



Final Report

Mid Size Sustainable Energy Financing Facility (MidSEFF)

Günaydın Wind Power Plant: Non Technical Summary (NTS)

March 2013

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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 1,050 million in loans through 7 Turkish banks for on-lending to private sector borrowers.

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00	March 2013	Final Report	M. Solari	M. Solari	M. Mancini

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1. General Plant Description

The 10 MW Gunaydin wind farm is located in Manyas District of Balikesir Province in Turkey. Balikesir Province is situated to the west of Turkey in the Marmara Region. The site is predominantly covered by scrub and farmland, with some areas of dense forestry on and around the site. The altitude of the project area from sea level ranges from 470 m to 650 m.

The construction of Günaydın Wind Power Plant (WPP) started in April 2012. The project was expected to start operation at the beginning of 2013.

The selected configuration adopts 5 GE 2.5 – 100 wind turbine models - each one rated 2,500 kWe with a 100 meter rotor diameter mounted on a tower with an 85 meter hub height.

Günaydın WPP project has been granted with Energy Production License given by the Energy Market Regulatory Office (EMRA) on November 11, 2011. Table 1 presents the key aspects of the project.



Figure 1.1: General view of the area

Table 1-1: Key project summary data

Project Name	Günaydın Wind Power Project
Project Borrower	Manres Enerji was established in 2007 by Fina Enerji Holding as a special purpose company for Günaydın Wind Power Plant. Manres Elektrik Üretim A.Ş. is sub-borrower
Project Sponsors	Fina Holding is part of Fiba Group and was founded by Hüsnü Özyeğin in 1987. Fina Holding controls and manages all non-financial investments of Fiba Group including investments in retail, tourism, energy, ship building, port management and entertainment sector operations.
EBRD Transaction	The total project cost is EUR 18,040,935 including capitalized financing costs. The proposed financial scheme includes debt financing in the amount of EUR 4,500,000 from MIDSEFF and EUR 10,764,000 from Hermes as an ECA Loan and the borrower's own contribution in the amount of EUR 2,776,935. The debt to equity ratio is approximately 85:15. The investment is already started and will be completed in the beginning of 2013.
Project Description / Business Purpose:	The construction of Günaydın Wind Power Plant (WPP) started in April 2012 and the plant is expected to start operation in 2013. Günaydın WPP will produce 36.0 GWh/year of net electricity based on a probability level of 75%. The overall capacity factor of the Günaydın WPP is 41.9%. The electricity generation from the renewable plant will replace electricity from the national grid and enable reduction of 21,312 tonnes of CO ₂ equivalent per year, as calculated for the base case scenario.
Installed Power	12.5 MWe curtailed at 10 MWe
Annual Electricity Production	36,000,000 kWh

2. Environmental and Social Baseline

2.1 Environmental description of the project area

The plant location and its surroundings are mostly rural and used as pasture land. There are forest areas in the north and northeast of the Project site; however neither the turbines nor the switchyard area is located on the forestry area. The wind farm is located both on the treasury land and private land. Due to the favourable wind conditions in the region, there are five licensed wind farms around the proposed project.

Balikesir Province and the Project site are located in the 1st Degree Seismic Zone according to the earthquake zones determined by the General Directorate of Disaster Affairs (GDDA).

About birds presence, the project is located between a major and secondary migration route that crosses the Anatolian Peninsula from the North-West to the South-East and it's over a secondary migration route as detailed by the map below.



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

At the project site and in close vicinity there are no National Park and Private Protected Area but there are a number of conservation sites and important bird habitats around the Günaydın WPP. The nearest relevant area is Bird Lake (Lake Manyas) which is approximately 25 km far from the project location. Other protected area is Uluabat Lake with approximately 40 km distance.

According to a dedicated assessment done by a biologist on the site there are 58 flora species belonging to 21 families, none of which are endemic or under protection.

Table 2-1: Environmental characteristic

ENVIRONMENTAL ASPECTS	PRESENCE/DISTRIBUTION	COMMENTS
Land use	The project area consists of private and treasury lands	Permits are received.
Waters surface	Birds lake, Uluabat Lake (25 and 40 km far respectively)	-
Protected area	• Bird Lake (Lake Manyas)	-

	• Uluabat Lake	
Flora and Fauna	58 flora species belonging to 21 families	None of which is identified endemic or under protection.

2.2 Social condition of the project area

According to the year 2007 census the total population of the Balıkesir province and Manyas district were approximately 1,118,133 and 23,135 people, respectively.

The project area is hilly and in the vicinity of Yaylaköy village in Manyas district. 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 place which is important historically, culturally and archeologically e.g.

3. Social and Environmental Impact

3.1 Land Use

Considering that the turbines are already erected and no physical resettlement action has been necessary. All of the lands belong to the treasury and private owners and they have already been purchased by mutual agreements. There is no settlement on the project area.

3.2 Water

There should be household water waste both during construction and operation phase. This is generally employees' daily waste. Based on the assumption that the daily domestic water requirement is 150 litres per capita, considering 30 employees during the construction phase and 8 employees during the operation phase, the domestic water requirement are respectively estimated to be 4.5 m³/day and 1.2 m³/day. Domestic wastewater generated by project workers will be collected in impermeable septic tanks constructed in line with Turkish regulation. These wastewaters will be collected by vacuum trucks of the Municipality of Manyas. As a consequence, WPP project will not affect the water component.

3.3 Waste

The solid waste that is expected to be generated at Günaydın WPP are excavation waste (from preparation of tower foundations) and domestic solid waste (paper, plastics, glass etc.). Daily domestic solid waste production is 1.34 kg per capita, for a total of 44 kg/day and 12 kg/day taking into account respectively 30 project workers during construction phase and 8 project workers during operation phase. The recyclable waste will be displaced in separate waste containers.

The excavation waste (app. 960 ton for each turbine) will be kept under cover during laying of the foundations (to prevent dust generation) and used as filling material for the same excavation holes. The domestic solid waste that cannot be re-used will be stored in containers on site and sent to Manyas Municipality's disposal site regularly.

As maintenance for construction machinery and equipment will be carried out at the technical services, no waste oil is expected to be generated at the construction site.

Medical waste that may be generated on site due to accidents will be handled in compliance with the "Regulation of the Medical Wastes Control" dated 22.07.2005.

3.4 Birds and other species

The project is between a mayor and a secondary bird routes migration and moreover 25 km far there is the Birds Lake that it's a very important birds' habitat. The sponsor should be implemented a monitoring campaign at least for the first two years to ensure the no interference with the birds migration.

The turbines are already constructed but there is no interference with valuable or protected fauna and flora species.

3.5 Emissions: Noise and Particulate

Noise emissions will be generated during construction due to equipment/machinery operation. A study shows that noise emissions are acceptable levels and the sponsor is obliged to work according to related regulations and all precautions will be taken by the sponsor before and during construction.

Noise emissions are expected during operation due to turbines working. A detailed study in the project information report shows that it is acceptable level for the nearest settlements, Yaylaköy Village which is abt. 390 m away from the nearest turbine (T2). The level of noise is acceptable level for the nearest receptors. Monitoring campaign could be put in place during operation in case.

Dust generated from earth-moving and material storage, and air emission from the operation of construction machinery and equipment. The air-emissions are at acceptable levels and the sponsor is obliged to work under the related Turkish regulation (Evaluation and Management of Air Quality).

During operation minimal emissions can be appear not directly associated with plant operation but with traffic, maintenance etc. So it can be easily said that no relevant aspects both construction and operation phases for emissions.

3.6 Landscape

Landscape is usually a sensitive aspect for this kind of project. The sponsor ordered a photomontage to assess the impact on landscape from the points of view of the closest receptors/points. The result of this study was presented in the ESIA. At the end of this study the visual impacts were considered as low. In any case the sponsor should implement also the assessment of transmission line visual impact.

Table 3-1: Impact Quantification

COMPONENT	IMPACT	QUANTIFICATION
Land use	Different use of the land	4 km ²
Water	Utilization and Discharge	4.5 m ³ /day during construction phase 1.2 m ³ /day during operation phase
Waste	Production of solid waste	1.34 kg/person/day (30 workers during construction and 8 workers during operation)
	Excavation waste	960 ton/turbin (vast amount of excavation waste is reused)
Birds and other fauna and flora species	Interference with migration routes/interference with protected species-	The project is located between a mayor and secondary migration route, a monitoring campaign will be done at least for the first two years to verify the real interference of the WPP with the birds migration routes. The project is already constructed and no interference with other fauna and flora valuable species has been registered
Emissions	Noise	Construction phase < 70dBA (law limit = 70dBA) Operational phase=40dBA (law limit = 50dBA)
	Particulate	1.4 kg/h (law limit = 1.5 kg/h)
Landscape	Changing in the aspect of the area	The photosimulation supplied by the sponsor demonstrate as the impact of the project is negligible, but in any case the PC suggests a photosimulation also considering the power line

MidSEFF Office

Asmadalı Sokak, No. 27

Kosuyolu

34718 Kadikoy, Istanbul

TURKEY

www.midseff.com