

## THERMTEC

**Coupled thermal- tectonical  
modeling of the Tauern Window**

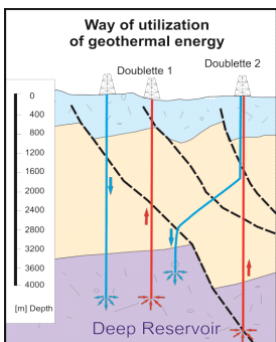
*Investigation of the actual geothermal conditions at the Alpine mountain range in order to detect positive heat-flux anomalies due to rapid exhumation of the Tauern Window.*



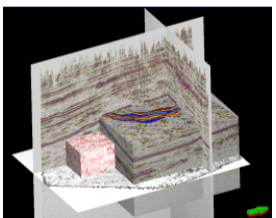
**Micro heating -grids based  
on seasonal storage of  
solar heat**

*Technical and economical feasibility study concerning micro heating grids based on seasonal storage of solar heat based on BHE techniques.*

**THERMODENG: Systematic-interdisciplinary  
modeling for optimal management and energetic  
use of thermal water resources**



*Research project with the focus on creating an optimal workflow from geophysical prospecting and description of reservoir parameters through to thermal-hydraulic simulation for assessment of useable resources.*



*More than 10 geological and geophysical studies with the focus on seismic interpretation, structural modelling, and well path planning within the last 10 years in Germany and Austria.*

**Geological Survey of Austria**

JOANNEUM  
RESEARCH



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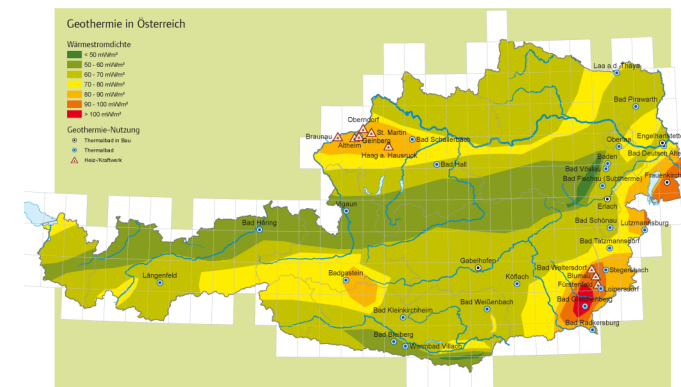
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## Geothermal Use and Research in Austria



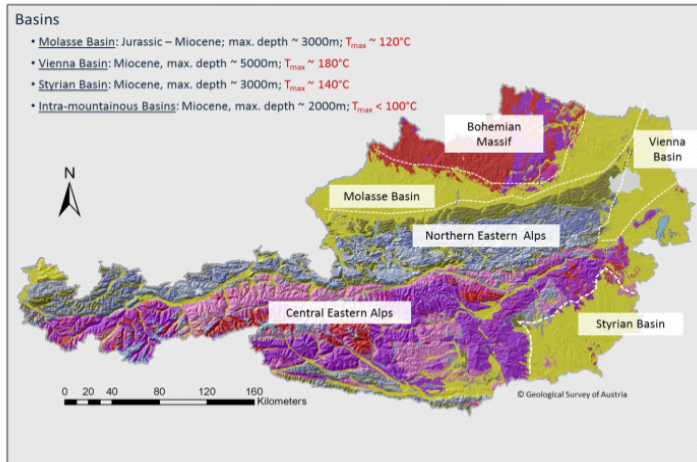
Heat-flow density map of Austria © GBA 2007



Deep BHE test site at Prottes near Vienna © OMV AG 2009

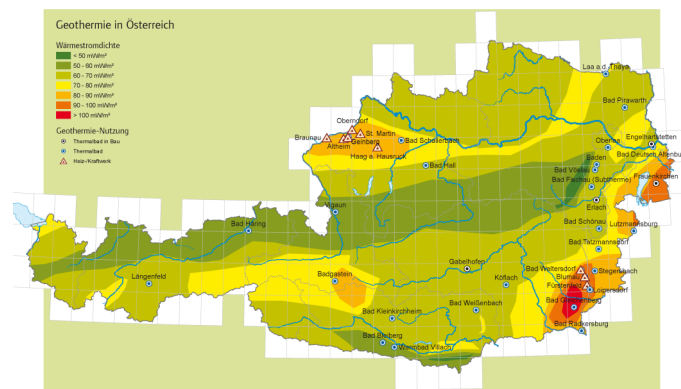
## General Overview

Austria faces average geothermal conditions, showing terrestrial heat-fluxes at a range of **40mW/m<sup>2</sup>** up to **120mW/m<sup>2</sup>**.



*Simplified geological map of Austria interpreted for geothermal use © GBA 2009*

The geothermal conditions are dominated by the Alpine Orogeny (strongly varying conditions) and the neighbouring Pannonian Basin (enhanced heat-flux). The most suitable regions for geothermal use are situated in the **Styrian Basin**, the **Vienna Basin** and the **Molasse Basin**).

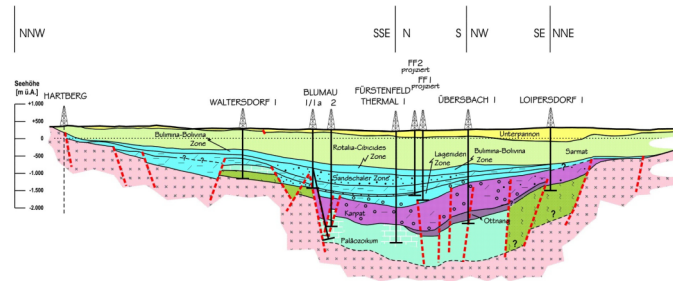


*Heat-flow density map of Austria © GBA 2007*

## Regions of Interest

### Styrian Basin

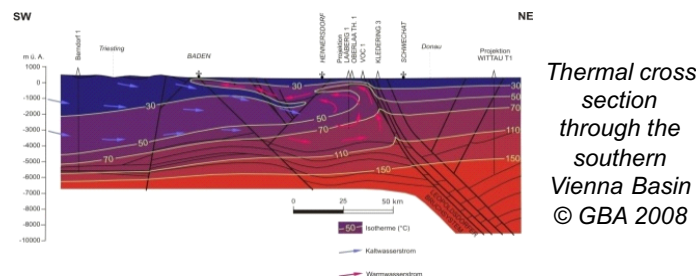
Situated at the south-eastern part of Austria the Eastern Styrian Basin offers favorable geothermal conditions due to geothermal influence by the Pannonian Basin. The most promising geothermal reservoirs are represented by **Paleozoic carbonates** and **Neogene sandstones and conglomerates**.



*Cross section through Styrian Basin at Fuerstenfeld © Goldbrunner et al. 2010*

### Vienna Basin

The Vienna Basin, situated at the north-eastern part of Austria is one of the most important hydrocarbon reservoirs in central Europe. It also offers huge potential for geothermal use with expected maximum reservoir **temperatures up to 200°C**. At its southern part an **active hydrodynamic system** exists, which is used for balneologic purposes.



*Thermal cross section through the southern Vienna Basin © GBA 2008*

## Traditional Use and Innovative Concepts

Austria has a **long-term tradition** in using thermal waters for **balneological purposes**. Traditionally used and well known spas are situated both at basin areas (e.g. Bad Blumau, Baden near Vienna) and at mountain ranges (e.g. Bad Gastein).



*Famous spa „Bad Blumau“ designed by the artist Hundertwasser © Bad Blumau 2009*

**Energetic use** of geothermal resources started in the late 1970s at Bad Waltersdorf (Styrian Basin) using a non-successful oil well for heating purposes. Since then hydrogeothermal use in Austria has been enhanced to more than 10 sites at the Molasse Basin and Styrian Basin with a **cumulated capacity of more than 60 MW<sub>th</sub> and 1 MW<sub>el</sub>**.

Beside traditional energetic use based on naturally occurring thermal waters, **R&D activities in Austria** are also strongly set on **innovative utilization concepts**, such as:

- Deep BHE concepts (borehole lengths up to 2kms)
- Seasonal heat storage combined with solar heating
- Energetic use of tunnel constructions (Tunnelthermie©)
- Large scale petrothermal systems (ehoch10 ©)