CATALOG OF PUBLIC-PRIVATE PARTNERSHIP POTENTIALS

City of Bijeljina
Bosnia and Herzegovina

Geothermal Heating System in the City of BijeljinaCity

City of Bijeljina
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Location:
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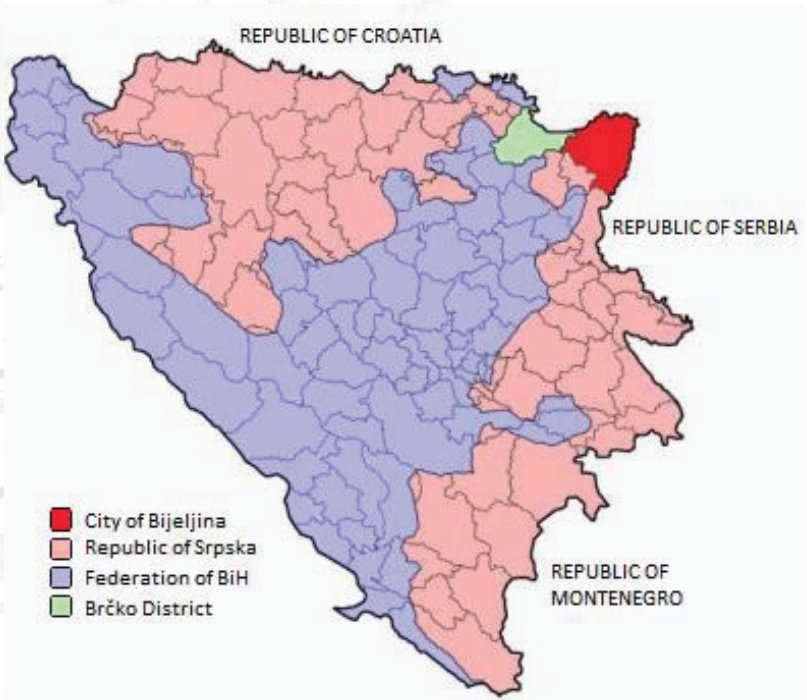

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Basic site information

•Four deep wells were drilledin Semberija region (Bijeljina, Dvorovi Dv-1, Popovi, Ostojićevo);

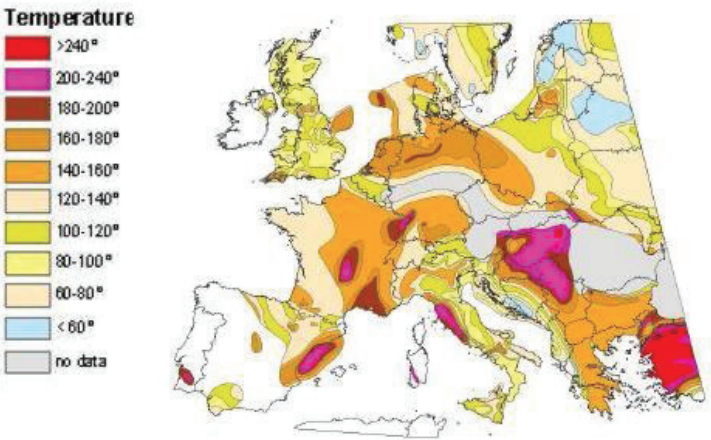
•The temperatureof the explored thermal water sites in the Semberija region range from 60°C to 130°C and the amountis estimated as the thermal equivalentamount of about 40 million tons of oil;

•Spa "Dvorovi" (spa and recreation complex -treatment, relaxation and recreation) -uniquenatural resource – hot water spring(75 Celsius degree, 1350 m deep).

•Instalation of the new geothermal well into the district heating system in the City of Bijeljina, would achieve the following objectives:

•Reduced transmition of harmful gases into the atmosphere and enhanced air quality in the City of Bijeljina;

•Decreased polution of land and ground waters, caused by disposal of dross and cinder from fossil fuels;
•Decreased annual heating expenses of facilities in the City of Bijeljina



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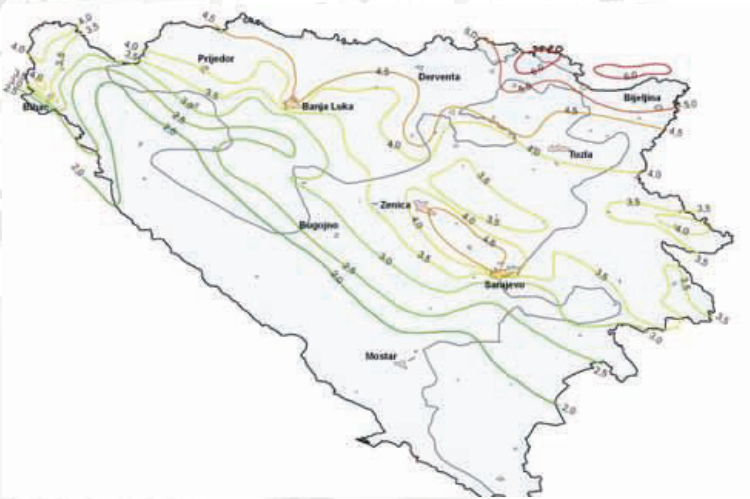
The geothermal gradient is one and a half times higher than the European Continental average

The temperature of the thermal water sites (which were discovered in 1957) in the Semberija region is between 60°C and 130°C and the amount is estimated as the thermal equivalent amount of about 40 million tons of oil. A detailed analysis of the level of conceptual design shows the possibility that the geothermal energy can be used for the whole heating system in Bijeljina City (23.600 housing units + industry). For these purposes, the required amount of thermal water is T=80 °C, 850 l/sec. The maximum heat output of the geothermal heating system for such a complete heating system is 280 MW. The geothermal energy can be also used for electricity production. The minimum electricity production from this potential is 34.400 MWh, the minimum heat production in form of district heat is 75.000 MWh.

The geothermal energy, besides above mentioned, can be used for: cooling, agriculture (greenhouses), aquaculture, and tourism.



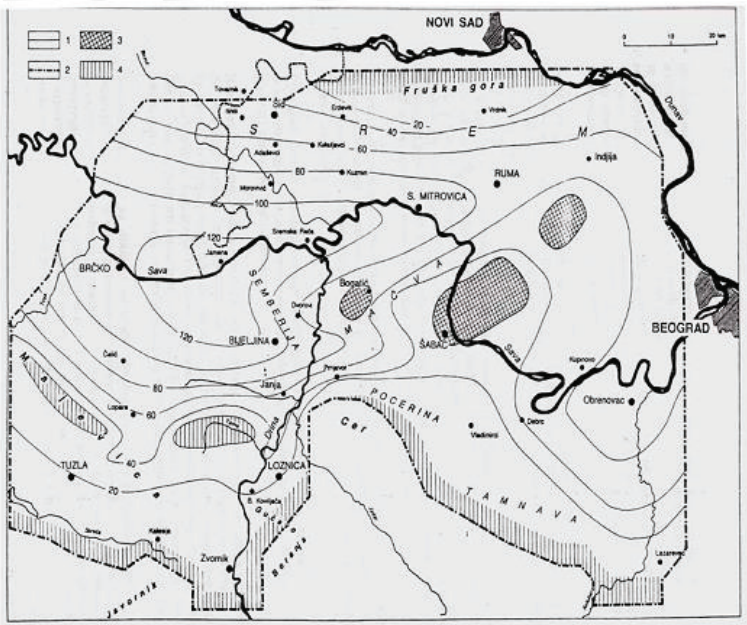
Objectivesbased on the interests of partners:

Public partner

-To use domestic renewable resources for economic development purposes;
-To decrease pollution in the City using the most ecological resource.

Private partner

-To use the energy source which exploration is cheaper than other energy sources;
-Stable income that does not depend on external influences.



Slika 11. **Karta temperature geotermalnih voda (°C) na gornjoj granici rezervoara od trijaskih krečnjaka** (1-izoterma; 2-granica modela; 3-područje bez krečnjaka; 4-područje hladnih voda u rezervoaru)

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Financing:

Proposed financing scheme & share distribution:

1. Construction of exploration well (1.7 Mil. Euro)
2. Construction of absorption well (650.000 Euro)
3. Construction of the heating system installation and necessary equipment (2 Mil. Euro)
3. Construction works (1 Mil. Euro)

Total costs:5.35 Mil. Euro

-The City of Bijeljina will provide the necessary construction permits.
The complete existing heating infrastructure shall be put in function.

Project payback period:

1. Heating area (in 2013): 70.000 m2;
2. Income: 657.312,7 Euro(heating season: 6 months)
3. Total income:1.6 Mil. Euro
4. Total expensesof the energy generating product (coal): 308.000,00 Euro

With the expected cost reduction of the thermal energy production, the achieved profit would amount around 0.67 Mil. Euro

The expected return of investment is planned within a timeframe of 8 years.

Project -Spa "Dvorovi" reconstruction and revitalization

City of Bijeljina
Bosnia and Herzegovina

BFC
BUSINESS FRIENDLY CERTIFICATE
SOUTH EAST EUROPE

Spa Dvorovi

Location:

- Bosnia and Herzegovina
- City of Bijeljina-115000 inhabitants
- Settlement Dvorovi (6km distance from Bijeljina)

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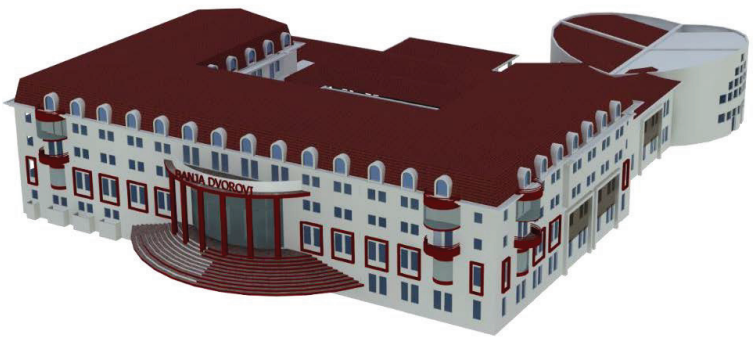
Basic information and current situation

- **Excellent location in the North-East BiH**
  (5km from BijeljinaCity-connected with bicycletrail, 14 km from border with Serbia)
- **Existing spa facilities include:**
  -spa,
  -hotel (one phase completed out of three planed phases),
  -outdoor five swimming pools,
  -health care centre,
  -restaurant, park and sport grounds,
  -geothermal potential (unique natural resource-hot water spring -75 Celsius degree, 1350 m)



Basic planning tool

- **Treatment**
- **Relaxation**
- **Recreation**

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Total Costs

- **Hotel second phase:** 2.562.262,99 €
- **Spa centre:** 1.368.248,44 €
- **Aqua park:** 1.178.640,98 €
- **Sport-recreation centre with indoor swimming pool:** 1.229.886,24 €
- **Sport grounds, bungalows, parking:** 512.452,6 €
- **Property relations:** 442.067,23 €

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Financing:

City of Bijeljina - existing facilities

Private partner - Reconstruction and Revitalization

Objectives based on the interests of partners:

Public partner
-To use natural resources for economic development purposes;-To decrease pollution in the City using the most ecological resource;-To improve sport tourism and recreation offers.

Private partner
-To expand business in a highly valuable location;
-To meet the regional demand of the tourism, health and sport tourism market

CONCEPTUAL LAYOUT OF THE PORT AREA BOSANSKA RAČA

City of Bijeljina
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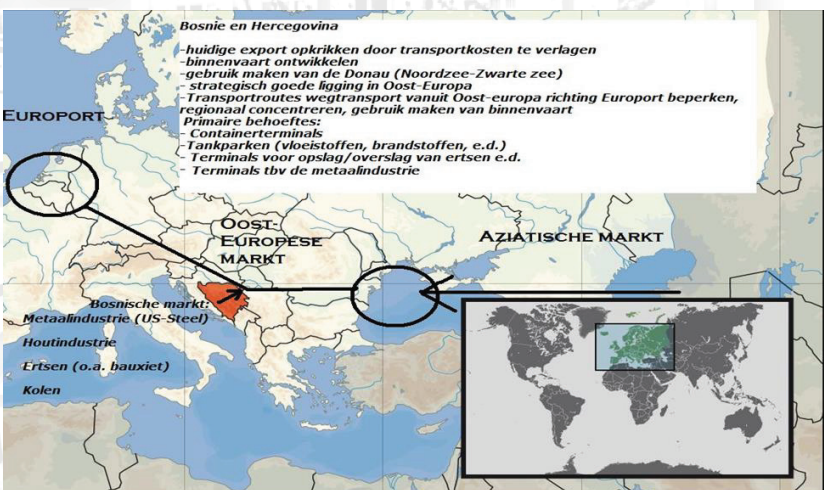
Basic facts that justify construction of the port in Bosanska Rača

- Geographic position of Bosanska Rača and port location
- Importance of the port in Bosanska Rača for economy of both the Republic of Spska and Bosnia and Herzegovina

Position of Bosanska Rača in Europe



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Importance of the port for economy of RS and BiH

- General economic development of the region
- Development of transportation and meeting the needs of transportation on the existing route
- Possibility of transport, sale and storing of customs goods
- Employment for a huge number of people
- Development of river tourism which is underdeveloped on the Sava river as well as on the whole territory of BiH

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Transportation network

- Road lines within the port connect to the regional road Kuzmin-Bijeljina so that the location is well connected with the motorway Beograd-Zagreb (via Kuzmin) and with eastern and western part of RS

- Rail lines connect to railroad Sid(Serbia) -Bijeljina

- Connecting points will depend on the figured dimension of port territory, and solution to these connections will be the subject of a special project
- Gravitation area of the port will consist of the territory of the Drina basin and partly the territory of right bank of the Sava

Structure of goods transportation routes considering the type and quantity

Table 1 – General loads

Type of load	Loading (t/year)	Unloading (t/year))
Fruit and vegetables	20 000	-
Concrete iron	-	50 000
Artificial fertilizer	-	50 000

Table 2 –Scattered loads

Type of load	Loading (t/year)	Unloading (t/year)
Bauxite	-	600 000
Smelter-grade alumina	650 000	-

Table 3 –Liquid loads

Type of load	Loading (t/year)	Unloading (t/year)
Oil derivatives	-	300 000

Options and location

- The selected location is about 20 km north from regional center Bijeljina and 5 km upstream from the mouth of the Drina river, on the right bank of the Sava river

- Two principal optionsare:
  - Port on the open bank
  - Closed (pool) port

- In both cases the chosen location is on the right convex bank of the Sava

Advantages and disadvantages of the chosen options

Optionon the open bank

Advantages:

•Only considering the investments, so it comes as the first phase of the construction

Disadvantages:

•Location not advantageous taking into account producing ground sediments

Optionwith pool like port

Advantages:

•Safe loading and unloading in all weather conditions

•Less danger from producing ground sediments

•Shelter in case of negative hydro-meteorological conditions

•Easier construction of operative bank

Disadvantages:

•bigger financial investments

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Closed (pool like) port

- Three sub-optionsof pool like port are considered:
- **Sub-option1**: about 900 m upstream from the existing bridge
- **Sub-option2**: in the restricted area between the railroad Sid-Bijeljina and regional road Kuzmin -Bijeljina , some 500 m downstream the existing bridge
- **Sub-option3**: some 2500 m downstream the existing bridge, downstream the existing

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Area balance in the port zone

Port on the open bank

Intention for the area	Unit	Area
Aquatorium	M²	37 000
Operative bank with the platform	M²	10 800
Terminal for general loads	M²	25 600
Terminal for scattered loads	M²	35 500
Terminal for liquid loads	M²	20 700
Other areas	M²	41 000
TOTAL	M²	170 600

Area balance in the port zone

Port on the open bank

Intention for the area	Unit	Area
Aquatorium and approaching channel	M²	64 500
Operative bank with the platform	M²	10 800
Terminal for general loads	M²	25 600
Terminal for scattered loads	M²	35 500
Terminal for liquid loads	M²	20 700
Other areas	M²	41 000
TOTAL	M²	198 100

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