



Final Report

Mid Size Sustainable Energy Financing Facility (MidSEFF) Haymeana I-II Hydro Electric Power Plants: Non Technical Summary (NTS)

August 2013

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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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Table of Contents

1.	Project Description	4
2.	Environmental and Social Baseline	6
2.1	Environmental description of the project area.....	6
2.2	Social condition of the project area	6
3.	Environmental and Social Impact	7
3.1	Land Use	7
3.2	Water	7
3.3	Waste	7
3.4	Fisheries	7
3.5	Emissions: Noise and Particulate.....	8
3.6	Emissions: Landscape	8

1. Project Description

This investment project consists of construction of two run off the river type hydroelectric power plants in the east of the Aegean Region near to the west of Central Anatolian Region of Turkey. The project area is located in Kütahya Province, Domaniç District. Water source of project is Orhaneli River for Haymeana I and Dora Creek for Haymeana II.

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

- regulators and fish passages;
- water transmissions channels ;
- head ponds;
- penstocks;
- power houses.
- switchyards.

Haymeana HEPP project has been granted with Energy Production License given by the Energy Market Regulatory Office (EMRA) on December 15, 2009. Table 1 is presents the key aspects of the project.



Figure 1.1: Project site

Table 1-1: Key project summary data

Project Name	Haymeana I – II Regulator and HEPP
Project Borrower	Üner Enerji Elektrik Üretim ve Sanayi A.Ş.
Project Sponsors	Polat Yol Yapı Sanayi ve Ticaret A.Ş.
EBRD Transaction	The total project cost is USD 22,206,485 including capitalized financing costs. The proposed financial scheme includes debt financing in the amount of USD 17,300,000 and the borrower's own contribution in the amount of USD 4,906,485. The debt to equity ratio is approximately 78:22. The investment duration will be 19 months approximately.
Project Description / Business Purpose:	The location of the proposed hydro power plants are at the Aegean Region of Kütahya Province within the boundaries of Domaniç Borough, located on the Orhaneli and Dola streams. Haymeana 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 33,123 tCO ₂ /year (calculated for base case scenario of electricity generation).
Installed Power	12.1 MW (9.60 MW Haymeana I – 2.5 MW Haymeana II)
Annual Electricity Production	58,470 MWh

2. Environmental and Social Baseline

2.1 Environmental description of the project area

Kütahya province is located in the central-west Anatolia region of the Aegean at the junction point of Upper Sakarya and South Marmara Region, surrounded by the numerous from small to medium sized mountain chains and the province is under the effect of these regions' climate. For this reason, the flora of the project site is mainly steppe and bushes. The tree species in the region accounts for 48% of black pine, 5% of calabrian pine, 1% of fagus, 14% of oak, 6% of juniper and 25% of mixed forest trees. 32.3% of territorial area of the province is rural land used for agriculture purpose. Main agricultural products are chick-pea, barley, sugar beet and tomato. Energy industry based on lignite coal has been also developed in the region.

The project site is located in the hilly sections of the valley and it comprises dry forestry land and meadow area. The lands belong to the forestry, treasury and private owners. No resettlement will occur on the project area. Land acquisition from private owners has been accomplished by mutual agreements. Besides, there is not any residential area nearby to be expropriated.

In the project region there are around 55 flora species and two of them are endemic and listed in LC category under IUCN criteria. There is only one fish species in the project region which need to be protected under BERN Convention. Furthermore the project location is far away from natural protected/valuables areas.

Table 2-1: Environmental characteristic

ENVIRONMENTAL ASPECTS	PRESENCE/DISTRIBUTION	COMMENTS
Land use	Forestry, Private and Treasury	Permits obtained, private lands purchased.
Waters surface	N.A.	-
Protected area	N.A.	-
Flora and Fauna	55 flora species and two of them are listed in IUCN; one fish species listed under BERN Convention	-

2.2 Social condition of the project area

According to the year 2011 census (provided in the www.tuik.gov.tr) the total population of the Kütahya is 564,264 people. Some scattered residential areas are near the project site. The nearest village, Muhacirler, is 900 meter in the west of power house and some houses at 300 m west to the regulator of Haymeana I. Güney Village is the nearest residential area, abt. 1 km to the Haymeana II project site.

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.

In order to assess the project acceptance by potentially affected communities a stakeholder holder engagement plan will be implemented.

3. Environmental and Social Impact

3.1 Land Use

In the project area there was 15 areas which were classified as agricultural lands. For this type of categorization the sponsor received Special Use Permit based on Soil Protection and Land Usage Law for "unusual and reasonable" uses of these lands other than for which the district is classified.

As per forestry lands, the "Preliminary Forest Permit" had been obtained. The Turkish legislation states that the sponsor has to pay a fee for each cut tree and the Government will use these fees for re-plantation.

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 15 m³/day for 100 employees during the construction phase and 1.8 m³/day for 12 employees 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 caused by employees is calculated about 115 kg/day during construction phase and 16.08 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 waste (58,303 ton) will be used as filling material and upgrading of roads. The domestic solid waste that cannot be re-used will be managed according to related regulations such as Solid Waste Control Regulation. They will be stored in containers on site and sent to the Municipality Landfill.

3.4 Fisheries

As indicated in the supplied Environmental Impact Assessment Report, most common resident fish communities in the project river are *Cyprinus carpio*, *Alburnoides bipunctatus*, *Leuciscus cephalus*, *Gobio gobio*, *Capoeta tinca*, etc. In the concerned water resource there are 6 fish species listed in IUCN under LC category, 1 species is listed at IUCN under VU category and one species classified under Bern Convention Annex III. Particular attention will be paid during construction and operation to avoid the negative effects on endemic fishes as well as other aquatic organisms. 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 in to the tunnel/channel and water intake structure. The biota monitoring during operation is recommended by the PC. Compensation measures (such as repopulation) could be prescribed according to monitoring results 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. 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). The maximum air emission is expected during power house construction which is 0.202 kg/h and it is smaller than the regulation limit, 1 kg/h.

During operation minimal emissions can 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.

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 assessment shows that noise emissions (except for blasting, 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 has already made according to related regulations and all precautions had taken into account by the sponsor before blasting.

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

3.6 Emissions: Landscape

The tunnel entrance area will need some landscaping work. It is suggested the implementation of a replantation plan and other natural engineering works in order to avoid negative visual impact of the hydropower structures on natural landscape.

Table 3-1: Impact Quantification

COMPONENT	IMPACT	QUANTIFICATION
Land use	<u>Different use of the land</u>	Forestry, Private and treasury (quantity to be defined)
Water	<u>Utilization and Discharge</u>	15 m ³ /day during construction 1.8 m ³ /day during operation
Waste	<u>Production of solid waste</u>	115 kg/day (50 workers) during construction 16.08 kg/day (6 workers) during operation
	<u>Excavation waste</u>	53,900 m ³ – Haymeana I 38,049 m ³ – Haymeana II
Fish life	<u>Entering to channel/tunnel to the turbines</u>	No evidence of threatened or endangered species
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>Scraped vegetation</u>	-

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