

CEEE/EÇEM-ÇESAM JOINT SEMINAR

Geoenergy Systems and Underground Thermal Energy Storage (UTES) - Swedish Experiences of Design and Utilization

Göran Hellström, Professor
Neoenergy Sweden AB

Date: October 8, 2012

Time: 10:00 – 11:45

Place: Reşat Aytaç Auditorium, Engineering Bldg,
Özyeğin University, Çekmekoy Campus

There is growing interest in geoenergy and Underground Thermal Energy Storage (UTES) systems in many countries around the world. These systems using the ground as a source of heat or cold or as a storage medium for thermal energy can be utilized for heating, cooling and combined heating and cooling purposes. This technology is preferred in green buildings to replace fossil fuels and increase energy efficiency. This seminar will focus on the following topics of geoenergy and UTES systems:

- Description of system solutions
- Experiences
- Design
- New trends

Prof. Hellström has performed research work within the Lund Group for Ground Heat Systems in Sweden since 1977. The research group focused on studies of thermal processes and heat transfer problems of UTES using both analytical and numerical methods. Special attention to the heat transfer capacity of borehole heat exchangers, which have also been investigated in laboratory experiments. Other studies involve natural convection around the interface between two zones of different temperature in aquifers, development of detailed simulation models for heat transfer problems and heat balance in energy systems. The simulation models and design tools deal with several types of ground-source applications: Aquifer Thermal Energy Storage (ATES), Borehole Thermal Energy Storage (BTES), and Cavern Thermal Energy Storage (CTES). He is the author of the wide-spread commercial tool Earth Energy Designer (EED) for ground-source heat pumps with multiple boreholes. This development has been performed in both national and international collaborative projects. The knowledge and the developed software are applied in commercial designs of UTES installations as well as evaluation of research projects. Prof. Hellström has also participated in dimensioning and evaluation of many large-scale applications. Examples of such projects are the Avantor-Nydalen project (Oslo, Norway), Brf. Ljuskärrsberget (Stockholm, Sweden) and the Chemistry Department (Lund, Sweden), which are currently among the five largest BTES installations in Europe. He has also been involved in design of the BTES applications for the IKEA stores and high-temperature storage applications. Another application is rock cooling systems for about 30 mobile telephone switching stations and ground cooling of about 50 broadcasting systems for the national digital network. Prof. Hellström has

also been teaching Thermodynamics at Lund University and Renewable Energy at Luleå Technical University.

For content, please contact to:

Prof. Dr. Halime Paksoy, Çukurova University, ÇESAM (hopaksoy@cu.edu.tr) or

Prof. Dr. M. Pinar Mengüç, Ozyegin University, CEEE/EEM (pinar.menguc@ozyegin.edu.tr)

For transportation and location details, contact:

Dilek Murtezaoglu, CEEE/EÇEM (dilek.murtezaoglu@ozyegin.edu.tr)

There is a shuttle at 10:00 to Ozyegin Çekmeköy Kampus leaving from Ozyegin Altunizade Campus.

For the campus location and the access details please see the link below:

<http://www.ozyegin.edu.tr/new/OzUDE-YASAM/Kampuslere-Ulasim/Cekmekoy-Kampusu-Ulasim>