



Final Report

Mid Size Sustainable Energy Financing Facility (MidSEFF)

Şadılı 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. Project Description

The 38.5 MW Şadılı wind farm is projected to be built in the Western Anatolian Region of Turkey. The project area is located approximately 20 km southeast of Keşan District Tekirdağ province with some parts of the land belonging Çanakkale province as well.

The Project site has a total area of 70,000 m² including turbine location and access roads. The closest settlement to the Project site is Elmalı village in the northeast.

The wind farm area lies in complex terrain along a mountain ridge, surrounded by bushes and small trees. The final configuration of the plant consists of 14 production units, model GE Energy 2.75-100, placed in single array which follows the natural development of the site's ridge at altitudes ranging about from 542 m to 660 m above sea level.

It is planned to generate an annual average of about 119.4 GWh/year with a total installed power of about 38.5 MW based on a 14 x 2.75 MW generators configuration.

The wind farm will be connected to the Keşan 154kV substation with an overhead line with a length of 28.354 meter.

The construction started at the beginning of February 2012. The electricity generation from a renewable source will replace the electricity from the national grid and enable reduction of 71,377 tonnes of CO₂ equivalent gases per year, as calculated for the base case scenario of electricity generation.



Figure 1.1: Project location and the nearest designated areas map

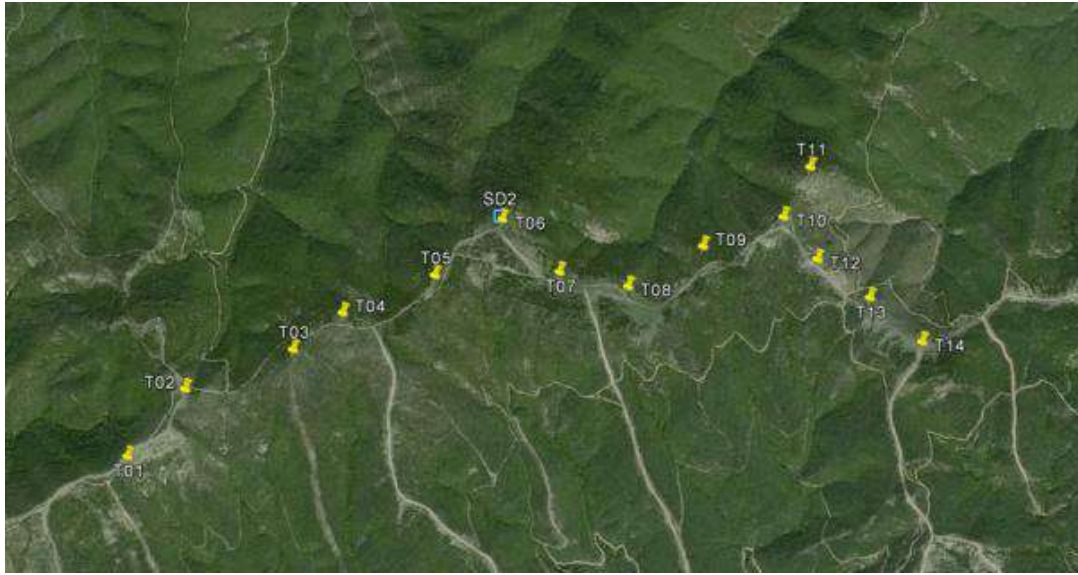


Figure 1.2: Şadıllı WPP layout on detailed aerial map

1.1: Key project summary data

Project Borrower	Çanres Elektrik Üretim A.Ş.
Project Sponsor	Fina Holding
EBRD Transaction	The total project cost is EUR 44,971,261 including capitalized financing costs. The proposed financial scheme includes debt financing in the amount of EUR 8,150,000 from MIDSEFF and EUR 20,950,000 as an ECA Loan and the borrower's own contribution in the amount of EUR 15,871,261. The debt to equity ratio is approximately 65:35. The investment will be completed in June 2013.
Project Description / Business Purpose:	<p>The Şadıllı Wind Power Plant (WPP) is planned to be constructed approximately 20 km southeast of Keşan in the Çanakkale region of western Turkey.</p> <p>The Şadıllı WPP will produce 119.4 GWh/year of electricity based on a probability level of 75%, including the losses. The overall capacity factor of the Şadıllı WPP is 35.40%.</p> <p>The wind farm will be connected to the Kesan Transformer Station through a 28.354-meter tension line (154 kV).</p> <p>The electricity generation from a renewable source will replace the electricity from the national grid and enable reduction of 71,377 tonnes of CO₂ equivalent gases per year, as calculated for the base case scenario of electricity generation.</p>
Installed Power	38.5 MWm
Annual Electricity Production	119,400,000 kWh/year

2. Environmental and Social Baseline

2.1 Environmental description of the project area

The general terrain at the plant location and its surrounding can be described as complex owing to significant variation in orography across the site. The ground cover across the site ridge comprises of dense coverage of large bushes up the 2 m in height and small trees up to 5 m in height. The ground cover across the flat plateau which surrounds the site is comprised largely of agricultural land interspersed with areas of low lying settlements. The site lies in a hilly region with relatively cleared land on the hill top and areas of forestry and vegetation along the slopes and valleys. The presence of forestry across the site is significant.

The provided reports from the Sponsor stated that the project area is out of the bird routes. A map showing the routes in Turkey was attached to the reports: according to that map (Figure 2.1) a subordinate route passes approximately 15 km away from south-west direction and 20 km away from north-east direction of the project area.

No endemic, threatened or endangered flora and fauna species were identified in the Project site and its vicinity. However, since the Project is close to the Dardanelles strait, an ornithological study and bird monitoring survey is required in order to determine the potential effects of the Project on the population and the behaviour of bats and bird species both for the construction and the operation phases.



Figure 2.1: Wide Scale Bird Migration Routes

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 Sadilli WPP

The nearest relevant area is Soroz Bay National Protected Zone which is approximately 14 km far from the project location. Other protected areas Gelibolu and Dardanelles are 30 and 40 km away respectively. Danişment, Gökçetepe and Korudağ are the nearest recreational areas and at least 10 km away from the WPP.

According to a dedicated assessment done by a biologist on the site no threatened and endangered flora and fauna species are present in the project area.

Table 2-1: Environmental characteristic

ENVIRONMENTAL ASPECTS	PRESENCE/DISTRIBUTION	COMMENTS
Land use	The project located within forest area.	-
Waters surface	Soroz Bay	14 km far away
Protected area	N.A	14 km far away
Flora and Fauna	Presence of a secondary migratory route Some endemic species (Calchicum burttii) in the region	-

2.2 Social condition of the project area

According to the year 2011 census the total population of the Tekirdağ province and Keşan district were approximately 829,873 and 80,010 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 Elmalı Village which is located about 2.9 km to the nearest turbine. Elmalı Village has a population of 334 according to 2011 census data. Other settlements close to the Project site are Yenidibek and Alışık Villages in Malkara District, Şadılı, Süleymaniye and Bayramiş Village in Gelibolu District of Çanakkale Province.

The main economic activities in Malkara District are agriculture and animal husbandry. Two-thirds of the district area is used directly or indirectly for agriculture.

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 Project will be located within forest areas and there are no privately owned lands within the Project, no expropriation will be carried out; therefore there will be no physical resettlement or economic displacement. The energy transmission line will also pass through forest areas.

The final "Forest Permit" will be received from Prime Ministry in compliance with the memorandum n. 2012/15 released in Official Gazette n. 28325 on 16.06.2012. The sponsor had applied on 14.09.2012 and waiting for the affirmative opinion.

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 45 employees during the construction phase and 20 employees during the operation phase, the domestic water requirement is respectively estimated to be 6.75 m³/day and 3 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 Gelibolu or Malkara.

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

3.3 Waste

The solid waste expected to be generated at Şadıllı 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 62 kg/day and 27 kg/day taking into account respectively 45 project workers during construction phase and 20 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 Gelibolu or Malkara 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

A map showing the routes in Turkey was attached to the reports: according to that map (Figure 2.1) a subordinate route passes approximately 15 km away from south-west direction and 20 km away from north-east direction of the project area. In any case in the ESIA the precautions, in order to avoid bird collision with the wind turbines has been explained and assured to carry out bird monitoring campaign during construction and in first year of the operation.

3.5 Emissions: Noise and Particulate

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

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/h while for turbine foundation construction is 0.88 kg/h. Switchyard construction will cause 0.32 kg/h dust emission and crane pad construction will result in 0.31 kg/h dust emission. These all values are under the 1.5 kg/h 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 (Elmalı Village and Bayramiç Village). The result of this study was presented in the ESIA. At the end of this study the visual impact was considered 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	Different use of the land	0.7 km ²
Water	Utilization and Discharge	6.75 m ³ /day during construction phase 3 m ³ /day during operation phase
Waste	Production of solid waste	1.34 kg/person/day (62 workers during construction and 20 workers during operation)
	Excavation waste	3,750 kg/turbine (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 two secondary migration routes. The selected turbines are designed in such a way that they minimize the impacts on the migrating or nesting of the birds and bats, as well as the feeding ones.
Emissions	Noise	Construction phase < 70dBA (law limit = 70dBA) Operational phase=40dBA (law limit = 50dBA)
	Particulate	Not exceed 1.0 kg/h (law limit = 1.5 kg/h)
Landscape	Changing in the aspect of the area	The photo simulation supplied by the sponsor demonstrates as the impact of the project is negligible, but in any case the PC suggests a photo simulation also considering the power line.

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