

Cyprus University of Technology

Renewable Energy Research

Contact details

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The laboratory of ground heat exchangers (GHEs) and heat pumps (division of Renewable Energy Research) of the Cyprus University of Technology (CUT) specializes in field testing and monitoring of GHEs, as well as studying the thermal properties of the surface lithology of Cyprus. Maps showing the thermal properties of the ground and heat exchange rate at different areas of various configurations of GHEs have already been constructed and published.

Overview of facilities**Laboratory testing facilities**

- GHE performance. Available GHEs include: U-tube (single and double) in various sizes, spiral and well types

Field testing facilities

- TRT equipment (heating)
- Thermal properties measuring equipment of soils and rocks

Computational capacities

- COMSOL Multiphysics, FlexPDE and GLD

Key projects

- Cyprus Research Promotion Foundation, 2009-2011: Investigation and determination of the geothermal parameters of the ground in Cyprus, for use in the design of ground heat exchangers and heat pumps. Technology/Energy /0308(BIE)/15
- Cyprus Research Promotion Foundation, 2011-2014: Investigation and determination of the geothermal parameters of the lithologies in Cyprus, for the compilation of the isothermal map of the island. Technology/Energy/0311/(BIE)/
- <http://res-research.cut.ac.cy/> (under construction)

Key references

- Christodoulides P., Florides G.A., Pouloupatis P.D. A practical method for computing the thermal properties of a Ground Heat Exchanger, Renewable Energy 94, 81-89, 2016.
- Kalogirou S.A., Florides G.A., Pouloupatis P.D., Christodoulides P., Joseph-Stylianou J., Artificial Neural Networks for the Generation of a Conductivity Map of the Ground, Renewable Energy 77, 400-407, 2015.
- Florides G.A., Pouloupatis P.D., Kalogirou S., Messaritis V., Panayides I., Zomeni Z., Partasides G., Lizides A., Sophocleous E., Koutsoumpas K. Geothermal properties of the ground in Cyprus and their effect on the efficiency of ground coupled heat pumps. Renewable Energy 49, 85-89, 2013.
- Florides G., Christodoulides P., Pouloupatis D. Single and double U-tube ground heat exchangers in multiple-layer substrates. Applied Energy 102, 364-373, 2013
- Kalogirou S., Florides G., Pouloupatis P., Panayides I., Joseph-Stylianou J., Zomeni Z. Artificial neural networks for the generation of geothermal maps of ground temperature at various depths by considering land configuration. Energy 48, 233-240, 2012.
- Florides G.A., Christodoulides P., Pouloupatis P. An analysis of heat flow through a borehole heat exchanger validated model, Applied Energy 92, 523-533, 2012.

Additional information, remarks

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Ongoing PhD theses, research

- The design aspects of Ground Heat exchangers, Lazaros Aresti, 2013-18, Cyprus University of Technology
- Estimating the ground heat absorption rate of Ground Heat Exchangers, Iosiphina Iosif-Stylianou, 2014-18, Brunel University

Potential supervisors for thesis, PhD thesis

- Paul Christodoulides
- Georgios Florides
- Soteris Kalogirou, soteris.kalogirou@cut.ac.cy