



## **MeProRisk – 3-D geothermal reservoir modeling in the North German Sedimentary Basin**

Juliane Arnold (1), Darius Mottaghy (1), Renate Pechnig (1), Daniel Gnjezda (2), and Christian Vogt (2)

(1) Geophysica Beratungsgesellschaft mbH, Aachen, Germany (j.arnold@geophysica.de), (2) Applied Geophysics and Geothermal Energy, EON Energy Research Center, RWTH Aachen University, Germany

MeProRisk is a joint project of five university institutes at RWTH Aachen University, Free University Berlin, and Kiel University. Two partners, namely Geophysica Beratungsgesellschaft mbH (Aachen) and RWE Dea AG (Hamburg) present the industrial side. The project is funded by the German Ministry of Education and Science (BMBF). The MeProRisk project aims to improve strategies to reduce the risk for planning geothermal power plants.

Within the framework of this project we present a study on the development of a geothermal 3-D model for the so called Hohne gas field which is situated in the western part of the Northern German Sedimentary Basin. We set up a 3-D structure model which is based on stratigraphic information recovered from 104 industrial boreholes. The stratigraphic units reach from the Permian to the Quaternary age. The region is strongly structured since it is affected by salt rock bodies. Interpretations of 3-D seismic data sets help to identify this tectonic situation and complement the stratigraphic information needed for the 3-D model. This model forms a basis for numerical simulations of heat transport and fluid flow.

To obtain relevant geothermal parameters as input data for the numerical models we studied petrophysical data from borehole logs and from laboratory measurements. This data is available from one 5 km deep borehole and two additional drillholes which are 2 km deep. On the basis of this information we were able to derive the lithological composition of the formation and to determine specific values for thermal and hydraulic key parameters of each lithological unit.

In the first instance, we aim at determining the undisturbed temperature field at a larger scale. Then, a small scaled model based on the regional model is built up. It is used to assess the thermal and hydraulic potential of the different horizons in the study area.