



Final Report

Mid Size Sustainable Energy Financing Facility (MidSEFF)

Salman Wind Power Plant: Non Technical Summary (NTS)

January 2014

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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 billion in loans through 7 Turkish banks for on-lending to private sector borrowers.

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1. General Plant Description

The project for the realization of the 27.5 MW Salman wind farm is located approximately 5 km north of the village of Salman, at the north-western end of the Karaburun peninsula, in the western Turkey. The location of the proposed wind power plant and regulator is at the Aegean Region of İzmir in Province within the boundaries of Karaburun Borough.

It is planned to generate an annual average of about 73.40 GWh/year with a total installed power of about 27.5 MW based on a 10 x 2.75 MW generators configuration.

The wind farm area lies in a complex hilly area, covered by large Mediterranean bushes and small trees. The final configuration of the plant consists of 10 production units model GE Energy 2.75-100, placed in sparse locations which occupy the hilltop of the selected reliefs, from 104 m to 266 m above sea level.

Salman WPP project will contribute to the share of renewable energy in the Turkish energy market. The generation of electricity from renewable source will replace the electricity from the national grid and enable the reduction of 44,040 tCO2/year.



Figure 1.1: Salman site panoramic views from Salman mast location

1.1: Key project summary data

Project Borrower	Öres Elektrik Üretim A.Ş.
Project Sponsor	Fina Holding
EBRD Transaction	The total project cost is EUR 32,858,549 including capitalized financing costs and working capital requirement. The proposed financial scheme includes debt financing in the amount of EUR 26,000,000 and the borrower's own contribution in the amount of EUR 6,858,549. The debt to equity ratio is approximately 79:21. The investment duration will be 24 months approximately.
Project Description / Business Purpose:	The location of the proposed wind power plant and regulator is at the Aegean Region of İzmir in Province within the boundaries of Karaburun Borough. Salman WPP project will contribute to the share of renewable energy in the Turkish energy market. The generation of electricity from renewable source will replace the electricity from the national grid and enable the reduction of 44,040 tCO ₂ /year.
Installed Power	27.5 MW
Annual Electricity Production	73.4 GWh

2. Environmental and Social Baseline

2.1 Environmental description of the project area

The project area is out of the main bird routes. However, there is a secondary bird migration route 2 km away from the Project area. A map showing the secondary routes in the project area was attached to the ornithological report and it is presented in Figure 2.1.

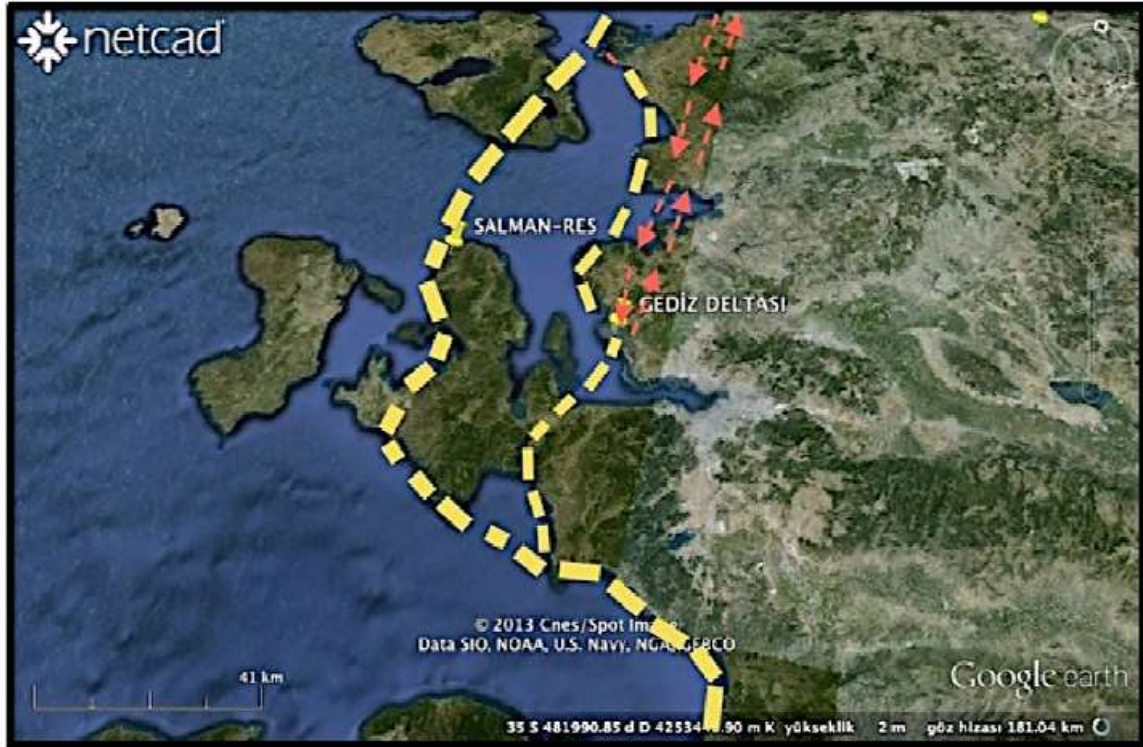


Figure 2.1: Bird Migration Routes in the Region of Salman RES

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 Salman WPP.

The nearest relevant area is Karaburun Foça Special Environment Conservation Area which is approximately 8.5 km far from the project location. Other protected areas Gediz delta wetland and Çiçek island are 30 and 27.5 km away respectively. It should be noted that there is no conservation status for these areas according to the national environmental legislation.

As a result of this study no threatened and endangered flora and fauna species were determined in the project area. Generally speaking the plant location area is in a natural status with no particular evidence of human structures and infrastructures.

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	Gediz delta wetland	30 km
Protected area	Karaburun Foça Special Environment Conservation Area and Çiçek island	8.5 km far away
Flora and Fauna	Secondary bird migration route 2 km away from the Project area.	Ornithology study prepared

2.2 Social condition of the project area

According to the year 2011 census the total population of the İzmir province and Karaburun district were approximately 3,965,232 and 8,848 people, respectively.

The plant location is within the forest areas and there is no residential area in the project area. There is not a directly affected community from the Project as the project area is located on rural area.

The closest settlement to the Project site is Parlak Village, is 1.9 km distance to the closest turbine no particular issues are expected.

Within the Project site and its close vicinity there are no archeologically, historically or cultural assets.

3. Social and Environmental Impact

3.1 Land Use

The land belongs to treasury and individuals and no settlement on the project area.

A number of expropriation actions will be needed along the route of the final energy transmission line. The information provided highlights that the characteristic of the soil and its actual use make it not so valuable. The economic displacement is not a critical aspect.

3.2 Water

There should be household wastewater both during construction and operational phases. This is generally employees' daily waste. Based on the assumption that the daily domestic water requirement is 150 litres per capita, considering 56 employees during the construction phase and 12 employees during the operation phase, the domestic water requirement are respectively estimated to be 8.4 m³/day and 1.8 m³/day. Domestic wastewater generated by project workers will be collected in impermeable septic tanks constructed in line with Turkish regulation. This wastewater will be collected by vacuum trucks of the Municipality of Karaburun.

According to the above information the WPP project will not affect the water component.

3.3 Waste

The solid waste that is expected to be generated at Salman WPP is 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 71 kg/day and 15 kg/day taking into account respectively 56 project workers during construction phase and 12 project workers during operation phase. The recyclable waste will be displaced in separate waste containers.

The excavation waste (app. 3,750 kg 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 Karaburun 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 etc 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 area is out of the main bird routes. However, there is a secondary bird migration route 2 km away from the Project area. A map showing the secondary routes in Salman RES region was attached to the ornithological report and it is presented in Figure 2.1.

3.5 Emissions: Noise and Particulate

Noise emissions will be generated during construction due to equipment/machinery operation. A study in the PIR 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.

During operational phase the noise emissions are expected to stem from only operational turbines. A detailed qualitative study regarding the noise emissions during this phase is not available in the PIR. However in ESIA this gap was filled. A noise measuring and monitoring campaign has been presented in ESIA Report.

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

A qualitative study based on the calculation methods and factors presented by the Ministry of Environment and Forestry is carried out in the ESIA. The results show that dust emission originated from access road construction will be 0.8 kg/hr while for turbine foundation construction is 0.88 kg/hr. Switchyard construction will cause 0.32 kg/hr dust emission and crane pad construction will result in 0.31 kg/hr dust emission. These all values are under the 1.5 kg/hr limit depicted by the related regulation.

The emissions from the vehicles are also investigated qualitatively in the PIR, and the values are found to be under the limit provided by the related regulations.

During operation minimal emissions can 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 (Parlak Village, Badembükü Village and Salman). 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 consultant considers the assessment of transmission line visual impact a gap to be filled and suggests the use of the photo simulation to show, during the stakeholder meetings, to the villagers how will be the impact of the Project.

Table 3-1: Impact Quantification

COMPONENT	IMPACT	QUANTIFICATION
Land use	<u>Different use of the land</u>	N.A.
Water	<u>Utilization and Discharge</u>	8.4 m ³ /day during construction phase 1.4 m ³ /day during operation phase
Waste	<u>Production of solid waste</u>	1.34 kg/person/day (56 workers during construction and 12 workers during operation)
	<u>Excavation waste</u>	3750 kg/turbine (vast amount of excavation waste is reused)
Birds and other fauna and flora species	<u>Interference with migration routes/interference with protected species-</u>	The project area is out of the main bird routes. However, there is secondary bird migration route 2 km away from the Project area. A map showing the secondary routes in Salman RES region was attached to the ornithological report and it is presented in Figure 2.1. A monitoring campaign will be put in place for the first two years.
Emissions	<u>Noise</u>	Construction phase < 70dBA (law limit = 70dBA) Operational phase=40dBA (law limit = 50dBA)
	<u>Particulate</u>	0.52 kg/h (law limit = 1.5 kg/h)
Landscape	<u>Changing in the aspect of the area</u>	The photo simulation supplied by the sponsor demonstrates as the impact of the project is negligible.

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