The LIAG has carried out research in the field of geothermal energy for more than 50 years. With GeotIS, the institute operates a freely accessible geothermal information system since 2007, which is used as a digital geothermal atlas by universities and research institutes as well as project planners and investors.

GeotIS provides an overview of geothermal plants that are currently in operation or under construction in Germany.

Electricity generation
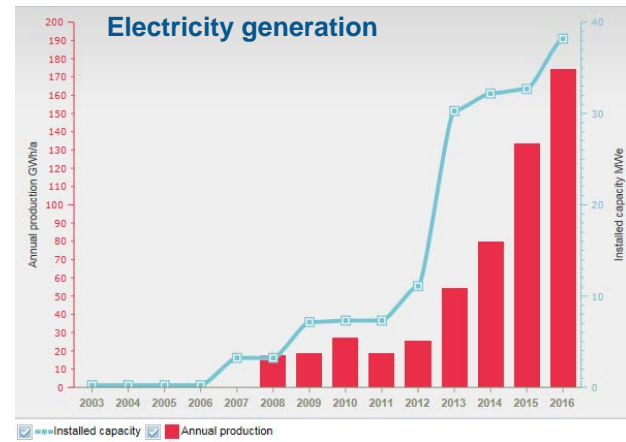
For each facility, details such as installed capacity or heat and power production can be retrieved.

Direct heat use
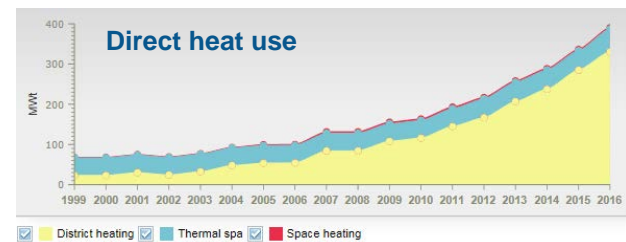
The data is updated annually and those interested can learn how the use of deep geothermal energy has evolved in recent years.

Project partners:
- Bavarian Environment Agency (LfU), Augsburg
- State Authority for Mining, Energy and Geology of Lower Saxony (LBEG), Hannover
- District Authority Freiburg, Baden-Württemberg, Department of Environment (RPF)
- State Agency for Environment, Nature Conservation and Geology of Mecklenburg-West Pomerania (LUNG), Güstrow
- Free University Berlin (FUB), Working Group Hydrogeology
- Geothermie Neubrandenburg GmbH (GTN)
- Karlsruhe Institute of Technology (KIT)
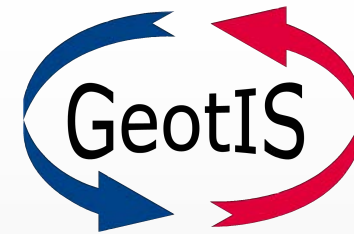- State Agency for Agriculture, Environment and Rural Areas (LLUR), Flintbek

Support:
- Working Group Deep Geothermal Energy of the State Geological Surveys
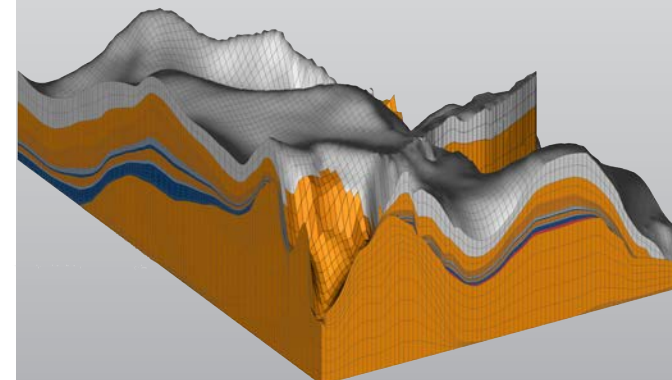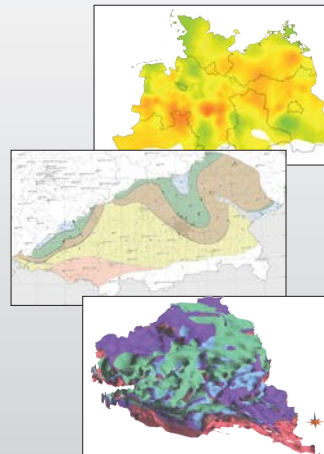- Federal Association of Natural Gas, Petroleum and Geoenergy e.V. (BVEG)

Geothermal Information System

In many places in Germany, the utilisation of deep geothermal energy is a climate and environmentally friendly alternative to fossil fuels, which is available regardless of the time of day or season and requires only a small amount of space.

Whether a geothermal project is successful or not depends very much on the subsurface geological conditions. That is why site selection is crucial when planning new facilities. The utilisation of geothermal energy is only economical if enough hot water can be produced from a well. Existing data, maps and 3D models provide an important source of information for new projects that also play a significant role in the planning of geological and geophysical exploration activities.

In the past, finding and editing relevant maps and data sets was very time consuming and difficult. Therefore, in 2006, the Leibniz Institute for Applied Geophysics (LIAG) in Hanover started the development of the Geothermal Information System for Germany (GeotIS).

The German Federal Government funded the work on GeotIS with the objective to reduce the exploration risk and facilitate access to information that enable an assessment of geothermal potentials.

GeotIS provides many geological and geophysical data that are critical to finding new sites, for example the temperature and permeability of deep aquifers. These data are also provided by the institute free of charge and are continuously updated. Users can select data that are relevant to them and display them interactively in maps or profile sections.

Vertical Section
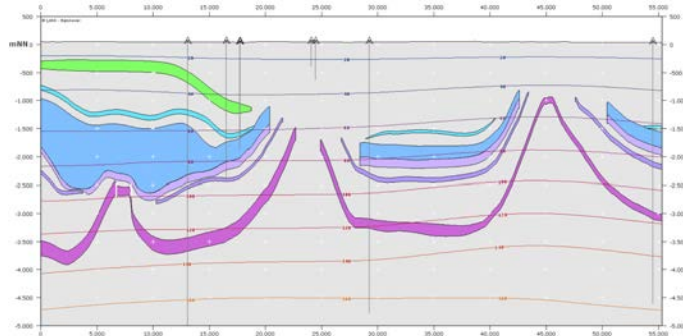
The position of the profile can be chosen freely on the topographical map
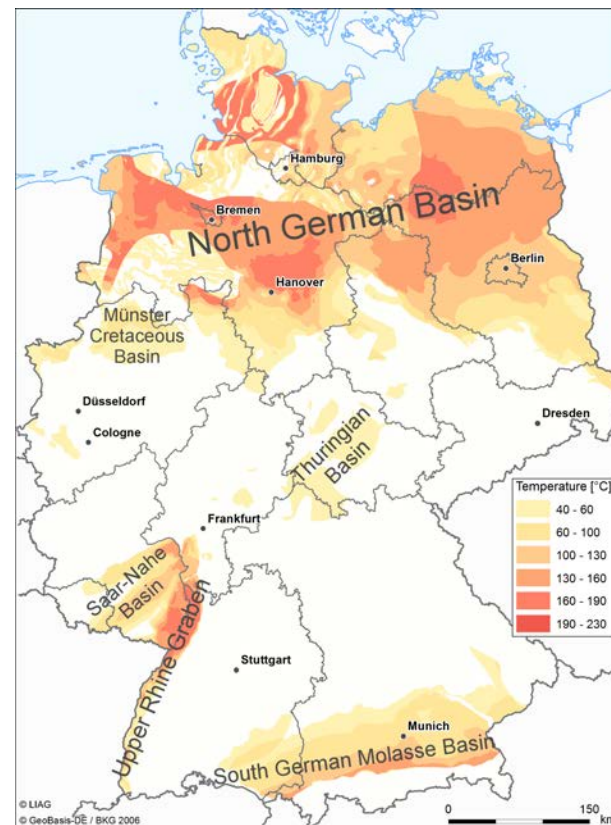
Temperature Distribution
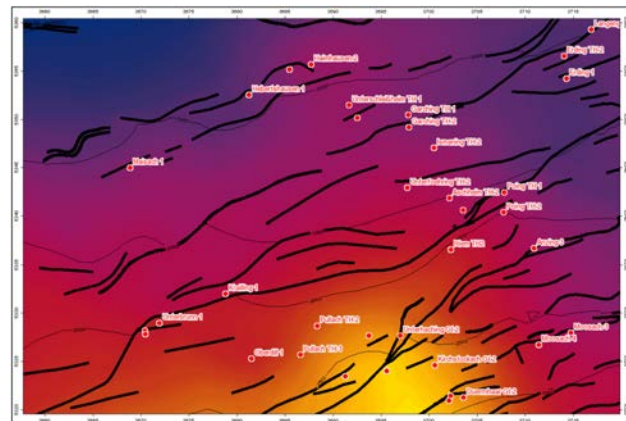
Graphic representation of the temperature distribution and depth lines on selected stratigraphic horizon
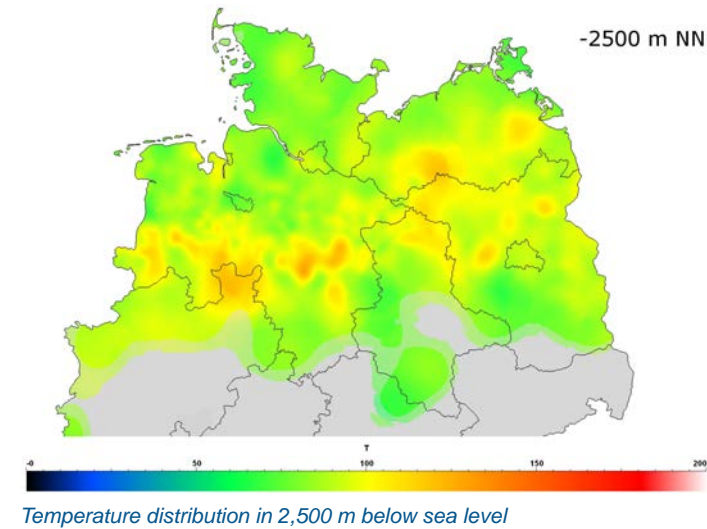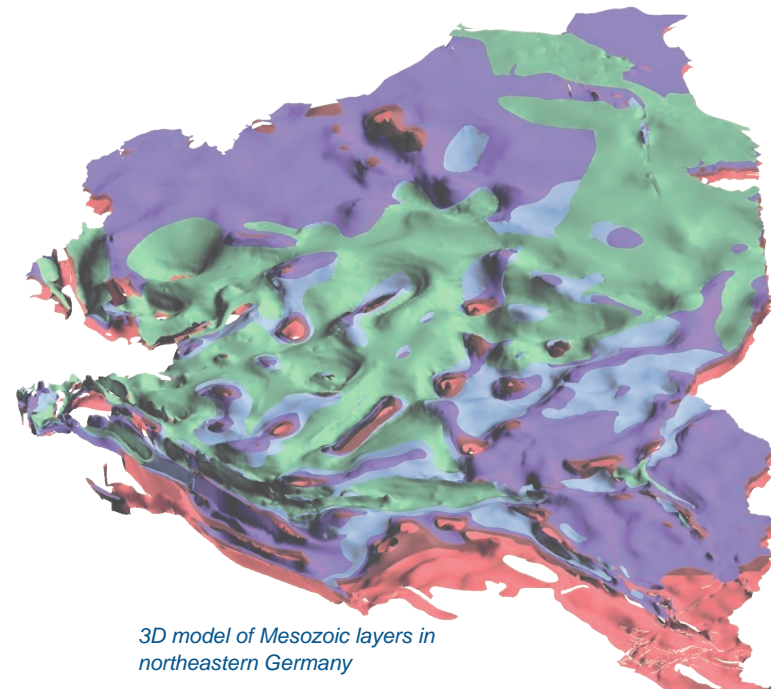
Geothermal Potentials

Data base
• drilling data from approximately 30,000 wells
• temperature data from approximately 11,000 wells, 10,500 of them in Germany (Geophysics Information System FIS GP)
• hydraulic data (poro-perm data, pumping tests)
• structural data

Temperature [°C]
40 - 60
60 - 100
100 - 130
130 - 160
160 - 190
190 - 230

© LIAG
© GeoBasis-DE / BKG 2006

Regions of hydrothermal potential

-2500 m NN
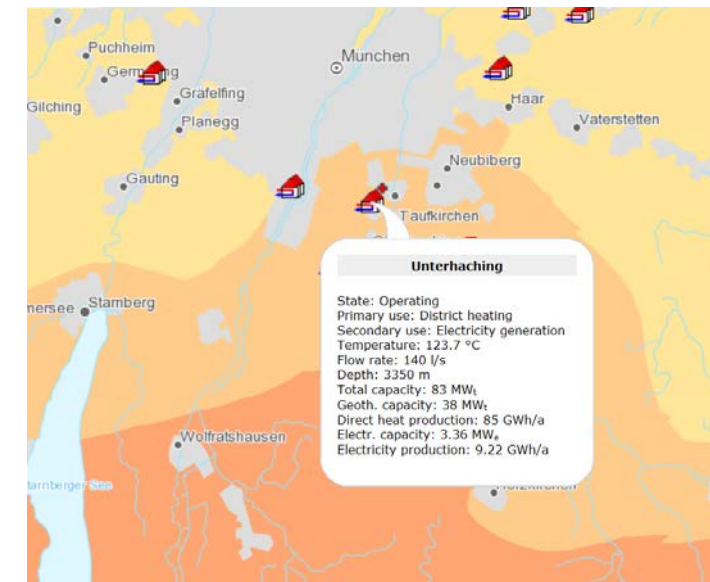
Temperature distribution in 2,500 m below sea level

3D model of Mesozoic layers in northeastern Germany

Features
An essential part of GeotIS are geological 3D models in which structures and parameters are stored:
• dynamic generation of interactive maps, combination of technical information with topographical and statistical data
• presentation of distribution, temperature and depth of relevant geological formations
• soil and underground temperatures
• further technical data, i. a. location and meta data of wells and seismic surveys, salt structures

Geothermal Installations

Unterhaching

State: Operating
Primary use: District heating
Secondary use: Electricity generation
Temperature: 123.7 °C
Flow rate: 140 l/s
Depth: 3350 m
Total capacity: 83 MW$_t$
Geoth. capacity: 38 MW$_t$
Direct heat production: 85 GWh/a
Electr. capacity: 3.36 MW$_e$
Electricity production: 9.22 GWh/a

• subdivision according to different types of use
• filter options
• annual update of the data of larger installations
• data sheet with details for each facility
• updated energy statistics for deep geothermal energy