



# GROUND COUPLED HEAT PUMPS EUROPEAN COMMITTEE

Deliverable 13 Ground-Reach

June 2007

Project GROUND-REACH  
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[www.groundreach.eu](http://www.groundreach.eu)

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

Project supported by

Intelligent Energy  Europe



## D 13 "GCHPs European Committee"

The creation of a European GSHP Committee, as a common platform between EGEC & EHPA was officially launched after a final discussion between EGEC and EHPA in Watford, June 21, 2006.

The key persons for running the committee and arranging the first committee meeting, secretariat etc. have been appointed:

- for EGEC: Burkhard Sanner, Olivier Griere, Walter J Eugster, Robin Curtis.
- For EHPA : Karl Ochsner, Martin Forsen, Thomas Nowak, Alex Lehmann

The first period was dedicated to establish the main points to discuss and the organization of this Committee.

### Duties of the EGSHPC

- Coordination of EGEC and EHPA activities
  - Promotion on a European Scale (events, campaigns, statements)
  - Statements towards Commission
  - Information towards the industry and the public at large
  - Education / Training
  - ....
- Documentation
  - Technology advances
  - Market figures / statistics
  - Environmental benefits
- Mission statement : to effectively assist the penetration of ground source heat pumps into the European market by coordinating the efforts of EGEC and EHPA.

The first general meeting was hold in Frankfort : 07-08 march 2007

Partitipants were Robin Curtis, Olivier Griere, Walter J Eugster and Burkhard Sanner for EGEC ; Martin Forsen, Thomas Nowak and Karl Ochsner for EHPA. Dimitrios Mendrinos was there as Groundreach coordinator.

The main discussion was on definitions and on the method to assess energy delivered for statistical reasons (Eurostat).

The classification of Renewable Energy Sources (RES) has to fulfil two main criteria:

- Allowing the attribution of energy production to the different RES
- Being compatible with existing data collection (e.g. air-water-brine for heat pumps)

The basic definition of geothermal energy (“...energy stored in form of heat beneath the surface of the solid earth”) was not disputed.

A lengthy discussion developed around the attempts to combine the two criteria stated above into one common classification scheme. The two drafts focussed on one of the topics each: That by EHPA on the existing classification of heat pump manufacturing, the draft by EGEC on the clear representation of the energy sources.

During the session no solution was found, the main problems remained:

- Water source heat pumps are not distinguished in the manufacturing statistics as using groundwater (i.e. shallow geothermal) or other water (surface, waste), so a clear attribution of the numbers to the actual source as with brine (ground) or air is not possible
- EGEC cannot accept shallow geothermal to be considered as “ambient heat”, as it is a clearly defined renewable energy source of its own.

However, discussions (email exchange, and exchange of opinions on the definition and classification) during the period march-june 2007 permitted to find a basis for understanding:

- Not “Ambient Heat (incl. shallow geothermal)”, but “Shallow Geothermal and Ambient Heat”
- Under that heading, keep the three categories of the manufacturing statistics unchanged

A final agreement was found in Gleisdorf the 29/06/2007 between Burkhard Sanner and Karl Ochsner (see Annex 1).

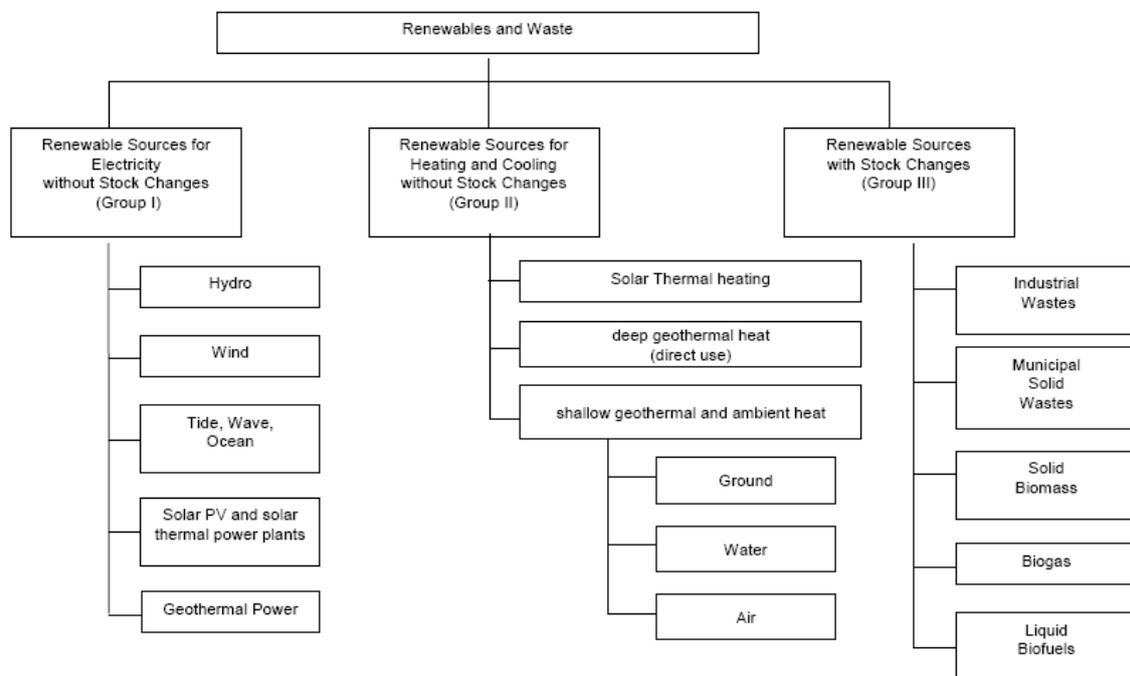
### **Appendices:**

1. Suggestions for classification EHPA and EGEC
2. Diagram of energy flows for heat pump systems (EGEC)
3. Definition Geothermal Energy (EGEC)

# Annex 1

Suggestions for classification EHPA and EGEC

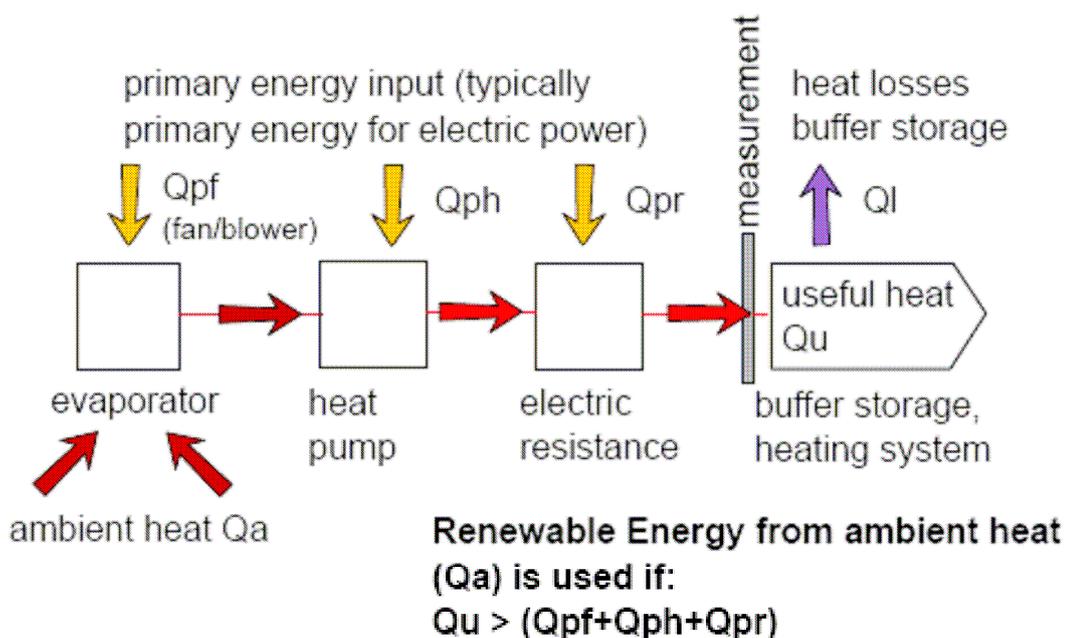
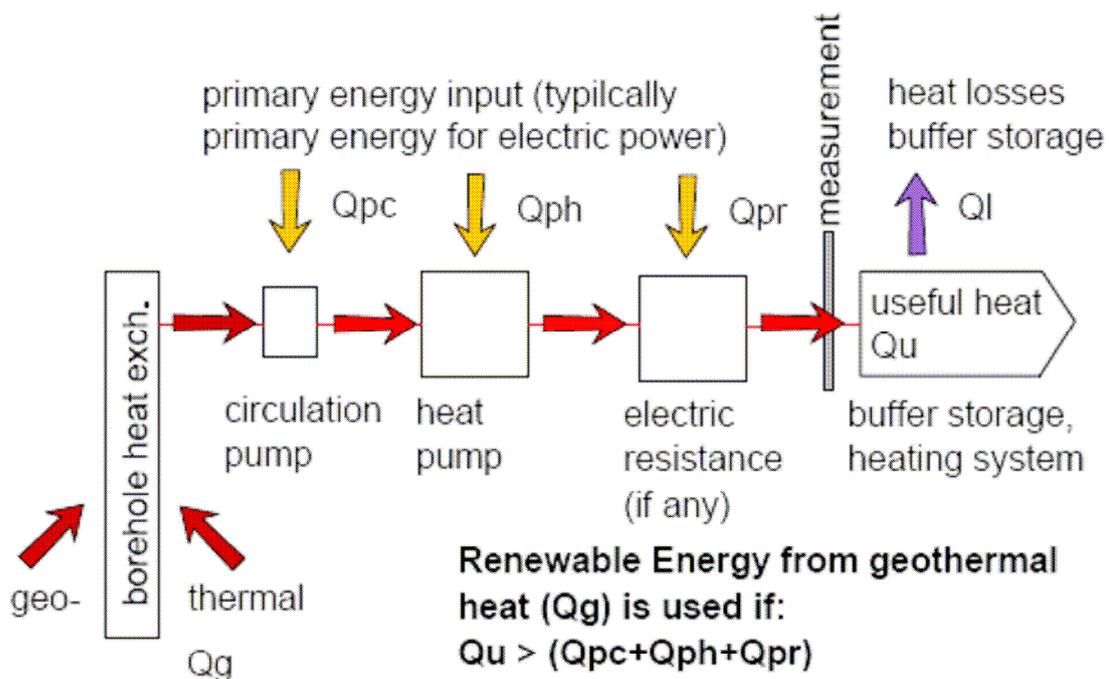
## Renewables and Waste Classification into Three Groups



## Annex 2

Suggestion EGEC :

Energy balance definition (system is considered as using RES, as long as  $Q_u$  is larger than the non-renewable input energies on an annual basis) :



## Annex 3

### **EGEC proposal for definition:**

*"Geothermal Energy is the energy stored in form of heat beneath the surface of the solid earth"* (existing basic definition of geothermal energy)

· Deep geothermal energy : Geothermal heat is produced at higher temperature levels (above ca. 25 °C), suitable for direct heating. This typically means deeper drillings (>200 m, sometimes several km) and large installations. In some cases heat pumps are installed also in this kind of applications, in order to bring the delivery temperature to desired values. Medium temperature resources are normally hot water with temperatures ranging from 100oC to 220oC.

Direct use technologies are where geothermal heat is used directly rather than for power generation and are built around the extraction of heat from relatively low temperature geothermal resources, generally of less than 150oC.

· Shallow geothermal energy (Ground Source Heat Pumps) : Geothermal heat is produced at low temperature levels, so a heat pump is required to increase the temperature to useful levels. Depth is typically less than ca. 200 m, the size of plants can range from small residential houses to large offices, etc.; cooling often is combined into these type of applications.

The most important ones are:

- Ground heat collectors (horizontal loops): These are usually installed in only 80-160 cm depth.
- Borehole heat exchangers (vertical loops): Those are vertical or graded boreholes up to ca. 150 m deep, equipped with pipes as heat exchangers. This is the type of installation most widely used in Central and Northern Europe. One or two borehole heat exchangers heat or cool residential houses, fields of borehole heat exchangers are used for offices, commercial buildings, whole subdivisions, etc.
- Energy piles, concrete building parts in the ground: are constructions necessary for static reasons, that can be equipped with heat exchangers pipes in new buildings.
- Heat storage: Warmth from summer in winter, and cold from winter against summer heat: feasible through geothermal energy.
- Other applications : Traffic areas free from snow and ice, bridges, airports, sport arenas Heat from mines and tunnels .

· Cooling sector : Geothermal energy has been used for cooling since a long time, in the form of reversible geothermal heat pumps, or direct cooling where the climate allows. And a very good potential for larger systems (large individual building, district cooling) can be seen in geothermal absorption cooling. The geothermal heat here is the driving energy for an absorption chiller.



Remarks :

The heat pump is the tool to allow production, or increase the production, of energy from energy sources like: low-temperature geothermal energy (ground and groundwater), surface water, air, waste heat, etc.



## Project Description

The GROUND-REACH project is expected to effectively assist EU policy towards both short and long term market penetration of ground coupled heat pumps, through analysing the market for ground coupled heat pumps and providing best practices, guidelines for local/regional authorities and key professional groups, conferences, meetings, website, brochure and other promotional tools. It will facilitate: A better understanding of ground coupled heat pumps merits and benefits and their importance towards Community policy objectives in relation to Kyoto targets and the buildings performance directive. An increased awareness and improved knowledge and perception of the ground coupled heat pumps technology among key European professional groups for short term market penetration.

The work is grouped in the following work packages:

WP#1 – Project management

WP#2 - Estimating the potential of ground coupled heat pumps for reducing CO<sub>2</sub> emissions and primary energy demand for heating and cooling purposes in the built environment: evaluation of available statistical information, definition of competing heating/cooling technologies, analysis of existing calculation tools, CO<sub>2</sub> emissions calculation.

WP#3 - Compiling and evaluating existing ground coupled heat pumps best practice information in Europe: identifying and updating information from all European member states, including case studies, and technical guidelines.

WP#4 - Analysing the contribution of ground coupled heat pump technologies to reach the objectives of the Buildings Performance Directive: Analysis of the technical, environmental and economic feasibility of ground coupled heat pump technologies; Guideline for supporting planners and architects in detailed technical aspects and in general questions; Standards review, evaluation and proposals.

WP#5 - Defining measures to overcome barriers for broader market penetration and setting up a long term dissemination plan: identification of market barriers including legal/regulatory, economical and technical, proposals for long term EU level interventions to overcome them, including a new directive on RES-Heat.

WP#6 - Launching a large scale promotional campaign at European level: brochure, poster, promotional text, presentations, interactive Internet site, setting-up the European Geothermal Heat Pump Committee, publications, international conference and exhibition, a series of regional meetings targeting key professional groups.

WP#7 - Common dissemination activities



## Project partners



Project Coordinator:  
Centre for Renewable  
Energy Sources (CRES)



SVEP Information &  
Service AB (SVEP)



Ecofys Netherlands  
b.v. (ECOFYS)



Cestec SpA



European Geothermal  
Energy Council (EGEC)



University of Oradea  
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The Energy Efficiency  
Agency (EEA)

ADEME



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la Maîtrise de  
l'énergie (ADEME)



European Heat Pump  
Association (EHPA)



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