



Final Report

Mid Size Sustainable Energy Financing Facility (MidSEFF)

Bozyaka Wind Power Plant: Non Technical Summary (NTS)

May 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 975 million in loans through 7 Turkish banks for on-lending to private sector borrowers.

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Acronyms

EBRD	European Bank for Reconstruction and Development
EMRA	Energy Market Regulatory Authority
WPP	Wind Power Plant
IUCN	International Union for Conservation of Nature
LC	Least Concern
MidSEFF	Mid Size Sustainable Energy Financing Facility
PC	Project Consultant
PIR	Project Information Report
NTS	Non Technical Summary
VAT	Value Added Tax
VU	Vulnerable

1. General Plant Description

The location of the proposed wind power plant is the Aegean Region of İzmir Province within the boundaries of Aliaga Borough, Bozköy Village location. Bozyaka WPP Project is an extension of 4.8 MW (2 turbines) to an operating project of 12.5 MW (5 units of Nordex N100/2500). The current WPP consist of 5 units of Nordex N100/2500 kW turbines with 100m hub height and it is planned to install 2 additional wind turbines (Nordex N117/2400 kW).

The existed WPP has started operation on 10th March 2012. The extension project investment started in 2014 will be completed on June 2015.

The capacity increasing of the project has been exempted from any additional environmental assessment study preparation for 17.3 MWm on 25.04.2013, whose structure and contents were preliminarily approved by local relevant authority, has been prepared according to Turkish regulation.

The Sponsor received energy production licence for 12 MWe/12.5 MWm WPP on 19th January 2011 with using of Nordex turbines. The license was amended to an installed capacity of 12 MWe/17.3 MWm on 18th October 2012 by EMRA. Table 1 presents the key aspects of the project.



Figure 1-1: Location of the Project District of İzmir Province

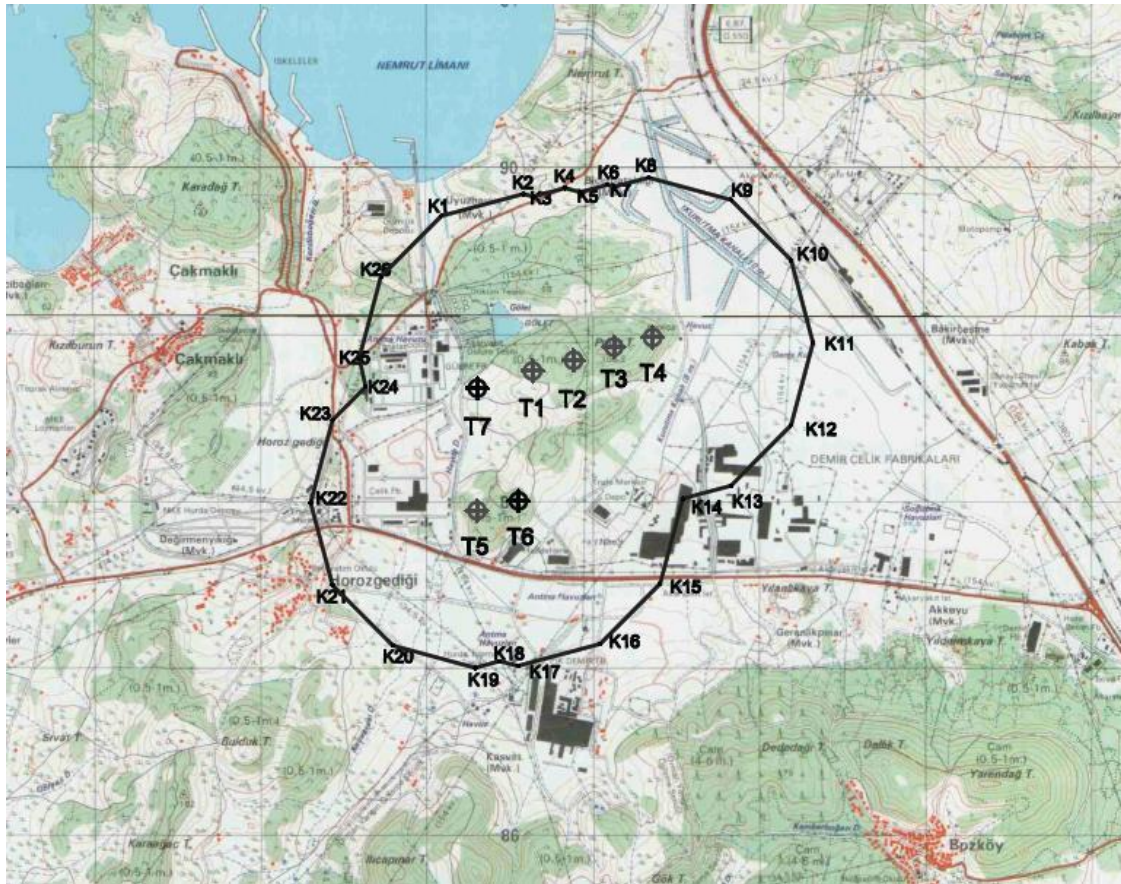


Figure 3-2: Territorial Framework and Bozyaka Wind Power Plant Project Location (T6 and T7 are the two new turbines to be installed)

Table 1-1: Key project summary data

Project Name	Bozyaka Wind Power Plant
Project Borrower	Ayres Elektrik Üretim A.Ş.
Project Sponsors	Kardemir Haddecilik ve Elektrik Üretim Sanayi Ticaret Ltd Şti
EBRD Transaction	The total project cost is EUR 7,315,777 including capitalized financing costs and working capital requirement. The proposed financial scheme includes debt financing in the amount of EUR 5,600,000 and the borrower's own contribution in the amount of EUR 1,715,777. The debt to equity ratio is approximately 77:23. The investment duration will be 11 months approximately.
Project Description / Business Purpose:	<p>The location of the proposed wind power plant is at the Aegean Region of İzmir Province within the boundaries of Aliağa Borough. The Bozyaka WPP project is an extension of 4.8 MW (2 turbines) to an operating project of 12.5 MW (5 units of Nordex N100/2500).</p> <p>The current WPP consist of 5 units of Nordex N100/2500 kW turbines with 100m hub height and it is planned to install 2 additional wind turbines (Nordex N117/2400 kW). 2 WTGs will be connected already in operation plant's grid system. There will be no additional energy transmission line. The electricity will be transported to the connection point in Aliağa TM-1 transformer with a 34,5 KV. Transmission line is 7,200m length.</p> <p>The project will contribute to the Turkish energy share by producing green energy which will be sold to the market, with expected annual revenue of EUR 1,162,904¹.</p> <p>After capacity extension, project annual generation will increase by 14.597 GWh/y which will further avoid 8,685 tCO₂/y.</p>
Installed Power	4.8 MWe
Annual Electricity Production	14,597 MWh/year (only for the extension object of this report)

¹ Expected revenue for base case scenario, first full year of operation (2016)

2. Environmental and Social Baseline

2.1 Environmental description of the project area

The Bozyaka Wind Power Plant (WPP) is situated in Aegean Region in İzmir Province, Aliağa District, Bozköy Village location. The project area is situated on the ridge of Pinar Hill, which is located at the southeast of Candarlı Gulf of Aliaga/Izmir.

One of the closest residential areas to the project is Horozgediği Village, located 1,000 m away from closest WTG. The other closest area Çakmaklı Village is located 2,500m from the closest WTG. Nevertheless, coal and fuel oil storage facilities are located 150-200m far from the project area because the location is in the heavy industrial zone.

The terrain of the site is rather plain where the turbines are planned to be located considering the surroundings of the site area. There are few complexities like valleys, ridges and hills.

In accordance with Turkish Wind Atlas, the existence of planned and under construction WPPs are known around the project area. According to this Wind Atlas, the ecological assessment consultant's and PC's observation, there is one WPP located in 30 km² around the Project area (in 6km diameter). There are also two other WPPs in closed area. These WPPs are as follows:

- Karadağ WPP with 10M capacity is 2km west of the Bozyaka WPP
- Kozbeyli with 30MW capacity is 5km southwest of the Bozyaka WPP
- Petkim WPP with 25 MW capacity is planned to constructed 5.5 km northwest of the Bozyaka WPP

On the basis of the information provided by the sponsor, the area is not really highly valuable under naturalistic viewpoint. The plant location is classified as forestry area but the area is not a real forest area but just brushes.

The Project Information Report includes a short study baseline on flora and fauna presence in the project area. According to this Ecological Assessment Report prepared in June 2014, the impacts on flora and fauna are not to be considered as a potentially highly critical aspect apart from the impacts on bird life.

According to Ecological Assessment Report in the wide area of the project location, there are 34 species of birds that are protected under Bern Convention Annex-II and 18 species protected under Bern Annex-III. They are all in LC (least concern) category. There is not any bird species under VU, EN, CR, NT categories.

Some bird migration routes pass near the project area.

Table 2-1: Environmental characteristic

ENVIRONMENTAL ASPECTS	PRESENCE/DISTRIBUTION	COMMENTS
Land use	The project area consists of private and forestry lands	Privately owned lands have already been purchased via bilateral agreements. Permits should be obtained for forest area.
Waters surface	-	-
Protected area	The project location is far away from natural protected/valuables areas.	-
Flora and Fauna	No significant and unmanageable impacts are expected on environment, people, fauna and flora or the health and safety of local communities at construction and operation.	-

2.2 Social condition of the project area

All private lands, where the WTGs will be installed, had been purchased via bilateral agreements. No high populated residential areas in the project areas nor in the near proximities: nearest settlement is located abt. 1.0 km far away from T-5; There is one scattered house in close proximity.

Within the project area, there is no agricultural activity. The characteristic of the soil and its actual use make it not so valuable. On the other hand, most of the project area is forestry: forest mainly consisting of meadow and bushes.

At site location, there is no evidence of relevant cultural heritage or cultural goods in general terms.

Local Stakeholder Consultation Meeting was held on in 2010 regarding the Carbon Credit Development Process for Gold Standard validation. The Carbon Consultant informed the local people around the neighbor villages, municipality officers, journalists, directorate of Environment and Urbanization, head of land registry etc about scope of the Bozyaka WPP for previous 12.5MWm/12MWe capacity, its potential environmental and social effects, the benefits of wind energy.

3. Social and Environmental Impact

3.1 Land Use

The Borrower has already purchased the privately owned lands which are within project area. The acquisition was made via bilateral agreements. No physical resettlement actions are expected to be needed. No high populated residential areas in the project areas nor in the near proximities: nearest settlement is located abt. 1.0 km far away from T-5; There is one scattered house in close proximity.

The Sponsor confirmed that no new main access road will be necessary but new ridgeway has been constructed for the 2 additional WTGs. These ridgeways will be used for connection routes only among the turbines.

It is stated that these 2 WTGs will be connected already in operation plant's grid system. There will be no additional energy transmission line. The electricity will be transported to the connection point in Aliğa TM-1 transformer with a 34,5 KV. Transmission line is 7,200m length.

3.2 Water

There should be household waste water 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 7 employees during the operation phase, the domestic water requirement are respectively estimated to be 4.5 m³/day and 1.05 m³/day. Domestic waste water generated by project workers will be collected in impermeable septic tanks constructed in line with Turkish regulation.

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 Bozyaka WPP is excavation waste (from preparation of tower foundations) and domestic solid waste (paper, plastics, glass etc.). Daily domestic solid waste production is 1.15 kg per capita, for a total of 34.5 kg/day and 8.05 kg/day taking into account respectively 30 project workers during construction phase and 7 project workers during operation phase. The solid waste will be stored in separate waste containers. And will be sent to the Municipality's Landfill Area.

The excavation waste will be kept under cover and used as filling material for the same excavation holes.

The maintenance for construction machinery and equipment are 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 handling in compliance with the "Regulation of the Medical Waste Control" dated 22.07.2005.

3.4 Birds and other species

A bird monitoring report has been implemented and an ecological report has been prepared in the project wide area. The project site is not on the way of main migration routes of birds. But not too far from local migratory route; attention is required on this aspect. In any case monitoring is required for at least the first two years of operation.

According to project’s ecological assessment report, no significant and unmanageable impacts are expected on environment, people, fauna and flora or the health and safety of local communities at construction and operation. The project location is far away from natural protected/valuable areas. The area has lost its natural ecosystem characteristic because it is surrounded by heavy industrial zone for a long time and the area is not a wildlife breeding and feeding area.

A dedicated chapter regarding flora and fauna of the project area was prepared. No relevant or endangered flora is expected in the project area according to PIR.

3.5 Noise

Noise emissions will be generated during construction due to equipment/machinery operation. Noise emissions are expected during operation due to turbines working. A study in the PIR (which was previously prepared for 12.0 MWe/12.5 MWm configurations) shows that noise emissions are at 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.

With the increasing of WTG number, the noise level during operation and construction might change and have a different impact on close vicinity of the plant. There is not any scattered house close to the project area. The closest village is 1 km away from T-5. By considering close receptors, a noise assessment should be done for both construction and operation periods.

It is recommended to conduct a noise monitoring campaign including the nearest receptor both for the construction and operation phases to observe any deviation from standards and to implement necessary measures on time.

3.6 Emissions to Air

Dust generated from earth-moving and material storage, and air emission from the operation of construction machinery and equipment. A study in the PIR shows that air-emissions are at acceptable levels and the supplied documentation states that the sponsor will 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. During construction dust emission and exhaust emission will be emitted. The sponsor is obliged to work according to related regulations and all precautions will be taken by the sponsor before and during construction. It is committed by Sponsor’s signature within the letter that is given by EIA Authority regarding EIA exemption decree for 4.8 MW extension of the plant.

So it can be easily said that no relevant aspects both construction and operation phases for emissions.

3.7 Landscape

Landscape is usually a sensitive aspect for this kind of project. Taking into account the position of the project (on a hill and close to the seaside) the Borrower a Landscape Maintenance Report has been implemented including a photomontage to assess the impact on landscape of whole plant considering the adding of these 2 turbines. In any case the adding of 2 turbines does not change a lot the landscape already affected by the existing plant.

Table 3-1: Impact Quantification

COMPONENT	IMPACT	QUANTIFICATION
Land use	Different use of the land	-
Water	Utilization and Discharge	4,5 m ³ /day during construction phase

		1.05 m ³ /day during operation phase
Waste	<u>Production of solid waste</u>	34.5 kg/day during construction phase for 30 workers for 8 workers 8.05 kg/day during operation phase (1.34 kg/person/day)
	<u>Excavation waste</u>	300 m ³ The excavation waste will be kept under cover and used as filling material for the same excavation holes
Birds and other fauna and flora species	<u>Interference with migration routes/interference with protected species-</u>	The project site is not on the way of main migration routes of birds but there are some secondary routes. A monitoring campaign is required for at least the first two years of operation. According to project's ecological assessment report, no significant and unmanageable impacts are expected on environment, people, fauna and flora or the health and safety of local communities at construction and operation.
Emissions	<u>Noise</u>	Construction phase < 70dBA (law limit = 70dBA) Operational phase=47 dBA (law limit = 50dBA)
	<u>Particulate</u>	0.189 kg/h (law limit = 1.5 kg/h)
Landscape	<u>Changing in the aspect of the area</u>	Photo simulation supplied by the sponsor demonstrates as the impact of the project is negligible being just an addition of 2 turbines in an already existing plant. There is no significant effect considering the location of villages (being on the foothill).

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