



Final Report

Mid Size Sustainable Energy Financing Facility (MidSEFF)

Pitane Wind Power Plant: Non Technical Summary (NTS)

February 2015

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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 4.8 MW Pitane WPP is located in Izmir Province, Dikili District, approx. 60 km north-west of Izmir and 2 km north-east of Çandarlı town.

It is planned to generate an annual average of about 16.40 GWh/year with a total installed power of about 4.8 MW based on a 2 x 2.4 MW generators configuration

The wind farm area is located in a slightly hilly area with an elevation of about 70 m above sea level. The wind farm area and the surrounding are determined by agricultural used land (grain and meadows) with hedges around the fields.

The construction phase was expected to start on 7th July 2014. Date for starting of operation is expected to be 7th February 2015. At the time of the site visit (mid-July), the construction phase had already started.

The wind farm will be connected to the National Grid (at Bergama substation) through a 34.5 kV overhead line with a length of 1.25 km. The agreement for the connection to the National Grid was signed with Gediz EDAŞ on February 4th 2013.

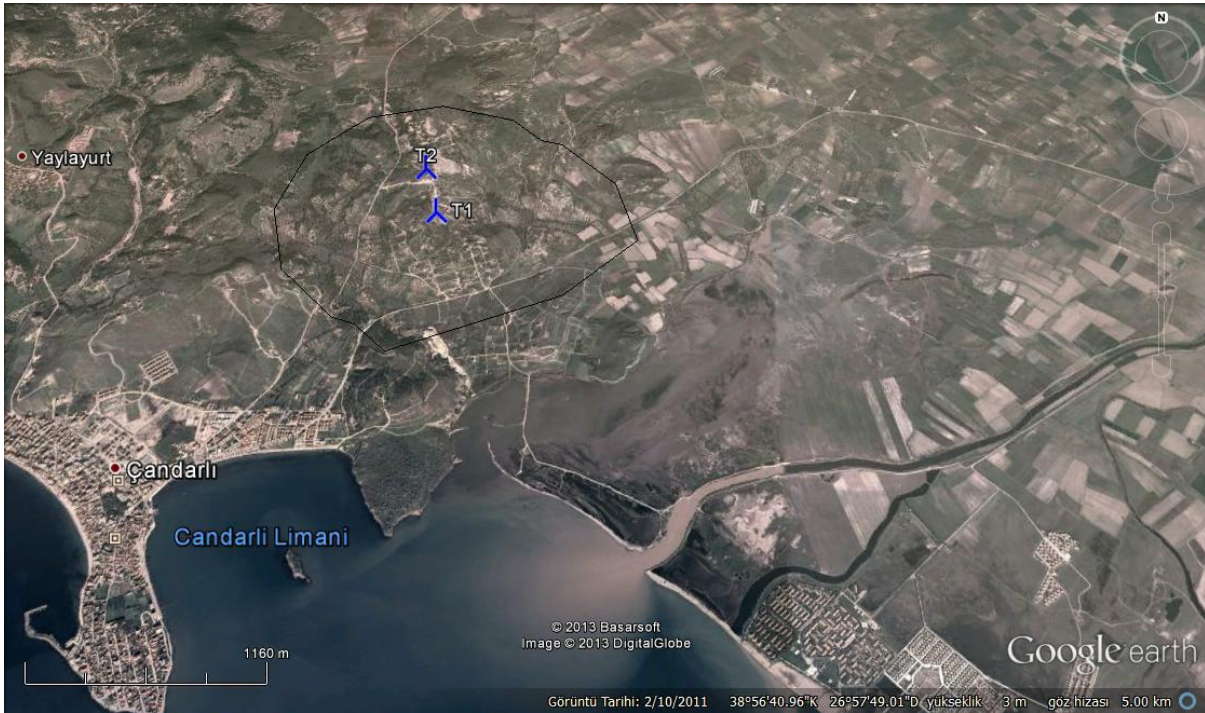


Figure 1.1: Pitane Wind Power Plant Turbines Location

1-1: Key project summary data

Project Name	Pitane Wind Power Project
Project Borrower	Bıçakçılar Çandarlı Elektrik Üretim Limited Şirketi is established by the owners of Bıçakçılar Elektrik Enerji as a special purpose company for Pitane WPP.
Project Sponsors	Bıçakçılar family had previously owned Turkey's leading medical equipment manufacturer (Bıçakçılar Tıbbi Cihazlar) and then sold all of their shares to a Kuwait based private equity fund. The next generation of the family started to invest in the electricity and construction fields.
EBRD Transaction	<p>Total Project cost is EUR 7,714,710 including VAT and investment period financing costs. The proposed financing scheme includes debt financing of EUR 5,600,000 (all financed through MidSEFF) and borrower's contribution of EUR 2,114,710. The debt to equity ratio is approximately 73:27.</p> <p>The group decision to draw a EUR loan is to diversify its foreign exchange risk to different currencies as existing loans are mainly based on USD.</p>
Project Description / Business Purpose:	<p>Pitane Wind Power Plant (WPP) is planned to be constructed in Izmir Province, Dikili District, approx. 60 km north-west of Izmir and 2 km north-east of Çandarlı town. The wind farm area is located in a slightly hilly area with an elevation of about 70 m above sea level.</p> <p>The construction started in July 2014 and operation is expected to begin on February 2015.</p> <p>Pitane WPP will produce 16.4 GWh/y of net electricity based on a probability level of 75%. The overall capacity factor of the WPP is 39.0%. This high value is mainly the result of the good presence of wind (7.4 m/s on average) and of the proper selection of the turbine model. The selected model is in fact specially developed for medium-low wind regions, where it can achieve a capacity factor up to 40%, as declared by the manufacturer. In case of Pitane WPP, probably this wind turbine type suits the wind conditions better than other models.</p> <p>Pitane WPP will be connected to the national grid through Bergama substation at 34.5 kV. A power transmission line (1.25 km long) at 34.5 kV will be constructed, connecting the substation which will be built at Pitane site, to Bergama substation. The agreement for the connection to the National Grid was signed with Gediz EDAŞ on February 4th 2013.</p> <p>Pitane WPP will generate revenues for 1,295,495¹ EUR/y.</p> <p>The electricity generation from the renewable plant will replace electricity from the National Grid and enable reduction of 9,660 tonnes of CO₂ equivalent per year, as calculated for the base case scenario.</p>
Installed Power	4.8 MW
Annual Electricity Production	P75: 16,400,000 kWh/year in first full year of production (2016)

2. Environmental and Social Baseline

2.1 Environmental description of the project area

The project area is out of the main bird routes. A map showing the secondary routes in Pitane RES region was attached to the ornithological report and it is presented in Figure 2.1.

As a result, bird monitoring campaign is advised to be performed in the leadership of an Ornithologist during birds' migration periods (both in spring (March-April) and in autumn (late August, September-October)) and also at winter time (January-February) and summer time (June-July) (Akdeniz Uni., 2012). The data obtained by these observations should be evaluated and submitted to the General Directorate of Natural Parks every six months (Akdeniz Uni., 2012).

No endemic, threatened or endangered flora and fauna species were identified in the Project site and its vicinity as a result of literature study. The natural vegetation of the region is composed of sparse red pine (*Pinus brutia*) forest and woody, bush like, or semi-bush species that spread in lower terrain of the forest. This vegetation type can be observed very often in Mediterranean and Aegean regions of the country. Thus, this vegetation does not have any conservation priority. Therefore, no adverse effect on the vegetation is foreseen due to implementation of the projection accordance with the national environmental legislation, there are no national parks no reserves, natural monuments, wildlife protection/improvement area.



Figure 2.1: Wide Scale Bird Migration Routes

Table 2-1: Environmental characteristic

ENVIRONMENTAL ASPECTS	PRESENCE/DISTRIBUTION	COMMENTS
Land use	The project located within marginal agricultural lands owned by treasury	Permits are received.
Waters surface	N.A	-
Protected area	N.A	-
Flora and Fauna	The natural vegetation of the region is composed of sparse red pine forest and woody, bush like, or semi-bush species that spread in lower terrain of the forest. The project area is out of the main bird routes.	- Bird monitoring campaign is advised.

2.2 Social condition of the project area

According to the year 2014 census the total population of the İzmir province and Dikili district were approximately 4,113.072 and 41,999 people respectively.

The plant location is within marginal agricultural lands owned by treasury and there is no high populated residential areas in the project areas nor in the near proximities: the closest village is Çandarlı approximately 1.2 km to the south. There are some scattered houses around the project area that are 400 meter far away. Considering the distance from residential areas no high criticalities are expected for nuisance to local people due to noise, shadow flicker and blade glint etc.

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

During the site visit the client informed PC that they will follow the procedure defined by Gold Standard (the client has applied for the Gold Standard and has already made an agreement with a consultant).

3. Social and Environmental Impact

3.1 Land Use

The Project will be located within marginal agricultural lands owned by treasury and all land types changed into the raw lands from treasure. There are no forests and private lands within the Project, no expropriation will be carried out; therefore there will be no resettlement.

3.2 Water

Domestic waste water will be produced due to daily water consumption of the employees both during construction and operation phase.

The Sponsor didn't supply any information about this issue and the PC considers this a gap to be filled. This aspect will be deeper analyzed during the monitoring phase.

3.3 Waste

The solid waste that is expected to be generated at Pitane WPP is excavation waste (from preparation of tower foundations) and domestic solid waste (paper, plastics, glass etc.).

The Sponsor didn't supply any information about this issue and the PC considers this a gap to be filled. This aspect will be deeper analyzed during the monitoring phase.

3.4 Birds and other species

As can be seen from Figure 2.1, the project site is not located in the vicinity of main migration routes of soaring bird species. However, the site survey and the previous studies conducted at the region designate that soaring bird species that migrate in groups, such as stork and crane use the valley in the northeast of the site rarely (Akdeniz Uni., 2012). Based on the literature survey, since transitions above fishgarth, which is 1.2 km away from the project site, is low, the number of transition above the turbines is also expected to be low and no adverse effect on these bird species is expected (Akdeniz Uni., 2012).

In any case the Ornithological – Ecological Assessment Report (Akdeniz Uni. 2012) identified some precautions in order to avoid bird collision with the wind turbines. Furthermore bird monitoring will be carried out during construction and in the first year of operation.

3.5 Emissions: Noise and Particulate

Noise emissions will be generated during construction due to equipment/machinery operation. No study has been supplied that shows if the noise emissions are at acceptable levels. The sponsor is obliged to work according to related regulations and all precautions should be taken by the Sponsor before and during construction.

Noise emissions are expected due to operation of turbines in operation phase.

The project area is far enough to the residential areas but aerial views shows there are some scattered houses around the project site and the PC considers the absence of a noise emissions modelling as a gap to be filled and suggests to the Sponsor the implementation of a noise modelling study and a monitoring campaign in case of complaints.

Dust is 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 projects. Considering the position of the project (on a hilly area far away from residential areas), the PC considers that landscape component should be assessed further. Besides, construction of turbines, underground transmission lines, and administration building lead to cut off a part of the degraded red pine trees. Landscape deformation is expected to a limited extent as a result of tree cutting. Therefore, PC recommends a photo-impact simulation from the most sensitive viewpoints and the implementation of some compensation/mitigation measures in case.

Table 3-1: Impact Quantification

COMPONENT	IMPACT	QUANTIFICATION
Land use	Different use of the land	No Information provided by Sponsor
Water	Utilization and Discharge	No Information provided by Sponsor
Waste	Production of solid waste	No Information provided by Sponsor
	Excavation waste	No Information provided by Sponsor
Birds and other fauna and flora species	Interference with migration routes/interference with protected species-	The project is , is not located in the vicinity of main migration routes of soaring bird species.. 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. Monitoring activity will be put in place.
Emissions	Noise	Construction phase < 70dBA (law limit = 70dBA) Operational phase=40dBA (law limit = 50dBA)
	Particulate	No information provided by Sponsor.
Landscape	Changing in the aspect of the area	A visual impact assessment and the photo-impact simulations were not supplied by the sponsor. PC suggests a photo-impact simulation from the most sensitive viewpoints and the implementation of some compensation/mitigation measures in case.

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