MIDSEFF

European Bank
for Reconstruction and Development

Final Report

Mid Size Sustainable Energy Financing Facility (MidSEFF)

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

April 2014

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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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Project Name: Kavak HEPP - Non Technical Summary (NTS)				Controlled Copy	
Rev. N.	**Date**	**Description Amendment**	**Edited by**	**Revised by**	**Approved by**
00	April 2014	Final Report	S. Demir	M. Solari	M. Mancini

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Acronyms

EBRD	European Bank for Reconstruction and Development
EMRA	Energy Market Regulatory Authority
EIA REPORT	Environmental Impact Assessment Report
HEPP	Hydro Electric Power Plant
MidSEFF	Mid Size Sustainable Energy Financing Facility
PC	Project Consultant
NTS	Non Technical Summary
VAT	Value Added Tax

1. Project Description

This investment consists of the construction of two run of the river hydroelectric power plants in the east of the Black Sea Region. The project area is located in Artvin Province, Arhavi District. The Kavak I regulator will be built on Orçi River and Kavak II regulator will be built on Sidere River which is a tributary of Kapistre River.

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

- regulators and fish passages;
- box-shaped channel;
- sedimentation pool;
- transmission tunnel;
- forebay pool;
- penstock;
- powerhouse;
- grid connection facilities.

The energy production license was given by the Energy Market Regulatory Office (EMRA) with the issue number of EÜ/4220-1/2518, on 03/01/2013. Table 1-1~~Table 1-1~~ presents the key aspects of the project.

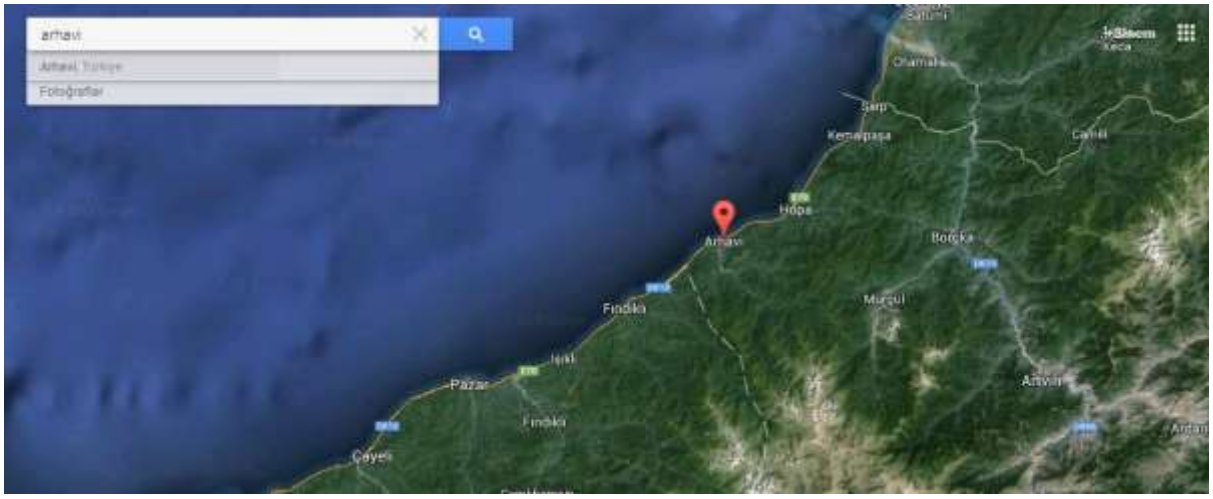

Figure 1-1: Project site

Table 1-1: Key project summary data

Project Name	Kavak I – II Regulator and HEPP
Project Borrower	Arhavi Elektirik Üretim Ltd. Şti.
Project Sponsors	MNG Group
EBRD Transaction	The total project cost is USD including 40,442,647 capitalized financing costs and working capital requirement. The proposed financial scheme includes debt financing in the amount of USD 28,679,188 and the borrower's own contribution in the amount of USD 11,763,459. The debt to equity ratio is approximately 71:29. The investment duration will be 24 months approximately.
Project Description / Business Purpose:	The location of the proposed hydro power plant is Artvin Province, Arhavi District in the east of the Black Sea Region near to the north of Eastern Anatolia. Kavak I and II HEPP projects will contribute to the share of renewable energy in the Turkish energy market. The generation of electricity from renewable source will replace the electricity from the national grid and enable the reduction of 20,753 tCO_2/year (calculated for base case scenario of electricity generation).
Installed Power	13.62 MWe (according to Turbine Contract)
Annual Electricity Production	37,940 MWh

2. Environmental and Social Baseline

2.1 Environmental description of the project area

Artvin Province is a province along the eastern Black Sea coast region of Turkey. It has steep valleys carved by the Çoruh River system, surrounded by high mountains of Kaçkar, Karçal and Yalnızçam(up to 3900 m) and forest with much national parkland including the Karagöl-Sahara, which contains the Şavşat and Borçka lakes.

The climate is wet all year round, and the summers are pleasantly cool, being strongly affected by the nearby Black Sea and its slight elevation as a result of being located on the terrace hills by the Çoruh River with most of it on the western bank The rain turns to snow at higher altitudes, and the peaks are very cold in winter.

The project site is located near main road of Arhavi (especially power house) and from place to place crosses by private lands which don't have economic values. The vegetation around project site is meadow and shrubs. The lands belong to the treasury and private owners.

153 flora species under 54 different families and all of them listed in LC category under IUCN criteria. There is no fauna species in the project region which need to be protected under BERN Convention.

Table 2-1: Environmental characteristic

ENVIRONMENTAL ASPECTS	PRESENCE/DISTRIBUTION	COMMENTS
Land use	Private and Treasury	-
Water surface	N.A.	-
Protected area	N.A.	-
Flora and Fauna	153 flora species listed in LC category under IUCN criteria	-

2.2 Social condition of the project area

According to the year 2013 census (provided in the www.tuik.gov.tr) the total population of the Artvin is 169,334 people. Some scattered residential areas are near the project site. The closest scattered houses are around 50 m far away from penstock route.

In general terms the provided documents and general know-how on the project location do not highlight any particular utilization of the river by local people.

3. Environmental and Social Impact

3.1 Land Use

In the project area there are private and treasury lands.

The size of the private lands to be expropriated has not been explored yet. There is no evidence of agricultural activities which has economic value on these lands.

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. Domestic waste water amount is calculated as to be 18 m³/day during construction phase and 2.25 m³/day during operation phase.

3.3 Waste

The hazardous waste is 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. The amount of household waste due to the employees is calculated as to be around 138 kg/day during construction phase and 17.25 kg/day during operation phase. Recyclable waste such as wood, glass 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 waste will be used as filling material for the same excavation holes. In EIA Report, it was denoted that the amount of the excavation waste will be 451,468 tons. The excess excavation waste will be stored in 2 separate areas. The height of each storage area will be 5 m and will have the capacity to store 260.850 m^3 soil. 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

As indicated in the supplied EIA Report, resident fish communities in the project river are Salmo Labrax, Alburnus chalcoides, Squalius cephalus, Lutirus frisii, Pontikola kessleri, etc. None of them are endemic.

The project will affect the fish habitat in the river but the developer will take precautions such as constructing a fish passage and grid device with an appropriate mesh size which will impede the entrance of small fish into the tunnel/channel and water intake structure during operation. Having protected species, in any case a monitoring campaign during operation phase as well as the construction phase will put in place and compensation measure (repopulation, increasing of the water in the river bed, etc) will be implemented in case. Particular attention has been paid during construction and operation to avoid the negative effects on resident fishes as well as other aquatic organisms.

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.

In accordance with the Turkish regulation on Evaluation and Management of Air Quality, the legal limit is 1 kg/h. However during construction of forebay and penstock, it is foreseen that the limit will be exceeded. Because of that within EIA Report a dust model has been developed as required by the Turkish Regulations. The settled/suspended particulate matter amount at the closest dwelling had been calculated with the dispersion model. It was found out that the threshold values won't be exceeded by considering the closest settlements are 500 m and 650 m away from the construction sites.

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 are expected both construction and operation phase

The PC suggests implementing an air monitoring during construction phase and to put in place the engineering action to reduce dust issues.

Noise emissions will be generated during construction due to equipment/machinery operation. The nearest settlements are 500 m away from Kavak I and Kavak II regulators. The expected noise level is 60.93 dBA which is lower than legal limits (70 dBA - daytime). Within the EIA report, it was committed that during construction and operation periods all noise levels will be kept at legally agreed level in line with the Turkish Regulation on Noise Control.

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

3.6 Landscape

Landscape is a sensitive aspect since the project's units will cross some private gardens. During the site visit the PC noticed especially through penstock area some landscaping work (replantation, natural engineering works, etc) will be needed. The Sponsor confirmed the penstock will go at same level with ground which will allow the replantation on it. During monitoring phase a deeper assessment could be carried out by the PC and, in case of need, some further mitigation measures could be evaluated and suggested.

Table 3-1: Impact Quantification

COMPONENT	IMPACT	QUANTIFICATION
Land use	Different use of the land	Private and treasury (quantity to be defined)
Water	Utilization and Discharge	18 m^3/day during construction 2.25 m^3/day during operation
Waste	Production of solid waste	138 kg/day during construction 17.25 kg/day during operation
	Excavation waste	451,468 tons
Fish life	Loss of fish/habitat	No evidence of threatened or endangered species
Emissions	Noise	Construction phase< 70dBA (law limit) Operational phase: No disturbance for the nearest receptors
	Particulate	>1.0 kg/h (law limit) monitoring campaign during construction phase
Landscape	Visual Impact	Some private gardens are crossed by channel/penstock

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