



Final Report

Mid Size Sustainable Energy Financing Facility (MidSEFF)

Saray Hydro Electric Power Plant: Non Technical Summary (NTS)

June 2012

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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 1,050 million in loans through 7 Turkish banks for on-lending to private sector borrowers.

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1. General Plant Description

This investment project consists of construction of a run off the river type hydro electric power plant in the East Black Sea Region of Turkey. The project area is located in Trabzon Province, on the left side of İyidere River. The project area is located downstream of Incirli HEPP. The Powerhouse of Saray HEPP is at about 4 km from the Black Sea.

Saray HEPP project is intended for energy generation purpose only; no irrigation or water supply facilities have been considered in the design. Saray HEPP main project parts are:

- water intake from tailwater of Incirli HEPP;
- water transmissions (circular tunnel – under pressure);
- surge tank;
- penstock;
- powerhouse (two Kaplan vertical axis turbines, 2 x 7.565 MWm and 2 x 6.75 MWe generators); gross head of 32.25 metres, tailwater level of 6.75 m a.s.l.

Saray HEPP project has been granted with Energy Production License given by the Energy Market Regulatory Office (EMRA) on September 07, 2009. Table 1 presents the key aspects of the project.



Figure 1.1: Saray HEPP Layout

Table 1-1: Key project summary data

Project Name	Saray Hydro Power Project
Project Borrower	Mertler Enerji Üretim Pazarlama A.Ş.
Project Sponsors	Adalı Holding A.Ş.- Adalı Group
EBRD Transaction	The total project cost is USD 41,313,958 including capitalized financing costs. The proposed financial scheme includes debt financing in the amount of USD 21,000,000 and the borrower's own contribution in the amount of USD 20,313,958. The debt to equity ratio is approximately 51:49. The investment duration will be 2.5 years approximately.
Project Description / Business Purpose:	The project concerns a 13.5 MWe (2 x 6.75 MWe) Kaplan type run off the river Hydro Electric Power Plant. The facility will produce 56.33 GWh per year with a capacity factor of 50%. The generation of electricity from renewable source will replace the electricity from the national grid and enable reduction of 30,756 tCO ₂ /annum.
Installed Power	15.13 MW
Annual Electricity Production	56.33 GWh

2. Environmental and Social Baseline

2.1 Environmental description of the project area

Most of the lands of the Trabzon Province are hilly and mountainous mostly covered with forestry, which is common in Black Sea Region. The mountains are parallel to the sea side, and elevates rapidly, leaving very narrow area between mountains and the sea. 90% of the cultivated areas are used for tea plant.

Generally speaking, the project is not in an industrial area, the surroundings are mainly forestry areas. According to information given in the Project Information Report (PIR) the necessary permissions from the General Directorate of Forestry will be taken according to the related Law on Forestry Areas, number 6831.

The Saray HEPP utilizes, to produce energy, the water from the tail water channel of the İncirli HEPP, located just upstream of Saray HEPP.

According to the Project Information Report (PIR) and the 2nd Revised Feasibility Report (FS), all the water turbined in the Saray HEPP will be released through the tail water channel to the İncirli Creek.

According to the PIR the flora and fauna species, present in the project area, are not endangered or threatened. Furthermore no protected or designated areas were found around the project location.

Table 2-1: Environmental characteristic

ENVIRONMENTAL ASPECTS	PRESENCE/DISTRIBUTION	COMMENTS
Land use	Total: 29,475.26 m ² (Private: 26,150.42 m ² Public: 3,324.84 m ²)	The sponsor is waiting to obtain the Final Expropriation Permits although all regulations had already been completed
Waters surface	N.A.	-
Protected area	N.A.	-
Flora and Fauna	No valuable species exist.	-

2.2 Social condition of the project area

According to the most recent data (December 31st 2010, as checked by PC on the Turkish Statistical Institute's web site) the population of Trabzon Province is abt. 763 thousand of people.

The project area is very closed to residential area, the nearest village is Güresen, about 200 meters away from the power plant that will be hidden by the trees present in this area. The water intake unit is 500 meter away from the main road.

The most of the lands of Trabzon Province is cultivated and forestry which is common in the Eastern Black Sea Region. The cultivated areas are near to the sea side. The areas which are far from the sea are mainly forestry and used for cultivation (mainly hazelnut). The hazelnut and tee plant cultivation are the main agricultural activities in Trabzon Province.

Trabzon is also one of the most popular touristic areas in the Region, due to the following aspects:

- presence of green areas;
- weather conditions (especially in the summer period) and;
- presence of historical and landscape relevant elements.

3. Social and Environmental Impact

3.1 Land Use

As described in Table 2-1 the most of the area are private lands and the sponsor's intention is to purchase these lands or acquire passage rights from the owners; in case of any difficult to agree with owners, the sponsor has obtained the authorization to expropriate these areas by the Energy Market Regulatory Authority (EPDK) according to Expropriation Law No. 4650, Electricity Market Law No. 4628 and law No. 5496.

3.2 Water

There will be household waste water both during construction and operation phase. This is generally employees' daily waste. The pollution is biological and physical. According to the Project information Report the household waste water amount is calculated as 10.86 m³/day during construction phase, 1.17 m³/day during operation phase. (60 employees during construction and 7 employees during operation are assumed).

3.3 Waste

The hazardous wastes are expected in negligible level due to construction machines, used oils etc. These wastes will be handled according to the related regulation as stated in the PIR. Most of the waste are household wastes caused by employees and the amount is 56.4 kg/days during construction phase and 6.58 kg/day during operation phase except recycle. Recyclable waste such as wood or plastic will be collected in separated box and delivered to the licensed companies. All these wastes will be managed according to related regulations such as Solid Waste Control Regulation. Usual good engineering practices are usually enough to cover this aspect.

About the management of excavated material during the construction phase, the main construction yard will be used as a collecting point for this type of material that will be used for adequate construction purposes (a total 101,000 m³ excavated material is expected during construction).

3.4 Fisheries

The project couldn't affect the fish habitat in the river being the project a tandem of İncirli HEPP it takes water directly from the tailwater channel of İncirli.

3.5 Emissions: Noise and Particulate

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 the air-emissions levels are acceptable and the sponsor has stated to work under the related Turkish regulations (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 impact is expected both during construction and during operation phase.

Noise emissions will be generated during construction due to equipment/machinery operation. The assessments in the PIR show that noise emissions (see below for blasting phase) 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.

Blasting will be made according to related regulations and all precautions will be taken by the sponsor before blasting.

Minimum noise emissions are expected during operation due to electro mechanic working and water flow/fall.

Table 3-1: Impact Quantification

COMPONENT	IMPACT	QUANTIFICATION
Land use	<u>Different use of the land</u>	Total: 29,475.26 m ² (Private: 26,150.42 m ² , Public: 3,324.84 m ²)
Water	<u>Utilization and Discharge</u>	10.86 m ³ /day (construction phase); 1.17 m ³ /day
Waste	<u>Production of solid waste</u>	56.4 kg/day (60 workers during construction phase) and 6.58 kg/day (7 workers during operation phase)
	<u>Excavation waste</u>	101,000 m ³
Fisheries	<u>Loss fish/ loss habitat</u>	No fish loss, water directly from the tail water channel of the İncirli HEPP
Emissions	<u>Noise</u>	Construction phase < 70dBA (law limit) Operational phase: No disturbance for the nearest receptors
	<u>Particulate</u>	< 1.5 kg/h (law limit)

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