



Final Report

# Mid Size Sustainable Energy Financing Facility (MidSEFF) Umurlar Ext Wind Power Plant: Non Technical Summary (NTS)

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European Bank for Reconstruction and Development

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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 1,500 million (which includes EUR 300 million provided by EIB) in loans through 7 Turkish banks for on-lending to private sector borrowers.

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## Table of Contents

1.	General Plant Description.....	4
2.	Environmental and Social Baseline .....	7
2.1	Environmental description of the project area.....	7
2.2	Social condition of the project area .....	8
3.	Social and Environmental Impact .....	9
3.1	Land Use .....	9
3.2	Water .....	9
3.3	Waste .....	9
3.4	Birds and other species.....	9
3.5	Emissions: Noise and Particulate.....	9
3.6	Landscape.....	10

## Acronyms

A.S.L	above sea level
dBA	decibel
EBRD	European Bank for Reconstruction and Development
ETL	Energy Transmission Line
WPP	Wind Power Plant
MidSEFF	Mid Size Sustainable Energy Financing Facility
NTS	Non-Technical Summary
PC	Project Consultant
PIR	Project Information Report
The Sponsor	Yıldırım Group

# 1. General Plant Description

Umurlar WPP is a 10 MW Wind Power Plant with 5 Vestas V100-2.0 MW turbine located in Balıkesir Province of Turkey, Dursunbey Borough, Kızıloz district. In Figure 1-1, a detailed map with the wind turbines' location are presented.

The sponsor, Yıldırım Group, is expanding the wind farm installing 8 Vestas V126 turbines each one rated 3.3MW with a selected tower height of 87 m or 117 m. After the extension, overall plant capacity will increase to 36.4 MW and generate approximately 100.66 GWh/y of electricity.

The first phase of the plant has started operation in September 2014. The construction of extension project started in September 2016 and will be completed in April 2017.

The project area is mainly covered by intensive coniferous trees and maquis and the altitude of the area is over 1200-1287 m above sea level (A.S.L).

The Electricity Generation License has been amended on 25<sup>th</sup> June 2015 based on the coordinates of the 13 turbines and 36.4 MWe for the Umurlar Ext WPP project. Table 1-1 presents the key aspects of the project.

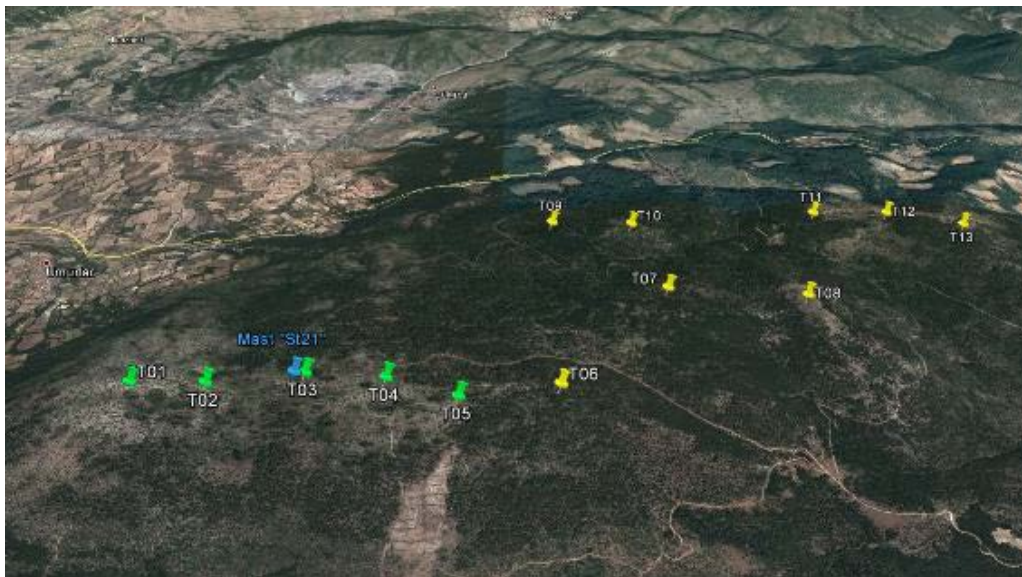


Figure 1.1: General view of project area (existing turbines-green and extension-yellow)

Table 1-1: Key project summary data

Key Project Summary Data	
<b>Project Borrower</b>	Elfa Elektrik Üretim A.Ş
<b>Project Sponsor</b>	Yıldırım Group
<b>EBRD Transaction</b>	The total project cost is EUR 31,421,401 including capitalized financing costs and working capital requirement. The proposed financial scheme includes debt financing in the amount of EUR 30,500,000 and the borrower's own contribution in the amount of EUR 921,401. The debt to equity ratio is approximately 97:3.
<b>Project Description / Business Purpose:</b>	Umurlar Wind Power Plant (WPP) is constructed on a mountainous area of Balıkesir province in western Turkey, in the neighbouring of Umurlar village. The existed Umurlar WPP has a 10 MW capacity with 5 turbines (Vestas V100). The sponsor, Yıldırım Group, is expanding the wind farm installing 8 additional turbines (Vestas V126) with 3.3 MW capacity of each, for a total of 26.4 MW capacity. After

	<p>the extension, the overall plant capacity will increase to 36.4 MWe and will generate approximately 100.66 GWh/y of electricity.</p> <p>The Umurlar WPP is connected to 154/33 kV Dursunbey TM. The existing energy transmission line is 9.3 km. Grid connection agreement has been signed between the Sponsor and Turkish Electricity Transmission Corporation on October 31th, 2011.</p> <p>For the estimation of the emission reductions; the Grid Emission Factor selected is 585 tCO<sub>2</sub>/GWh, as per the most recent statistics published by TEİAŞ. Applying this value to the annual production (100.66GWh/y), the CO<sub>2</sub> avoided emissions amount to 58,886 tCO<sub>2</sub>/y.</p>
<b>Key Parties Involved:</b>	<p>EBRD</p> <p>EIB</p> <p>Yıldırım Group</p>
<b>Project Name</b>	Umurlar Ext Wind Power Project
<b>Project Type</b>	Wind Power Plant
<b>Base Case Scenario:</b>	
<b>Installed Capacity</b>	26.4 MW for extension (36.4 MW of total capacity)
<b>Annual Electricity Production</b>	63.7 GWh/y for extension (100.66 GWh/y of total)

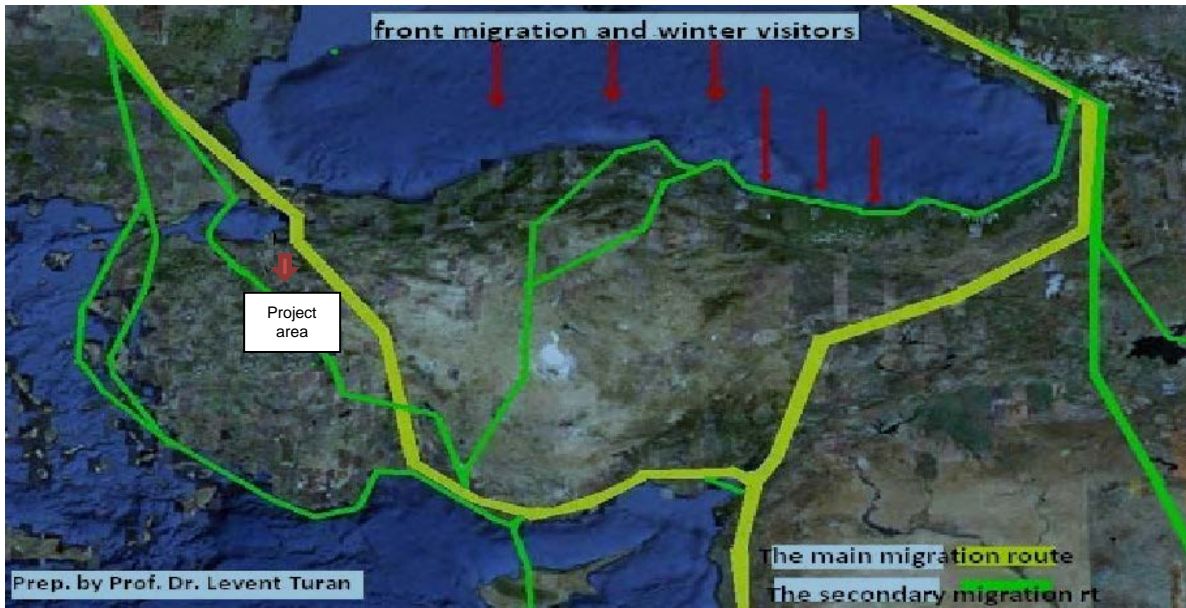


## 2. Environmental and Social Baseline

### 2.1 Environmental description of the project area

The wind farm is located on a mountainous area of Balıkesir province in Marmara Region, on forestry lands. There is no industrial facility or wind power plant around 10 km of the project site.

The project area is out of the main bird routes. The site is not located along an important migration route as shown in the figure below:



**Figure 2.1: Wide Scale Bird Migration Routes (by Prof. Dr. Levent Turan)**

The closest protected area is Alaçam Mountain Natural Area which is located approximately 20 km to the Umurlar Ext WPP Project site. According to the flora and fauna assessment given in the PIR, there are 65 bird species under 24 families in the Project area. No endemic or critically endangered species are determined in the Project site based on flora and fauna study and the Ornithology Report.

**Table 2-1: Environmental characteristics**

ENVIRONMENTAL ASPECTS	PRESENCE/DISTRIBUTION	COMMENTS
Land use	The project area consists of forestry lands	Pre-Forestry Permit has been obtained. There is no privately owned lands or agricultural area in the new turbine location. Final forestry permit should be obtained by the Sponsor.
Water surface	N.A.	-
Protected area	Alaçam Mountain Natural Area (approximately 20 km far away from the site)	The proposed project has no interaction with any protected area.
Flora and Fauna	163 taxon for flora, 8 amphibians, 15 reptiles, 15 mammalians and 65 bird species identified in the project site	None of the fauna or flora species around the project area is endemic or critically endangered species. Bird monitoring campaign is required.

## 2.2 Social condition of the project area

According to the year 2015 census the total population of the Balıkesir province and Dursunbey district were approximately 1.186.688 and 38.522 people, respectively.

There is no privately own area or any settlement currently exists on the project area. The closest residential areas to the turbines which will be installed in the scope of the extension Project are Umurlar, Kızılöz, Şabanlar, Durabeyler and Teşkesik villages. The distances between the proposed turbines and the closest sensitive receptors range between about 1,390 m and 2,000 m.

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

All of the lands are registered as forestry area and “Pre-Forestry Permit” has been obtained. There is no privately owned lands or agricultural area in the new turbine location. Final forestry permit should be obtained by the Sponsor.

### 3.2 Water

Based on the assumption that the daily domestic water requirement is 150 litres per capita, and considering 40 employees during the construction phase and 7 employees during the operation phase, the domestic water requirements were estimated as 6 m<sup>3</sup>/day and 1.05 m<sup>3</sup>/day, respectively. Domestic wastewater generated by workers is collected in impermeable septic tanks constructed in line with local environmental regulation.

### 3.3 Waste

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 recyclables.

Excavated soil will be re-used for the filling of the turbine foundation, access roads and site levelling purposes. Topsoil will be temporarily stored at the construction site and will be re-used. Dust prevention measures should be taken into account during excavation works. Excess material should be managed in compliance with the local regulations.

The recyclables will be separated from the domestic waste and domestic solid wastes will be collected in the closed bags and transferred to the waste container of Dursunbey Municipality weekly. Daily average domestic solid waste production will be 59.6 kg/day in the construction phase and 10.43 kg/day in the operation phase (assuming daily average domestic solid waste production amount of 1.49 kg per capita). Considering the amounts of waste and proposed mitigation measures, no significant impact is expected.

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

### 3.4 Birds and other species

No endemic or critically endangered species were determined in the Project site. In addition, the Project site is not located on the main migration route. Flora & fauna and ornithological monitoring studies of the project conclude that no significant impact on flora and fauna, including birds and bats, is expected provided that all applicable mitigation measures and requirements are implemented.

### 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 PIR study, the calculated noise level from a point which is 400 m far away from the WPP border is 58.34 dbA which is in-compliance with the national limit (70 dbA). The PC required a noise measurement for the existing and the new turbines before commissioning. The project area is far enough to the residential areas and noise measurement has been required during the operation in case of any complaint.

Dust will be generated from earth-moving and material storage, and air emission from the operation of construction machinery and equipment. According to the PIR, the dust emissions will be 0.23 kg/hour during construction works (lower than the limit value of 1 kg/hour). All proposed mitigation measures in the PIR should be implemented.

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

### 3.6 Landscape

Landscape is usually a sensitive aspect for these kinds of projects. The Consultant requires to the Sponsor the implementation of a dedicated study which includes a visual impact assessment and the photo-impact simulations from significant or sensitive viewpoints (such as Taşkesik Village and access road of Durabeyler Village). The study results should also be shared with the public during disclosure meetings with the stakeholders.

**Table 3-1: Impact Quantification**

COMPONENT	IMPACT	QUANTIFICATION
<b>Land use</b>	<u>Use of the forestry land</u>	“Pre-Forestry Permit” for the total area of 330,784.02 m <sup>2</sup> has been received. Final forestry permit should be obtained by the sponsor.
<b>Water</b>	<u>Utilization and Discharge</u>	6 m <sup>3</sup> /day during the construction phase 1.05 m <sup>3</sup> /day during the operation phase (assuming 40 workers during construction and 7 workers during operation)
<b>Waste</b>	<u>Production of solid waste</u>	59.6 kg/day in the construction phase and 10.43 kg/day in the operation phase (assuming 40 workers during construction and 7 workers during operation)
	<u>Excavation waste</u>	18.432 m <sup>3</sup> (The majority of excavation waste will be reused. Excess material should be managed in compliance with the local regulations)
<b>Birds and other fauna and flora species</b>	<u>Interference with migration routes/interference with protected species-</u>	The Project site is not located on the main migration route. The PC requires bird monitoring campaign for the first 2-years of operation taking into account the new turbine locations.
<b>Emissions</b>	<u>Noise</u>	58.34 dbA in construction phase < local reg. limit of 70 dbA 45 dbA in operational phase < local reg. limit of 65 dbA
	<u>Particulate</u>	0.23 kg/h (local reg. limit = 1 kg/h)
<b>Landscape</b>	<u>Changing in the aspect of the area</u>	A visual impact assessment and the photo-impact simulations from significant or sensitive viewpoints have been required.

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