

EEA Financial Mechanism 2014-2021 ENERGY AND CLIMATE CHANGE PROGRAMME



International conference Energy and Climate Challenges of the Republic of Croatia

13 - 14 APRIL 2023, DUBROVNIK

Stella Arneri
Director – General for European
Territorial Cooperation

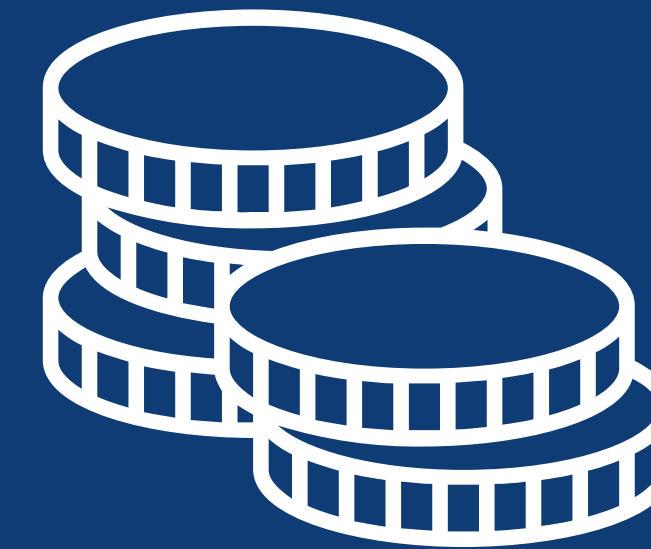
**Ministry of Regional Development
and EU Funds**



LEGAL FRAMEWORK

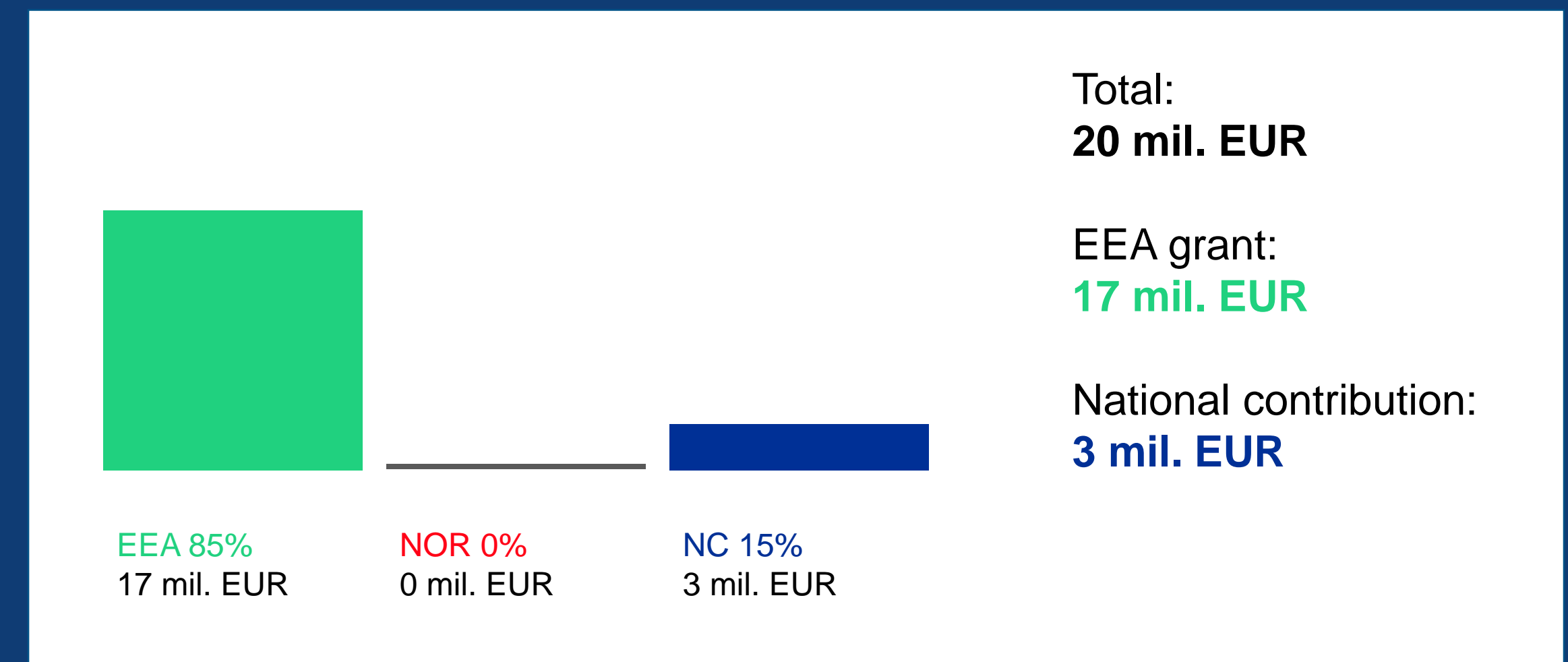
Memorandum of Understanding on the implementation of the EEA Financial Mechanism for the period from 2014 to 2021 between Iceland, the Principality of Liechtenstein, the Kingdom of Norway and the Republic of Croatia (3 July 2018)

Program agreement for the "Energy and climate change" program (21 December 2020)

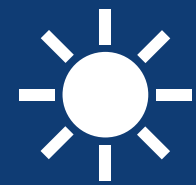


FINANCIAL FRAMEWORK

Program management: 1.1 mil EUR
Predefined project: 1.6 mil EUR
Calls for project proposals: 17.3 mil EUR



Increased solar energy production capacity



19 contracted projects

Total grant amount
9.320.348,68 EUR

Energy production from the sea



3 contracted projects

Total grant amount
2.283.434,30 EUR

Deep geothermal energy database



1 contracted project

Total grant amount
200.000,00 EUR

Predefined project

1 contracted project

Total grant amount
1.600.000,00 EUR



9 contracted projects

Total grant amount
2.499.531,95 EUR



3 contracted projects

Total grant amount
2.129.461,45 EUR



1 contracted project

Total grant amount
197.950,75 EUR



Technical documentation for geothermal energy

Increased geothermal energy production capacity

Shallow geothermal energy database

Total granted amount on the Programme level

18.230.727,13 €

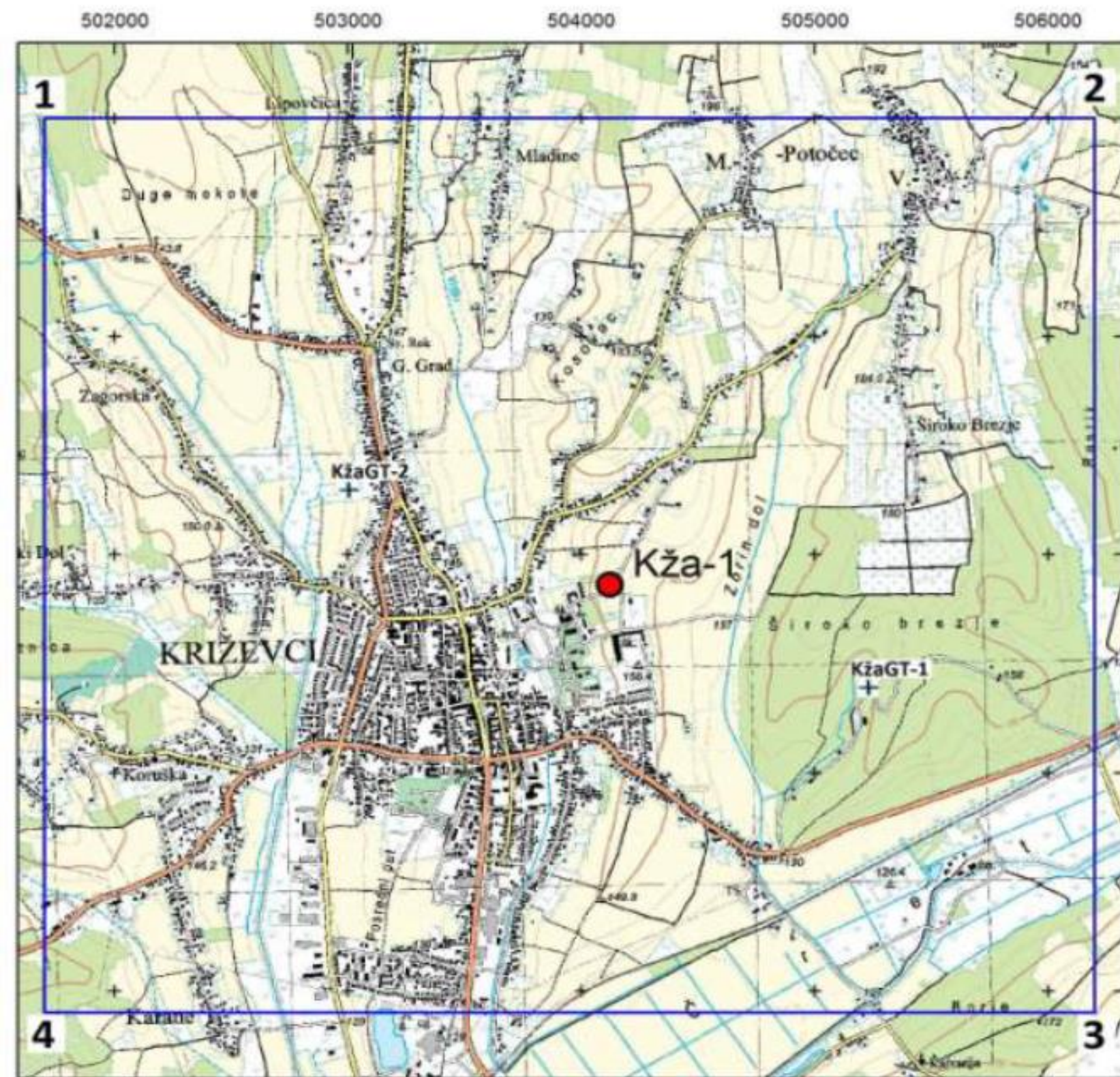


Examples of best practices

- **Technical documentation for geothermal energy**
- **Increased geothermal energy production capacity**
- **Energy production from the sea**
- **Increased solar energy production capacity**



Preparation of technical documentation for the use of geothermal energy in the area of the City of Križevci



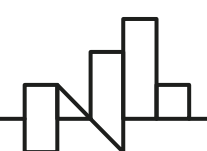
The goal of the project:

The goal of conducting exploratory oil-mining works in the existing geothermal well **Križevčanka-1 (Kža-1)** for the purpose of hydrodynamic measurement for the purposes of determining the characteristics of the reservoir and defining the parameters of the reservoir necessary for the preparation of the Elaboration on Reserves.

The geothermal well project (Kža-1-hydrodynamic tests) is planned for trial exploitation for the needs of hydrodynamic and laboratory tests in order to determine the characteristics of the deposit.

Expected results of the project:

- Increased production of energy from renewable sources
- Estimated annual MWh production from geothermal energy: 12,487 MWh
- Estimated reduction of annual CO₂ emissions: 2,500 t per year



Križevčanka-1 (Kža-1)

- **Location:** City of Križevci, Koprivnica - Križevci County
- **Drilled:** 1985/1986
- **Well status:** EXPLORATION
- **Well type:** VERTICAL
- **Well depth:** 1496 m

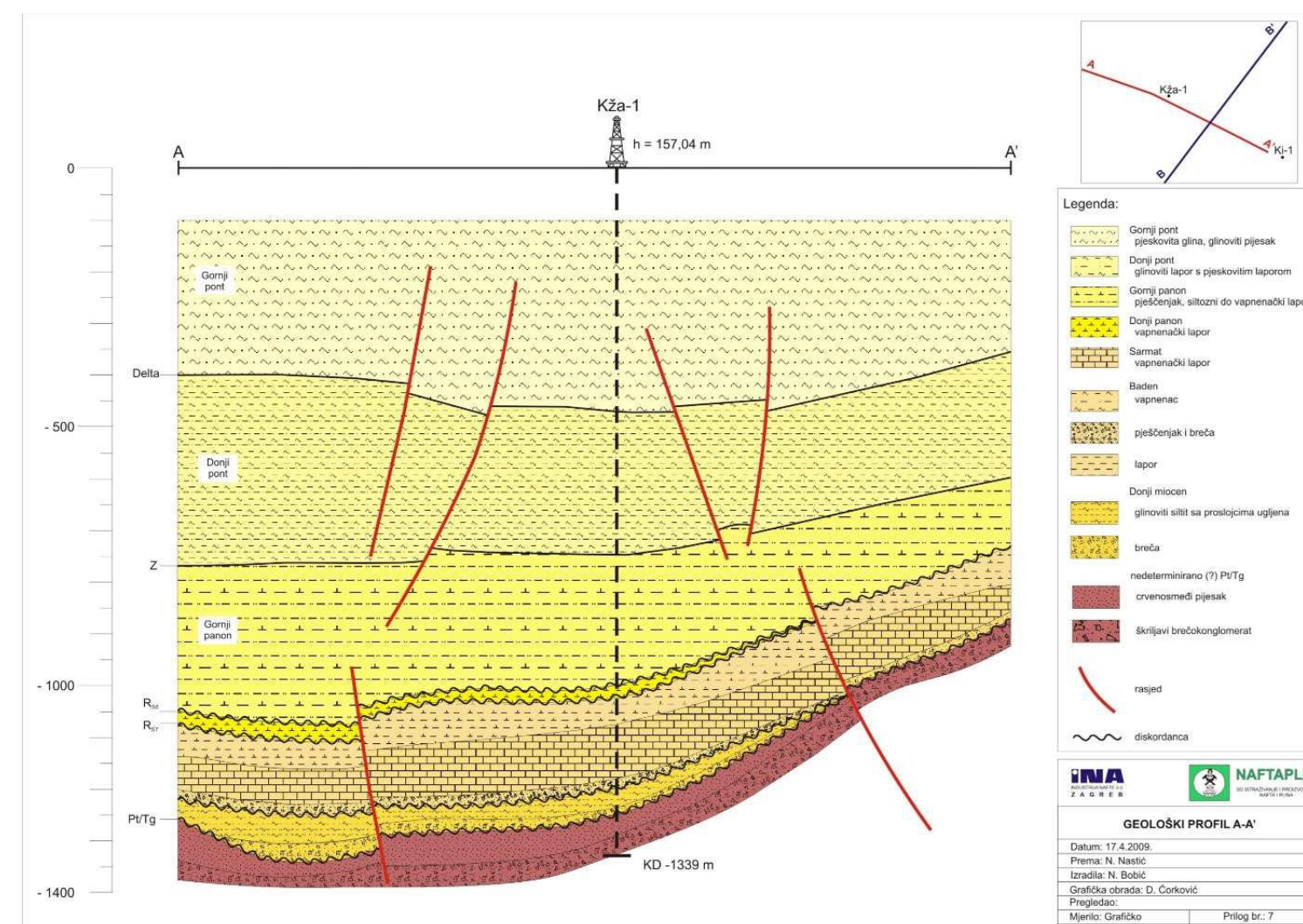
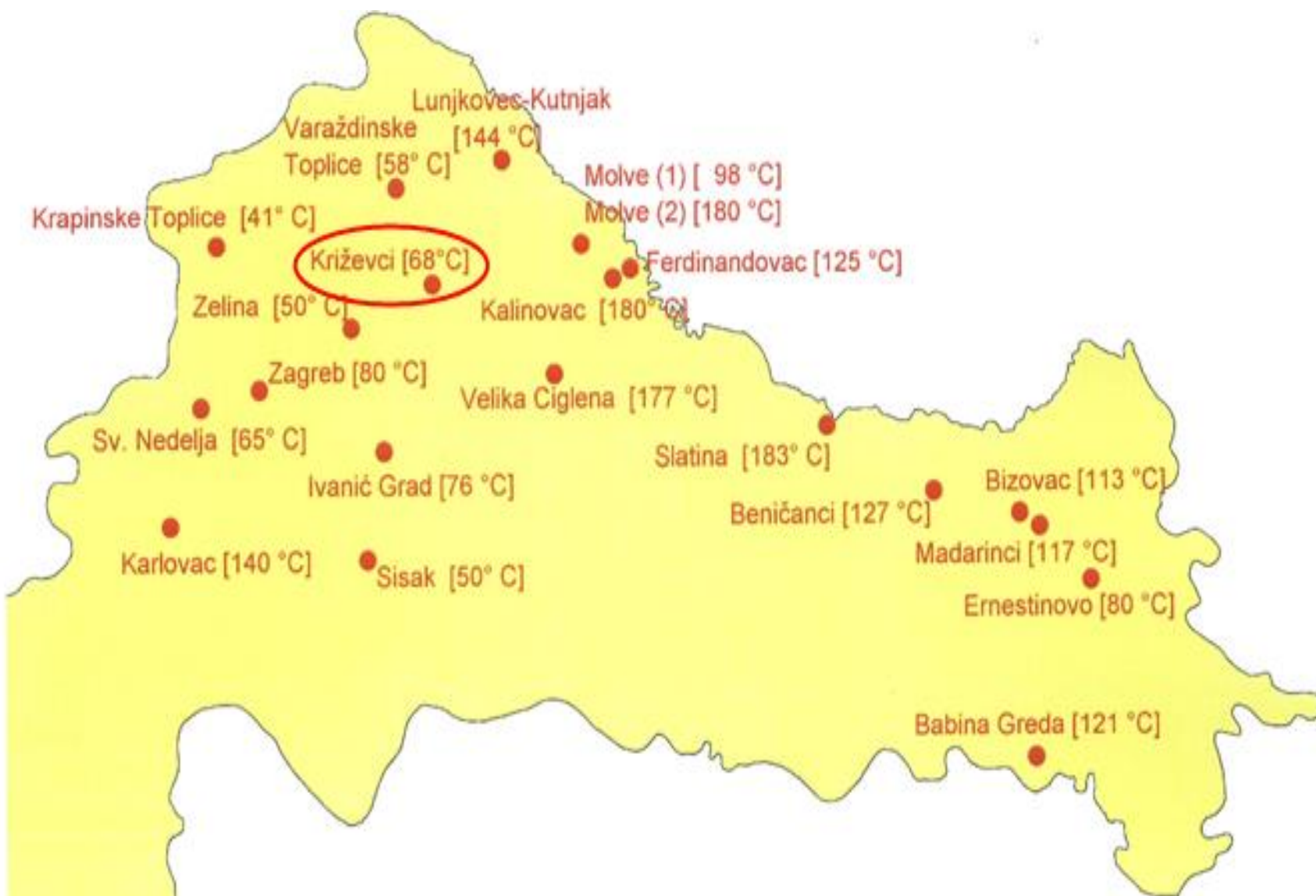
Geological profile of the well Kža-1

3 hydrothermal aquifer horizons:

- Limestones, sandstones, and breccias of Baden (1246-1342m)
- Lower Miocene sands and sandstones (1367-1374m)
- Paleozoic sands (1404-1496m)

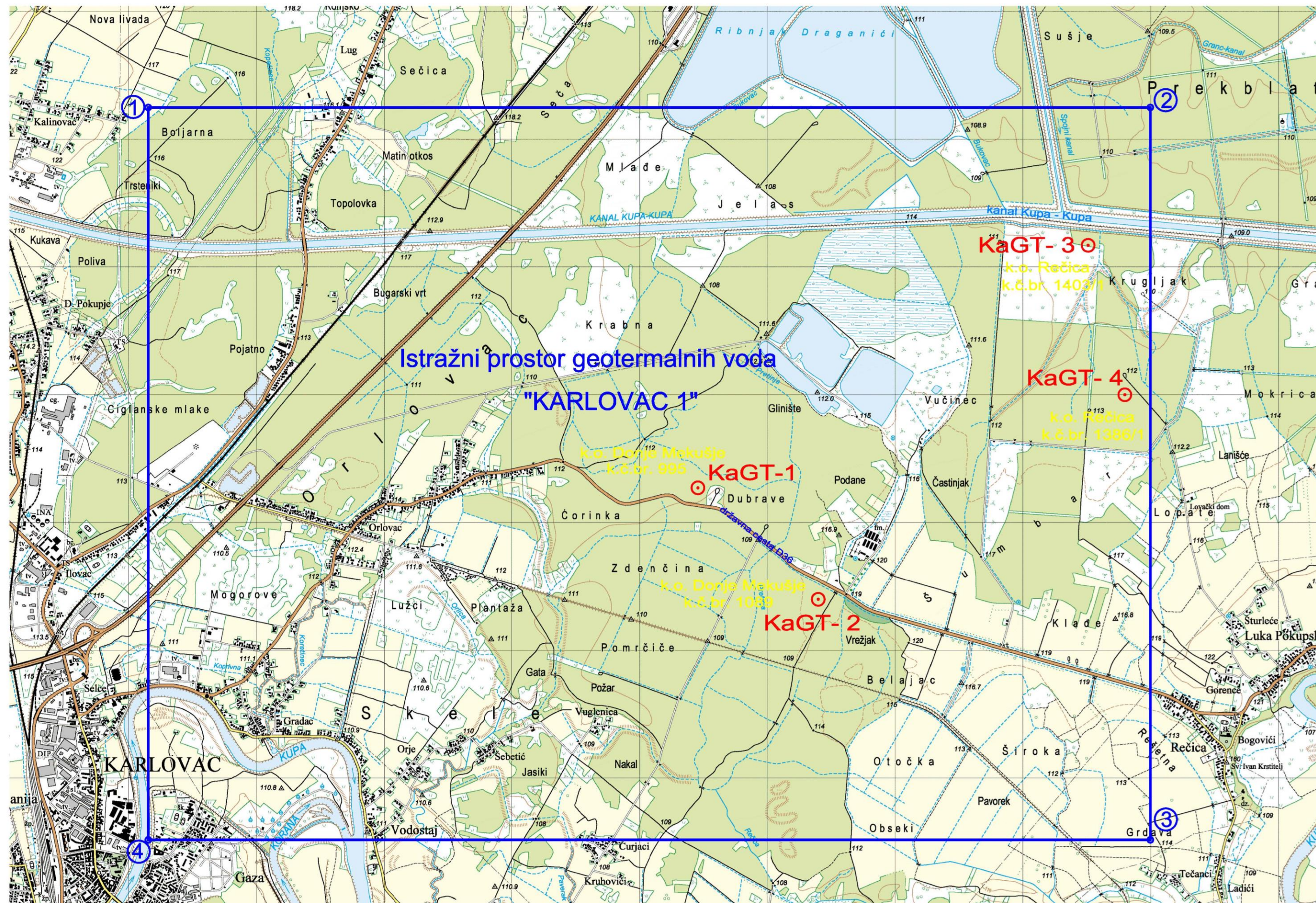
Examination

- **Temperature:** 68 °C
- **Bearing pressure:** 103 bar
- **Yield of the spring:** 350 m³/day
- **Geothermal potential:** 750 kw
- **Balneology:** the water is mineral, sodium-calcium-hydrocarbonate, chloride, sulfur hyperthermia
- The actual deposit **size and optimal production** have not been determined



Research and use of the geothermal potential of the City of Karlovac

Geothermal field „Karlovac 1”



Elaboration of the Project in two stages

STAGE I

- construction of two wells **KaGT-1** (production) and **KaGT-2** (injection - closer to the city, smaller depths for the needs of the City Heating Plant)

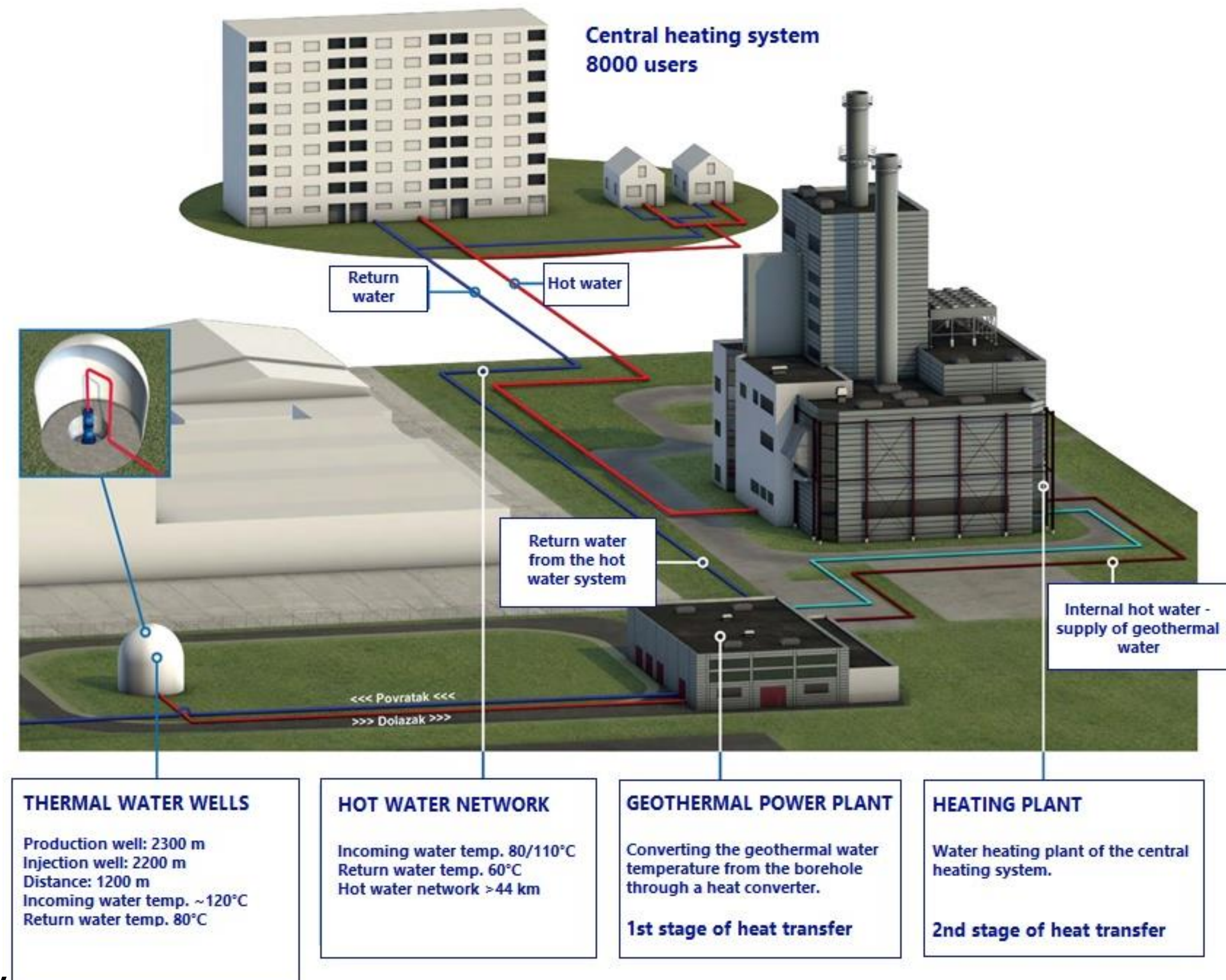
STAGE II

- construction of two wells **KaGT-3** (production) and **KaGT-4** (injection) in the deepest part of the reservoir (highest water temperature) for power generation in purpose to supply public institutions

Overview of the use of geothermal water in the district heating system (DHS) of the city of Karlovac

STAGE I:

- Preparation and verification of documentation (Project for construction of exploratory geothermal well and construction of well working space and Main project for construction of well working space)
- Preparations for drilling and drilling only KaGT-1 (depth of approximately 2500 m)
- Documentation, preparation and drilling of KaGT-2 (depth approx. 2700 m)
- Preparation of a study on reserves, preliminary and main project of elaboration and exploitation



Bilateral cooperation to increased production of energy from renewable sources

The goal of the project:

- Energy with lower carbon emissions and increased security of supply.
- Increased production from renewable energy sources.

SOLAR POWER PLANT "SE GRAD-EXPORT" (792 kW power)



Project results through savings:

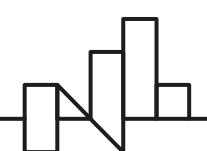
- Total kWh consumption – 1,357,372 kWh
- Total production of the solar power plant – 962,895 kWh
- Own consumption – 742,482 kWh
- Share of own consumption – 77.10%
- Self-sufficiency – 54.70%
- Total value of electricity consumed through 2022 – €153,626.00
- Annual savings through the solar power plant – €108,628.40

Project indicators:

Estimated production in MWh/year of **electricity from solar power**: 1089 MWh/year

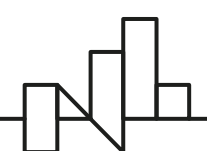
Estimated annual **CO₂- emissions reductions** (in tonnes): 359.420 t

Installed capacity for solar production in MW: 0,79 MW



Increased solar energy production capacity

SOLAR POWER PLANT "SE GRAD-EXPORT" (792 kW power)



Increased solar energy production capacity

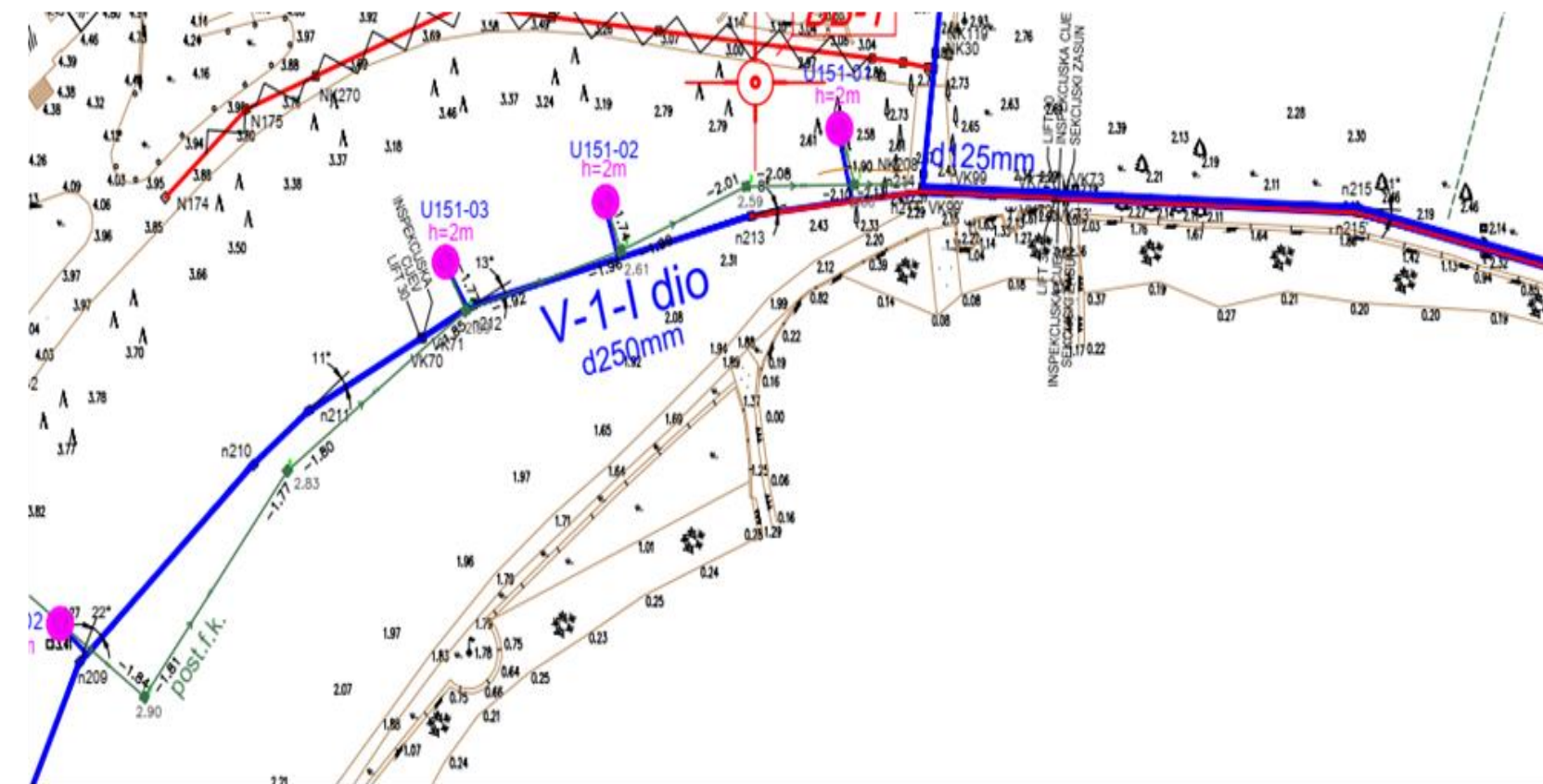
Sea for Heritage Energy Transition

Main activities of the pilot project

- Replacement of heating system in two hospital buildings (A and B)
- Installation of four inverter water-to-water heat pumps (4 x 100 kW) and associated equipment in the engine room
- Completion of seawater intake works (four additional wells and connection to the engine room)



Partial access to sea water

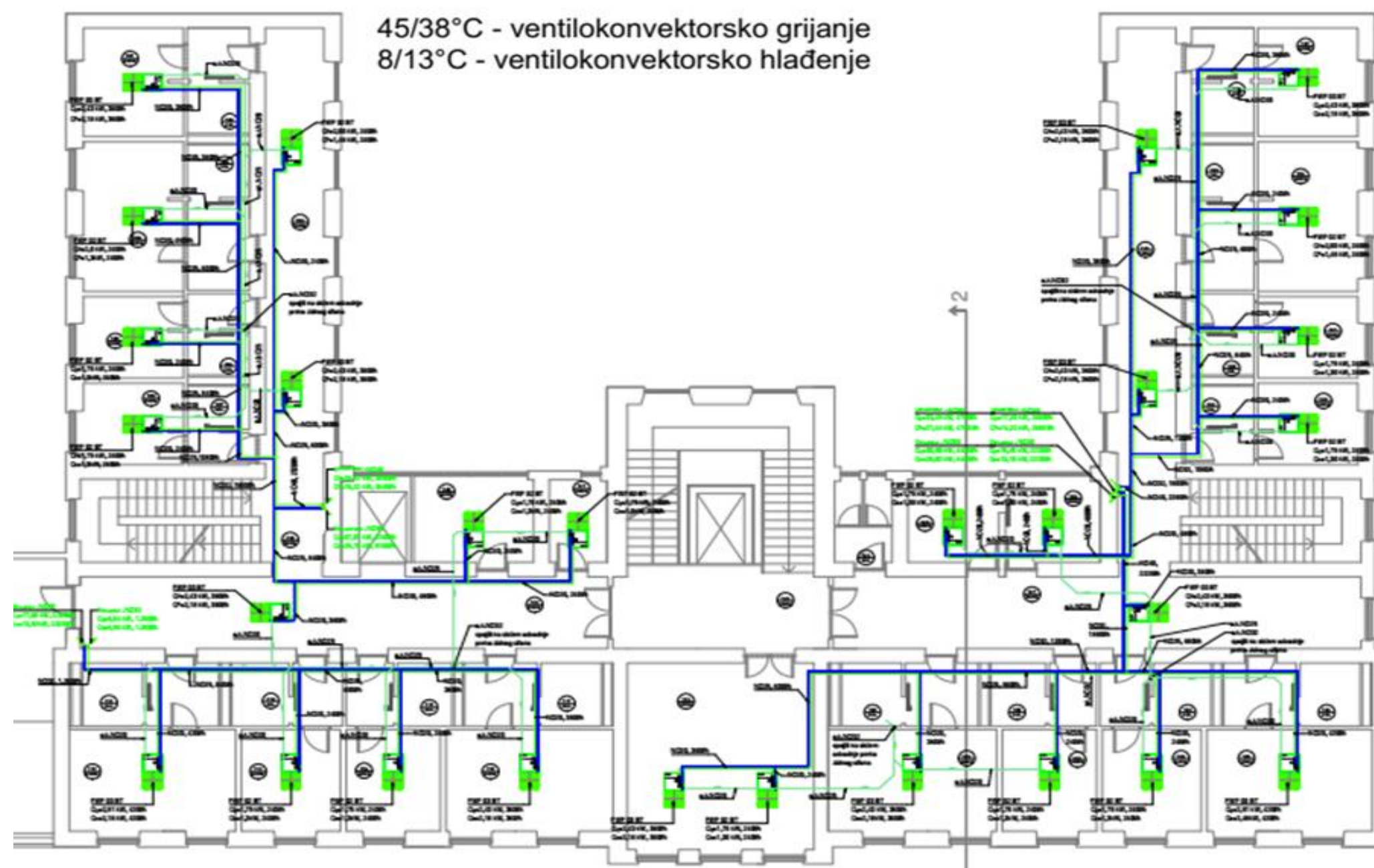


Dokidač: Temiška / G.O.	
Lokacija: Ruzić, kraj Ploče	
Projekt: ISTRAŽNO EKSPLOATACIJSKI ZDANAC B-1	
Datum izdavanja: 23.03.2016.	
Bukala garancija: Hemen KR 805 119	
Bukala: Miro Hvalić	
Napomena: RPN+2.8m od vha zdenca (+0.37m)	
0-2.3m	0-2.3m - pesak PVC odlična dnev. Ø 200/183mm
2.3-3.0m	2.3-3.0m - pesak PVC odlična dnev. Ø 200/183mm
3.0-4.0m	3.0-4.0m - pesak PVC odlična dnev. Ø 200/183mm
4.0-5.0m	4.0-5.0m - pesak PVC odlična dnev. Ø 200/183mm
5.0-6.0m	5.0-6.0m - pesak PVC odlična dnev. Ø 200/183mm
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17.0-18.0m	17.0-18.0m - pesak PVC odlična dnev. Ø 200/183mm
18.0-19.0m	18.0-19.0m - pesak PVC odlična dnev. Ø 200/183mm
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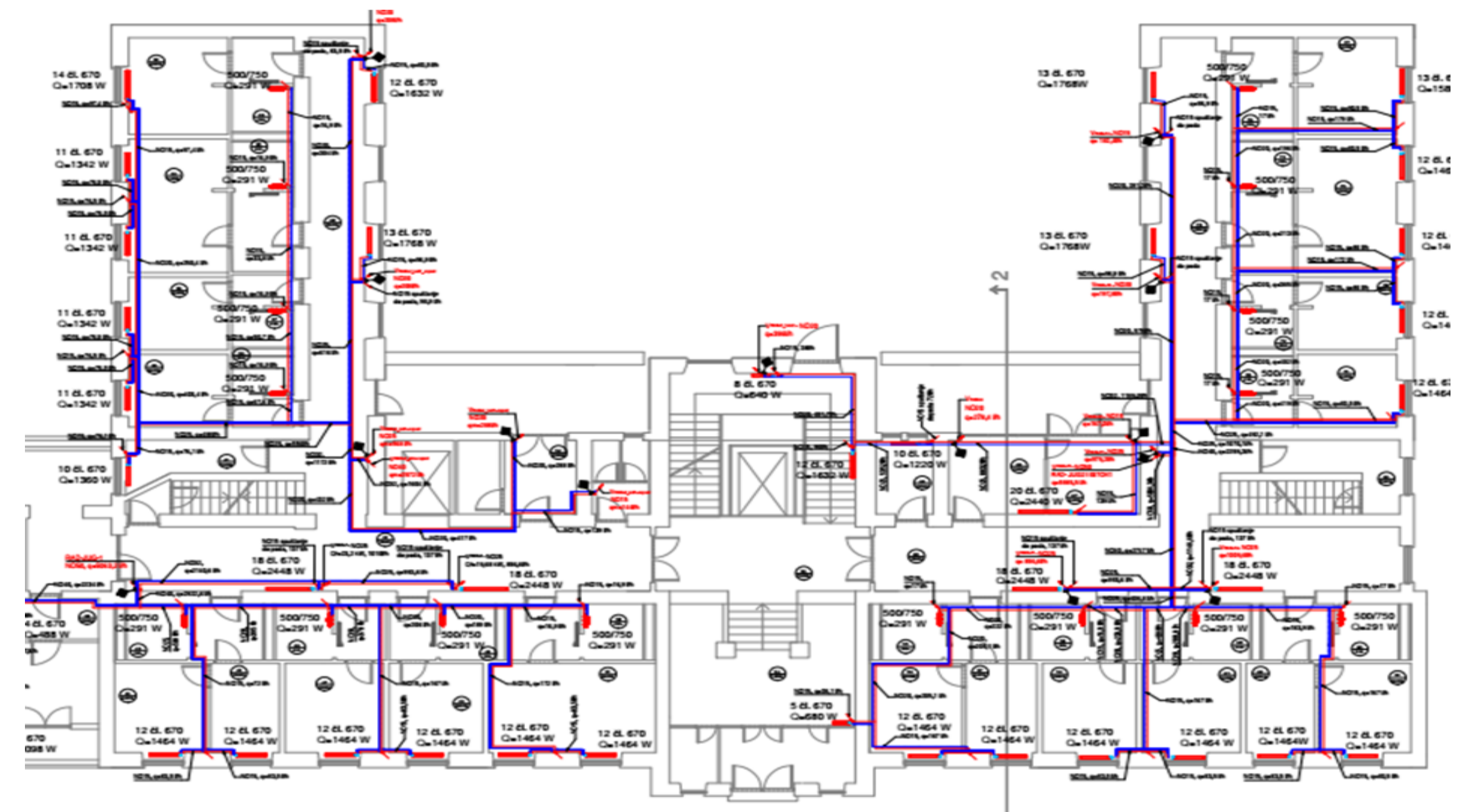


The results collected during the project will be the basis for the preparation of a study analyzing the potential of expanding the heating and cooling system with a heat pump in all buildings within the complex of the *Special Hospital for Orthopedics and Rehabilitation "Prim Dr. Martin Horvat" Rovinj-Rovigno*, as well as the preparation of guidelines and recommendations for the use of thermal energy from the sea into the energy transition process of protected buildings.

Cooling/heating distribution - Building A - fan coils



Heating distribution – Building A - radiators



Iceland
Liechtenstein
Norway grants



REPUBLIC OF CROATIA
Ministry of Regional
Development and EU Funds



Thank you for your attention!

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