

NEWSLETTER

- September 2006 – Issue n° 1

“Reaching the Kyoto targets by means of a wide introduction of ground coupled heat pumps (GCHP) in the built environment”

Project Outline

The GROUND-REACH project (financed by EC programme : Altener 2005) “Reaching the Kyoto targets by means of a wide introduction of ground coupled heat pumps (GCHP) in the built environment”, commenced on January 1st, 2006. GCHPs, or geothermal heat pumps, exploit the heat and/or the heat capacity of the earth, in order to provide efficient heating and cooling of buildings. GROUND-REACH aims in supporting and promoting GCHPs by a series of studies and a large scale promotional campaign targeting key professional groups. The latter, among others, will include a dedicated website showing the benefits and availability of the technology, an international conference and exhibition, press releases, email campaign, and a series of meetings with high expected market impact.

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NEWS from Ground Reach



Ground Reach website is already on the air...

Start of 2006 the Ground Reach website was set up. It is available at the following address: www.groundreach.eu. Interested users will find information on general aspects of the project as well as on current and upcoming project activities. A general overview of the project, a description of the work program and the indication of the project outcomes provides the user with the most important information. Links to the homepages of the project consortium and to the strategic partners gives suitable contact details about participating entities.

Several download options give access to relevant documents. On a result and publication site the user can download all major outcomes of the project work. Short summaries and internet links to related projects and reports, and to best practice examples provides the user with valuable background information.

E-survey : What is your opinion about geothermal heat pumps ?

In the framework of GROUND-REACH project, our mission is to aid Europe (and our country) to reach the Kyoto targets by using ground source heat pumps for heating and cooling of buildings.

For this reason, and in order to provide a complete European dimension to the e-survey, the project decided to conduct an e-survey from the GROUND-REACH web site: www.groundreach.eu

We are carrying out this survey in order to identify how key persons like you, feel about ground source heat pumps, which are also known as geothermal heat pumps. So please, spend 30 seconds of your precious time to reply to the questions, by answers that complies best with your opinion

Policy : GCHPs in the FP7

The EU-25 competitiveness ministers adopted a common position on the Commission's FP7 proposal in a Council meeting on 25 September 2006. The Council's common position will now be forwarded to the Parliament for its second reading, which is expected to take place on 29 November 2006.

First calls for proposals for FP7 projects could be published by December 2006 for submission in March 2007, and, after an evaluation period, the first FP7 project could begin at the end of 2007 or early 2008.

Geothermal energy should have a separate budget line in the theme : Energy ; with topics such as improvement of geothermal heat pump efficiency, the underground installations, heat and cold storage systems.

EHPA Statistics 2006

The European Heat Pump Association just published its statistics on the market.

More than **300 000** new heat pumps were installed in the EU-25 in 2005, with leading market in Sweden (**100 000**) and Germany (**25 000**). A large portion of that numbers belong to ground source heat pumps; e.g. ca. 70 % in Germany.

We estimate the European market represents now ca. **370 000** GCHP installations, and **4340** kWth in operation.

Heat Pumps for Renovations - New Generation of Heat Pumps by OCHSNER

The current development concerning oil and gas supply, raising energy prices and environmental reasons prove the importance of replacing fossil fuels by alternative and renewable energy. A very important role play heat pumps as an innovative future heating system based on the unlimited solar energy stored in air, water and ground.

Not only for new heating systems, but also for renovation of heating systems heat pumps are a modern and energy saving alternative. Cost saving, independent from any kind of fuel and environmental friendly, this are the convincing arguments for this kind of heating system.

Up to now heat pumps played an important role in new buildings. For renovation of heating systems in old buildings they were less considered. Nevertheless, with a modern heat pump you can save up to 50% of your heating-costs even with radiators. In combination with underfloor and wall heating there are heating-cost reductions of 75% and more possible - compared with other heating systems. Heating renovations mean high requirements for installers and producers, because it is necessary to take special care of the given situation of the existing building like the current piping and built in radiators. Therefore only specialists should be assigned with the renovation.



The new series "Golf plus" of OCHSNER supplies a flow temperature of 65°C with all heat sources and highest COPs.

The heat pump specialist OCHSNER has now developed a new series which is especially designed for heating renovations in old buildings. The new heat pump series "Golf plus" and "Air-Station plus" supply a flow temperature of 65°C with all heat sources (earth, water and air). Thus they are suitable for radiator heating and offer excellent COPs.

With the new generation the efficiency of the heat pumps raised significantly, what is testified by independent institutes like the Austrian research centre „Arsenal Research“ in Vienna and the Heat Pump Test Centre in Buchs, Switzerland. Arsenal measured in recent tests of OCHSNER direct expansion heat pumps the excellent COP of 5,5 at E4/W35 including the buffer loading pump! This means a more than 10% higher COP compared to the former generation. E4/W35 is equivalent to B0/W35 with brine systems. The ground coupled direct expansion system, which offers an operating cost advantage up to 15% compared to brine systems, is only one the outstanding developments of OCHSNER. More information about heat pumps is found under www.ochsner.com .

Heat pumps to be tested in practice

Fraunhofer-Institut für Solare Energiesysteme ISE (Germany) is going to start a four years field test for heat pumps. ISE is planning to measure 140 heat pumps installed in one-family houses.

In cooperation with seven heat pump manufacturers and two utilities the researchers will investigate how efficient electric heat pumps can meet the heat requirements of low energy houses. Of course, ground source heat pumps are part of these tests.

Growing interest for ground source heat pumps in the UK

United Kingdom - Almost 200 delegates attended the inaugural meeting of the Ground Source Heat Pump Association, organised by the National Energy Foundation (NEF) in Milton Keynes on 20th June.

The new association has been formed to promote and develop the Ground Source Heat Pump (GSHP) industry, which is growing rapidly, with installations in the UK increasing by at least 60 % each year.

More information on : <http://www.nef.org.uk/gshp/index.htm>

Focus on a best practice case study : *the Renewable Energy House*

On the last day of January 2006, the geothermal heat pump in the Renewable Energy House has been set into operation successfully. It is coupled to 4 borehole heat exchangers each 115 m deep and provides 25 kW of heat for the back building with conference room etc.

The presence of a geothermal system in the heart of Brussels already in the construction stage has convinced MEPs and officers of the EU-Commission that geothermal energy is not

only for some remote places like Iceland, but it is here to be used. The heat pump and some of the work was sponsored, however, EGEC had to carry substantial sums to get the project going.

In order to be ready for further political and lobbying action in Brussels, EGEC need your support for covering the cost incurred for the geothermal plant. For sponsoring opportunities, and to learn how we can make your support known to the public, please contact EGEC (e.g. under info@egec.org)



In the Renewable Energy House, geothermal energy is used in the form of a geothermal heat pump with 4 vertical borehole heat exchanger (BHE, “vertical loops”) each 115 m deep.

The heat is used to heat the rear building with conference room in wintertime. The 4 BHE have been installed by drilling inside the interior courtyard (fig. 1), with the drilling rig passing the narrow doorway with only a few centimetres of clearance. The geothermal system is not only used for heating, but can act also as a heat sink for the condenser heat of the solar absorption cooling system in summertime.

As BHE, plastic pipes (polyethylene) are installed in boreholes, and the remaining room in the hole is filled (grouted) with a pumpable material. With the 4 BHE, the pipes are connected in such a way that equal distribution of flow in the different channels is secured. Manifolds are at the building, and the pipes are connected in trenches in the field. The basic concept of U-pipe-BHE, consists of a pair of straight pipes, connected by a 180°-turn at the bottom. Two of such U-pipes are installed in one hole. The advantage of the U-pipe is low cost of the pipe material, and double-U-pipes thus being the most frequently used BHE in Central Europe.

The maximum heat load for the back building is 25 kW, the monthly distribution can be seen in fig. 3. The design of the BHE has to account for the heat load, but also for the heat injection from solar absorption cooling in summer (cf. fig. 2). For calculation of the number and depth of BHE, the software EED was used, jointly developed by the universities in Giessen/Germany and Lund/Sweden.

The design of the radiators in the back building shall secure a maximum supply temperature be in the order of 35-40 °C, and in any case below ca. 55 °C.

The heat pump (generally a device which allows transport of heat from a lower temperature level to a higher one, by using external energy e.g. to drive a compressor) for the REH is from Ochsner company, Austria; it belongs to the “Golf” range of Ochsner heat pumps, is of the type GMSW 38, and has a heating output 28.3 kW.



Drilling for BHE in the courtyard



Visit of EHPA-delegation in the REH basement (photos: EGEC)

Upcoming EVENTS



Intelligent Energy Turkey – EU : International Conference on Renewable Energies, Energy Efficiency and Energy Policies : 28-29 October 2006, Ankara, Turkey

28th New Zealand Geothermal Workshop and NZ Geothermal Association Seminar : 15-17/11/2006, Auckland, New Zealand. Contact: Jane Brotheridge

9. Geothermische Fachtagung - Mehr Energie von unten (more energy from beneath) : 15.-17.11.2006, Karlsruhe, Germany

1st National GeoExchange Business and Policy Forum : 27.-28.11. 2006, Hilton Lac Leamy, Gatineau, Canada

The 1st African Geothermal Conference (ARGeoC1) : 23/11-01/12/2006, Addis Ababa, Ethiopia. Contact: Geological Survey of Ethiopia

AGU Fall Meeting - Geothermal Reservoir System Session : 11-15/12/2006, San Francisco, USA. Abstract Submission Deadline: 7 September Contact: Dr. Huilin Xing

3rd BSME-ASME International Conference on Thermal Engineering : 20-22/12/2006. Dhaka, Bangladesh.

Please send your request to be unsubscribed to : info@egec.org

This Ground Reach Newsletter was elaborated by EGEC – European Geothermal Energy Council.