



Near-Surface Geothermal Energy

Research on innovative processes for object- and grid-based
energy supply through near-surface geothermal energy

Our Team offers services in the field of innovative, near-surface geothermal energy supply systems. In addition to classic development and utilization concepts, this also includes medium-depth geothermal probe configurations. Established, safe, durable and efficient heat pump technologies are combined with geothermal probes or well installations as heat source and seasonal storage.

75%
of Germany's space
heating and hot water
can be provided by
geothermal heat pumps

Single and multi-
family housesLarge
Solitaires

Urban quarters



Scalable performance –
Practically implementable area wide

Application options for geothermal heat pumps

Especially the combined heat and cooling supply by means of near-surface borehole heat exchangers, i.e. heat extraction in the heating period and heat injection (regeneration) in the summer months (building cooling), offers significant potential for decarbonizing Germany's heat supply. Geothermal probe systems are ideally suited for the seasonal storage of heat and/or cold and thus offer an increase in efficiency for the entire system.

In contrast to other renewable energies, geothermal energy is available all year round and independent of the time of year, time of day and weather conditions.

Our portfolio for concept development and validation includes both grid- and object-based projects. The team plans and designs the integration of heat pump systems for heating and cooling purposes, their monitoring and optimization, the integration of further renewable energies/sector coupling (PV, PV-T, solar thermal, waste heat) and the associated load management and the measurement technology, monitoring strategies and tests required for this. In addition, projects are supported with numerics and analytics as well as multi-criteria analyses.

Partners are supported by innovation consulting, further education and product development. Active further development and optimization of own and external technologies and processes (e.g. measurement technology and components of geothermal probes) are targeted.

Our Competences

- **Innovative near-surface geothermal energy supply - object- and grid-based supply**
- **Systemic consideration of the components: geothermal probe, heat pump, distribution systems as well as coupling with further energy sources**
- **Heat pump applications - sector coupling (PV, PV-T, solar thermal, waste heat), load management**
- **Measurement / Testing**
 - **Geothermal Response Test (GRT)**
 - **Large-scale GRT for probes up to 1,000 m depth and grids**
 - **Testing according to AwsV**
- **Simulation and modeling - analytical / numerical methods, multi-criteria analysis**
- **Monitoring - optimization, failure analysis, concept development**

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