



Final Report

Mid-Size Sustainable Energy Financing Facility (MidSEFF)

Edincik II Wind Power Plant: Non-Technical Summary (NTS)

June 2016

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European Bank for Reconstruction and Development

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Non-Technical Summary (NTS)**

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The European Bank for Reconstruction and Development (EBRD) launched in January 2011 a financing facility aimed at scaling up Renewable Energy and Energy Efficiency investments in Turkey, to increase the country's energy savings and decrease its carbon emissions. The Turkish Mid-Size Sustainable Energy Financing Facility (MidSEFF) launched by the EBRD with support from the European Investment Bank (EIB) and European Commission (source of the Technical Cooperation funds) will provide a total of EUR 975 million in loans through 7 Turkish banks for on-lending to private sector borrowers.

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Acronyms

dBa	decibel
EBRD	European Bank for Reconstruction and Development
ETL	Energy Transmission Line
MidSEFF	Mid Size Sustainable Energy Financing Facility
MoFAL	Ministry of Food, Agriculture and Livestock
NTS	Non-Technical Summary
PC	Project Consultant
TEDAS	Turkish Electricity Distribution Company
The Sponsor	E.N.A Tekstil A.Ş. and Umut İnşaat Turizm Sanayi ve Ticaret A.Ş.
WPP	Wind Energy Power Plant

1. General Plant Description

Edincik WPP is a 30 MW (12 Nordex N100/2500) wind power plant located in Balıkesir Province of Turkey, Bandırma District, Edincik Township and, the plant started operation in July 2013.

The Sponsor, Edincik Enerji, is expanding the wind farm installing 11 additional Nordex N117 turbines each one rated 2.4 MW with 117-meter rotor diameter and 91-meter hub tower height. After the extension, overall plant capacity increased to 56.4 MW and generate approximately 197.4 GWh/y of electricity.

The project area is mainly covered by sparse coniferous trees and maquis shrubland and the altitude of the area is between 200 m and 332 m mean sea level.

The Electricity Generation License was amended on 13th March 2014 based on the coordinates of the 23 turbines and 56.4 MWe for the Edincik II WPP project. The construction of Edincik II Wind Power Plant (WPP) has started in November 2014.

Table 1 presents the key aspects of the project.

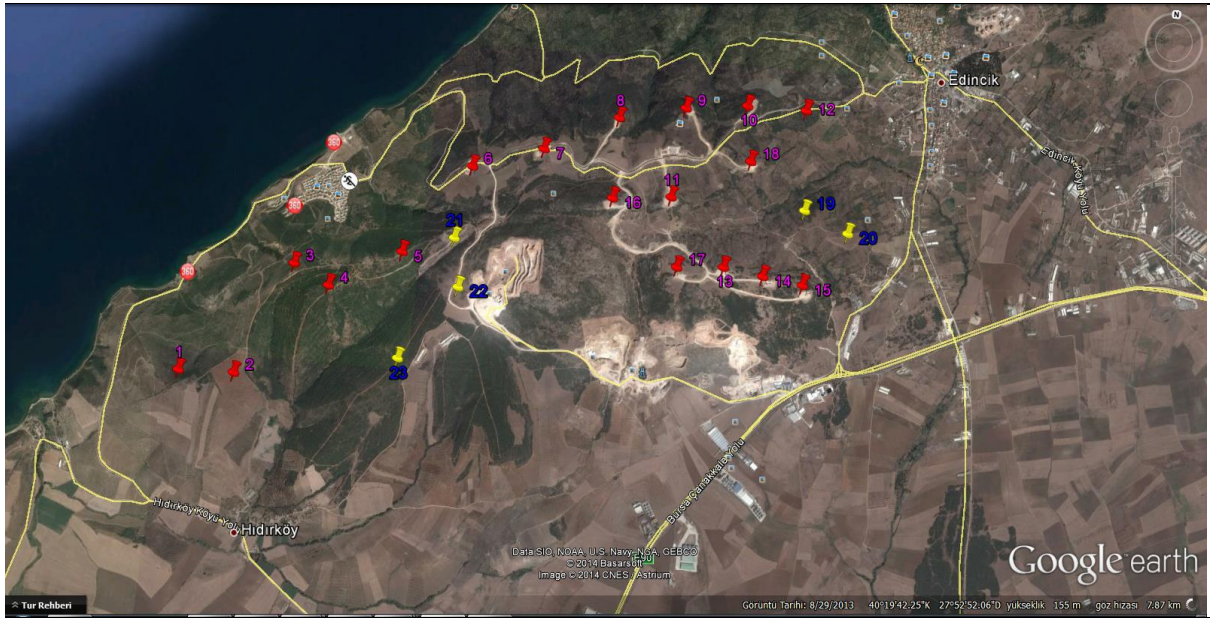


Figure 1.1: General view of the plant layout

Table 1-1: Key project summary data

Key Project Summary Data	
Project Borrower	Edincik Enerji Üretim A.Ş.
Project Sponsors	E.N.A Tekstil A.Ş. and Umut İnşaat Turizm Sanayi ve Ticaret A.Ş.
Project Description / Business Purpose:	<p>Edincik Wind Power Plant (WPP) is constructed approximately 13 km west of Bandırma District on the southern shore of Turkey's Sea of Marmara.</p> <p>The existed Edincik WPP is a 30 MW (12 Nordex N100/2500) capacity. The Sponsor, Edincik Enerji, is expanding the wind farm installing 11 additional turbines 2.4 MW each, for a total of 26.4 MW. The wind generators are of the model Nordex N117. After extension, the overall plant capacity will increase to 56.4 MWe and will generate approximately 197.4 GWh/y of electricity.</p> <p>The grid connection point is Bandırma 2 substation which is approximately 9 km away from the wind farm. The connection voltage is 154 kV with double circuit 795MCM overhead transmission line Grid connection agreement was signed by the Sponsor and Turkish Electricity Transmission Corporation on June 7th, 2012.</p> <p>For the estimation of the emission reductions, the Grid Emission Factor selected is 532 tCO₂/GWh, as per the most recent statistics published by TEİAŞ. Applying this value to the annual production (P75, 86.0 GWh/y), the CO₂ avoided emissions amount to 45,754 tCO₂/y.</p>
Key Parties Involved:	<p>EBRD</p> <p>EIB</p> <p>Edincik Enerji Üretim A.Ş.</p> <p>Isbank</p>
Project Name	Edincik II Wind Power Project
Project Type	Wind Power Plant
Base Case Scenario:	
Installed Capacity	26.4 MW for extension, (56.4 MW total capacity)
Annual Electricity Production	86.0 GWh/y for extension, (197.4 GWh/y in total)

2. Environmental and Social Baseline

2.1 Environmental description of the project area

The wind farm is located on the military lands (assigned to the treasury during construction of the plant), forestry and agricultural (private) lands. There are two more licensed wind farms about 5 km away from the project site.

The Sponsor has obtained the “EIA not required” decision for phase 1 from the Ministry of Environment and Urbanization. Following the project’s extension the full EIA study was carried out and the certificate of EIA Positive Decision was obtained on 22nd August 2014 for “Edincik WPP Capacity Extension Project”.

The project area is located between a major and secondary migration route that crosses the Anatolian Peninsula from the North-West to the South-East as can be seen from the figure 2.1.

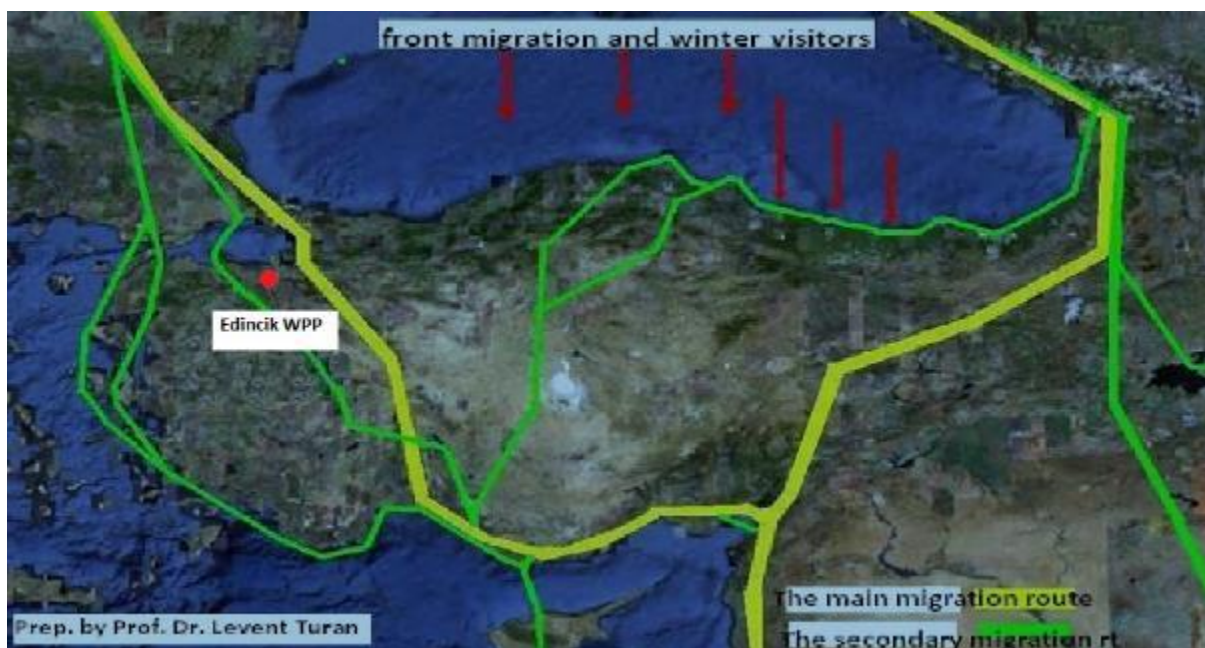


Figure 2.1: Wide Scale Bird Migration Routes

There are a number of valuable sites and important bird habitats around the Edincik II WPP. The nearest relevant area is Manyas Bird Sanctuary (Lake Manyas) which is approximately 20 km far from the project location. According to the project’s EIA report, there are more than 75 flora species belonging to 34 families and none of them are endemic or under protection. About fauna; it has been found 8 reptiles and 14 mammalians living/likely living in the project site but none of them listed as endangered, under protected or endemic. There is no endangered species of birds in and around the project area based on the Ornithology Report.

Table 2-1: Environmental characteristics

ENVIRONMENTAL ASPECTS	PRESENCE/DISTRIBUTION	COMMENTS
Land use	partially located on forest, private and agricultural lands	The preliminary “Forest Permit” has been obtained. Final forest permit and the non-agricultural land use permits must be obtained.
Waters surface	Manyas Lake (approximately 20 km far from the site)	-

Protected area	Manyas Bird Sanctuary (approximately 20 km far away from the site)	-
Flora and Fauna	75 flora species, 8 reptiles and 14 mammals living/likely living in the project site. None of the fauna or flora species in and around the project area is endangered, under protection or endemic.	A biota monitoring campaign is required for the first two years of operation phase to ensure no interference with the bird's migration.

2.2 Social condition of the project area

According to the year 2014 census, the total population of the Balıkesir province and Bandırma district were approximately 1,189,057 and 145,089 people, respectively.

The project area is hilly and overlooks to the east of the village of Edincik, from where it is easily accessible through an existing road of about 1.4 km. The area in which the wind turbines will be constructed is not suitable in terms of agricultural activities.

At the project site and in close vicinity, there is no historically, culturally and archeologically important place.

3. Social and Environmental Impact

3.1 Land Use

The project site is partially located on forest, partially private lands and agricultural lands. For private lands, one parcel is already rented for 49 years by mean of mutual agreements. The Sponsor has started expropriation procedures to get authorization from related authorities for all private lands of the project.

The preliminary “Forest Permit” for forest land (42,868 m²) of 3 turbines was obtained on 30th May 2014 from Ministry of Forestry and Water Affairs in compliance with related regulations. For the other forest land (119,731.00 m²) hosting 20 turbines, preliminary “Forest Permit” was obtained on 2nd April 2013. For agricultural lands, it has been applied for a “Non-Agricultural Utilization Permit” but the permit has not been received yet. The Sponsor should obtain the final forestry permit and Non-Agricultural Utilization Permit and shared with the PC.

3.2 Wastewater

Based on the assumption that the daily domestic water requirement is 150 litres per capita, considering 30 employees during the construction phase and 10 employees during the operation phase, the domestic waste water productions were estimated as 4.5 m³/day and 1.5 m³/day, respectively. Domestic wastewater generated by workers is collected in impermeable septic tanks constructed in line with local environmental regulation. The domestic wastewater is collected by vacuum trucks of the Municipality of Bandırma.

According to the above information, the Project will not cause degradation in environmental quality in terms of the water component.

3.3 Waste Production and Management

Sources of solid waste during the construction works will be excavation waste mainly from the preparation of tower foundations, and solid waste including domestic waste and construction waste (paper, plastics, glass etc.).

The recyclables will be separated from the domestic waste and the domestic solid waste will be stored in containers on site and sent to Manyas Municipality’s disposal site regularly. Daily average domestic solid waste production will be 40.2 kg/day in the construction phase and 13.4 kg/day in the operation phase (assuming daily average domestic solid waste production amount of 1.34 kg per capita).

A major part of the excavation material will be used as filling material. Excess material must be managed in compliance with the local regulations.

Waste oil arising from the vehicles during the construction phase must be delivered to licensed companies to be disposed of as stated in “Regulation on Control of Waste Oil”.

3.4 Birds and other species

The project is between a major and a secondary bird routes migration. Main bird migratory road, which is known to be closest to the area where Edincik WPP is planned to be built, is in the line that passes over Bosphorus and is approximately 125 km distance to the project area. The secondary migration route passes through Dardanelles Strait over Şarköy in Trakya, follows Aegean shores, and is in approximately 100 km west of the area where Edincik II WPP will be built. Moreover, 20 km far away from the project area, there is Manyas Bird Sanctuary that it’s a very important birds’ habitat.

The Sponsor must implement a biota monitoring campaign in the first two years of operation phase to ensure no interference with the bird's migration. Based on monitoring, the mitigation/compensation measures must be implemented by the Sponsor, if any.

3.5 Emissions: Noise and Particulate

Noise emissions will be generated during construction due to equipment/machinery operation and noise emissions are expected during operation due to turbines working. According to the related EIA study, the noise level at Edincik Township - which is about 750 m away from the project site, will be under the regulatory limit of 70 dBA. The PC requires noise monitoring twice a year during the operational period in case any possible complaint from locals is received.

Dust is generated from earth-moving and material storage, and air emission from the operation of construction machinery and equipment. Dust prevention measures must be taken during excavation works. The Sponsor has committed to work in compliance with the related local regulations and take all the measures stated in the EIA report.

During operation, minimal dust emissions can occur not directly associated with plant operation but with traffic, maintenance etc.

3.6 Landscape

The landscape is usually a sensitive aspect for this kind of projects. Being place on hills' ridge, the site is potentially visible from quite long distance such as the nearest neighbourhood (at 1 km distance), considering what above, the PC considers this aspect as potentially critical.

In order to properly assess the landscape impact, the PC requires to implement a detailed Visual Impact Assessment study with a photo-simulation which shows the turbines and project area from significant or sensitive viewpoints such as nearest settlements, main roads and the coast.

In addition, there are two more WPPs around the project area. The nearest wind power plant to the project site, Bandırma III, is just 2 km to the project site and it is also owned by Edincik's Sponsor. Other WPP, Ayyıldız WPP, is 1.7 km to the Edincik WPP. An overall photo impact simulation is required (where applicable), including also the other two WPPs in order to assess the cumulative impact.

Table 3-1: Impact Quantification

COMPONENT	IMPACT	QUANTIFICATION
Land use	<u>Different use of the land</u>	0.145 km ² agricultural area and 0.270 km ² forest area
Water	<u>Utilization and Discharge</u>	4.5 m ³ /day during the construction phase 1.5 m ³ /day during the operation phase
Waste	<u>Production of solid waste</u>	40.2 kg/day in the construction phase and 13.4 kg/day in the operation phase (assuming 30 workers during construction and 10 workers during operation)
	<u>Excavation waste</u>	6,912 m ³ (The majority of excavation waste will be reused)
Birds and other fauna and flora species	<u>Interference with migration routes/interference with protected species-</u>	The project is located between a major and a secondary migration route. The PC requires bird monitoring for the first two years of operation by covering all turbines and other WPPs in the proximity. The construction works have been completed and no negative impact on fauna and flora valuable species resulted during the construction phase.
Emissions	<u>Noise</u>	Construction phase < local reg. limit of 70 dBA Operational phase < local reg. limit of 65 dBA

	<u>Particulate</u>	0.117 kg/h (local reg. limit = 1 kg/h)
Landscape	<u>Changes in the aspect of the area</u>	A Photo-Impact Simulations from significant or sensitive viewpoints concerning the entire wind farm, including the new turbines and whenever possible the two other plants in the surroundings is required.

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