



# Vranduk

## Hydropower Project

### Project Information Leaflet

#### May 2013

Elektroprivreda Bosne i Hercegovine (EPBiH) proposes to construct a new 20 MW hydropower plant (HPP) on the Bosna River near the village of Vranduk in the municipality of Zenica in central Bosnia and Herzegovina. Vranduk is situated in the Zenica-Doboje Canton on the left bank of the Bosna River between the town of Zenica and the settlement of Nemila. The Vranduk HPP will generate about 96 GWh of electricity per year.

### Why is the hydropower plant needed?

- **Increase the supply of electricity from renewable energy sources** with the objective of reducing CO<sub>2</sub> emissions, air pollutants and related pressures on climate change, in line with European legislation and the Strategic Plan and Program for the Development of the Energy Sector of the FBiH
- **Provide a reliable and high-quality electricity supply** in the Federation of BiH, improving the living standard in FBiH
- **Creation of employment opportunities** during construction, operation and maintenance of the hydropower plant

*This leaflet presents the main elements of the Project, the key positive and adverse impacts, and measures that will be taken to avoid adverse effects and enhance positive impacts. It also gives you the opportunity to comment on the proposed Project, either online or by using the grievance form which you can find at the end of this leaflet.*

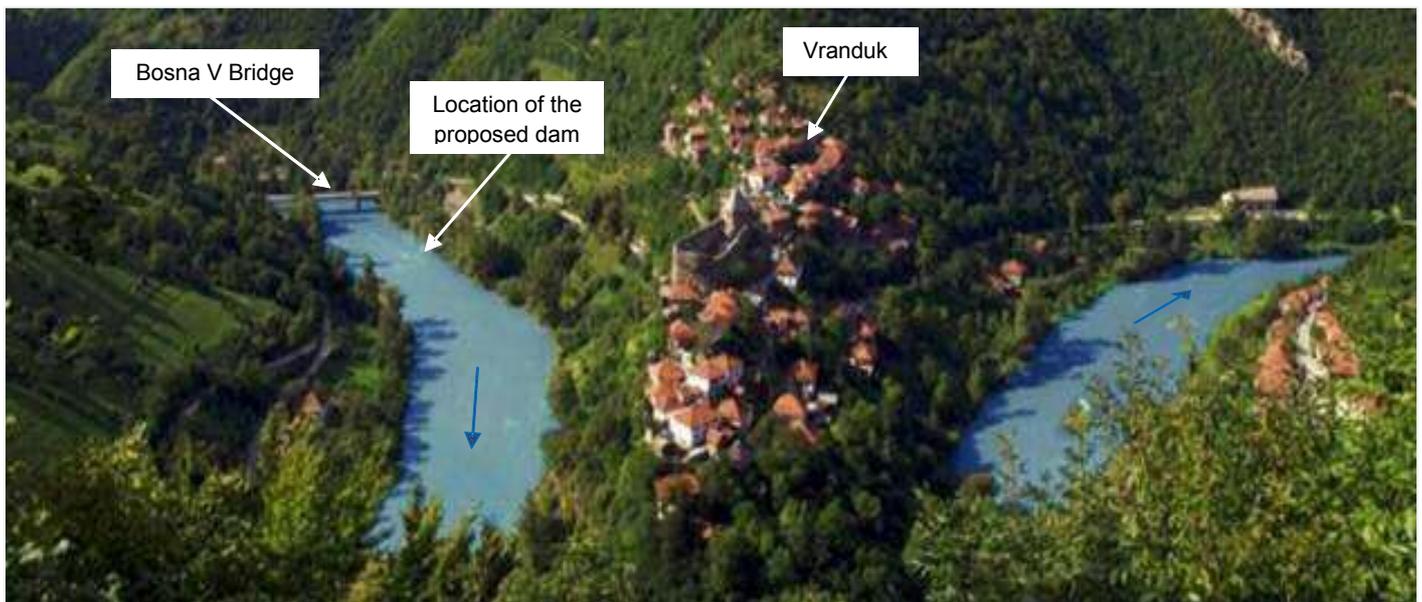
An Environmental and Social Impact Assessment has been prepared to assess the benefits and impacts of the Vranduk HPP and to identify mitigation measures to manage any potential adverse impacts of the Project. An initial **Environmental and Social Action Plan (ESAP)** has been drawn up for the Project which comprises the actions that will be taken by EPBiH in order to avoid or reduce negative impacts and enhance Project benefits. The ESAP will also include all mitigation and monitoring measures included in the Environmental Permit for the Project which FBiH Ministry of Environment and Tourism issued in 2011.

In order to manage environmental and social impacts associated with Project construction, operation and maintenance, EPBiH will develop and regularly update an **Environmental and Social Management System (ESMS)**. The ESMS will be aligned to best practice principles.

# What is the Project composed of?

The Vranduk HPP will be a diversion run-of-river hydropower plant that will operate continuously and without any water storage capacity for peaking generation. The Project is comprised of the following key components

- Construction of a dam ([1] see reference in figure opposite) about 150 m downstream from the Bosna V Bridge [12], including a small generating unit, a fish ladder and a gate storage chamber. The approximate location of the dam is shown in the image below.

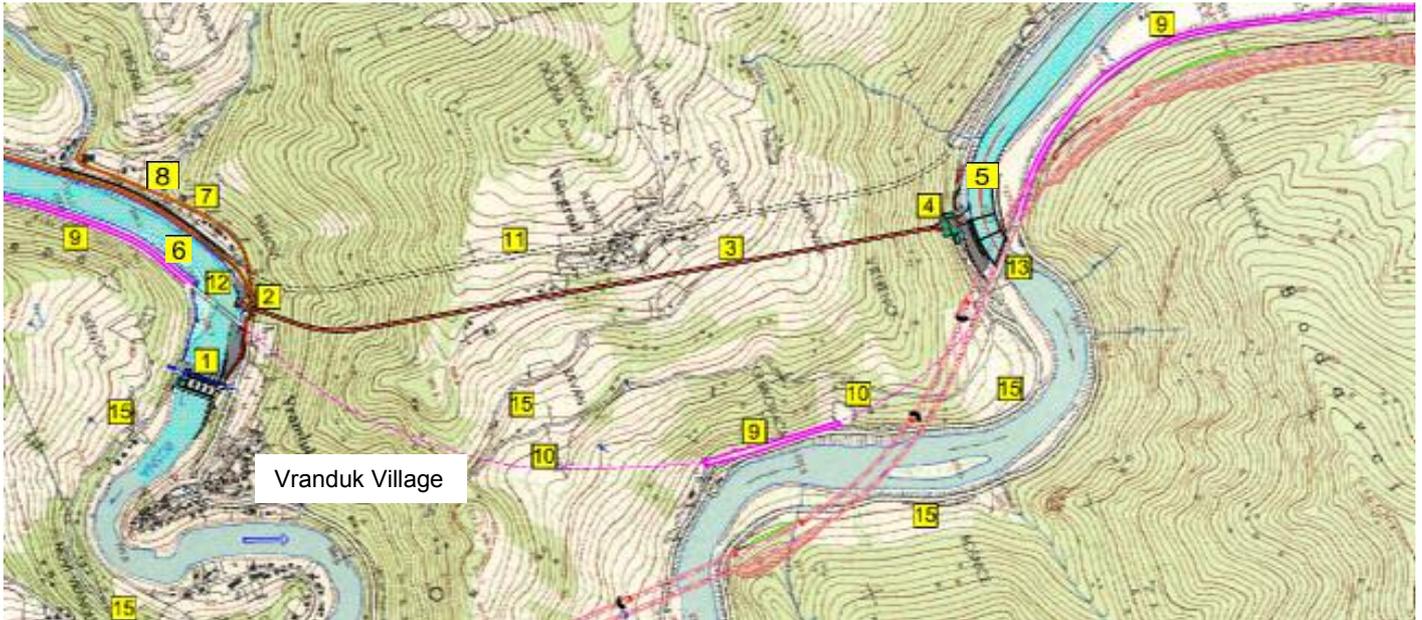


Photography showing the Bosna River, Vranduk and the approximate location of the dam

- Creation of a water reservoir extending up to 6.1 km behind the dam [6], with a surface area of 42 ha at the highest operating water level. This would be an increase of 12% of submerged area compared to the current mean flow.
- Construction of a water intake structure upstream of the dam on the left river bank [2].
- A 1.5km power tunnel [3] from the left river bank to a powerhouse [4] on the left bank of the river 6.7km downstream from the dam and just downstream of the Bosna IV Bridge. [13].
- Powerhouse facilities: control building, auxiliary structures with transformers and SF 6 facility  
New electricity connections from the powerhouse and the small generating unit in the dam to the local electricity transmission and distribution networks.
- Making the river up to 2.9 deeper from the tailrace for about 2.5 km [5] from the tailrace and settlement Nemila

Provision of the Ecologically acceptable flow in accordance with Law on Waters in the part of water flow between dam and powerhouse

Flushing of floodwaters and sediments will occur periodically throughout the year through gates in the dam to manage and avoid the buildup of sediment within the reservoir.

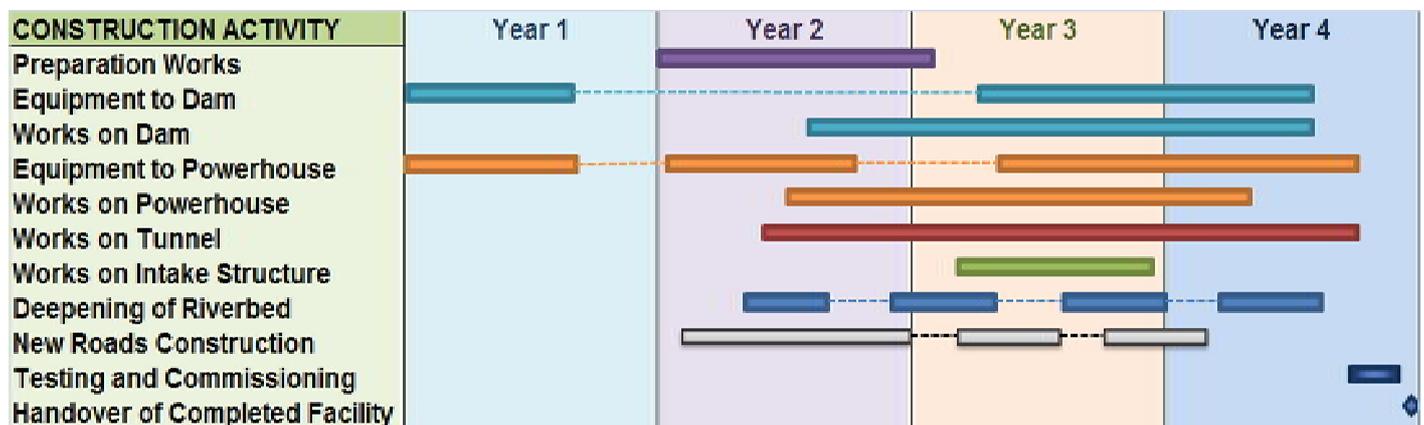


Plan showing the site location and components of the Vranduk HPP near the village of Vranduk

In addition, the existing roads will be reconstructed and the new one will be built as follows:

- Rehabilitation of around 4 km of the Vranduk-Zenica road [8] and ten culverts under the road and the railway line on the left bank of the reservoir.
- Construction of a new road [7] (around 600 m) between the intake structure and Hanovi, including an overpass over the railway line upstream of the dam.
- Rehabilitation of a service road between the intake structure and the dam (around 160 m).
- Rehabilitation of the local road Zenica-Nemila between the powerhouse and Nemila on the left river bank (around 1.2 km)

It is estimated that the construction of the Vranduk HPP will take approximately four years, starting in September 2014 and ending in 2018. The current schedule is presented below -- it might be modified as planning goes forward.



# Main Impacts, Mitigation and Monitoring

**EPBiH will be required to meet all relevant national environmental and labour standards and the best practice requirements of the environmental and social policies of the European Bank for Rehabilitation and Development (EBRD), the Project Lender.**

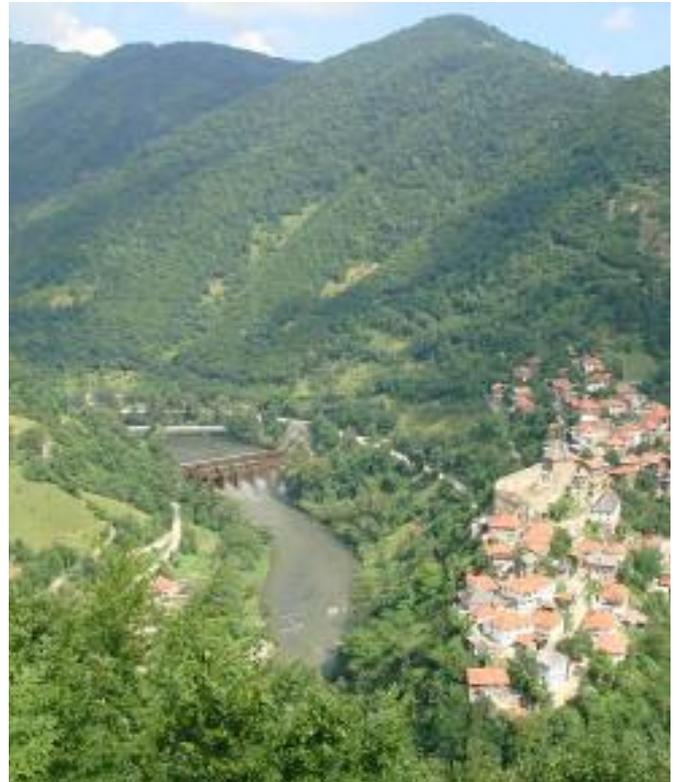
## *Main Impacts and Associated Mitigation Measures during Construction*

- Employment opportunities will be available through Project activities either as direct job opportunities (there will be approximately 500 workers employed during the construction phase of the Project) or by providing services to construction workers.
- EPBiH will provide expert assistance to local community organisations in conjunction with Project activities, these include assistance, in accordance with the Law, to the National monument Old town Vranduk and to the local Fisheries Association. A 'friendly' environment agreement has also been signed between EPBiH and Zenica Municipality to provide funding for 34 projects in the municipality with a budget of approximately KM 1.5 million (projects include the construction of sports fields, water supply and roads for local communities).
- Land acquisition and resettlement will affect no more than 15 households. Those people affected have already been notified by EPBiH and land acquisition, resettlement and all relevant compensation will be carried out under FBiH law and follow EBRD requirements. A Resettlement Policy Framework (RPF) will be prepared defining the prescribed land acquisition and resettlement process to be employed by EPBiH.
- Spoil from the tunnel excavation will be used for the rehabilitation and construction of roads where possible. In addition, EPBiH will develop a Waste Management Plan for the avoidance, reuse, recycling and disposal of waste during the construction and operational phases, which also includes the disposal of spoil from excavations.
- EPBiH will develop a Traffic Management Plan in order to manage access to Vranduk, Hanovi, Nemila, the Almy concrete production facility and other communities during construction and to minimise disturbance to schools, and other sensitive areas. This Plan will also take into account the planned construction of the motorway section Zenica-Nemila between 2015 and 2018.
- Increased noise and vibrations from construction works will be reduced as much as feasible through the implementation of measures included in a Construction Environmental Monitoring Plan that EPBiH will develop.
- Turbidity of the water in the Bosna River due to suspension of fine material during the construction of the dam, intake structure and the deepening of the downstream riverbed will occur. However, this fine material will settle as the river flows downstream, particularly as the current flow of the river will be maintained during the stage of construction of the dam by using cofferdams.

- It is not expected that water resources for local communities will be impacted by construction works. However, water sources used by local communities will be monitored to ensure that water quality is maintained.

### ***Main Impacts and Associated Mitigation Measures during Operation***

- Greenhouse gas emissions produced by the Vranduk HPP will be minimal compared to electricity generated by coal plants.
- There will be less floating waste in the Bosna River downstream of the dam due to waste collection in the reservoir.
- The reservoir will provide new opportunities for recreation and sports activities.
- The Project design will reduce as much as possible any change in the appearance of the Bosna River landscape due to the dam, in particular from the Vranduk Fortress. A simulated view of the proposed dam is presented in the picture on the right.
- Employment opportunities for approximately 15 to 20 skilled workers during the operation phase of the Project.



Simulated view of the proposed dam on the Bosna River below the Bosna V Bridge and next to Vranduk

- Possible investments are planned for preparation of program for tourism development and a plan for protection and maintenance of the 'Old Town Vranduk'.
- EPBiH has paid single fee concession in accordance with the Concession Agreement for Hydropower Plant Vranduk.
- Floods will not be worsened by the Project and an Emergency Preparedness and Response Plan will be developed and disclosed to local communities.
- EPBiH will consult with authorities to design and schedule arrangement of the riverbed between the powerhouse and Nemila so that impacts on water quality and biodiversity are minimised.
- There will be changes to the natural vegetation on the riverbanks downstream of the dam due to the reduced flow and submersion of a small area of natural shrubs and trees by the reservoir (0.027 ha). Biodiversity downstream of the dam will be monitored so water levels can be adjusted to avoid negative impacts from reduced flows.
- Continued fish movement in the Bosna River will be addressed either through a fish ladder in the dam structure or by implementing other options, such as restocking of fish up and downstream of the dam.

# Public Consultation and Contact Details

A Stakeholder Engagement Plan (SEP) identifies key stakeholders and ensures that they are well informed about the Project including any potential positive or negative impacts of the Project. The SEP also provides a formal grievance mechanism to be used by stakeholders for registering complaints, concerns, queries and comments.

If activities change or new activities relating to stakeholder engagement commence, the SEP will be updated and it will be reviewed on a regular basis. The SEP includes the following:

- Public consultations and information disclosure requirements of the law and EBRD
- Identification of stakeholders and other affected parties
- Overview of previous engagement activities
- Stakeholder engagement programme including methods of engagement and resources
- A grievance mechanism

Stakeholders can be individuals or organisations that may be directly or indirectly affected by the Project or may be interested in the Project. **Anyone may comment** on the proposed Project and the documents that have been disclosed for public review - the Environmental and Social Impact Assessment, the SEP, this leaflet and the Environmental and Social Action Plan. Comments will be accepted **for 120 days** from **Tuesday 14 May 2013 until Wednesday 11 September 2013**. If requested by any of the stakeholders a public consultation will be held to discuss these documents.

The documents will be available on the EBRD website ([www.ebrd.com](http://www.ebrd.com)) and the EPBiH website ([www.elektroprivreda.ba](http://www.elektroprivreda.ba)) as well as the following locations:

- Zenica Municipality Building: Trg BiH 6, 72 000 Zenica, BiH
- EPBiH Sarajevo: Vilsonovo šetalište 15, 71000 Sarajevo, BiH
- EPBiH Zenica: c/o Electrodistribution Zenica Safvet bega Bašagića 6, 72000 Zenica, BiH
- EBRD Sarajevo (BiH): 15th Floor, Tower B, Unitic Towers, Fra Anđela Zvizdovića 1, 71000 Sarajevo, BiH
- EBRD London (UK): One Exchange Square, London EC2A 2JN, United Kingdom

All comments will be considered in preparing final documents and plans, and will be considered by the European Bank for Reconstruction and Development in its decision on whether to provide financing for the Project. All comments or enquiries should be directed to:

Amil Kamenica,  
Executive Manager for Capital Investment, EPBiH

Kadira Močević  
Head of Department of Environmental Management, EPBiH

Telephone: +387 33 751 749

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Address: Vilsonovo šetalište 15, 71000 Sarajevo

E-mail: [he\\_vranduk\\_ESAP@elektroprivreda.ba](mailto:he_vranduk_ESAP@elektroprivreda.ba).

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In addition, the Feedback / Grievance Form at the end of this leaflet can be used at any time, including during construction and operation.

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# Feedback / Grievance Form

You may use this form if you have any comments, complaints or grievances regarding the Project. The form can be posted to the address provided below. A copy of this grievance form is also available on the company website [www.elektroprivreda.ba](http://www.elektroprivreda.ba).

Full Name			
Contact Information  <i>Please include how you wish to be contacted (i.e. mail, telephone or e-mail)</i>	Post al Address:		
	Telephone number:		
	E-mail address:		
Preferred language <i>(please tick)</i>	Bosnian <input type="checkbox"/>	Croatian <input type="checkbox"/>	English <input type="checkbox"/>
	Serbian <input type="checkbox"/>		
	Other <input type="checkbox"/>		
Description of feedback or grievance <i>(What happened? Where did it happen? Who did it happen to? What is the result of the problem?)</i> :			
Date of incident / grievance			
One time incident / grievance date.....			
Happened more than once? How many times? .....			
Still on-going (i.e. currently experiencing problem) Y / N <i>(please circle)</i>			
How would you like to see this problem resolved?			
Signature.....Date.....			
Please return this form to: JP EPBiH d.d.-Sarajevo, Vilsonovo šetalište 15 , 71000 Sarajevo			
(For office use only) Reference number:			