

Brown coal mine “Banovići” is a mine in the Tuzla Canton with a very rich mining tradition. Mass production of coal from this mine begins with surface exploitation in 1946. After the Second World War, the municipality of Banovići developed as well on the resources of this mine’s high quality brown coal. The maximum recorded production from this mine was during the eighties of the last century in the amount of around 2.5 million tons of coal per year. Today, the mine’s coal production ranges approximately 1.5 million tons per year. This development was intense during the seventies of the last century. In TPP Tuzla were built thermal power blocks which partly, in addition to lignite from the mine “Kreka” and brown coal from the mine “Durnevik”, were also consuming the brown coal from the mine “Banovići”. Among the blocks constructed in that period, and which partly consumed the coal from the mine “Banovići” today are in operation Block 3 and Block 4, Block 5 and Block 6 which consume annually around 1 million tons of brown coal from the mine “Banovići”. With the plan to gradually put out of use mentioned power blocks, and with a plan of construction of new lignite-fired energy blocks, the demand for coal from BCM (brown coal mine) “Banovići” in TPP “Tuzla” ceases. Stated fact suggests finding of a new the consumer. The current analysis of the key settings of the basic concept of long-term development of BCM “Banovići” ltd, as an integrated energy subject of Coal mine and TPP “Banovići ” is in accordance with accepted development and investment trends in Europe and in the World. The construction of the block with approx. 300 MW of optimal power, with the consumption of approx. 1.2 million tons of raw coal and starting its operation in 2018, would provide secure placement of coal for the mine “Banovići”, after putting out of use the mentioned blocks in the TPP “Tuzla”.

For the safe and long-term securing of continuity of delivery of coal, respectively the amount of heat, necessary for electricity production in the new power block (approximately 300 MW) in TPP “Banovići”, it was necessary to review the state of coal reserves and determine the necessary quantity and quality of brown coal from open pits “Grivice” and “Turija” and pit “Omazići” in the long-term. The coal from these pits will be the main supplier of future TPP “Banovići” and other consumers. Therefore, the justification of the construction of such facility, TPP “Banovići” is unquestionable, in terms of coal resources of the ledge, as well as the technical-technological and economic-financial potentials of the mine.

The main objectives of the construction of TPP “Banovići” block:

Construction of thermal power unit on the location of BCM “Banovići” will provide the most efficient use of primary coal energy from open pit mines “Turija”, “Grivice” and “Omazići” pit. Analysis of coal reserves in these locations and other conditions justify the construction of this 300 MW thermal power unit. The construction of the new TPP will satisfy the public interest and the broader social needs, as well as the involvement of private sector in the project.

New TPP is basically intended for the production of electricity, with the possibility of distance heating of local population.

In addition, the construction of the new TPP “Banovići” will enable increased direct employment, and for the operation of such plants is also related the engagement of diverse economic entities from the area.

Anticipated electricity production is 1706 GWh per year, with employment of 200 workers in TPP, which means 0.8 employees per one MW of installed capacity. This specific value is close to the value of modern-day units in the western European countries. The phase of construction of TPP was planned quite conservatively (48 months) and includes primarily risks of possible unforeseen bureaucratic procedures.

The structure of investment in the power plant:

Equipment 74%.

Construction works 15%

Initial investments 5%.

The main purpose of the thermal power plant is the electricity production and its placement in the unique electricity market. The facility is designed to generate electricity (and heating) thereby being the subject to existing local law regulations, current international technical standards and regulations, as well to the current regulations in the European Union.

If we take into account the fact that opting for the power of thermal power plant is determined by the available fuels - coal, the available amount of water for cooling, the possible placement of power and energy from thermal power block into electric power system (EPS) and the space available for the construction, each of these criteria was analyzed separately.

Coal reserves in the entire basin, confirmed by the project documentation, amount to approximately 147 million tons.

Designated fuel for the TPP is a mixture of coal from the open mine pit “Turija”, “Grivice” and “Omazići” pit, in the ratio of 40:40:20. Taking into account the annual available quantity of coal for TPP which amounts to 1,200,000 t, depending on the plant’s operation, the potential gross power of the block (on the generator’s terminals) ranges from 250 MW to 300 MW, and the annual number of working hours ranges from 6250 (300 MW) to 7,500 (250 MW).

Water supplies for cooling of the TPP are based on the use of rainwater, which is collected in reservoirs in daily mine pits and pumped into the watercourse. Data from a special study, which is in the verification process, say that the available annual water supplies needed for the TPP are estimated to approximately 5.12 million m<sup>3</sup> per year (accumulation of open mine pits Turija, Luka and Bešin, and Ramići).

When we take into account the criteria of security and the lowest costs of construction of the connection, it is confirmed that by connecting TPP Banovići to EES, the transmission possibilities of EES BiH will not be violated.

The solution was proposed for the safe and reliable delivery of generated electricity for the maximum block size of 300 MW, and that solution is the connection to the 400 kV transmission line. Relocation of existing transmission lines at the location of future TPP Banovići will be carried out.

The concept of TPP “Banovići” block was analyzed in terms of technology in coal combustion, usage of solid combustion products and supplying of water for cooling. Coal combustion technology is one of the important factors for the concept of TPP “Banovići”. Technologies of in-flight fuel combustion and fuel combustion in a fluidized bed were analyzed for the brown coal-fired thermal power block with envisaged 300 MW of power. Consultation with a potential supplier of steam boilers led to opting for the technology of coal combustion in a fluidized bed (CFBC). Technology of combustion of fuel in a fluidized bed represents the best compromise as regards simplicity of the plant, environmental requirements and economics, so its greatest advantages over in-flight combustion technology include: a wide range of fuels and adaptability to the fuel used, stable level of efficiency at partial loads, efficient cleaning of flue gases that is in the boiler only, no waste water in the desulphurization plant, low technical minimum, the flexibility of action depending on the load, lower investment, operating costs and electricity price.