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Harmonized web-based information systems for shallow geothermal energy use in Austria

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Neither regional development, construction projects nor infrastructure development – structural planning does not fully consider energy supply in Austria (yet). The project “Spatial Energy Planning for Heat Transition” is part of the research initiative “Green Energy Lab”, which has a project life-time from June 2018 to May 2021. It aims to provide a sound basis for the integration of heat in private and public planning processes and for the implementation of the energy infrastructure of the future together with energy providers.

Three Austrian states (Vienna, Styria and Salzburg), their capital cities and pilot-municipalities of all scales work together to provide all information necessary for the implementation of spatial heat-planning – as role model for Austria and other European countries. The GIS-based web-tool “heat-atlas” will provide this harmonized data and serve an information platform for project developers as well as for regional planning, fostering a sustainable use of all available sustainable energy resources and infrastructures to their full extent. The system of the information platform is arbitrarily scalable and is aimed to be expanded to other interested regions of Austria on demand.

One part of this “heat-atlas” is about shallow geothermal energy and covers vertical closed loop and open loop systems. The Geological Survey of Austria developed new methods to estimate capacity and energy resources as well as to show possible limitations of shallow geothermal energy use on property level. The resource calculations combine location-specific parameters such as thermal conductivity, underground temperature and groundwater availability with system-specific parameters such as mode of operation, operational hours, geometry and threshold values demanded by official regulations.

The method provides not only information about the maximum amount of energy available on the property, but also about the cover ratio of the demand. So called level-1 maps show the resources for standardized well-doublets and borehole heat exchangers independently of the property. The calculations for level-2 maps consider site-specific properties such as heating and cooling demand, operational hours and size of the property. This enables the estimation of the overall energy resources and the cover ratio of the property.

The results are shown as maps and as location specific query, which gives a concise summary of all relevant information for one location in form of an automatically generated report. More

information about the project is available at <http://www.waermeplanung.at/>.