0ca3-4492-b901-3722c7b682f7?download
Expected Average Annual Emission Reduction	tCO2e	243,442	Assumption made by project owner
Total Investment Cost	mUSD	195.96	Renewable Power Generation Costs 2019 - IRENA: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jun/IRENA_Power_Generation_Costs_2019.pdf
Percentage of Turbine Cost	%	69.0	2019 Cost of Wind Energy Review – NREL - https://www.nrel.gov/docs/fy21osti/78471.pdf
Percentage of Construction Expenses	%	7.1	
Percentage of Electrical Infrastructure	%	10.1	

Percentage of Other Costs	%	13.8	
Depreciation	Years	Turbine & EM = 10 Years Construction = 40 Years Electrical Infrastructure = 30 Years	Turkish Revenue Administration - https://www.gib.gov.tr/sites/default/files/fileadmin/user_upload/Yararli_Bilgiler/amortisman_oranlari.pdf
Yearly Operational Cost	mUSD	6.36	1. 2019 Cost of Wind Energy Review – NREL - https://www.nrel.gov/docs/fy21osti/78471.pdf 2. Renewable Power Generation Costs 2019 - IRENA: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jun/IRENA_Power_Generation_Costs_2019.pdf
Fixed Tariff Rate for first 10 years	$/MWh	73.00	Law No: 5346 - https://www.mevzuat.gov.tr/mevzuatmetin/1.5.5346.pdf
Tariff Rate after 10 years	$/MWh	52.97	Average market price for years 2014-2018 published by EPİAŞ: https://seffaflik.epias.com.tr/transparency/piyasalar/gop/ptf.xhtml
Corporate tax rate	%	22	Tax Regulation for 2020 - https://www.vergidegundem.com/pb_kurumlar_vergisi_oranlari

Expected carbon price	$/tCO2e	3	Assumption made by carbon consultant

The investment amount was estimated by applying the weighted average investment amount per kW of wind power plants to be installed in the Eurasia region (1633 USD/kW), which is included in the "2019 IRENA Renewable Power Generation Costs" report. The break-up rates of the investment cost are taken from the "2019 Cost of Wind Energy Review - NREL" report.

For depreciation calculation, the rates published by the Turkish Revenue Administration were used. According to this published document, the turbine depreciation rate is 10 years, construction expenses are 40 years, and the electrical infrastructure rate is 30 years. The depreciation calculation for other expenses is made by distributing these expenses proportionally to other main expenses.

The operational expenses have been estimated by applying the ratio of the LCOE values of wind power plants in the North America (0.051 USD/kW) and Eurasia (0.064 USD/kW) regions from the IRENA report to the annual per kW operational expense value of onshore wind power plants in the NREL report (43 USD/kW). As a result of this calculation, it was predicted that the project would have an annual operational expense of 53 USD/kW, and the annual operational expense value was found by multiplying this value by the installed power. A detailed demonstration of the calculation of operational expense estimations is in Excel Spreadsheet.

For the annual estimated generation, the generation license value of 192,500 MWh was used. To this value, a transmission loss value of 1.9% was applied together with the 0.6% annual degradation factor specified in the 2014 Elsevier report.

In Turkey, a fixed tariff of $73/MWh is applied for the first 10 years to renewable energy plants that have been commissioned until 2021. For the estimation of electricity price after 10 year, the average market price between 2014-2018 published by EPİAŞ was applied.

As the after-tax Project IRR calculated, 2019 corporate tax rate of 22% has been applied.

The after-tax Project Internal Rate of Return (IRR) value of this project is calculated as %7.52 without the VCC Revenue. With VCC revenue, this value increases to 7.97%.

The revenue acquired from the operation of the power plant is not financially attractive to do the investment. Therefore, it is contended that the VCC revenues are required to make the project more financially attractive.

Sub-step 2d - Sensitivity analysis

The sensitivity analysis is applied in order to show that investment decision is not the most attractive alternative financially.

- Investment Cost
- Operating Cost
- Generation
- Tariff Rate

For a range of ±10% fluctuations in parameters above as advised in "Tool for the demonstration and assessment of additionality", Table-8 below has been obtained.

Table 8. Sensitivity analysis for the project IRR

Parameter		-10%	-5%	5%	10%
Investment Cost	w/o ACC Rev.	11.48%	9.6%	6.03%	4.36%
	with ACC Rev.	12.83%	10.93%	7.41%	5.75%
Operational Cost	w/o ACC Rev.	8.96%	8.37%	7.17%	6.54%
	with ACC Rev.	10.25%	9.71%	8.57%	7.98%
Generation Value	w/o ACC Rev.	2.60%	5.29%	10.06%	12.18%
	with ACC Rev.	4.06%	6.70%	11.37%	13.49%
Electricity Price	w/o ACC Rev.	2.60%	5.29%	10.06%	12.18%
	with ACC Rev.	4.22%	6.78%	11.31%	13.38%

Parameter		-10%	-5%	5%	10%
Investment Cost	w/o VCC Rev.	8.82%	8.14%	6.94%	6.42%
	with VCC Rev.	9.31%	8.61%	7.39%	6.85%
Operational Cost	w/o VCC Rev.	7.91%	7.71%	7.32%	7.12%
	with VCC Rev.	8.35%	8.16%	7.78%	7.58%
Generation Value	w/o VCC Rev.	5.89%	6.71%	8.30%	9.07%
	with VCC Rev.	6.33%	7.16%	8.77%	9.54%
Tariff Rate	w/o VCC Rev.	5.89%	6.71%	8.30%	9.07%
	with VCC Rev.	6.38%	6.71%	8.74%	9.50%

It may be seen from the sensitivity analysis, Project IRR value for the proposed project activity is less than the benchmark IRR (19%) for 25 years.

The Project IRR becomes 9.07% with a 10% rise in generation value and electricity

price, 8.82% with a 10% decrease in investment costs and 7.91% with a 10% decrease in operational cost. As a result, one can say that the project could be competitive neither a rise in price of electricity or generation occurs nor the investment cost or operational cost decrease.

The investment cost should decrease by 52% to reach 19%. As can be seen from the sensitivity analysis, it is unlikely that the benchmark will be breached. According to the realized agreements and the trial balance of the company, the actual investment amount of the project is 6% less than the estimated amount. Since the investment has been realized, there is no possibility of further decrease in the investment amount.

Even if we assume there is no operational cost, the project IRR still cannot reach 19%. When the project's 2023 trial balance is examined, it is seen that operational expenses have decreased by 50%.

The energy generation should increase by 82% for IRR to reach 19%. When the power plant's actual electricity generation data is compared with the estimated generation data, it is seen that it generated 93% less electricity in 2021, 55% less in 2022, and 19% less estimated value in 2023. When the risks that may disrupt the generation of the project also considered, it is not expected that the benchmark will be exceeded due to the increase in the 25-year generation value.

The tariff price should increase by 82% reach 19%. As explained in sub-step 2c, the project's sales price of 73 USD/MWh for the first 10 years is fixed. Also, it should be noted that the mentioned tariff rate is not a net tariff rate and there will be losses due to imbalance costs and exchange rate costs etc. After the 10-year fixed tariff price, the project will sell the electricity at the Day-Ahead Market price determined by EPİAŞ. The tariff price for operational years 11-25 was determined by taking the average of the market prices of the last 5 years from EPİAŞ's Transparency Platform. Although it is difficult to estimate the market price after 2030, the 10th operational year of the project, the most appropriate method was used to calculate this value at the investment decision date. Nevertheless, when we consider the current electricity sales price trend, it is seen that it is not a possible scenario for the tariff price to increase enough to exceed the benchmark value.

Considering the realized parameters; even if we consider the most conservative scenario where the investment amount decreases by 6%, the generation value of all years decreases by 19%, the generated electricity sold at the fixed tariff price (73 USD/MWh) after 10 years, and operational expenses decrease by 50.5% in the IRR sheet, it is seen that the Project IRR can only reach 8.56%.

In conclusion, the above benchmark and accompanying sensitivity analysis reveal the

fact that no alternative scenario, with or without VCC revenues, can make the project pass the benchmark IRR expectation. Therefore, the project is not financially attractive without VCC revenue.

Step 3: Barrier analysis

This step is not implemented for the project.

Step 4: Common practice analysis

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

According to the requirements of common practice:

Projects are considered similar if they are in the same country/region and rely on a broadly same technology, are of similar scale and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing.

According to latest statistics published EMRA, there are 679 wind power projects started commercial operation before the investment decision date of the project activity.

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

Since the installed capacity is 120 MWe, the total capacity of power plants which will be included in the analysis will be between 60 MWe – 180 MWe.

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

a) The projects located in applicable geographic area,
b) The projects apply the same measure as the proposed project activity,
c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity,
d) The plants in which the projects are implemented produce goods or services with comparable quality, properties, and applications

areas as the proposed project plant,

e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1,
f) The projects started commercial operation before the project design document is published for global stakeholder consultation or before the start date of the proposed project activity, whichever is earlier for the proposed project activity.

Regarding the conditions:

- Applicable geographical area has been selected as Türkiye.
- Wind energy projects have been selected regarding the same energy source type of projects.
- The selected plants deliver the same service (electricity generation).

Applicable output range has been determined from Electricity Production License Database by EMRA for 2nd October 2019 which is the investment decision date of the project activity.

Table 9. Operational Wind Energy Power Plants Within the Scope of Common Practice

Project	Installed Capacity (MWe)
Soğanlı RES	99.80
Soma RES	120.00
Gülpınar RES	160.00
Saros RES	138.00
Tatlıpınar RES	120.20
Bağlar RES	100.00

Maslaktepe RES	68.40
Edincik RES	77.40
Çerçikaya RES	63.30
Hasanoba RES	76.00
Bergres RES	69.95
Evrencik RES	129.60
Ömerli RES	100.00
Ulu RES	120.00
Sibelres RES	80.00
Geyve RES	129.80
İçdaş Biga RES	60.00
Üçpınar RES	108.60
Fatma RES	70.00
Yahyalı RES	92.85
Denizli RES	91.00
Kuşadası RES	103.50
Kartaldağı RES	63.00
Kangal RES	128.00

Balabanlı RES	96.80
Kocatepe RES	88.00
Süloğlu RES	66.00
Albay Çiğiltepe RES	172.60
Uluborlu RES	60.00
Cerit RES	90.00
Zonguldak RES	120.00
Killik RES	85.00
Aliağa RES	120.00
Geycek RES	168.00
Şah RES	105.00
Bandırma RES	87.00
Aksu RES	80.00
Balıkesir RES	142.50
Çamseki RES	63.10
Poyraz RES	66.90
Kıyıköy RES	99.45
Sebenoba RES	60.00

Yuntdağ RES	60.00
Şamlı RES	126.50
gökçedağ RES	150.60

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

When the CDM projects that are registered, in the validation process, or have submitted for registration are excluded from the projects mentioned in Step 2, 2 projects remain. Therefore, Nall is 2.

Project	Installed Capacity (MWe)
Kuşadası RES	103.5
Albay Çiğiltepe RES	172.6

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

There is no difference in the technology applied in the proposed project activity. Ndiff=0.

As per paragraph 12 of the Tool, projects differ between "investment climate on the date of the investment decision", such as *(ii) Subsidies or other financial flows; (iii) Promotional policies; (iv)* Legal regulations, have been accepted as Ndiff. These projects are Privatized, Autoproducer, owned by a public institution (EUAS) and owned by Build–operate–transfer (BOT) company. Since investment climate was totally different as capital budget was used, subsidies and promotional policies were provided for these projects, they have been classified as Ndiff.

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

- F = 1 – 0/2 = 1
- N_{all} - N_{diff} = 2 - 0 = 2

Since the proposed project activity would be common practice only both of the following conditions apply:

F > 0.2 and N_{all} - N_{diff} > 3

Outcome of Step 5:

Since N_{all} - N_{diff} = 2 the project activity is **not common practice and therefore the project is additional.**

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3.5 Uncertainty management

Emission reduction calculations of the project were made according to the guideline in ACM0002 v22.0. As per the methodology, the calculations should be based on a conservative approach and the monitoring parameters should be described clearly. In accordance to this, the monitoring parameters are described in Section 17.

The emission factor used in emission calculations is calculated and published every year by the Turkish Ministry of Energy and Natural Resources. The latest updated data for Operating, Build and Combined Margin Emission Factors have been published by the Ministry of Energy and Natural resources on 18.03.2024. The Ministry has calculated the factors using the "Tool to calculate the emission factor for an electricity system version 07.0". Since it's the latest available data, published by the Ministry, these factors have been considered.

Calculation of the Operating Margin Emission Factor

It's been published as 0.7279 tCO2/MWh by the Ministry of Energy and Natural Resources.

Calculation of the Build Margin Emission Factor

It's been published as 0.3541 tCO2/MWh by the Ministry of Energy and Natural Resources.

Calculating of the Combined Margin Emission Factor

It's been published as 0.6345 tCO_2/MWh by the Ministry of Energy and Natural Resources.

Another parameter used in emission calculations is the electricity generated by the power plant. The electricity generated in the power plant is measured by main and backup meters at the sub-station. Both meters are jointly inspected and sealed in order to be protected from interference by any of the parties. Authorization of recording and servicing of meters is controlled by the local distribution company.

TEİAŞ is performing remote reading of the meters and monthly power meter readings are the basis for monitoring net electricity fed into the grid. EPİAŞ records will be used as the source of net generated electricity value and meter reading forms or OSF forms issued by TEİAŞ will be used for the crosscheck.

The website of EPİAŞ (https://cas.epias.com.tr/cas/login) is accessible to Project owner with their unique user ID and password. Once accessed, the Project owner is able to call electricity generation and consumption reports of their own projects. The same reports are used by the Project owner for invoicing TEİAŞ. The electricity generation data is reported on a monthly basis.

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

3.6 Leakage and non-permanence

According to ACM0002 v22.0, there is no risk of leakage and/or non-permanence in wind power plants

3.7 Mitigation results

3.7.1 Eligible areas within GHG project boundaries (AFOLU sector projects)

Not applicable since the project is not an AFOLU project.

3.7.2 Stratification (Projects in the AFOLU sector)

Not applicable since the project is not an AFOLU project.

3.7.3 GHG emissions reduction/removal in the baseline scenario

Baseline Emissions

The baseline emissions are to be calculated as follows:

$$\boldsymbol{BEy} = \boldsymbol{EG_{PJ,y}} \times \boldsymbol{EF_{grid,CM,y}} \qquad \text{Equation (1)}$$

where;

$\mathbf{BE_y}$ = Baseline Emissions in year y (tCO_2e)

$\mathbf{EG_{PJ,y}}$ = 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)

$\mathbf{EF_{grid,CM,y}}$ = Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"(tCO_2/MWh)

For greenfield power plants, quantity of net electricity generation is:

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

Where:

$\mathbf{EG_{PJ,y}}$ = 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)

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

Calculation of Combined Margin

Operating, Build and Combined Margin Emission Factors of the Turkish National Grid have been published by the Ministry of Energy and Natural Resources on 18.03.2024. The Ministry has calculated the factors using the "Tool 07: Tool to calculate the emission factor for an electricity system v07.0". Since it's the latest available data, published by the ministry, these factors have been considered.

Calculation of the Operating Margin Emission Factor

It's been published as **0.7279 tCO2/MWh** by the Ministry of Energy and Natural Resources.

Calculation of the Build Margin Emission Factor

It's been published as **0.3541 tCO_2/MWh** by the Ministry of Energy and Natural Resources.

Calculating of the Combined Margin Emission Factor

It's been published as **0.6345 tCO_2/MWh** by the Ministry of Energy and Natural Resources.

The combined margin is calculated ex-ante and has been fixed for the crediting period.

$$BE_y = EG_{facility,y} \times EF_{grid,CM,y}$$

$$= 420{,}000 \times 0.6345$$

$$= 266{,}490\ tCO_2e / year.$$

Project Emissions

As it is stated in ACM0002 v22.0, renewable energy power generation project emissions considered 0.

PEy = 0

Leakage

In accordance with the ACM0002 v22.0, leakage is taken as zero since the project is a new power plant.

LEy = 0.

3.7.4 GHG emissions reduction/removal in the project scenario

According to ACM0002 v22.0 methodology, emission reductions related to project activities is estimated as follows:

ERy = BEy – PEy – LEy

where:

ERy = Emission reductions in year y (tCO_2/yr)

BEy = Baseline emissions in year y (tCO_2/yr)

PEy = Project emissions in year y (tCO_2/yr)

LEy = Leakage emissions in year y (tCO_2/yr)

ERy = BEy - PEy - LEy **Equation (2)**

ERy = 266,490 – 0 – 0

ERy = 266,490 tCO_2

Year	GHG emission reductions/removals in the baseline scenario (tCO_2e)	GHG emission reductions/removals in the project scenario (tCO_{2e})	GHG emissions attributable to leakages (tCO_{2e})	Estimated Net GHG Reduction/Removals (tCO_{2e})
19.12.2020 – 31.12.2020	9,491	0	0	**9,491**
01.01.2021 – 31.12.2021	266,490	0	0	**266,490**
01.01.2022 – 31.12.2022	266,490	0	0	**266,490**
01.01.2023 – 31.12.2023	266,490	0	0	**266,490**
01.01.2024 – 31.12.2024	266,490	0	0	**266,490**
01.01.2025 – 31.12.2025	266,490	0	0	**266,490**
01.01.2026 – 31.12.2026	266,490	0	0	**266,490**
01.01.2027 – 18.12.2027	255,998	0	0	**255,998**
Total	**1,865,429**	**0**	**0**	**1,865,429**

Annual Average	**266,490**	**0**	**0**	**266,490**

The emission reductions of the project were calculated using "ACM 0002 v22.0" and "Tool 07: Tool to calculate the emission factor for an electricity system v07.0". Since these methodologies are compatible with ISO14064-3:2019. The mitigation results achieved as a result of the project activity are verifiable within the framework of ISO 14064-3:2019.

4 Compliance with Laws, Statutes and Other Regulatory Frameworks

The project is not enforced by any laws or regulations. Applicable laws and regulations are listed below:

- Electricity Market Law (Enacted on 30/03/2013)
- Law on Utilization of Renewable Energy Resources for the Purpose of Generation Electricity (Enacted on 18/05/2005)
- Energy Efficiency Law (Enacted on 02/05/2007)
- Environment Law (Enacted on 25/11/2014)
- Forest Law (Enacted on 08/09/1956)

5 Carbon ownership and rights

5.1 Project holder

Individual or organization	**Sekans Enerji Limited ŞTİ.**
Contact person	Sıla Duran
Job position	General Manager
Address	Emniyet Evleri District, Eski Büyükdere Street, No: 1/1 Aparment No: 1B04 Kağıthane/İstanbul, Türkiye
Phone number	-
Email	sila@sekansdanismanlik.com

5.2 Other project participants

Individual or organization	**Ulu Yenilenebilir Enerji Üretim Anonim Şirketi – Legal owner of the project**
Contact person	Zeynep Yarga
Job position	Authorized Signatory
Address	Ankara Street No:222, Gaziosmanpaşa District Gölbaşı/Ankara, Türkiye
Phone number	+90 312 438 11 50
Email	zyarga@guris.com.tr

5.3 Agreements related to carbon rights

The project activity has been developed and operated by project holder, Ulu Yenilenebilir Enerji Üretim Anonim Şirketi. Carbon ownership and rights are only assigned to the project holder Sekans Enerji Limited ŞTİ..

5.4 Land tenure (Projects in the AFOLU sector)

Not applicable since the project is not an AFOLU project.

6 Climate change adaptation

Ulu WPP contributes to climate change adaptation by generating electricity from wind energy, which is a renewable, clean and sustainable source. The project activity reduces the country's reliance on fossil fuels in electricity supply in this manner.

7 Risk management

The project holder assessed the risks related to the implementation of the project activity in terms of environmental, financial and social aspects and mitigation measures have been taken for both construction and operation phase of the project. Identified risks and mitigations are listed in the table below in accordance to the BCR's Permanence and Risk Management Tool v1.1:

Risk Category	Identified Risks	Mitigations
Environmental	Ecosystem Protection	Regarding impact on bird and bats carcasses and nests, Ornithology Report was prepared and it's been reported that no negative impact was considered.
	Wastewater Generation	Wastewater produced by employees during operation is collected in an impermeable septic tank and later they are periodically transferred to wastewater treatment plant.
	Solid Waste Generation	Domestic wastes are properly stored and dispose in accordance with the Waste Management Regulation.
	Hazardous Waste Generation	Oil wastes will be handled appropriately in closed containers and transported by licensed transporters to the licensed processing and disposal facilities.
	Noise Pollution	A Noise Impact Assessment was conducted, and it was concluded that no negative impact was considered.
Financial	Potential Power Price Changes	In Türkiye, a fixed feed-in-tariff is applied for renewable energy power plants for the first 10 years. This prevents renewable power plants from being negatively affected

		financially in case electricity prices change negatively.
Social	Occupational Accidents	All employees receive Occupational Health and Safety training every year. There are warning signs at the power plant against situations that may threaten occupational safety. Within the measures taken, the possibility of occupational accidents has been minimized.
	Negative impacts on locals	During the construction phase of the project, negative effects on the local people regarding the land dispute were prevented by complying with expropriation laws and by keeping in constant communication with the citizens affected by the project site. There is no discrimination based on language, religion, race, or gender among the employees working at the power plant. Any potential negative effects to employees are prevented by complying the Labor Law.

7.1 Reversal Risk

The project will be operated properly throughout its technical lifetime. Periodic maintenance of the equipment in the power plant is carried out regularly.

The main and backup meters, through which the electricity generation will be monitored, are regularly checked by TEİAŞ and calibrated every 2 years. The values read on these meters are monitored every hour, and in case of any inconsistency in the values read on

the main and backup meters, the distribution company intervenes immediately, and the problem is resolved. Within this action plan, there is no possibility that the emission calculations made by the power plant will be wrong.

Any operational risks have been minimized by adhering to relevant laws and regulations and applying routine maintenance activities.

7.1.1 Loss Event Report

If an event occurs that will cause loss or reduction of VCCs, a report regarding this situation will be prepared and submitted within a year.

8 Sustainable development safeguards (SDSs)

The impact of the project activity on environmental and social aspects is shown below based on BioCarbon's SDS Tool v1.0.

Environment

1. Land use: Resource Efficiency and Pollution Prevention and Management

- During the construction phase of the project, negative effects on the local people regarding the land dispute were prevented by complying with expropriation laws and by keeping in constant communication with the citizens affected by the project site.
- Domestic wastes are properly stored and disposed of in accordance with the Waste Management Regulation.
- Wastewater produced by employees during operation is collected in an impermeable septic tank and later they are periodically transferred to wastewater treatment plant.
- Oil wastes will be handled appropriately in closed containers and transported by licensed transporters to the licensed processing and disposal facilities.

2. Water

Due to the nature of the project activity, it does not cause any harm to the surrounding water resources. How to dispose of wastewater is shown in the section above.

3. Biodiversity and Ecosystems

Regarding impact on bird and bats carcasses and nests, an Ornithology Report was prepared, and it's been reported that no negative impact was considered.

4. Climate Change

Ulu WPP contributes to climate change adaptation by generating electricity from wind energy, which is a renewable, clean and sustainable source. The project activity reduces the country's reliance on fossil fuels in electricity supply in this manner.

Social

1. Human Rights

a. Labor and Working Conditions

Employee rights in Türkiye are protected by the Labor Law. According to the Labor Law:

- Forced labor and child labor is prohibited.
- The employer is responsible for the safety of employees and the workplace. In this context, employees of power plants, which are classified as very dangerous workplaces, are required to receive OHS training every year.
- Every employer is obliged to give its employees the rights written in the Labor Law.

b. Gender Equality and Women Empowerment

Project Holder does not discriminate against gender during recruitment. There is no gender discrimination in relations with the local people.

c. Land Acquisition, Restrictions on Land Use, Displacement, and Involuntary Resettlement

During the construction phase of the project, negative effects on the local people regarding the land dispute were prevented by complying with expropriation laws and by keeping in constant communication with the citizens affected by the project site. No local people were forcibly displaced due to the project activity.

d. Indigenous Peoples and Cultural Heritage

There was no damage to the cultural heritage and no harm to indigenous people due to the project activity.

e. Community Health and Safety

Hazardous and domestic wastes generated by the project activity, which may harm the environment and the health of the local people if not disposed of properly, are disposed of properly in accordance with the Waste Management Regulation, thus preventing any harm to the health of the local people.

Areas that would threaten the safety of local people are surrounded by fences. There are warning signs in areas where there may be a safety hazard.

2. Corruption

There is no misuse of funds, fraudulent reporting, conflict of Interest, lack of transparency, weak regulatory oversight, lack of accountability mechanisms, environmental permitting corruption and subcontractor corruption in project activity.

3. Economic Impact

During construction and operational period, the project has created employment opportunities for the local community. The project contributes the economic development of the region by providing sustainable energy resources.

The positions at the wind projects require skilled workers, which will be achieved by adequate training. The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe work environments..

9 Stakeholder engagement and consultation

The promotion of the Ulu WPP project was made on 21/11/2019 with the participation of the local people and the representatives of the relevant institution in Sorgun County, Keles Town of Bursa Province.

Additionally, the participants from the below institutions were participated.

- Ministry Of Environment and Urbanization
- Ministry Of Agriculture and Forestry
- Provincial Directorate of Environment and Forestry

65 people attended the meeting.

The project was introduced to the local people and the questions of the participants were answered.

The announcement letters were put up on the public places and presented in the mukhtar's office. Additionally, the meeting announcement was shared in 2 newspapers, one of which was local, on 7 November 2019. The meetings are comprised of presentation that includes the Project information and a record of comments. To ensure communication of the meeting, project brochures were shared with the heads.

Agenda:

- Introduction of Project Representatives
- Introduction of the project activity
- Assessment of Impact of Project on Sustainability
- Q&A Session and Feedbacks

Local stakeholders were also informed on environment and social impacts on SDG elements of the project during the meetings.

It is important for the Project Owner to monitor the on-going stakeholder engagement process to ensure that consultation and disclosure efforts are effective, and stakeholders delivering grievances have been meaningfully consulted throughout the process. Therefore, the Stakeholder Engagement Plan is executed by the Project Owner.

Local stakeholders were also informed on environment and social impacts on SDG elements of the project during the meetings.

9.1 Summary of comments received

Stakeholders considered clear signs of climate change in the region in recent years. The common outcome of the stakeholder consultation was positive, and stakeholders were in favor of the Project. Local people were employed during construction and are being employed during operation. Contribution to the local economy and leading to improvement in living standards were also supported by the stakeholders. There was no negative comment from the participants during the meeting.

9.2 Consideration of comments received

The contact information of the plant responsible was shared with the stakeholders and it was stated that the project owner and local community would always be in touch. Additionally, the participants were informed about the ongoing grievance process.

10 Sustainable Development Goals (SDGs)

The project is expected to contribute SDG 7, 8 and 13.

- **Goal 7 Affordable and Clean Energy**

The project produces electricity from renewable energy sources using wind as the power source and to contribute to Türkiye's growing electricity demand through a sustainable and low carbon technology. The project displaces the same amount of electricity generated by the grid dominated by fossil fired power plants.

The project contributes to the following target 7.2. and following indicator 7.2.1.

- **Goal 8 Decent Work and Economic Growth**

During construction and operational period, the project has created employment opportunities for the local community. The project contributes to the economic development of the region by providing sustainable energy resources.

The positions at the wind projects require skilled workers, which will be achieved by adequate training. The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe work environments.

The project contributes to the following targets 8.5.; 8.8.and following indicators 8.5.2.; 8.8.1.

- **Goal 13 Climate Action**

The project contributes to improve the environmental situation in the region and in the country as avoiding fossil fuel-based electricity will enhance the air quality and help to reduce the adverse effects on the climate. Through renewable technologies and wind-based electricity sustainable and climate friendly development is promoted. While emission reduction is realized, technology transfer is also realized as benefitting from wind energy.

The project contributes to the following target 13.3. and following indicator 13.3.2.

11 REDD+ Safeguards (For REDD+ projects)

Not applicable

12 Special categories, related to co-benefits (optional)

Not applicable

13 Grouped projects (if applicable)

Not applicable

14 Other GHG program

The project had a submission for Global Carbon Council on 15 December 2023, however, it was decided to abandon this submission and move on to registration for BCR. Since there is no de-registration procedure in GCC yet, the submission has not been officially canceled, but there will be no registration request within this submission and this submission will be officially canceled when GCC's de-registration procedure is published.

Ulu Yenilenebilir Enerji Üretim Anonim Şirketi hereby confirms that Ulu Yenilenebilir Enerji Üretim Anonim Şirketi will not seek to issue any GHG instruments under the Global Carbon Council for the crediting period for which we will request VCC through the BioCarbon Registry

15 Double counting avoidance

No GHG related environmental credits are applied to the Turkish power sector. Also, the "Ulu WPP" is not included in an ETS or other GHG trading mechanism. Since an ETS is not implemented in Türkiye, an emission reduction cap has not been enforced for any sector. As an ETS is not implemented in Türkiye, no double-counting risk exists for Türkiye and this project

This information is confirmed in the no-double counting declaration by Sekans Enerji Limited ŞTİ..

If any such risk of double counting exist in Türkiye, the Project Holder (Sekans Enerji Limited ŞTİ.) shall retire eligible units equal to the quantity of VCCs in accordance to BCR's Avoiding Double Counting (ADC) Tool v2.0

16 Monitoring plan

The Project Owner will be responsible for the overall management of the monitoring procedures including recording, data collection and storage. The project owner is also responsible for the administration of the data, setting up a carbon team who is responsible for monitoring all data required to estimate emission reductions. The emission reductions based on these monitored data will also be calculated by the Project Owner.

According to the methodology applied, the electricity supplied to the national grid by the project and the electricity consumed by the project activity shall be monitored. The net electricity is the difference between the electricity supplied and consumed by the project and shall be taken into account for emission reduction calculations.

Two power meters are installed at the grid interface of the project. One is the main meter, and the other is the back-up meter of the main meter for cross-checking. Both meters are jointly inspected and sealed in order to be protected from interference by any of the parties.

The capacity of the transmission line connected is 154 kV, the accuracy class for main power meters have been defined in the Communiqué for Power Meters as 0.2S-0.5S class. The calibration will be implemented in accordance with the related standard procedures (IEC-EN 62053-22 and 62053-23) by either Turkish Electricity Transmission Corporation (TEIAS) or the provider company in the name of TEIAS. The meters are calibrated every ten years. Additionally, the meters are tested every two years.

Corrective actions and emergency preparedness: The Project Owner regularly check the monitoring system on errors. In the case of errors, corrective actions will be undertaken by the Project Participant, or if required, by the supplier of the monitoring equipment

TEIAS is performing remote reading of the meters and monthly power meter readings are the basis for monitoring net electricity fed into the grid. EPIAS records will used as the source of net generated electricity value and meter reading forms or OSF forms issued by TEIAS will be used for the crosscheck.

The website of EPIAS (https://cas.epias.com.tr/cas/login) is accessible to Project owner with their unique user ID and password. Once accessed, the Project owner is able to call electricity generation and consumption reports of their own projects. The same reports

are used by the Project owner for invoicing TEIAS. The electricity generation data is reported monthly basis.

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

Data and Parameters fixed during the crediting period

Data / Parameter	$\mathbf{EF_{grid,CM,y}}$
Unit	tCO2 / MWh
Description	Combined Margin Emission Factor of the Turkish National Grid. It's been published by Turkish Ministry of Energy and Natural Sources for 2021 on 18/03/2024.
Source of data	Turkish Ministry of Energy and Natural Sources. See: https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%Boklim/%C4%BoklimDe%C4%9Fi%C5%9Fikli%C4%9Fi/TUESEmisyonFktr/Belgeler/TUESEF_Bilgi_Formu.pdf
Value applied	0.6345
Justification of choice of data	Official data published by Host Country's Ministry of Energy and Natural Sources.
Purpose of Data	Calculation of baseline emissions.
Comments	The emission factor is fixed ex-ante; thus, no monitoring and recalculation of the emissions factor during the crediting period is required

Data / Parameter	**$EF_{grid,OM,y}$**
Unit	tCO2 / MWh
Description	Operating Margin Emission Factor of the Turkish National Grid. It's been published by Turkish Ministry of Energy and Natural Sources for 2021 on 18/03/2024.
Source of data	Turkish Ministry of Energy and Natural Sources. See: https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%Boklim/%C4%BoklimDe%C4%9Fi%C5%9Fikli%C4%9Fi/TUESEmisyonFktr/Belgeler/TUESEF_Bilgi_Formu.pdf
Value applied	0.7279
Justification of choice of data	Official data published by Host Country's Ministry of Energy and Natural Sources.
Purpose of Data	Calculation of baseline emissions.
Comments	The emission factor is fixed ex-ante; thus, no monitoring and recalculation of the emissions factor during the crediting period is required

Data / Parameter	**$EF_{grid,BM,y}$**
Unit	tCO2 / MWh
Description	Build Margin Emission Factor of the Turkish National Grid. It's been published by Turkish Ministry of Energy and Natural Sources for 2021 on 18/03/2024.

Source of data	Turkish Ministry of Energy and Natural Sources. See: https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%Boklim/%C4%BoklimDe%C4%9Fi%C5%9Fikli%C4%9Fi/TUESEmisyonFktr/Belgeler/TUESEF_Bilgi_Formu.pdf
Value applied	0.3541
Justification of choice of data	Official data published by Host Country's Ministry of Energy and Natural Sources.
Purpose of Data	Calculation of baseline emissions.
Comments	The emission factor is fixed ex-ante; thus, no monitoring and recalculation of the emissions factor during the crediting period is required

Data and Parameters monitored

Data / Parameter	**$EG_{PJ,y}$**
Unit	MWh/yr
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data	Meters
Value applied	The annual electricity fed to the grid is estimated as 420,000 MWh

<table>
<tr><td>Justification of choice of data</td><td>The net electricity value supplied to the grid is continuously measured by on-site power meters and recorded monthly. EPİAŞ (which is an association of TEİAŞ) records provide the exact electricity value delivered to the grid. These values are cross-checked with the on-site meter records.

The generation data is recorded by two metering devices continuously. ISVM (Electricity fed to the grid) and UECM (Electricity consumed from the grid) are measured. Net generation is calculated by substracting UECM from ISVM.</td></tr>
<tr><td>Monitoring Frequency</td><td>Monthly</td></tr>
<tr><td>Monitoring Equipment</td><td>
<table>
<tr><th colspan="3">Ulu WPP</th></tr>
<tr><th>Parameters</th><th>Main Meter</th><th>Spare Meter</th></tr>
<tr><td>Brand</td><td>EMH</td><td>EMH</td></tr>
<tr><td>Type</td><td>LZQJ-XC-P2FB-BB 1A</td><td>LZQJ-XC-P2FB-BB 1A</td></tr>
<tr><td>Location</td><td>On-site</td><td>On-site</td></tr>
<tr><td>Serial Number</td><td>9276687</td><td>9276688</td></tr>
<tr><td>Accuracy</td><td>0.2S</td><td>0.5S</td></tr>
<tr><td>Latest Test Date</td><td>28/10/2020</td><td>28/10/2020</td></tr>
</table>
</td></tr>
<tr><td>Purpose of Data</td><td>Calculation of baseline emissions.

To assess to contribution to SDG7.</td></tr>
</table>

QA/QC	• Back-up meters are used for crosschecking the accuracy and all meters are periodically tested. • 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 fulfill, which are categorized according to the installed capacity. The periodical test or maintenance is under the responsibility of TEİAŞ. Since TEİAŞ meters are sealed by distribution company 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
Comments	-

Data / Parameter	**ER_y**
Unit	tCO_2/yr
Description	Emission reductions by the project activity in year y (t CO_2/yr) In accordance with ACM0002, Version 22.0, baseline emissions include CO2 from electricity generation in power plants that are displaced due to the project activity. And baseline emissions correspond to emission reductions and are calculated as the net electricity generated by the project activity, multiplied with combined margin CO2 emission factor for grid connected power generation in year y.
Source of data	1. Meters

	2. Turkish Ministry of Energy and Natural Sources. See: https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%Boklim/%C4%BoklimDe%C4%9Fi%C5%9Fikli%C4%9Fi/TUESEmisyonFktr/Belgeler/TUESEF_Bilgi_Formu.pdf
Value applied	266,490
Justification of choice of data	1. The net electricity value supplied to the grid is continuously measured by on-site power meters and recorded monthly. EPİAŞ (which is an association of TEİAŞ) records provide the exact electricity value delivered to the grid. These values are cross-checked with the on-site meter records. 2. Official data published by Host Country's Ministry of Energy and Natural Sources
Monitoring Frequency	Monthly
Purpose of Data	Calculation of baseline emissions. To assess to contribution to SDG13.
QA/QC	The QA/QC procedure for the $EG_{PJ,y}$ parameter will be applied the same for this parameter.
Comments	-

Data / Parameter	**Number of Employment**
Unit	Number

Description	Number of people permanently working for the operation of the project
Source of data	Social Security System (SGK) records
Value applied	8
Justification of choice of data	Checking the employment records to confirm the number of employment
Monitoring Frequency	Annually
Purpose of Data	To assess to contribution to SDG8.
QA/QC	N/A
Comments	-

Data / Parameter	**Quality of Employment**
Unit	Number of training provided
Description	Number of OHS and job-related training provided to the employees
Source of data	Training Record
Value applied	At least one training per year
Justification of choice of data	OHS training is provided to all employees working at the power plant. It is mandatory to provide OHS training to employees at least once a year.

	Certificates of OHS training will be stored in the site area during the operation period. According to "Regulation on the Procedures and Principles of Employee's OHS Training" in official gazette No. 28648 on 15/05/2013, it is responsibility of PO to provide regular OHS trainings to employees. In addition to OHS trainings, the project owner provided job-related training the employees.
Monitoring Frequency	Each monitoring period.
Purpose of Data	To assess to contribution to SDG 8.
QA/QC	N/A
Comments	-

NOTE: This Project Document (PD) shall be completed following the instructions included. However, it is important to highlight that these instructions are complementary to the BCR STANDARD, and the Methodology applied by the project holder, in which more information on each section can be found.