Geophysical Research Abstracts
Vol. 18, EGU2016-13086, 2016
EGU General Assembly 2016

Cheap-GSHPs, an European project aiming cost-reducing innovations for shallow geothermal installations. - Geological data reinterpretation

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The success and widespread diffusion of new sustainable technologies are always strictly related to their affordability. Nowadays the energy price fluctuations and the economic crisis are jeopardizing the development and diffusion of renewable technologies and sources. With the aim of both reduce the overall costs of shallow geothermal systems and improve their installation safety, an European project has took place recently, under the Horizon 2020 EU Framework Programme for Research and Innovation. The acronym of this project is Cheap-GSHPs, meaning "cheap and efficient application of reliable ground source heat exchangers and pumps"; the CHEAP-GSHPs project involves 17 partners among 9 European countries such Belgium, France, Germany, Greece, Ireland, Italy, Romania, Spain, Switzerland. In order to achieve the planned targets, an holistic approach is adopted, where all involved elements that take part of shallow geothermal activities are here integrated.
In order to reduce the drilling specific costs and for a solid planning basis the INSPIRE-conformal ESDAC data set PAR-MAT-DOM (“parent material dominant”) was analysed and reinterpreted regarding the opportunities for cost reductions. Different ESDAC classification codes were analysed lithologically and sedimentologically in order to receive the most suitable drilling technique within different formations. Together with drilling companies this geological data set was translated into a geotechnical map which allows drilling companies the usage of the most efficient drilling within a certain type of underground. The scale of the created map is 1: 100,000 for all over Europe. This leads to cost reductions for the final consumers.
Further there will be the definition of different heat conductivity classes based on the reinterpreted PAR-MAT-DOM data set which will provide underground information. These values will be reached by sampling data all over Europe and literature data. The samples will be measured by several different laboratory instruments in variable states of saturation. Literature data are then also compared to the resulting laboratory measurements.
All in all this new data set will provide the development of more efficient cost planning tools. It provides detailed underground information on an European-wide level and the dimensioning of a spatial geothermal installation can be optimised. In order to provide a new drilling cost estimation, a new parameter called "drillability" is here suggested; the drillability is based on the drilling time for different type of rocks/sediments. The results are cost reductions which makes geothermal energy solution more attractive for end consumers especially on residential levels.