



Mid Size Sustainable Energy Financing Facility (MidSEFF)

Mutlular Biomass Power Plant: Non Technical Summary (NTS)

October 2016

Final Report

European Bank for Reconstruction and Development

**Mutlular Biomass Power Plant:
Non Technical Summary (NTS)**

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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 1,500 million (which includes EUR 300 million provided by EIB) in loans through 7 Turkish banks for on-lending to private sector borrowers.

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00	May 2016	Draft Report	B. Daylan	M. Solari	G. Devrim Sener
01	October 2016	Final Report	B. Daylan	G. Devrim Sener	G. Devrim Sener

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1. General Plant Description

Mutlular Biomass Power Plant will consist of one 30MW condensing steam turbo-generator and one 130t/h biomass boiler. The location of the proposed biomass power plant is within Gönen Industrial Organized Zone (OIZ) of Gönen District in Balıkesir Province.

The certificate stating that an “EIA is not required” has been obtained on 8th May 2015 with a decision number of 3166 for the proposed project which is planned to be located in Tuzakçı Neighborhood, Gönen District in Balıkesir Province. Later on, since the project location has been changed, the certificate stating that an “EIA is not required” has been obtained on 2nd September 2015 with a decision number of 7015 in accordance with the new location in Gönen OIZ. Then, the project is considered in the Annex 1 of the EIA Directive since the feedstock capacity of the plant has been increased from 350 ton/day to 700 ton/day (without changing the plant capacity as 30 MWe). Besides that, the utilization of animal waste is excluded from the project scope since the boiler is not suitable for combustion of animal waste. Regarding all these changes, a new EIA report has been prepared in October 2016. However, the final “EIA Decision” certificate has not been obtained yet. According to the EIA report, the organic waste that will be utilized in the plant will be forestry and agricultural residues such as poppy seed meal, cotton waste, sunflower stalk, boll stalk, rice stalk, canola stalk, corn stover, olive seed etc.

The final electricity production license has been obtained on 29.09.2016 with a license number of EÜ/6493-12/03572. Mutlular Biomass Energy Power Plant is connected to Gönen Transformer Station 154/34,5kV via 9.9 km existing Energy Transmission Line (ETL) and the grid connection agreement has been signed by the official letter dated on 31.05.2016.

Location of the project area is shown in Figure 1-1.

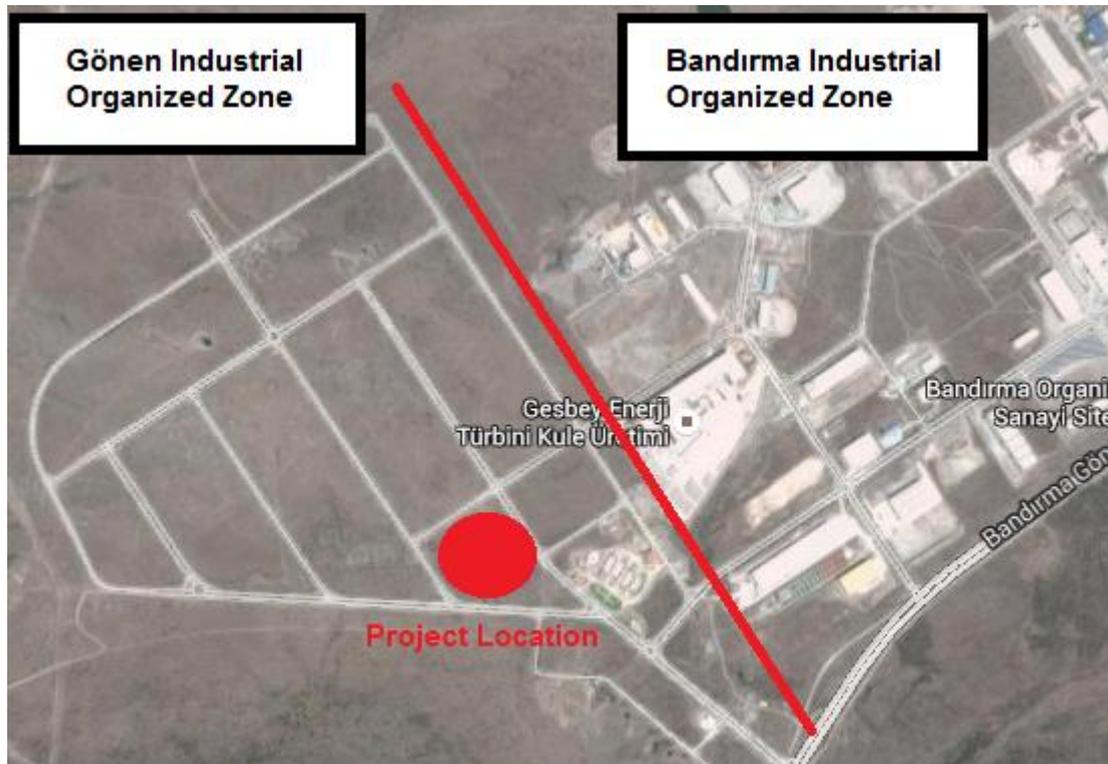


Figure 1.1: Mutlular Biomass Power Plant Project Location

The construction of Mutlular Biomass Power Plant (BPP) is planned to start in May 2015. The project is expected to start operation till end of 2016. Table 1 presents the key aspects of the project.

Table 1-1: Key project summary data

Project Name	Mutlular Biomass Power Plant
Project Borrower	Mutlular Enerji Sanayi ve Ticaret Ltd. Şti.
Project Sponsors	Mutlular Group
EBRD Transaction	Total Project cost is USD 36,927,961 including VAT, investment period interest, premiums and arrangement fees. The proposed financing scheme includes debt financing of USD 28,203,730 (all financed through MIDSEFF as 4 different loans) and borrower's contribution of USD 8,724,231. The debt to equity ratio is approximately 76:24.
Project Description / Business Purpose:	<p>The location of the proposed Biomass Power Plant is within the Gönen District in the Balıkesir Province in Marmara Region of Turkey.</p> <p>The project involves the construction of a conventional biomass power plant, fired with biomass fuel, consisting of a steam boiler with a steam production capacity of 130 tons/h and a steam turbine with electricity generator of a power capacity of 30 MWe, along with the entire technical infrastructure including stockyards for biomass fuel, and the electricity output system (transformer unit) to the national power grid.</p> <p>Mutlular BPP project will contribute to the share of renewable energy in the Turkish energy market replacing electricity from the national grid and enabling the reduction of 90,588 tCO₂/year.</p>
Installed Power	30 MWe
Annual Electricity Production	172,237,000 kWh/year in first full year of production

2. Environmental and Social Baseline

2.1 Environmental description of the project area

The plant area covers totally 84,158.22 m² in Gönen OIZ. Project area is almost 15 km far away from Gonen downtown and 28 km far from the Bandırma District.

The area is classified as Leather and Mixed Organized Industrial Zone. Gönen OIZ has its own EIA certificate that was obtained on 16.03.1995. The existing infrastructures provided in the Zone include roads, water, natural gas, electricity, communications and wastewater treatment.

The site area is approx. 250 m far from the Bandırma-Gönen main road. Because the plant location is within the organized zone, main access roads and side road in OIZ have been already constructed by the Organized Zone authority. No further road construction or rehabilitation will be necessary.

The nearest natural protected/valuables area is Kuş Cenneti National Park which is 14 km away from the project site. The project will not affect the substantial touristic population since the area is located in the OIZ. However, the project area is located in 1st Degree Seismic Zone, therefore the seismic risk is considered high. The ground study of the project location (dated on August 2015) has been supplied by the Sponsor.

Table 2-1: Environmental characteristic

ENVIRONMENTAL ASPECTS	PRESENCE/DISTRIBUTION	COMMENTS
Land use/characteristic	The Project is located in Gönen OIZ.	Since the project location is in the Organized Industrial Zone (OIZ), the environmental considerations are considered negligible due to the fact that the OIZ is already allocated as an Industrial Area
Water surface	Manyas Bird Lake is 37 km away from Gönen OIZ.	
Protected area	Kuş Cenneti National Park is 14 km away from the project site.	
Flora and Fauna	As a result of flora and fauna studies carried out in the study area, there are not any species available being endemic, or rare by national or international agreements.	
Seismic risk	High	The ground study dated on August 2015 has been supplied by the Sponsor.

2.2 Social condition of the project area

The area is classified as Leather and Mixed Organized Industrial Zone. Gönen OIZ has its own EIA certificate that was obtained on 16.03.1995. The existing infrastructures provided in the Zone include roads, water, natural gas, electricity, communications and wastewater treatment.

The closest residential areas to the project area are Bostancı and Taştepe Villages, located 3 km and 5 km away from project area, respectively. The other closest settlement is Buğdaylı Village that is located 3 km away from the Project area. Nearest settlements are shown in Figure 2-1.

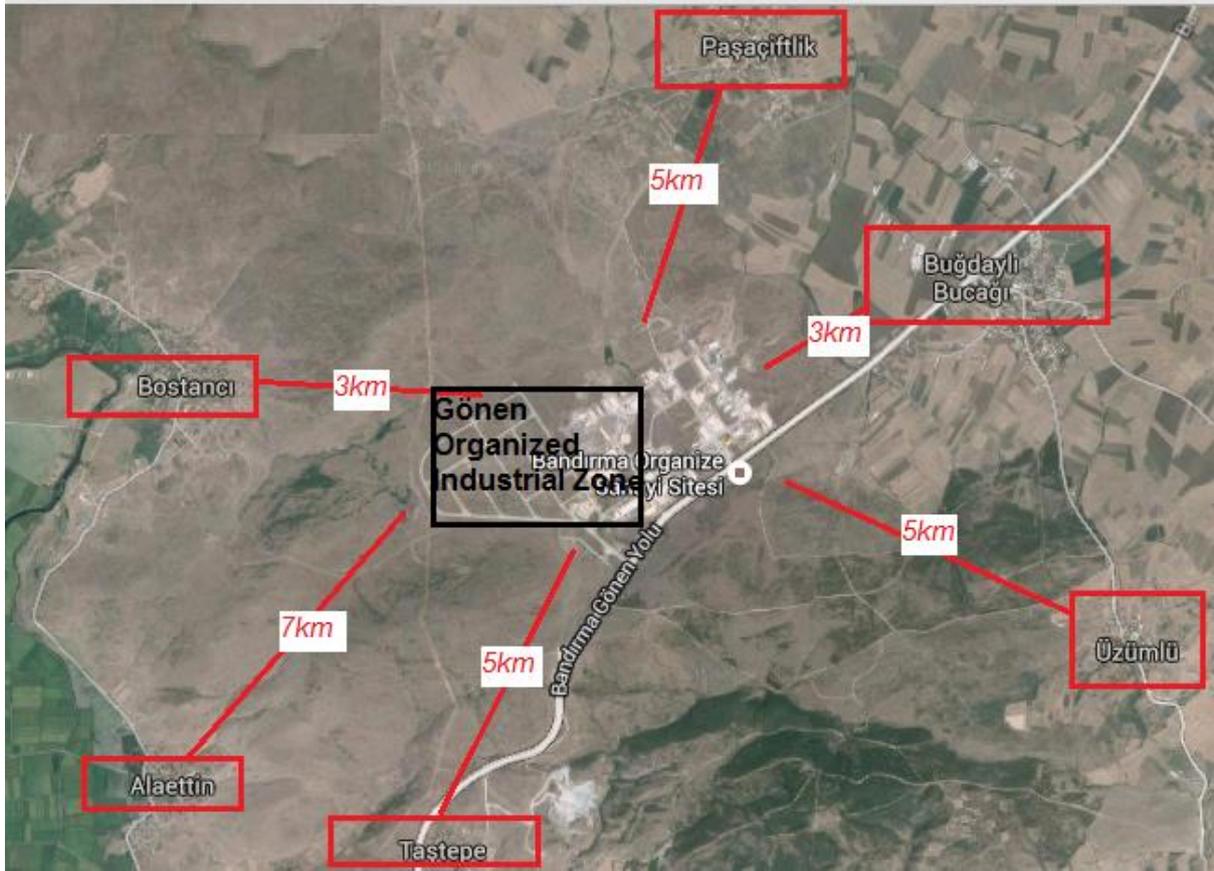


Figure 2.1. Nearest settlements to the project area

Balıkesir is the 13th biggest province in Turkey. According to TÜİK (Turkish Statistical Institute) data, Balıkesir’s population was calculated as 1,189,057 in 2014. Gonen District’s population is 73,095 with city centre and rural areas.

Gönen is a district of Balıkesir Province of Turkey, in the southern part of Marmara Sea. The town is mostly known for its therapeutic hot springs, leather processing and rice production. The town is surrounded by Bandırma in the northeast, Biga and Yenice in the west, Marmara Sea and Gulf of Erdek and Balya in the south.

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

3. Environmental and Social Impact

3.1 Land Use

The land is located in Leather and Mixed used Organized Industrial Zone. There will be no tree cuttings for the Project site.

The plant area covers totally 84,158.22 m² in Gönen OIZ. The purchasing process of the area has been finalized. There will be no land acquisition for the Project.

3.2 Water/Wastewater

Based on the assumption that the daily domestic water requirement is 150 litres per capita, and considering 20 employees during the construction phase and 150 employees during the operation phase, the domestic water consumption (and, consequently, discharge) in the construction and operation phases were estimated as 3 m³/day and 22.5 m³/day, respectively. It is accepted that all domestic water consumption is converted to wastewater.

During operation, 2.448 ton/day water will be used as cooling operations and recirculated continuously.

In the EIA report, it is stated that water will be supplied from the OIZ water system during construction and operational phases according to the Preliminary Sales Contract signed between Gönen OIZ management and Mutlular A.Ş. The wastewater will be sent to the wastewater treatment plant of Gönen OIZ which is under construction and expected to start operation till end of March 2017 based on the information obtained from the Sponsor. The connection permit to Gonen OIZ wastewater treatment plant from the OIZ management should be obtained by the Sponsor. The wastewater will be collected in a septic tank and sent to a wastewater treatment plant guided by the OIZ authority until the finalization of the treatment plant of the Gönen OIZ.

The feedstock storage area has an impermeable cement layer to prevent soil pollution in case of any leachate.

3.3 Waste

Waste which is expected as a result of construction activities can be classified as domestic waste, construction waste, including excavated materials and demolition waste and hazardous waste (waste oil etc.). These wastes will be managed according to related national regulations.

Daily average domestic solid waste production will be 23 kg/day in the construction phase and 173 kg/day in the operation phase (assuming daily average domestic solid waste production amount of 1.15 kg per capita). The recyclables will be separated from the domestic waste and domestic solid wastes will be collected in the containers and sent to Municipality. Excavated soil will be re-used for the filling of the area and site levelling purposes.

According to the EIA report, 23,450 ton ash will be produced from combustion of agricultural and forestry feedstock with a total capacity of 700 ton/day. In the EIA report, it is stated that the produced ash will be collected in a separate storage area (with a capacity of 540 m³) and sent to the facilities that utilize these wastes as raw material. Based on the information obtained from the Sponsor, the produced ash will be analyzed and then, the possible utilization facilities (fertilizer or cement producers) will be identified according the result of the analysis report.

Waste oil arising from the vehicles during the construction phase should be delivered to licensed companies to be disposed as stated in "Regulation on Control of Waste Oil". Considering the amounts of waste and proposed mitigation measures, no significant impact is expected.

3.4 Noise and Vibration

Noise emissions will be generated during construction due to earthmoving works, construction of power plant and operation of construction machinery and equipment.

A noise modelling study in the EIA report has been supplied by the Sponsor for construction and operation periods. During construction, the level of noise in a distance of 250 m to the project location will be 64.95dBA which is lower than the limit value of 70 dBA. According to the EIA report, since noise insulation systems will be used for the plant buildings, no noise emissions will be expected during operation. In the EIA report, it is stated that indoor noise measurements will be made and the Workplace Environment Measurement Report will be prepared for the operational period. According to the measurement results, the related measures (earplug etc.) will be supplied for the staff.

3.5 Emissions to air

Potential impacts of the Mutlular Biomass Power Plant on air quality will occur during the construction and operation phase of the project. Dust formation from earthmoving activities and other gas emissions from construction machinery will be the main sources of impacts on air quality during the construction phase of the project.

Since the new EIA report comprises mostly operational phase related to capacity increase, the air emission from construction phase is evaluated in the final PIR (dated on August 2015). According to the study, dust emissions - 0.18 kg/hour - are within acceptable levels (below 1 kg/hour).

In the EIA report, an air emission modelling study is also prepared for the operational phase. According to the air emission modelling study, the expected dust emissions (maximum value of PM emissions are 119 μm^3) are higher than the limit values (above 50 $\mu\text{g}/\text{m}^3$) presented in the Industrial Air Pollution Control Regulation. Additionally, the expected SO_2 emissions (356.8 $\mu\text{g}/\text{m}^3$) will be slightly higher than the limit value (350 $\mu\text{g}/\text{m}^3$). A bag filter system will be used for the dust emissions. NO_x/SO_x abatement systems will be used, if needed. In the EIA report, it is stated that all the measures will be implemented and on-line monitoring system will be used in order to measure the air emissions such as $\text{SO}_2/\text{NO}_x/\text{CO}/\text{CO}_2$ and dust.

In conclusion, it can be easily said that no relevant critical aspects for construction phase are expected related to emissions to air in accordance with the provided documents. Relating to the air emissions during the operation phase, there are some relevant critical aspects expected. Required mitigation measures should be implemented as it is defined above.

The PC requires the placement of fire extinguishers to the suitable parts of storage area due to the rapid combustible behavior of feedstock.

3.6 Landscape

The plant will include some horizontal structure (pipeline, grating system and feeding belt) and some vertical structures, such as (cooling tower, ash silo, flue gas chimney) or other facilities in the project area. Since the project will be located in Gönen Industrial Zone, this aspect is considered not critical.

3.7 Odour

Since the animal waste are excluded from the project scope, it is not expected to produce odor emissions related to feedstock storage, as a result, there will be no need any odor precautions based on the information provided with the EIA Report.

3.8 Seismic

Because Gönen is located in 1st degree earthquake zone, an obligatory ground study of the Project land is requested. The ground study dated on August 2015 has been supplied by the Sponsor. According to the report, no groundwater level was observed during the drilling activities. However, a drainage system has been suggested for the surface water that will be affected the groundwater production. According

to the report, the soil amplification level has been classified as B and therefore, the effective ground acceleration coefficient should be used as $A_0 = 0.40$ according to the Regulation on the Buildings to be Built in Seismic Zone.

Table 3-1: Impact Quantification

COMPONENT	IMPACT	QUANTIFICATION
Land use	<u>Project located in OIZ</u>	The plant area covers totally 84,158.22 m ² in Gonen OIZ. The purchasing process of the area has been finalized.
Water/Wastewater	<u>Utilization and Discharge</u>	Assuming 20 workers during construction and 150 workers during operation, the domestic water requirements (and, consequently, discharge) are estimated to be 3 m ³ /day during construction and 22.5 m ³ /day during operation. (It is accepted that all domestic water consumption is converted to wastewater). The connection permit to Gonen OIZ wastewater treatment plant from the OIZ management should be obtained. 2.448 ton/day cooling operation (recirculated)
Waste	<u>Production of solid waste</u>	23 kg/day during construction 173 kg/day during operation (assuming 20 workers during construction and 150 workers during operation) Ash:23,450 ton/year The produced ash will be sent to the facilities that utilize these wastes as raw material.
	<u>Excavation waste</u>	5,805.98 ton during construction Excavated soil will be re-used for the filling of the area and site levelling purposes.
Noise and vibration	<u>Noise</u>	Construction (64.95dBA) and operation phases < 70dBA (law limit) A noise modelling has been supplied for construction phase. No noise emissions will be expected during operation
Emissions to air	<u>Particulate</u>	0.18 kg/h during construction (<1.0 kg/h - law limit) Max 119 µ/m ³ > 50 µ/m ³ (law limit) during operation
	<u>SO₂</u>	356.8 µg/m ³ is slightly higher than the limit value of 350 µg/m ³
	On-line monitoring system will be used in order to measure the air emissions such as SO ₂ /NO _x /CO/CO ₂ and dust. A bag filter system will be used for the dust emissions. NO _x /SO _x abatement systems will be used, if needed.	
Seismic	<u>Possible damage to the project due to earthquake</u>	1st Degree Seismic Zone The ground study of the project site has been supplied.

MidSEFF Office

Asmadalı Sokak, No. 27

Kosuyolu

34718 Kadikoy, Istanbul

TURKEY

www.midseff.com