

# CENTRAL EUROPE Project Transenergy

## Transboundary Geothermal Energy Resources of Slovenia, Austria, Hungary and Slovakia

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- Project deals with geothermal aquifers as groundwater is the media for heat delivery.
- General problem is that recharge and exploitation are often not in the same country.
- The project concerns the transboundary geothermal aquifers in Central Europe area (Pannonian region).

### The role of geothermal energy

Several studies show that geothermal energy could deliver an important contribution to the future energy mix. This is especially emphasized in the remote future. Fig. 1 gives an example.

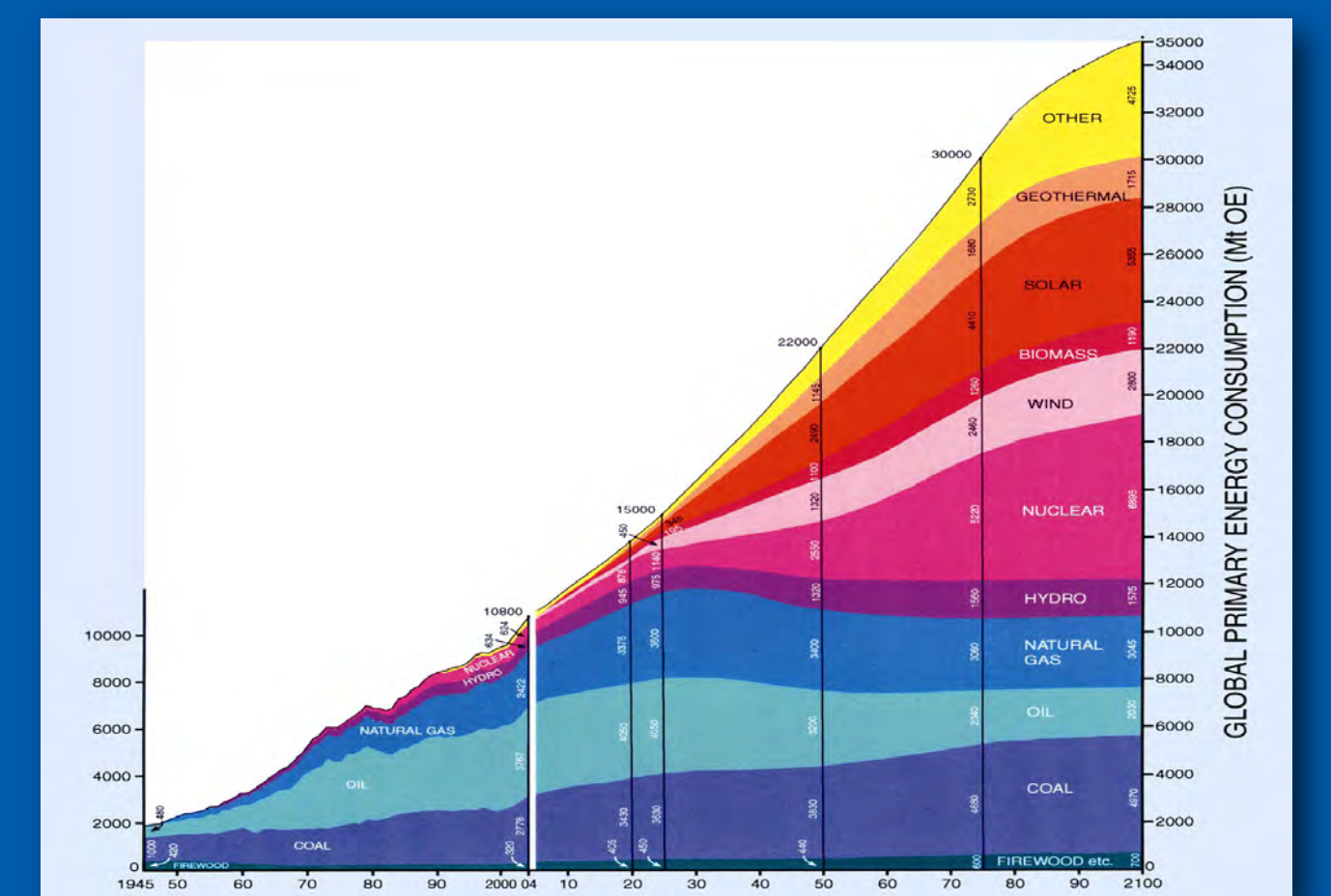


Fig. 1

Energy mix of the future (Schollnberger, 2006). Geothermal energy will become more important.

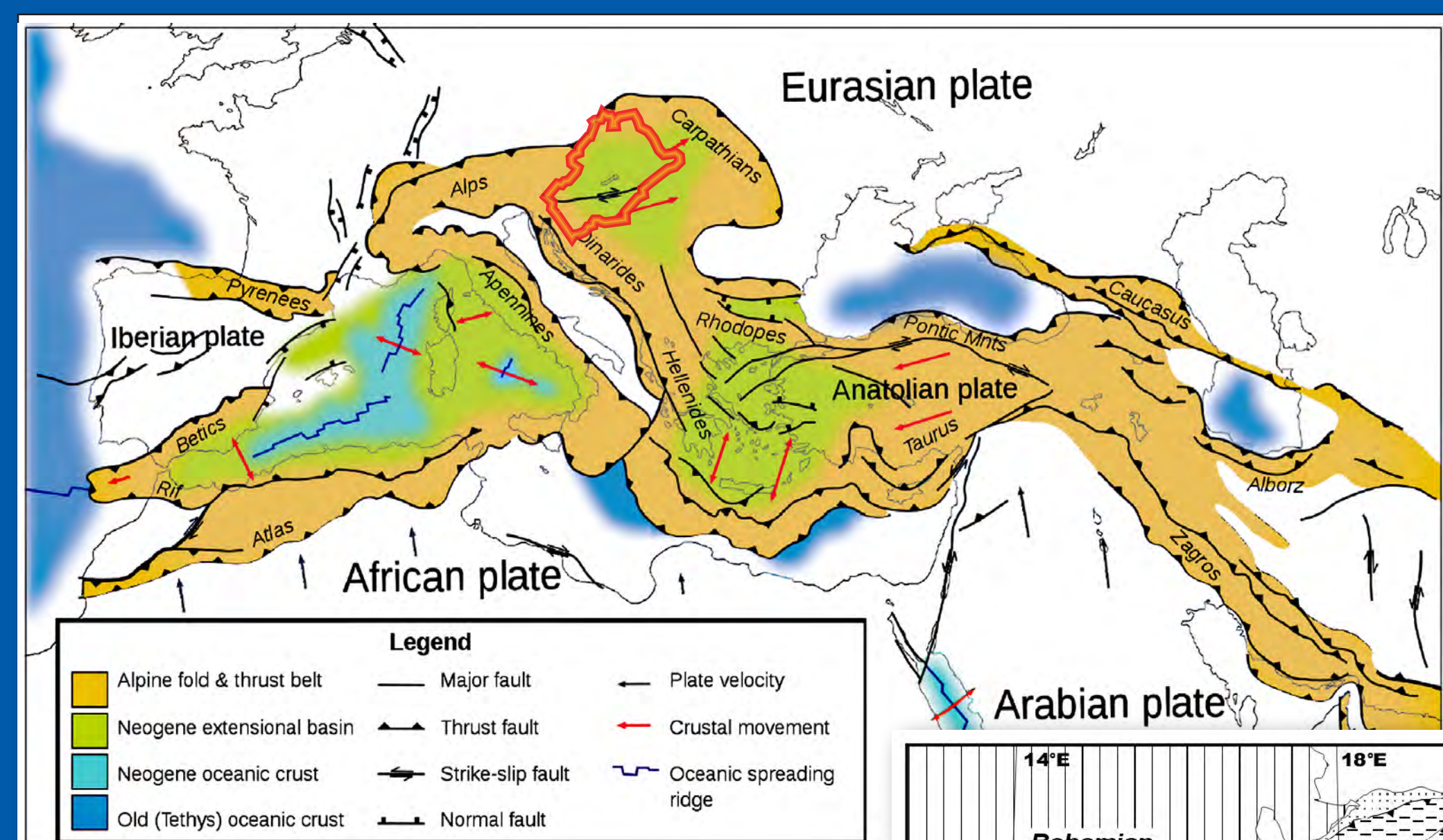


Fig. 2 Tectonic map of the Mediterranean (Woudloper, 2009); the project area (red line) is situated in a Neogene extensional basin.

### The project area

The project area is the western Pannonian region which encloses the border region of Austria, Hungary, Slovakia and Slovenia (fig. 4). The geothermal potential of this area is high. This is due to the geotectonic position (fig. 2): Neogene extension of the lithosphere led to a high geothermal heat flow and resulted in the creation of deep Neogene basins (fig. 3) which contain deep thermal water aquifers. Several thermal water aquifers appear also in the pre-Neogene basement, fig. 5 gives an example.

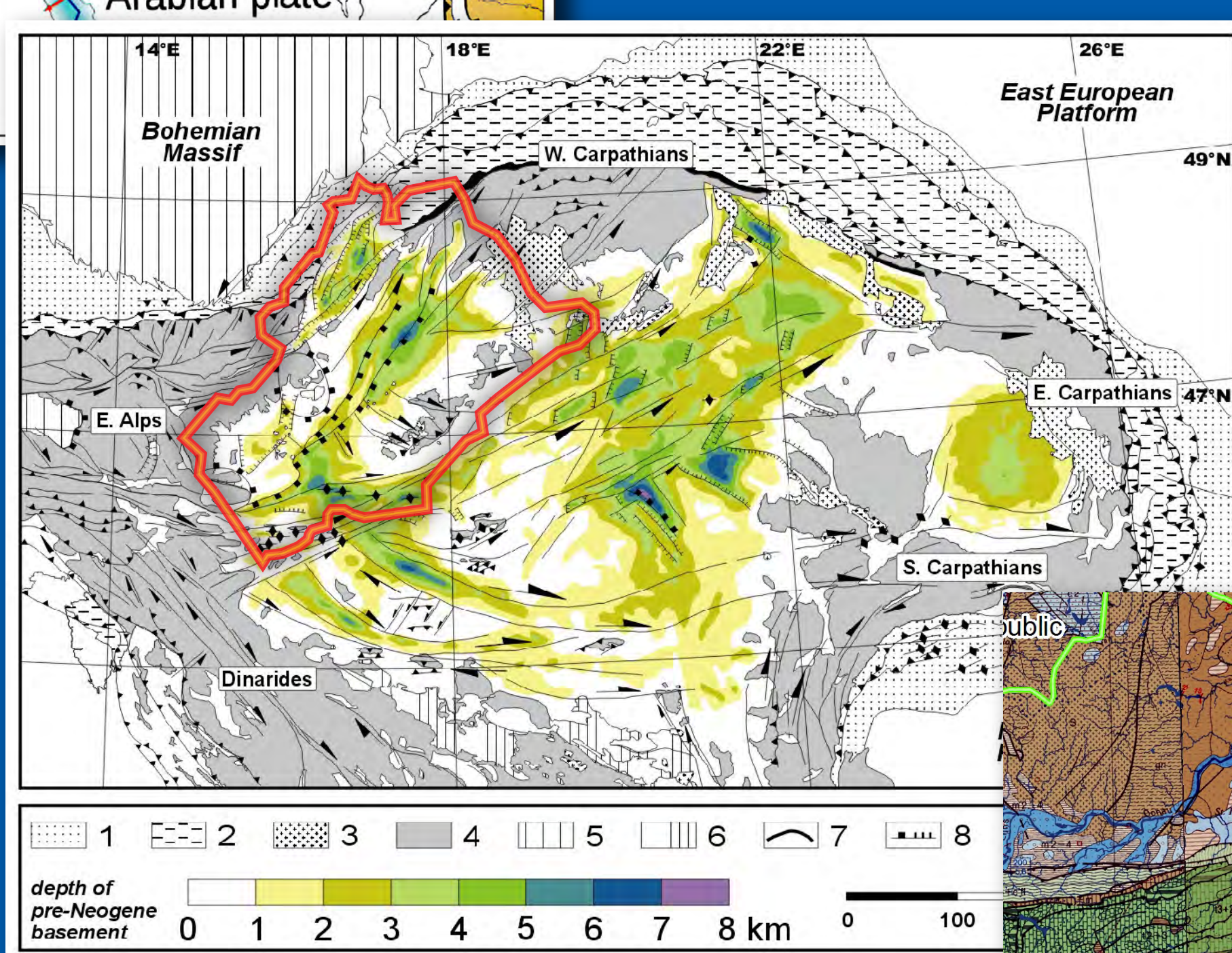


Fig. 3 Depth of pre-Neogene basement (Kovac, 2000); the project region (red line) comprises several deep Neogene basins (Vienna basin, Danube basin etc.).

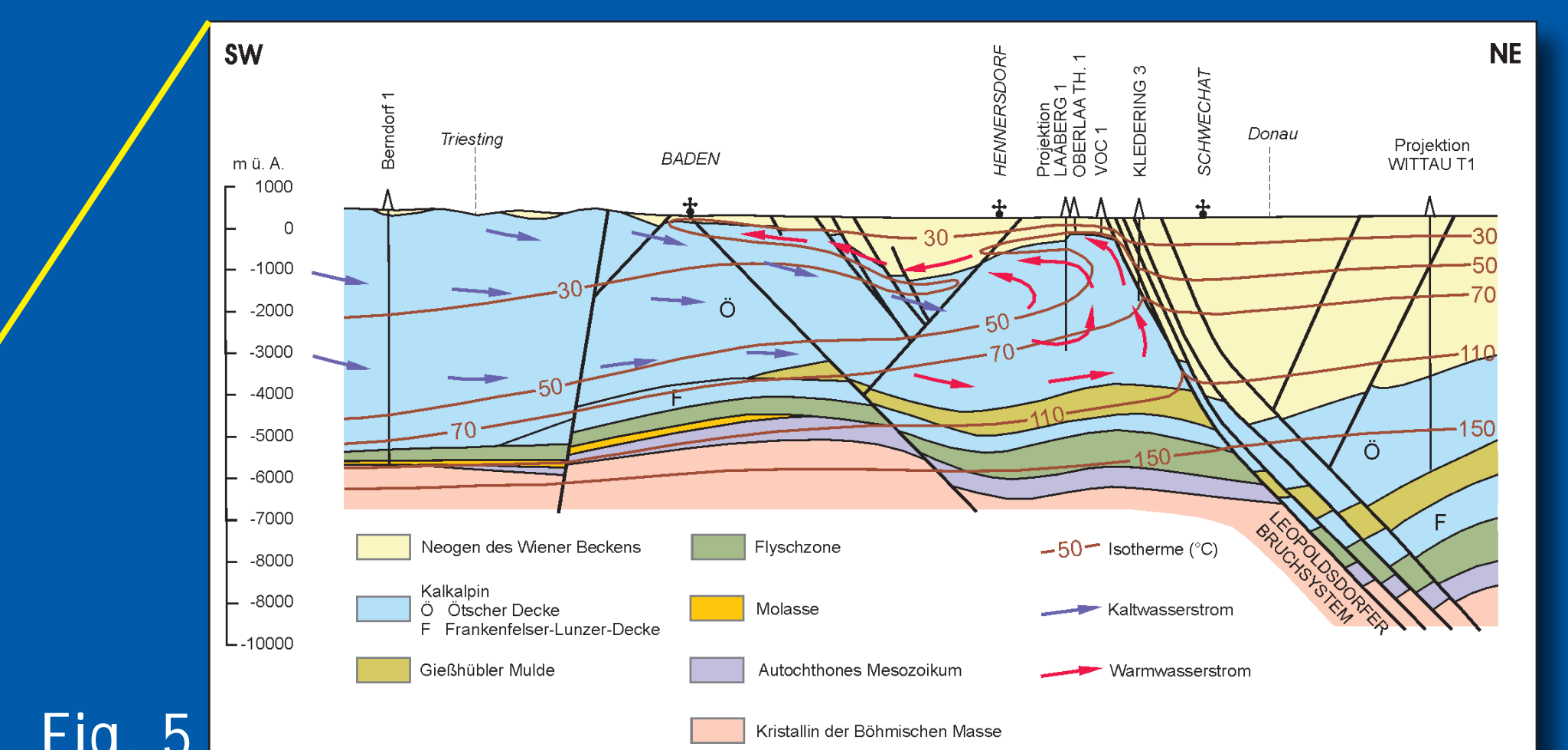


Fig. 5

Cross section through the western margin of the Vienna basin (Wessely, 1983); in the Northern Calcareous Alps (blue) beneath the Neogen filling (yellow) occurs one of the big thermal water circulations of the project area.

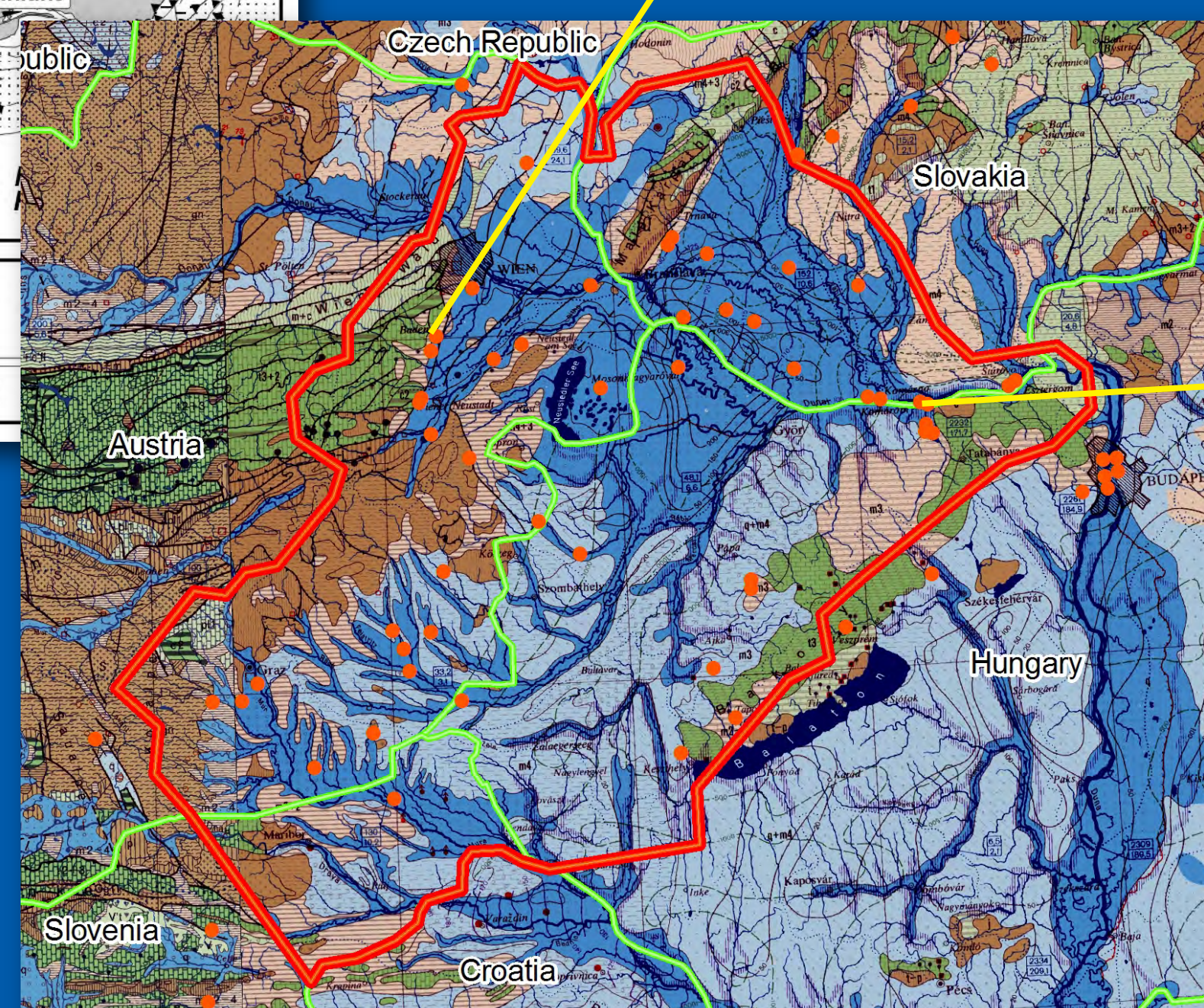


Fig. 4 Hydrogeological map of Europe (UNESCO), in the project area (red line) are situated several thermal spas (orange points).

Example of transboundary structure of Komarno-Sturovo region. Water of the thermal well SB-1 in Patnice with a temperature of 27°C originate in the depth of 200 m. Water infiltrates in the Pilis Mountains in Hungary. Discharge area is located in Slovakia.



Fig. 6

### The aims of the project

The project deals with the geothermal aquifers - as groundwater is the media for heat delivery. The general problem is that sometimes the water recharges in one country and the exploitation occurs in the neighbouring country. The project should improve the management of transboundary geothermal aquifers in Central Europe area (Pannonian region).

The project will provide implementation tools for an enhanced and sustainable transboundary thermal water management. The different target groups (authorities, thermal water users, consulting companies) are involved in the project. The worked out tools will be delivered to them and to the public by the project website. These tools are:

**Geological, hydrogeological and geothermal maps and models** will give an overview on the quantity and quality of the thermal water occurrences for everyone. The content of this maps and models will be harmonized between the involved counties.

**Utilization maps** will inform about the actual situation.

A **strategy paper** will identify the **geothermal potential** of the region as well as possible arising conflicts concerning the use of transboundary thermal water aquifers:

- **Overuse** - there exists old spas in the region.
- **Environmental pollution** - most thermal waters are formation waters.
- **Reinjection** is necessary for thermal use to sustain the hydraulic potential of the thermal water and to avoid pollution of the recipient.

Furthermore the project will give an overview on the legal situation in the four countries and the EU and it will give advices concerning the **legal frame of transboundary thermal water abstraction**.

Duration of the project: April 2010 - March 2013

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Project website:

<http://transenergy-eu.geologie.ac.at/>