



Final Report

Mid Size Sustainable Energy Financing Facility (MidSEFF) Koçlu Hydro Electric Power Plants: 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 1 billion 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
HEPP	Hydro Electric 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. Project Description

This investment consists of the construction of run of the river hydroelectric power plant in the Black Sea Region. The project area is located in Giresun Province, Kozbükü District. The main water source of the project is Yağlıdere Creek.

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

- spillway
- water intake
- sedimentation pool
- regulation pond
- pressurized conveyance tunnel
- surge tank
- penstock
- powerhouse hosting 2 horizontal axis Francis turbines
- tailwater channel

Table 1-1 presents the key aspects of the project.

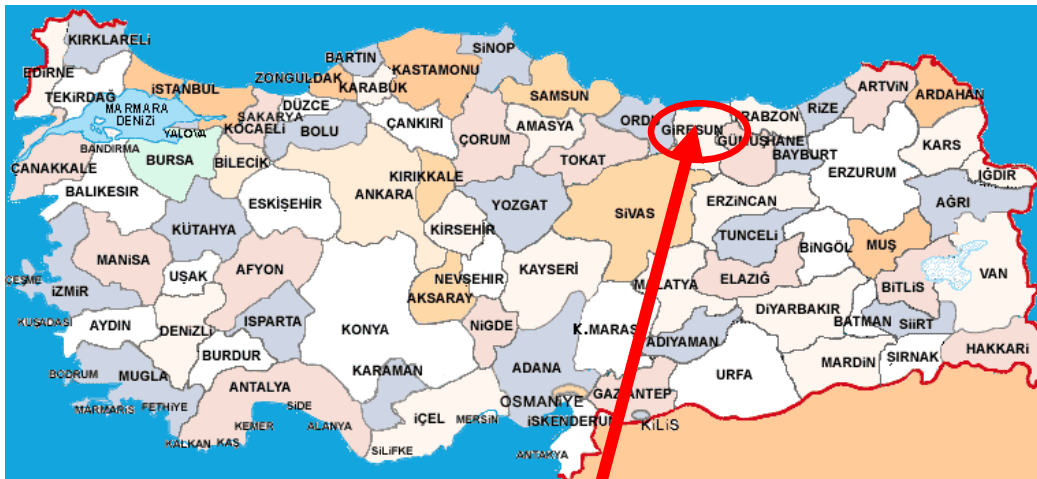


Figure 1-1: Project site location



Figure 1-2: Territorial Framework of Koçlu HEPP

Table 1-1: Key project summary data

Project Name	Koçlu Regulator and HEPP
Project Borrower	İyon Enerji Üretim Sanayi ve Ticaret A.Ş.
Project Sponsors	Sanko Group
EBRD Transaction	The total project cost is USD 65,835,651 and the debt financing will be USD 60,000,000 entirely from MidSEFF. According to the current financing plan, the debt to equity ratio is 88:12.
Project Description / Business Purpose:	<p>The location of the hydro power plant is in Eastern Black Sea Region, Giresun Province, Kozbükü District. The main water source of the project is Yağlıdere River Basin.</p> <p>Koçlu has a total installed capacity 36.33 MWm / 35.69 MWe. The plant will be realized with 2 horizontal axis Francis turbines. The HEPP exploits a net head of about 254.01 m and a nominal flow rate of 16 m³/s.</p> <p>Koçlu HEPP projects will contribute to the share of renewable energy in the Turkish energy market replacing electricity from the national grid and enabling the reduction of 55,928 tCO₂/year.</p>
Installed Power	36.3 MWm / 35.7 MWe
Annual Electricity Production	104,150 MWh

2. Environmental and Social Baseline

2.1 Environmental description of the project area

Giresun Province is in the Black Sea Region of north-eastern Turkey, about 175 km (109 mi) west of the city of Trabzon.

The surrounding region of Giresun has a rich agriculture, growing most of Turkey's hazelnuts as well as walnuts, cherries, leather and timber, and the port of Giresun has long handled these products. The harbour was enlarged in the 1960s and the town is still a port and commercial centre for the surrounding districts, but Giresun is not large, basically one avenue of shops leading away from the port. Like everywhere else on the Black Sea coast it rains (and often snows in winter) and is very humid throughout the year, with a lack of extreme temperatures both in summer and winter. As a result Giresun and the surrounding countryside is covered by luxuriant flora.

Giresun has a borderline oceanic/humid subtropical climate, like most of the eastern Black Sea coast of Turkey, with warm and humid summers and cool and damp winters. Giresun has a high and evenly distributed precipitation throughout the year. Precipitation is heaviest in autumn and spring. Snowfall is quite common between the months of December and March, snowing for a week or two, and it can be heavy once it snows.

The location of the proposed hydro power plant is in Black Sea Region, Giresun Province, Yağlıdere District, Kozbükü Township. The main water source of the project is Yağlıdere Creek. Koçlu regulator is located downstream of Kozbükü.

According to the general knowledge about the region, the documents supplied by the sponsor and observations gained during the site visit, the actual location of the plant is not normally used for recreational activities and the facility does not affect any cultural site.

According to the Ecological Evaluation Report, 3 amphibians, 8 reptiles, 46 birds and 12 mammals were identified. No endemic species had been observed within the project site as Fauna but these species are protected under BERN Convention. As per Flora, 3 endemic species were identified which are protected under Bern Convention's Annex-III.

During construction, the upper part of the earth stripped out and reused as recommended in the Ecological Evaluation Report. As well as, the remaining seed in the soil was germinated. The other precautions to be taken during construction activities for protected flora/fauna species.

Table 2-1: Environmental characteristic

ENVIRONMENTAL ASPECTS	PRESENCE/DISTRIBUTION	COMMENTS
Land use	Forestry	Permit obtained
Water surface	N.A.	-
Protected area	-	-
Flora and Fauna	As per Flora, 3 endemic species were identified which are protected under Bern Convention's Annex-III As of reptiles; 3 species were listed under Bern Convention Annex-II and 4 species are listed under same convention's Annex-III. As of bird species; 29 of them are listed under Bern's Annex-II	The other precautions to be taken during construction activities for protected flora/fauna species were listed in ecological evaluation. During site visit, the PC observed that the post-construction activities

	<p>and 15 of them are listed under Bern Convention's Annex-III. One mammal specie is listed under Bern Convention's Annex-II and 5 of them are listed under Bern Convention Annex-III.</p>	<p>regarding flora (landscape) were put in place as recommended.</p>
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2.2 Social condition of the project area

According to the year 2014 "Address Based Census", the total population of the Yağlıdere district including the population of suburbs is approximately 16,292 people. The nearest village/settlement is Sancar and Koçlu Townships, 100m far from the Regulator area.

3. Environmental and Social Impact

3.1 Land Use

The Project site is entirely within the forestry land. The related permits have been received.

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. Some considerations included in the Project Information Report show that water discharge will be managed according the Water Pollution Control Regulation.

The household wastewater amount is calculated as 18.4 m³/day for construction phase and 1.84 m³/day during operation phase. In operation phase the wastewater will be stored within a septic tank and will be sent to Municipality's waste water treatment plant periodically.

3.3 Waste

The hazardous waste is expected in negligible level due to used oils from construction machines, waste batteries and accumulators etc. These have been handled according to the related regulation as stated in the PIR. The amount of household waste due to the employees is calculated about 200 kg/day during construction phase and 20 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.

The excavation material will be used firstly for upgrading the surrounding of regulator area and power plant area. Later on, it will be used as refill material through tail water channel and road upgrading. The excess excavation material will be stored in a special storage yard. The storage will be made in accordance with the Turkish regulations: "The Regulation on Control of Excavation Material, Construction and Residue Waste" which was released on 18.03.2004 on Official Gazette n. 25406.

3.4 Fisheries

An Ecological evaluation report has been conducted as combination of site study and literature research. 5 different species of fish have been found within the plant area which are: *Oncorhynchus mykiss* (rainbow trout), *Squalius cephalus* (The chub), *Capotea banarescui*, *Barbus tauricus* (Crimean barbell), *Alburnus chalcoides* (Danube bleak).

In accordance with IUCN *Squalius cephalus* and *Alburnus chalcoides* are listed under LC (least concerned). On the other hand, *Barbus tauricus* and *Alburnus chalcoides* are protected under Bern Convention, Annex-III. According to the Report, none of these species are endemic.

In ecological evaluation report, it is also denoted that special precautions will be taken in spawning campaign of these protected species. Having protected species, in any case the PC suggests the implementation of a monitoring campaign during operation phase and put in place any compensation measure (repopulation, increasing of the water in the river bed, etc) in case.

3.5 Emissions: Noise and Particulate

Dust was generated by earth-moving and material storage; air pollutant emissions were generated by the operation of construction machinery and equipment. Some considerations are included in the PIR Report and show that the levels of dust emission during construction works including excavation have been 0.299 kg/h and acceptable (below 1 kg/h). In post construction supervision report, it was denoted that during construction activities in order to overcome excess dust emission, water spraying was implemented to access roads.

During operation minimal emissions could be originated not directly associated with plant operation but with traffic, maintenance etc. During operation phase, no relevant critical aspects are expected related to air-emissions.

During construction period, the major source of noise was the tunnel construction works. In accordance with the post construction supervision report the noise level during tunnel construction were below the legal limit which is 70 dBA.

Minimum noise emissions are expected during operation due to electro mechanic working and water flow/fall. Potential complaints and mitigation measures about this item will be checked during monitoring visits.

3.6 Landscape

Landscape is usually not a really sensitive aspect. A site survey should be done after construction activities are finished: in case of not negligible impact, some compensation/mitigation measures (in particular morphological arrangement or trees planting) could be prescribed.

Table 3-1: Impact Quantification

COMPONENT	IMPACT	QUANTIFICATION
Land use	<u>Different use of the land</u>	Forestry
Water	<u>Utilization and Discharge</u>	10.5 m ³ /day during construction 1.2 m ³ /day during operation
Waste	<u>Production of solid waste</u>	18.4 m ³ /day for construction phase (200 workers) and 1.84 m ³ /day during operation phase (20 workers)
	<u>Excavation waste</u>	200,000 m ³
Fish life	<u>Loss of fish/habitat</u>	The monitoring campaign has been implemented to monitor this aspect.
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) monitoring campaign suggested during construction phase
Landscape	<u>Visual Impact</u>	To be verified after the construction phase, some compensation measures could be put in place

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