In addition to the temperature, the hydraulic conductivity of the utilised aquifer is another crucial factor for the capacity of a geothermal energy plant. Assessing the permeability of geological layers requires reliable values for the hydraulic parameters. An important objective in this context is determining the hydraulic conductivity k_f and the T/H values (transmissivity / aquifer thickness) of the horizons being investigated. A method was developed for this purpose which uses the test and laboratory data to mathematically derive the hydraulic properties by using approximate solutions. Already existing and new hydraulic conductivities calculated using this method are visualised in maps showing the hydraulic conductivity or permeability of the formation.

The exploration risk for geothermal wells can be quantitatively assessed using the database contained within GeotIS. Although this is requested by private investors, insurance companies and public funding bodies, the system cannot replace a detailed feasibility study which has to form the solid platform for every geothermal project (cf. Section 3.1.5).

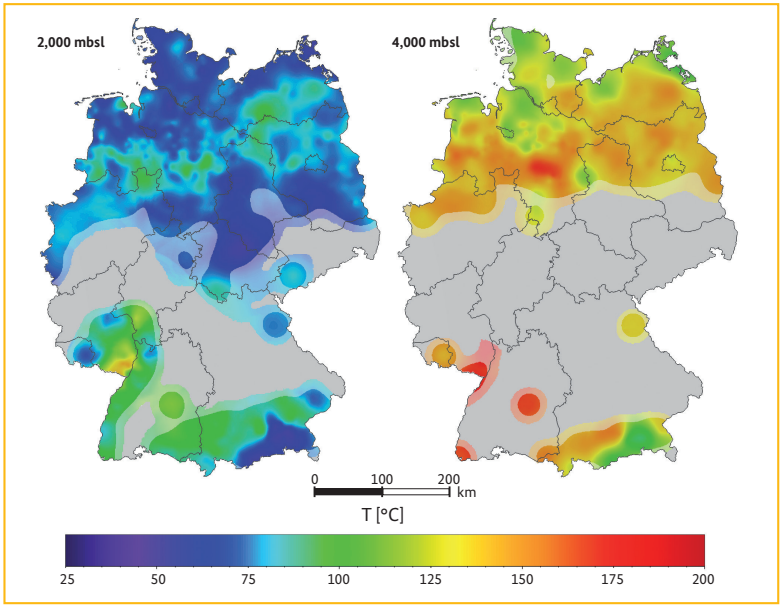

Fig. 27: Distribution of subsurface temperatures in Germany at 2,000 m and 4,000 m bsl. Grey areas indicate regions with inadequate amount of available data.

7 Areas with Hydrogeothermal Utilisation in Germany

The most important regions in Germany with respect to hydrogeothermal utilisation are the North German Basin, the Upper Rhine Graben and the South German Molasse Basin (Fig. 28). Reservoirs with hot water existing deep underground in these regions can be used for direct heating purposes at temperatures above 60 °C. In addition, temperatures exceeding 100 °C allow the generation of base load power.

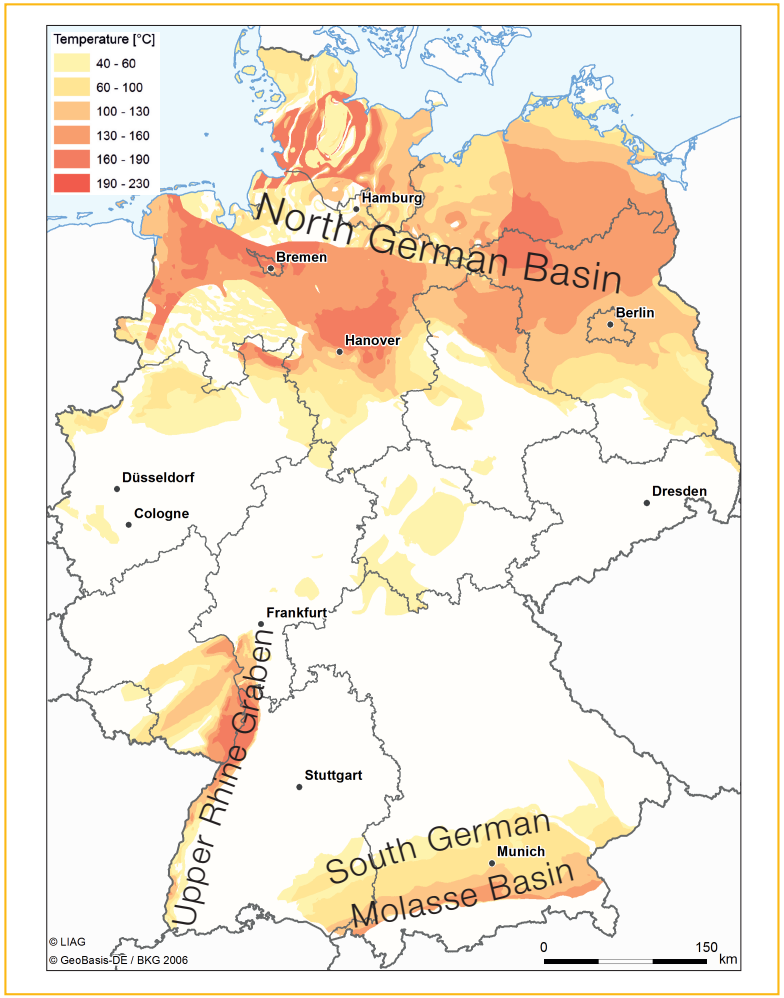

Fig. 28: Overview of the most important regions in Germany considered suitable for hydrogeothermal utilisation (North German Basin, the Upper Rhine Graben and the South German Molasse Basin) and associated temperature ranges (Map adapted from Suchi et al. 2014).