

1. TITLE OF THE PROJECT HYDROPOWER SYSTEM UPPER HORIZONS

2. SECTOR Energy

3. LOCATION

The term Upper Horizons means the undeveloped part of the hydropower system Trebišnjica, which is located above the existing Bileća reservoir (elevation 400 masl) encompassing the basins of the rivers Zalomka, Bregava and partly Trebišnjica or karst fields Gacko, Nevesinje, Dabar and Fatničko.

The buildings of HPP Dabar are spread over 32 km and are located in the municipalities of Nevesinje, Berkovići and Bileća.

HPP Bileća is located in the municipality of Bileća, about 5 km from the city, while HPP Nevesinje is located in the municipality of Nevesinje.



The total estimated investment for HPS Upper Horizons amounts to EUR 325.56 million.

4. BRIEF DESCRIPTION OF THE PROJECT

The current conception of hydropower water use of Upper Horizons was defined in the preliminary design of Upper Horizons from 1976, which envisages the construction of three hydropower plants upstream of the Bileća reservoir as follows: HPP Dabar, HPP Bileća and HPP Nevesinje (all of which are in the Republic of Srpska).

The main elements of the hydropower system Upper Horizons given in this design are based on the concept for which the water management permits are obtained.

HPP DABAR

Installed capacity: 159,15 MW

Average annual generation 251,8 GWh with additional energy effects of 265 GWh/annually downstream hydropower plants.

Estimated total investment: 179,9 million euro

HPP Dabar is planned to be built as the first hydropower plant in the Upper Horizons of Trebišnjica River, because it provides the highest energy and water management effects. HPP Dabar is a typical diversion hydropower plant.

HPP Dabar is located on the northern edge of Dabar field. HPP Dabar would use treated water from HPP Nevesinje (water transferred from Gacko field and its own water of the Zalomka River) and own water of Nevesinjsko field.

RS Government has granted a concession to the company HPP Dabar for the construction of HPP Dabar.

The buildings of HPP Dabar are as follows:

- dam Pošćenje with reservoir,
- supply tunnel with intake house,
- surge tank,
- pipeline under pressure,
- power house with accompanying facilities,
- regulation of the Ponikve abyss.

The buildings located downstream from the power plant, and necessary for its operation are:

- channel and balancing reservoir in the Dabar field,
- channel through Fatničko field,
- Dabarsko field - Fatničko field tunnel,
- Fatničko field – Bileća reservoir tunnel.

Under the first phase of construction of the multipurpose system Upper Horizons, the construction of the Dabar - Fatnica tunnel of total length of 3235m and Fatničko field - Bileća reservoir tunnel of total length of 15 650 m is completed.

Basic features of HPP Dabar are:

- natural flow 2.11 m³/s
- elevation of Nevesinje reservoir 836.0 masl
- storage capacity of Nevesinje reservoir 52.8 x 106 m³
- structural net head 330.70 m
- installed flow 55.0 m³/s
- installed capacity 159.15 MW
- average annual generation 251.80 GWh/yr.

Having in mind the value of the investment there is open an opportunity for cooperation in the sphere of finding an adequate model for financing projects.

HPP NEVESINJE

Installed capacity: 60 MW

Average annual generation 100,6 GWh

Estimated total investment: 97,4 million euro

Hydropower plant Nevesinje is a diversion plant, which consists of:

- Zalomka reservoir,
- embankment dam Rilje with clay core,
- embankment dam Nadinići with clay core,
- inlet tunnel from the intake house,
- surge tank,
- pipeline under pressure,
- power house,
- outlet tunnel with an intake house and connecting channel.

HPP Nevesinje uses water from the reservoir, created by construction of the Rilje dam on the Zalomka River and embankment dam Nadinići which closes the reservoir at the upstream side, given the backflow elevation is higher than ground elevation.

Basic features and parameters of HPP Nevesinje (according to technical documentation drafted in the period from 1980 to 1986 by Energoinvest Sarajevo):

- | | |
|---|---------------------------|
| - natural flow | 4.7 m ³ /s |
| - volume of the basin for the maintenance of the backflow level | 185.5 mil. m ³ |
| - elevation of maximum backflow | 970 m asl |
| - elevation of normal backflow of HPP operation | 970 m asl |
| - installed flow through turbines | 55 m ³ /s |
| - installed capacity of the hydropower plant | 60 MW |
| - number of generators | 2 |
| - max./min. level of tail water | 836/828 m asl |
| - constructive head | 127.10 m |
| - average annual generation | 100.6 GWh |

HPP BILEĆA

Installed capacity: 33 MW

Average annual generation 116,4 GWh

Estimated total investment: 48,26 million euro

Hydropower plant Bileća is a diversion plant designed at the end of the existing hydropower tunnel, which connects Fatničko field with Bileća reservoir. The tunnel is currently being used only for transporting water from Fatničko field to Bileća reservoir. The construction of the power house and accompanying facilities next to the site of the current discharge made tunnel station an inlet tunnel of the hydropower plant.

According to the current technical solution (preliminary design with feasibility study drafted by the Institute for Water Management Jaroslav Cerni in 2007), HPP Bileća is run-off-river consisting of:

- basin in front of the intake house,
- intake house (in function as of the construction of the tunnel in 2005),
- inlet tunnel (Fatničko field – Bileća reservoir tunnel, completed and partially coated),
- surge tank,
- gallery of the closures and pipelines under pressure,
- discharge with chute (in function as of the tunnel construction),
- power house,
- outlet water ways.

Basic data and parameters of HPP Bileća with usage of the Dabar water:

- natural flow (without losses)	46.67 m ³ /s
- volume of the basin for the maintenance of the backflow level	40 000 m ³
- elevation of maximum backflow	470.00 m asl
- elevation of normal backflow of HPP operation	465.66 m asl
- installed flow through turbines	60 m ³ /s
- installed capacity of the hydropower plant	33 MW
- number of generators	2
- max./min. level of tail water	400/395 masl
- nominal net head	63.10 m
- average annual generation	116.4 GWh

In principle, HPP Bileća is related to the construction of the whole system of Upper Horizons, but it can be build separately and independently from the other two hydropower plants in the system (HPP Nevesinje and HPP Dabar).

5. PROJECT DETAILS

PROJECT STATUS

HPP Dabar: In order to implement Dabar project, a series of activities have been conducted in order to obtain construction permits: the property issues have been completely resolved, location conditions were provided and environmental permit obtained. Research works have been performed, access roads built and the preparation of the Detailed Design is in progress.

HPP Nevesinje: Preliminary Design has been drafted in the period from 1980 to 1986 by Energoinvest Sarajevo. For the purposes of actualization of this Preliminary Design, the activities are underway in carrying out detailed geological research.

HPP Bileća: For the purposes of MH ERS, MP Trebinje, Institute Jaroslav Cerni from Belgrade in 2007 drafted new Preliminary Design with Feasibility Study for HPP Bileća.

REASONS TO INVEST IN THE PROJECT

Electricity is a good like any other good, and consequently has its market price. The demand for energy worldwide, including this region, is growing rapidly. In the liberalized market, "satisfying own needs" is certainly not the only criterion for the construction of new plants. The HES Upper Horizons project seems particularly attractive, because, in addition to the electricity generation in new plants, the electricity generation in the downstream, existing power stations in the Trebišnjica basin, would be increased. Previous analysis showed that the planned hydropower plants of HES Upper Horizons have extremely favorable technical and economic parameters. Further, since the planning and construction of hydropower plants requires many years from preliminary planning phase to the start of work, and this project has been prepared for a number of years, and is coming to an end, it makes it very interesting for investment. It should be added that it has been already invested a lot in this project, many facilities and supporting infrastructure have been built, particularly for HPP Dabar (access roads, power lines, construction settlements, etc.).

The following important facts should be taken into account when it comes to evaluation of the Upper Horizons project, especially when considering the integration of this system in the ecological and social environment. At stake is not only the hydropower project, but it is a large integrated development project of public importance, with very complex target structure. The project must be treated as a development project of planning, utilization and protection of catchment areas of Upper Horizons, whose realization should initiate a complex mechanism of reconstruction and development of Eastern Herzegovina, which is now threatened by unfavorable tendencies in social, economic and development terms.

6. PROJECT FINANCING

TOTAL ESTIMATED INVESTMENT

According to the current estimates, the total investment for the construction of the hydropower plants amounts to:

HPP Dabar:	EUR 179.9 million
HPP Nevesinje:	EUR 97.4 million
HPP Bileća:	EUR 48.26 million

The total estimated investment for HPS Upper Horizons amounts to EUR 325.56 million.

Note: *The significant funds have already been invested in the realization of HPS Upper Horizons project, since all property issues for HPP Dabar have been resolved, access roads to the site have been built and certain part of the preparatory work for HPP Dabar and HPP Bileća have been completed.*

PLANNED SOURCES OF FINANCING

Energy Development Strategy of the Republic of Srpska envisages different models of financing in the energy sector: public financing, mixed financing (public-private partnership) and private financing.

- RS Government has granted a concession to the company HPP Dabar for the construction of HPP Dabar. The model of public financing is envisaged, which would be about 25% of the funds provided from equity by MH ERS ZP HPP on Trebišnjica and about 75% by loans.
- The Government shall make a final decision on modalities of implementation and financing of HPP Nevesinje and HPP Bileća.

7. LOCATION FOR THE PROJECT IMPLEMENTATION

The buildings of HPP Dabar with accompanying facilities is planned to be built in the municipalities of Nevesinje, Berkovići and Bileća and the plant itself is located on the river in the Dabar field.

The buildings of HPP Nevesinje are located in the municipality of Nevesinje, and power plant is located on the Zalomka River, on the eastern edge of Nevesinjsko field.

HPP Bileća is located in the municipality Bileća, in the Čepelica village, the exit part of the tunnel Fatničko field- Bileća reservoir.

8. HAVE THE ACTIVITIES IN PROJECT IMPLEMENTATION BEEN ALREADY INITIATED?

On April 2011, the Government of the Republic of Srpska adopted the Decision on the Implementation of HPP Dabar. By its decision, the Government of the Republic of Srpska granted a concession for the construction and operation of HPP Dabar to the concession company HPP Dabar. Seventy percent of the share capital for HPP Dabar is provided by ZP HPP Trebišnjica and thirty percent by MH ERS Holding Company. The preparatory activities in the implementation of HPP Dabar project have been initiated after the establishment of the company HPP Dabar.

9. APPLICANT AND CONTACT DETAILS

MINISTRY OF INDUSTRY, ENERGY AND MINING

Trg Republike Srpske 1, 78 000 Banja Luka

Tel: +387 51 339 581

Fax: +387 51 339 651

E-mail: mier@mier.vladars.net