

## **BORDER CROSSING 40 MW GEOTHERMAL DISTRICT HEATING NETWORK FOR SIMBACH (D) AND BRAUNAU AM INN (AT)**

... awarded with the Bavarian Energy Appreciation Prize 2004

Bayerischer Energiepreis 2004

### **Objectives**

Aim of the project was the development of an innovative border crossing geothermal district heating supply for the two towns Braunau am Inn (Upper Austria) and Simbach am Inn (Bavaria). More than 500 customers will be supplied with geothermal heat. A huge underground water reservoir which reaches from Northern Bavaria to the Alps is tapped in a depth of 2,000 m. The project was carried out by a consortium of seven partners who founded the Geothermie Fördergesellschaft Simbach-Braunau mbH to exploit the geothermal resource. The overall aim was to show the technical and economical viability of a geothermal district heating supply compared to fossil fuels using the innovative technologies demonstrated in this project and to save green house gas emissions by the use of geothermal energy.

### **Technological concept**

In 1995 a feasibility study elaborated by ZREU proved the viability of a common geothermal heating supply system for the cities Braunau and Simbach. As a result of this the underground heat source was exploited by a "geothermal doublet" consisting of two wells of which one is used for the tapping of the hot water (production well) and the other for the reinjection of the water into the underground (reinjection well) to provide a closed circuit. The reinjection is necessary to keep up the pressure in the underground system and to avoid any emissions on the surface. The quality as well as the quantity of the thermal water remains untouched.



The starting points of the drillings on the surface are very close with a distance of only 15.5 m in Simbach am Inn. The first well for the reinjection has been drilled vertically in Simbach to a depth of nearly 1,850 m. The second highly sophisticated deviated drilling required technologies which had so far only been used in the prospection for petroleum and natural gas. It crosses the border in a depth of 1,100 m leading in an angle of 66 ° downwards to a depth of 1,900 m beneath Braunau in Austria. The total length of this drilling is over 3,200 m.

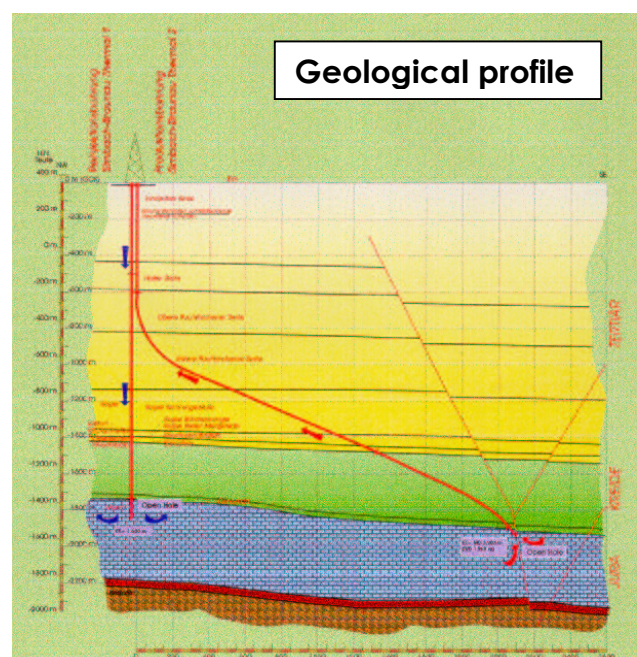
Through the production well 74 l/s of thermal water with a temperature of 80 °C are extracted which provide 35 km of district heating network with a total thermal power of 40 MW. More than 550 buildings are supplied with 68 GWh sustainable heating energy per year. According to the calculated energy demand of both cities about 30% of the total heating requirements can be covered by the district heating network, respectively 19% by geothermal energy.

The flow temperature of the grid can be raised to 105 °C at maximum load by means of an additional gas boiler in the central heating plant to reduce the return temperature in the grid as much as possible. A completely new developed connection scheme of the house stations to the grid using innovative single pipe systems was demonstrated in parts of the network to minimise investments for the connection of single houses.

The project was accompanied by ZREU as technical and organisational consultant for the overall management of the project. ZREU also carried out the engineering of more than 500 house stations connected to the district heating network in Simbach am Inn.

## Economy

The investment for the total project amounts to 19 Mio.€ of which 4 Mio.€ can be assigned to the drilling. The European Union awarded a financial support of 2.3 Mio.€ within its THERMIE-programme. In addition to that national funding was granted by the states Bavaria (2.8 Mio.€) and Upper Austria and by Kommalkredit Austria AG (1.9 Mio.€). Due to the great interest of the population in this environmentally friendly energy supply a much larger percentage of households than originally expected could be connected to the district heating network. The construction of the district heating network was carried out mainly by regional companies. The installation of the 500 house connection stations was done by local installation companies which provides a strong boost for the small and medium enterprises in the region.



## Environmental aspect

The CO<sub>2</sub> equivalent of the reduced green house gas emissions amounts to approx. 10.700 t per year. The project already plays a model role for other communities in Bavaria and Austria and leads to a great interest in this kind of energy supply.

## Project partners

- Geothermie-Fördergesellschaft Simbach- Braunau mbH (owner and operator of wells)
- Geothermie-Wärmegesellschaft Braunau- Simbach mbH (owner and operator of dh-network)
- Zentrum für rationelle Energieanwendung und Umwelt GmbH, ZREU (energy concept and project management)
- Geoteam Technisches Büro für Hydrologie, Geothermie und Umwelt GmbH (drilling concept)
- Rohöl-Aufsuchungs AG (RAG) (drilling company)