



Final Report

# **Mid Size Sustainable Energy Financing Facility (MidSEFF)**

## **Yakinca Hydro Electric Power Plant: Non Technical Summary (NTS)**

July 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 975 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 Eastern Black Sea Region of Turkey. The project area is located in Giresun Province, Şebinkarahisar District on Kelkit creek. This creek is the borderline between Giresun and Sivas provinces and between the Black Sea and the East Anatolian Regions.

Yakınca HEPP project is intended for energy generation purpose only; no irrigation or water supply facilities have been considered in the design. The project includes the following main project items:

- regulator and fish passage;
- water transmission tunnel;
- head pond;
- penstock;
- power house.

There are many HEPPs upstream of the Yakınca HEPP, the closest one, namely Muratlı HEPP, is about 3 km far from the regulator point. The nearest projects downstream are a dam and a HEPP belong to DSİ at about 15 km.

Yakınca HEPP project has been granted with Energy Production License given by the Energy Market Regulatory Office (EMRA) on January 29, 2009. Table 1 presents the key aspects of the project.

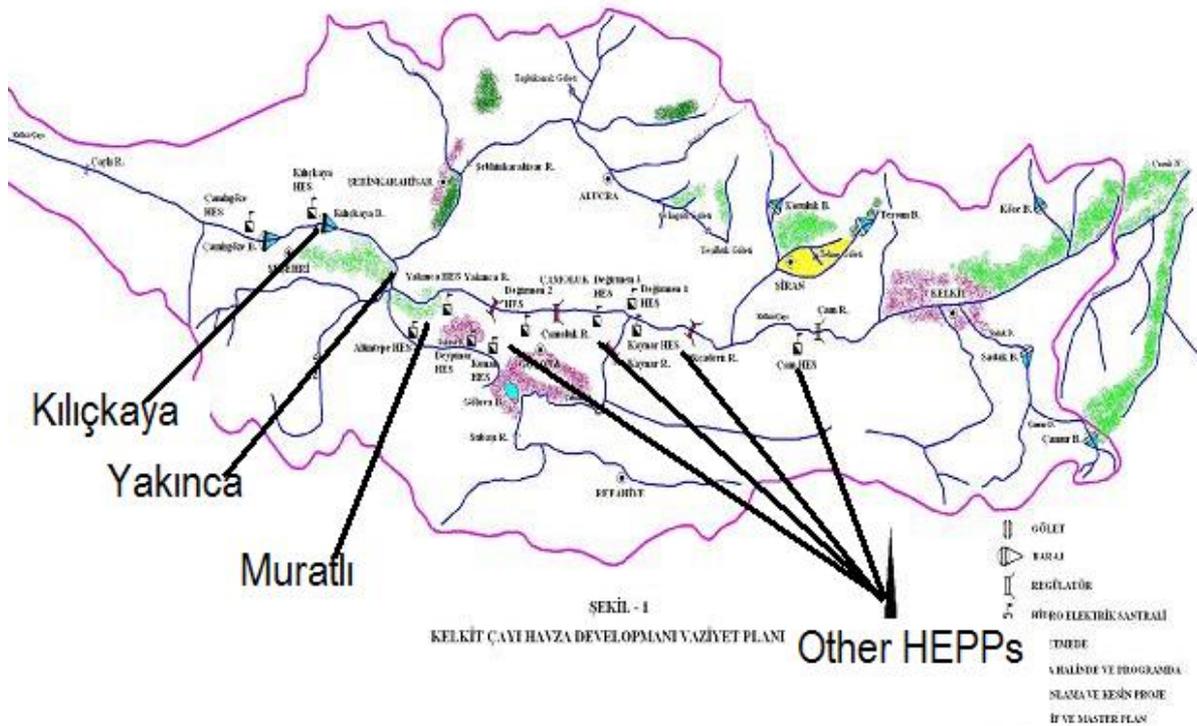


Figure 1.1: Other projects near Yakınca HEPP

**Table 1-1: Key project summary data**

<b>Project Name</b>	Yakınca Hydro Power Project
<b>Project Borrower</b>	Tırsan Elektrik Üretim A.Ş. (Tırsan Energy)
<b>Project Sponsors</b>	Tırsan Energy
<b>EBRD Transaction</b>	The total project cost is EUR 15,709,623 including VAT and capitalized financing costs. The proposed financial scheme includes debt financing in the amount of EUR 10,600,000 and the borrower's own contribution in the amount of EUR 5,109,623. The debt to equity ratio is approximately 67:33%. The investment will be completed in the middle of year 2013
<b>Project Description / Business Purpose:</b>	The project concerns a 14.49 MWe (3 x 4.83 MWe) Kaplan type run off the river Hydro Electric Power Plant. The facility will produce 31.59 GWh per year with. The generation of electricity from renewable sources will replace electricity from the national grid and enable reduction of 17,248 tCO <sub>2</sub> /year carbon savings (base case scenario).
<b>Installed Power</b>	14.49 MW
<b>Annual Electricity Production</b>	31.59 GWh

## 2. Environmental and Social Baseline

### 2.1 Environmental description of the project area

Most of the lands of Giresun Province is hilly but covered with forestry, mainly pine, chestnut, hornbeam, oak and elm trees. Near to Sivas Border there are some sites for landfills but also some areas that are green field, as the project site.

The project area consists of mainly forestry and meadow covered areas. There is only a small private land (600 m<sup>2</sup>) near the regulator. The private land has already bought by mutual agreement. The permits for forestry and meadow were obtained.

According to the Project Information Report (PIR) no protected areas are closed to the project area but there are 47 flora species and none of them are endemic, nonetheless the study shows the presence of some fauna species such as *salamandridae*, *bufonidae*, *emydidae*, *anguidae* etc in the project region which are protected under BERN Convention.

According to the PIR no protected or designated areas were found around the project location.

**Table 2-1: Environmental characteristic**

ENVIRONMENTAL ASPECTS	PRESENCE/DISTRIBUTION	COMMENTS
Land use	Total: 8,225 m <sup>2</sup> (Private: 600 m <sup>2</sup> )	
Waters surface	N.A.	-
Protected area	N.A.	-
Flora and Fauna	47 endemic flora species Some endangered species under BERN Convention	-

### 2.2 Social condition of the project area

According to the year 2011 census (provided in the [www.tuik.gov.tr](http://www.tuik.gov.tr)) the total population of the Giresun is 419.5 thousand people. Some scattered residential areas are near the project site. The nearest village, Yakınca, is 700 meter in the southwest of the tunnel. Yusufşeyh settlement is 1.5 km south of the tunnel and Doğanyuva settlement is 2.5 km north of the regulator.

Near the seaside there are some limited agriculture areas used to grow hazelnut, corn, bean, cabbage and tobacco but with poor performance except for hazelnut. Hazelnut is the main economic agricultural product in the region and Giresun is one of the leading producers of hazelnut. There are also some small-scaled fishery activities on the coast.

## 3. Social and Environmental Impact

### 3.1 Land Use

As described in Table 2-1 the most of the area are Forestry Area and the sponsor already obtained the Forestry permit. There is only a little private land (600 m<sup>2</sup>) near the regulator that is already bought by mutual agreement .

### 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 4.5 m<sup>3</sup>/day during construction phase and 1.2 m<sup>3</sup>/day during operation phase (30 employees during construction and 8 employees during operation are assumed).

### 3.3 Waste

The hazardous wastes are expected in negligible level due to used oils from construction machines, waste batteries and accumulators etc. These will be handled according to the related regulation as stated in the PIR. The amount of household waste caused by employees is calculated about 40.2 kg/day during construction phase and 10.72 kg/day during operation phase. Recyclable waste such as wood and plastic will be collected in separate boxes and will be delivered to licensed companies. All these activities related to waste management will be carried out according to the related regulations such as Solid Waste Control Regulation.

About the management of excavated material during construction phase, closed to the main construction yard there is a concreting area used also as a collecting point for the excavated material.

### 3.4 Fisheries

The project could affect the fish habitat in the river but the sponsor shall take precautions such as the construction of a fish passage to minimize this impact. In the PIR there is only general information about the possible loss of fish and it is expected to be minimal. Monitoring campaign on the aquatic biota, during operation is suggested and compensation measures should be implemented in case.

### 3.5 Emissions: Noise and Particulate

Dust will be generated by earth-moving and material storage; air pollutant emissions from the operation of construction machinery and equipment. Some considerations are included in the Project Information Report and show that the levels of air-emissions are acceptable and the sponsor has stated to work within the related Turkish regulation (Evaluation and Management of Air Quality).

During operation minimal emissions can be originated not directly associated with plant operation but with traffic, maintenance etc.

In conclusion, it can be easily said that no relevant critical aspects (both for construction and operation phase) are expected related to air-emissions.

Noise emissions will be generated during construction due to equipment/machinery operation. Assessments within PIR show that noise emissions (see below for blasting phase) are at acceptable levels and the sponsor has stated to work according to related regulations and all precautions will be taken into account by the sponsor before and during construction.

Blasting will be made according to related regulations and all precautions will be taken into account by the sponsor before blasting. The section to be excavated is very short (abt. 1 km) for this reason the impact is considered low.

### 3.6 Land stability

Pre-construction land stability surveys have been completed and the results are presented in the geological report. According to this report, the proposed earthworks are considered acceptable in terms of soil stability subject to final design and detailing.

**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: 8,225 m <sup>2</sup> (Private: 600 m <sup>2</sup> )
Water	<u>Utilization and Discharge</u>	4.5 m <sup>3</sup> /day (construction phase); 1.2 m <sup>3</sup> /day
Waste	<u>Production of solid waste</u>	40.2 kg/day (30 workers during construction phase) and 10.72 kg/day (8 workers during operation phase)
	<u>Excavation waste</u>	336,860 tons
Fisheries	<u>Loss fish/ loss habitat</u>	With fish device the fish loss will be minimal, a monitoring campaign is suggested to keep monitored the aquatic biota.
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)
Land Stability	<u>Landslides</u>	No criticalities has been found

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