



Draft Report

Mid Size Sustainable Energy Financing Facility (MidSEFF)
Çakıl Wind Power Plant:
Non-Technical Summary (NTS)

May 2018

AKBANK

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This report has been prepared by “Golder Associates Ltd. Şti.” and reviewed by “Stantec Mühendislik ve Müşavirlik Ltd. Şti.”, for the European Bank for Reconstruction and Development (EBRD) in relation to the above-captioned project and is confidential to the client. Neither the Companies nor any person acting on their behalf, including any party contributing to this report, makes any warranty, expressed or implied, with respect to the use of any information disclosed in this report; or assumes any liability for direct, indirect or consequential loss or damage with respect to the use of any information disclosed in this report. Any such party relies upon this report at their own risk.

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Acronyms

BERN	Bern Convention
CITES	The Convention on International Trade in Endangered Species of Wild Fauna and Flora
CR	Critically Endangered
EAR	Ecosystem Assessment Report
EBRD	European Bank of Reconstruction and Development
EIA	Environmental Impact Assessment
EMRA	Energy Market Regulatory Authority
EN	Endangered
ESMP	Environmental Management Plan
ETL	Energy Transmission Line
GIS	Geographical Information System
IUCN	The International Union for Conservation of Nature
KBA	Key Biodiversity Area
LC	Least Concern
MidSEFF	Mid-Size Sustainable Energy Financing Facility
MoFWA	Ministry of Forestry and Water Affairs
MWe	Megawatt electrical
MWm	Megawatt mechanical
PA	Project Advisor
PC	Midseff Project Consultant
PIR	Project Information Report
SACs	Special Areas for Conservation
SEP	Stakeholder Engagement Plan
TEİAŞ	Turkish Electricity Transmission Company
The Sponsor	Demirer Group
The Sub-borrower	Güvenres Enerji Elektrik Üretim A.Ş.
TS	Transfer Station
UTM	Universal Transverse Mercator
VOR	VHF Omni-directional Radio Range
WPP	Wind Power Plant
VU	Vulnerable

1. General Plant Description

The Çakıl Wind Power Plant (WPP) project is composed of 14 wind turbines to be realized under the legal status of the Güvenres Enerji Elektrik Üretim A.Ş. (The Sub-borrower) established to build and operate the WPP project located in the Bursa and Yalova Provinces. The Sponsor of the project is the Demirer Group.

The Çakıl WPP project area is located in the Bursa and Yalova Provinces. 1 turbine (T1) is located in the Çınarcık District and 3 turbines (T2, T4 and T5) are located in the Armutlu District of the Yalova Province. Other turbines (T3, T6, T7, T8, T9, T10, T11, T12, T13, and T14) are located in the Gemlik District of the Bursa Province. The location of the WPP project is shown in Figure 1-1.

The project area is classified as forest area and in a natural status with no particular evidence of human structures and infrastructure. Additionally, there are some private agricultural lands within the project site boundaries.

The Çakıl WPP project with 44 wind turbines and 88 MWe total installed capacity was previously granted with the “EIA not required” decision by the letter of the Yalova Provincial Directorate of Environment and Urbanization dated 6th July 2009. The project was revised by the Energy Market Regulatory (EMRA) following to the “EIA not required” decision. As a consequence, the revised project had 17 wind turbines and 31.55 MWe total installed capacity. Finally, the General Directorate of State Airports has indicated in the letter dated 19th April 2013 that installation of 3 wind turbines is not allowed since the turbines will impact the VHF Omni-directional Radio Range (VOR) signals.

For the final configuration, the Project Information Report (PIR) for the Çakıl WPP with 14 wind turbines and 31.55 MWe total installed capacity was prepared in June 2013. Subsequent to the submission of the PIR to the Bursa Provincial Directorate of Environment and Urbanization, the project has been granted with the “EIA not required” decision by the letter of the Bursa Provincial Directorate of Environment and Urbanization dated 21st June 2013.

The Sponsor has obtained the Electricity Production Pre-License dated 3rd September 2014 (amended on 19.03.2015) for the Çakıl WPP project and shared them with the Golder PA (Project Advisor) and MidSEFF PC (Project Consultant).

The connection agreement process will be completed with Turkish Electricity Transmission Company (TEİAŞ) after obtaining the production license from EMRA.

The generators and nacelles of the wind turbines will be purchased from the Enercon GmbH in Germany. The towers and blades will be produced in Turkey. Technical characteristics of the project provided by the Sponsor are given below:

- Turbines;
 - 2 x Enercon E-92, 2.0 MWm, 85 m steel tower,
 - 5 x Enercon E-92, 2.0 MWm, 78 m steel tower,
 - 7 x Enercon E-126 EP3, 4.0 MWm, 99 m steel tower.
- Total installed capacity: 31.55 MWe / 41.2 MWm;
- Expected electricity production (P75): 103 million kwh/year.

A new Energy Transmission Line (ETL) will not be constructed for the connection to the electricity distribution system. A connection will be made to the existing 154 kV ETL which provides the connection of the Kürekdağı WPP to Yalova WPP– Orhangazi TS (Transfer Station).

New roads will be constructed within the scope of the project. In addition, some of the village roads will be improved to provide transfer of the blades to the turbine locations.

The closest settlements are the Haydariye Neighbourhood and the Selimiye Village, which are approximately 800 meters and 1,100 meters distant from the T13 and T5 turbines, respectively.



Figure 1-1: General Layout of Çakıl WPP

Several existing and planned WPPs are present in the surrounding area (Figure 1-2), of those plants the nearest existing (the Küredağı WPP) is located 2 km distant to the Çakıl WPP. The Yalova WPP is another nearby project, which is approximately located 4 km distant to the Çakıl WPP.

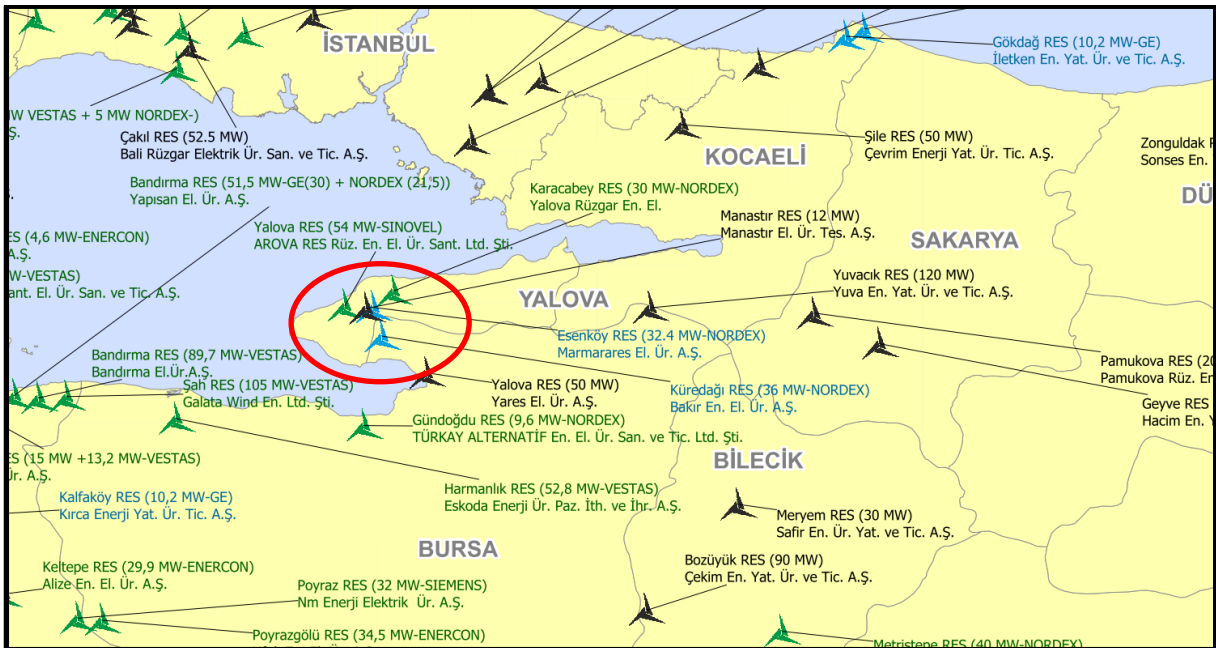


Figure 1-2: The Location of the Çakıl WPP and Other WPPs around the Project Area

The coordinates in UTM (ED50 datum) of the proposed turbines according to the Electricity Production Pre-License (amended on 19th March 2015) are given in Table 1-1 below.

Table 1-1: The Coordinates in UTM (ED50 Datum) of the Proposed Turbines

Turbine	Easting	Northing
T1	678293.846	4496472.904
T2	669434.780	4490264.236
T3	670411.355	4489158.773
T4	669625.140	4488287.420
T5	669507.995	4486720.610
T6	670371.937	4487174.546
T7	671309.095	4487086.687
T8	677005.255	4490923.175
T9	678308.489	4491303.895
T10	680045.229	4488635.150
T11	681829.757	4487996.245
T12	682314.443	4487996.245
T13	681543.351	4486652.342
T14	686037.717	4488536.010

2. Environmental and Social Baseline

2.1 Environmental Description of the Project Area

The Çakıl WPP project is planned to have total installed capacity of 31.55 MWe/41.2 MWm and annual electricity generation of 103 million kwh/year (P75). The WPP project is composed of 14 wind turbines located in the Bursa and Yalova Provinces. Expected completion date is September 2018 for the first part of the project (“the provisional acceptance” will be obtained in September 2018) and 7 turbines out of 14 will start to generate electricity after the provisional acceptance). Expected completion date for the second part of the project will be March 2019. The expected operation date will be April 2019 for the second part.

Summary of the environmental characteristics of the extension project is given below.

Table 2-1: Summary of Environmental Characteristics

ENVIRONMENTAL ASPECTS	PRESENCE /DISTRIBUTION	COMMENTS
Land use	The plant location is within the forest areas and some private lands (agricultural lands).	<p>According to the information provided by the Sponsor, the project area belongs to the General Directorate of Forestry and the Sponsor has received the necessary Forest Permit from the General Directorate. The Sponsor has applied to the related Authority with the letter dated 14th December 2017 in order to extend the expiration date of the initial Forest Permit and the expiration date was extended until 19th June 2018.</p> <p>Expropriation is carried out for private lands by EMRA in line with the council of Ministers' decision for the private (agricultural) lands, where the site access roads are located. No physical resettlement actions are needed.</p> <p>A new Energy Transmission Line (ETL) will not be constructed for the connection to the electricity distribution system. A connection will be made to the existing 154 kV ETL which provides the connection of the Kürekdağı WPP to Yalova WPP– Orhangazi TS (Transfer Station).</p>
Water surfaces	İznik Lake is 13.5 km distant to the project site.	There will not be any interaction with any water surface area during the project works.
Protected areas	<p>The PIR highlights that there are no important cultural goods/heritage sites/finds in the project area.</p> <p>According to the Geographical Information System (GIS) data of the Ministry of Forestry and Water Affairs (MoFWA), there are several conservation sites around the Çakıl WPP project site including Delmece Natural Park (0.4 km to T12) and Harmankaya Nature Park (4.5 km to T1 and T9).</p> <p>The project area is located in the Armutlu Peninsula Key Biodiversity Area (KBA) defined by Doğa Derneği (Non-Governmental Organization), which is a partner of</p>	<p>There is not any interaction with any legal protected areas during the project works.</p> <p>According to the table of the Doğa Derneği, there is not any regional/local endemic bird species in the KBA. All of the important species in the KBA are classified as “LC” except <i>Coracias garrulous – Europe</i> listed as “VU”. Bird Monitoring of the project area also covering the related species (<i>Coracias garrulous – Europe</i>) during the next bird monitoring activities is required, just in case.</p>

	Birdlife International.	
<p>Flora and Fauna</p>	<p>According to the Ecosystem Assessment Report (EAR) dated April 2016, none of the flora species found at the project site are classified under CITES or the BERN Convention lists. However, 8 endemic flora species (<i>Eryngium bithynicum</i> Boiss., <i>Centaurea consanguinea</i> DC., <i>Geropogon hybridus</i> (L.) Schultz Bip., <i>Onosma bracteosum</i> Hausskn. Et Bornm., <i>Campanula betonicifolia</i> Sm., <i>Stachys cretica</i> L. subsp. <i>anatolica</i> Rech. Fil., <i>Scrophularia cryptophila</i> Boiss. Et Heldr. and <i>Verbascum parviflorum</i> Lam.), classified as Least Concern (LC) according to IUCN categorization, have been found at the project site. It is indicated in the report that the related endemic flora species are wide-spread in most regions of Turkey and that the project will not create pressure on continuity of these species. According to the study, there is no flora species classified as Critically Endangered (CR). According to the study, three fauna species (<i>Testudo graeca</i>, <i>Vulpes vulpes</i> and <i>Ursus arctos</i>) are listed under CITES. There is no fauna species classified as Critically Endangered (CR) or Endangered (EN). There are 17 fauna species listed under Annex I and 9 species are listed under Annex II of the BERN Convention.</p> <p>The bird monitoring studies indicates that the turbine locations are close to the bird migration routes. According to the Spring and Autumn 2017 Bird Monitoring Reports, the bird migration routes change seasonally.</p>	<p>Seasonally (once in 3 months) bird monitoring studies will be conducted for the first 2-years of the operation. The bird monitoring will be proceeded during the construction period as well. Barrier effect of wind turbines must be observed during the monitoring studies in operation phase.</p> <p>A bird monitoring study is required conducted immediately after construction of the turbines. According to the outcomes of this monitoring studies, critical turbines will be determined considering the collision impact and required measures must be defined.</p>

2.2 Social Condition of the Project Area

The WPP project is located in the Gemlik District of the Bursa Province and Çınarcık & Armutlu Districts of the Yalova Province. According to the 2017 statistics, the population of the Bursa and Yalova Provinces are 2,936,803 and 251,203, respectively. According to the same statistics, the population of the Gemlik, Çınarcık and Armutlu Districts are 109,494; 32,590 and 8,848 respectively.

The closest settlements are the Haydariye Neighbourhood and the Selimiye Village, which are approximately 800 meters and 1,100 meters distant from the T13 and the T5 turbines, respectively.

The major part of the project area belongs to the Ministry of Forestry and Water Affairs (MoFWA). A Final Forest Permit was received from the Bursa Regional Directorate of Forestry in compliance with Forest Law No. 6831 on 17.10.2017 for a 654,434.08 m² area. According to the information provided by the Sponsor, the project area belongs to the General Directorate of Forestry and the Sponsor has received the necessary Forest Permit from the General Directorate. The Sponsor has applied to the related Authority with the letter dated 14th December 2017 in order to extend the expiration date of the initial Forest Permit and the expiration date was extended until 19th June 2018.

Land acquisition/expropriation process for the construction of new roads is carried out by the EMRA according to the related national regulations. No physical resettlement actions are needed.

The PIR highlights that there are no important cultural goods/heritage sites/finds in the project area.

3. Social and Environmental Impacts

3.1 Land Use

The plant location is within the forest areas and some private lands (agricultural lands). Forest Permit has been received from the Bursa Regional Directorate of Forestry and the Sponsor has applied to the related Authority with the letter dated 14th December 2017 in order to extend the expiration date of the initial Forest Permit and the expiration date was extended until 19th June 2018. The expropriation process for agricultural lands continues. A Landscape Restoration Plan will be prepared for the Project.

3.2 Water Use & Wastewater Management

There will be use of water and discharge of waste water both during construction and operation phases. Based on the assumption that the daily domestic water requirement is 150 L per capita, considering 10 employees during the construction phase and 6 employees during the operation phase, the domestic water requirements are low, estimated to be 1.5 m³/day and 0.9 m³/day. The waste water generated by the project workers will be collected in impermeable septic tanks constructed in line with Turkish regulations. The wastewater will be transferred to the nearest treatment plant by vacuum trucks of the Municipality.

Water will also be used together with air to cool turbine generators during operation period of the project. The cooling water will be provided to the closed system for one time only, thus there is no wastewater generation regarding cooling process.

The needed water is supplied from nearby water network and transferred by tankers to the project site. According to the above mentioned information, the WPP project is not expected to affect the water component.

3.3 Waste Production and Management

The solid waste that is expected to be generated at the Çakıl WPP project consists of excavation waste (from the preparation of tower foundations), domestic solid waste (household and recyclable wastes), oil waste, tire waste etc.

Daily domestic solid waste production is estimated as 1.15 kg per capita, resulting in a total of 11.50 kg/day and 6.9 kg/day taking into account respectively 10 project workers during construction phase and 6 project workers during operation phase. The recyclable waste (paper, plastics, glass, etc.) is to be placed in separate waste containers. The domestic solid wastes will be sent by trucks which belong to related Municipality or a licenced company.

The excavation waste (app. 1.700 m³) originating from excavation will be used as filling material for the wind turbine installations and the switchyard construction.

According to the PIR, waste oil is expected to be generated from the maintenance of the turbines and generation of approximately at 2,800 litres/year. According to the Sponsor, Enercon turbines generate minimal waste oil compared to industry standards as there is no gear box in the nacelle which may need regular oiling. It is stated in the PIR that the oil wastes will be managed outside of the project area (Bursa Industrial Centre) during construction period and oil wastes generated due to operational activities will be temporarily stored at the project area under appropriate conditions and delivered to a licensed company for disposal in accordance with "Regulation On Waste Oils Control".

The oil filter wastes generated as a result of maintenance activities during the operation period will be treated as hazardous waste according to the PIR and the related wastes will be controlled according to the "Waste Management Regulation" (previously included in regulation on hazardous wastes as stated in the PIR).

End of life tires which will be generated during the project works will be delivered to licensed companies according to the "Regulation on Control of End of Life Tires".

The specific measures for the proper management of all types of waste will be considered in the Waste Management Plan within the scope of Environmental and Social Management Plan (ESMP) which is to be prepared by the Sponsor.

3.4 Birds and other species

According to the EAR, none of the flora species found at the project site are classified under CITES or the BERN Convention lists. However, 8 endemic flora species (*Eryngium bithynicum* Boiss., *Centaurea consanguinea* DC., *Geropogon hybridus* (L.) Schultz Bip., *Onosma bracteosum* Hausskn. Et Bornm., *Campanula betonicifolia* Sm., *Stachys cretica* L. subsp. *anatolica* Rech. Fil., *Scrophularia cryptophila* Boiss. Et Heldr. and *Verbascum parviflorum* Lam.), classified as Least Concern (LC) according to IUCN categorization, have been found at the project site. It is indicated in the report that the related endemic flora species are wide-spread in most regions of Turkey and that the project will not create pressure on continuity of these species. According to the study, there is no flora species classified as Critically Endangered (CR).

Two bird monitoring studies for pre-construction period have been completed for the 2017 spring and autumn seasons. The monitoring reports have been submitted to the General Directorate for Nature Conservation and National Parks. According to the Bird Monitoring Reports, the turbine locations are close to the bird migration routes and the bird migration routes changes seasonally.

A bird monitoring study will be conducted immediately after construction of the turbines. A collision risk assessment study will be conducted according to the outcomes of this monitoring studies. According to the collision risk assessment study, critical turbines will be determined considering the collision impact and required measures will be defined. The Sponsor will conduct bird monitoring campaigns once in 3-months during the first 2 years of the operation according to the official letter received from the General Directorate for Nature Conservation and National Parks. Barrier effect of wind turbines will be observed during the monitoring studies in operation phase.

The monitoring of the project area will cover the related species (*Coracias garrulous* – Europe) defined by Doğa Derneği during the bird monitoring activities just in case.

3.5 Emissions: Noise and Particulate

During construction, dust emissions and exhaust emissions will be emitted. Dust emissions which will arise from the construction activities is foreseen to be 0.026 kg/h in the PIR document. Considering the legal limit for dust emission which was set by the Regulation on Control of Industrial Air Pollution is 1 kg/h, the expected dust emission during construction is acceptable. The PIR provides specific measures to mitigate adverse impacts of dust emissions during construction period. During operation, only minimal air emissions not directly associated with plant operation but caused by traffic, maintenance, etc. may occur. The PIR includes some calculations regarding gaseous emissions originating from vehicles and machinery during the construction period, but does not include any mitigation measures. The definition of overall mitigation measures against air emissions during construction and operation phases of the project and monitoring activities are also required. These will be addressed in the ESMP.

Noise will occur during construction and operation due to equipment/machinery operation. The nearest residential area sensitive to noise are the Haydariye Neighbourhood and the Selimiye Village, which are approximately 800 and 1,100 meters distant from the nearest turbines, respectively. Since there is no information is available in the PIR about the projected/likely noise levels for the construction or operation phases, a noise evaluation/modelling for both the construction and operation phases will be implemented. Noise measurement study is required once all turbines are in operation. Noise measurement may be needed during the construction phase in case of any grievance.

3.6 Landscape

Landscape is usually a sensitive aspect for this kind of project. Considering the location of the project (close to the seaside and the settlements), it is required out a Visual Impact Assessment Study which includes photo-impact simulations from significant or sensitive viewpoints to assess the impact on landscape. In case of any non-negligible impact, compensation/mitigation measures are likely to be necessary.

There is no plan regarding tree cutting and landscape restoration. A Landscape Restoration Plan will be prepared considering the implementation of necessary mitigation/restoration activities in order to guarantee the area’s re-instatement after tree cutting. The project will be also supervised and monitored taking into account required mitigation/restoration measures regarding landscape during construction and after project completion during operation phase. Landscape Restoration Monitoring Reports will be prepared during the construction and operation phases.

3.7 Summary of Environmental and Social Impacts

A summary of the impacts with their quantifications is given below.

Table 3-1: Impact Quantification

COMPONENT	IMPACT	QUANTIFICATION
Land use	<u>Use of forestry and agricultural land</u>	Forest Permit has been received from the Regional Directorate of Forestry and expired until 19 th June 2018. Expropriation process continues for the private (agricultural) lands.
Wastewater	<u>Water utilization and discharge</u>	1.5 m ³ /day and 0.9 m ³ /day domestic wastewater during the construction and operation phases, respectively (assuming 10 workers in the construction phase and 6 workers in the operation phase).
Waste	<u>Production of solid waste</u>	11.5 kg/day and 6.9 kg/day domestic waste during the construction and operation phases, respectively (assuming 10 workers in the construction phase and 6 workers in the operation phase).
Fauna and flora	<u>Interference with flora-fauna species</u>	Project site closes to the bird migration routes. The Sponsor is committed to conduct bird monitoring during the construction phase and once in 3 months during the first 2 years of the operation phase. A bird monitoring study will be conducted immediately after construction of the turbines. A collision risk assessment study will be carried out by the Sponsor according to the outcomes of this monitoring study. According to the collision risk assessment study, critical turbines will be determined considering the collision impact and required measures will be defined.
Emissions	<u>Noise</u>	A noise evaluation/modelling for both the construction and operation phases will be implemented. Noise measurement will be conducted during the construction phase (if any grievance) and operation phase (at least once).
	<u>Particulate (Dust & Gaseous Emissions)</u>	During construction, dust emissions and exhaust emissions will be emitted. Dust monitoring is required during the construction phase. During operation, minimal air emissions can be appear not directly associated with plant operation but with traffic, maintenance, etc. Mitigation measures regarding air emissions will be addressed in the ESMP.

Landscape	<u>Changes in the aspect of the area</u>	A “Visual Impact Assessment Study” and a “Landscape Restoration Plan” will be prepared and implemented for the Project. In addition, Landscape Restoration Monitoring Reports will be prepared for the construction and operation phase by taking mitigation measures defined in the Landscape Restoration Plan.
Cumulative Impacts	<u>Other WPPs and ETL’s</u>	The Sponsor will evaluate the cumulative impacts from the roads and nearby existing and planned WPPs and other ETL’s of existing/planned WPPs particular reference to bird life and landscape.

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