D5.5.

Know-how gained and lessons learnt from the case studies including feedback from target

November 2014

Philippe Dumas, Luca Angelino, Alexandra Latham **EGEC**

Christian Boissavy, Virginie Schmidlé - Bloch **AFPG**

Co-funded by the Intelligent Energy Europe Programme of the European Union

Introduction

The task consisted in **presenting case studies** which can be considered exemplary for a replication of geoDH system, especially in region with a juvenile market where no examples of geothermal installations can be shown. A selection of best practice examples allows also to illustrate the training courses and to promote these systems during the dissemination phase.

The target group of this task was market actors of the geothermal and district heating sector.

1- Objective and methodology

Good practices are already used but not well known. For that reason best practice examples of existing geothermal district heating schemes throughout Europe or schemes that are in the final stages before market implementation, have to be summarized, classified and analysed.

The goal was to create examples of good practises in EU countries, covering centralised, large and small scale systems, different transfer media, as well as different resources.

Methodology to select case studies

Each partner chose the most interesting geoDH projects in its country with minimum 2 systems per country. Interest means the project reaches high economic performance, it has innovative aspects and that it ensures sustainability.

The database has to present no less than 20 projects.

The case studies will be created using the following approach:

a) they will be put together in close liaison with the relevant players: district heating/geothermal companies/local authorities, building owners and users, etc.

b) they will be subject to consultation and feedback from the relevant stakeholders

c) they will include information regarding the implementation of the schemes: business models, drivers for the projects, pitfalls, etc

d) they will include, where available, measured values of performance

e) they will summarise the possible benefits achieved in each scheme

f) integrate the perspective of the target group of building owners and end users

These best practice examples cover:

- the different geothermal DH technologies: traditional medium enthalpy plants, but also innovative ones with low enthalpy assisted by heat pumps and Enhanced Geothermal Systems - EGS

- purely DH or CHP systems

This collection of examples was presented in a database available online.

Moreover, the know-how gained and the lessons learnt from the case studies, including the perspective of all target groups that are involved in delivering the projects, e.g. municipalities, district heating and geothermal companies, building owners and end users, etc. had to be presented. These lessons learnt can be found in the final chapter of this report for market actors of the geothermal and district heating sector.

The case studies were selected on the basis of fair and transparent criteria and procedures, which should prevent unnecessary market distortions.

If, in the selection of the case studies members of the consortium could found themselves in a situation of conflict of interest, this is indicated in the report, and special care should be taken to ensure that the selection remains fully transparent and fair.

2- Data collection

The first step was done during the 4th Project meeting and 2nd Advisory committee meeting on 19th September 2013 in Copenhagen .

AFPG presented a table for the collection of information on the best cases covering all partners countries:

- BULGARIA
- CZECH REPUBLIC
- DENMARK
- FINLAND
- FRANCE
- GERMANY
- GREECE
- HUNGARY
- IRELAND
- ITALY
- LITHUANIA
- NETHERLANDS
- POLAND
- PORTUGAL
- ROMANIA
- SLOVAKIA
- SLOVENIA
- SPAIN
- UK

The data to be collected should cover for each Case study:

- Region>City>location
- Owner
- Operator
- "Installed capacity (MWth)"
- "DH length (m)"
- Inhabitants connected
- Design of the DH
- "subsurface and surface technical schemes"
- significant pictures if any
- Operating Temperature of the DH
- "Temperature of the geothermal resource (production - injection)"
- "Geothermal flow rate"
- Installed geothermal capacity"
- Heat Pump if any (power in Mwe and COP)"
- Production of heating and/or cooling
- "Others uses (drinking water, cascade uses…)"
- Dates of begining and end of construction
- "Planing of the operation (from pre-studies to full completion)"
- Organisational scheme
- Administration scheme
- "Investement for geothermal well"
- "Investement for geothermal heating station"
- "Investement for DH network and substation"
- "Financing (banks, funds, PPP…)"
- "Amount of Subsidies if any"
- Difficulties faced
- Administrative permits
- Cost of the produced MWh
- Cost of the MWh sold Comparison with fossil energies
- Final energy cost structure
- Taxes
- Pay back
- Innovation if any

Partners then had to fill in this table with max. 3-4 cases per country, ideally including some CHP cases.

During the following project meeting (5th) on 27-28 February 2014 in Florence, for the Task 5.1 Best practices examples (leaded by AFPG), two main actions were done: review of data collection and proposal of online tool.

AFPG presented the 11 examples already received. More examples and minimum a case from: Bulgaria, Italy, UK, Germany, Poland, Slovenia and Romania were needed.

AFPG made also a proposal for 2 pages pdf sheet:

Centrale géothermique haute température

RITTERSHOFFEN (67)

afpg
Association Française des Professionnels de la Géothermie

Géothermie en milieux fracturés pour alimentation en chaleur du process industriel de Roquette à Beinheim

Fiche réalisée à partir de données ECOGI

© Groupe ES

Maître d'Ouvrage: ECOGI

Assistant Maître d'Ouvrage: ESG

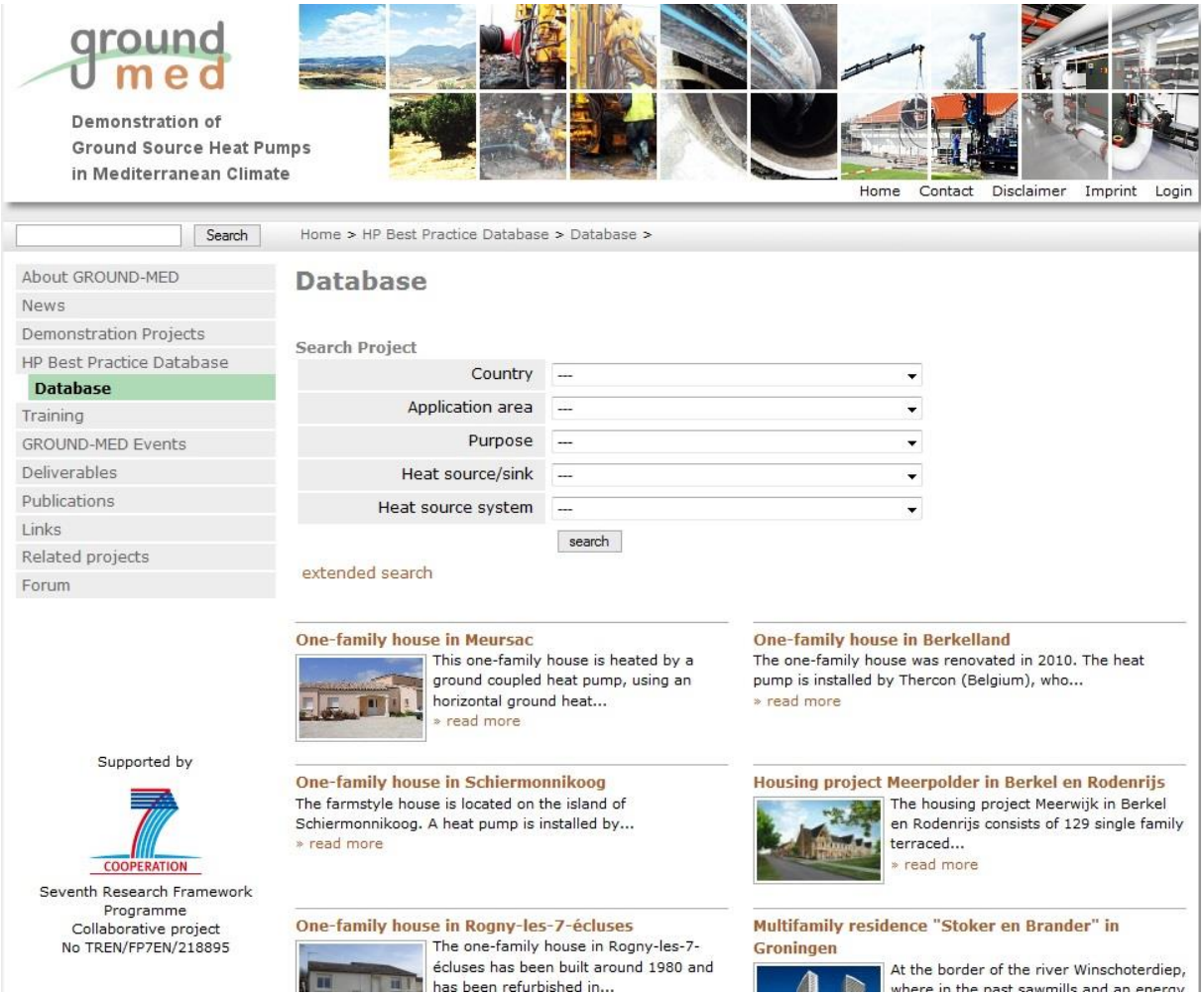
Maître d'Œuvre: CFGS

Description du projet

Le projet ÉCOGI (Exploitation de la Chaleur d'Origine Géothermale pour l'Industrie) consiste à extraire la chaleur du fluide géothermal qui circule dans un réseau faillé pour alimenter, après transport dans une boucle d'eau surchauffée, les procédés industriels de l'usine Roquette Frères, située à Beinheim. Il s'agit de la toute première déclinaison industrielle française de l'expérience réussie de géothermie profonde du site pilote de Soultz-Sous-Forêts. Ce projet est porté par la société ECOGI qui rassemble trois actionnaires: le Groupe ÉS -énergéticien de référence régionale-, la Caisse des Dépôts, et le Groupe Roquette Frères, engagé dans un plan de réduction de ses émissions de CO_2 issues de ses activités industrielles.
Ce projet a débuté à l'été 2011 avec l'aménagement de la plateforme, les sondages de reconnaissance, suivis du forage du premier puits d'exploration. Un second puits sera foré en mars 2014 afin de créer une boucle pour l'exploitation de la ressource géothermale. La mise en service pour alimenter l'usine Roquette Frères est prévue pour 2015.

Juillet 2013

EGEC presented the proposal for an online tool:



Finally, during the 6th project meeting on 24 September 2014 in Brussels, final activities on Task 5.1 Best practices examples were done:

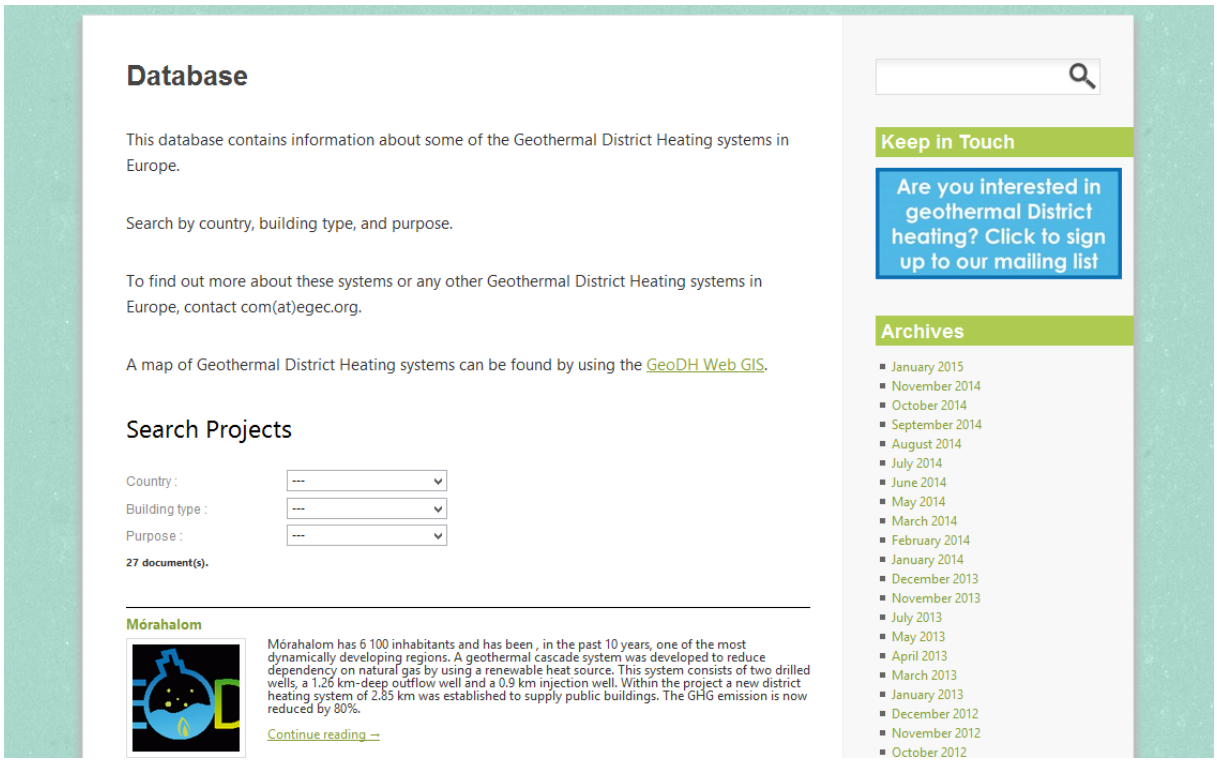
- review of online tool
- add more case studies: UK (Southampton), Germany (2 cases) and Romania (2 cases)
- add a qualitative analysis
- EGEC to provide these cases in the excel sheet
- AFPG to publish 1 factsheet on case studies/country
- Partners to publish rest of the factsheets on case studies/country

3- Results

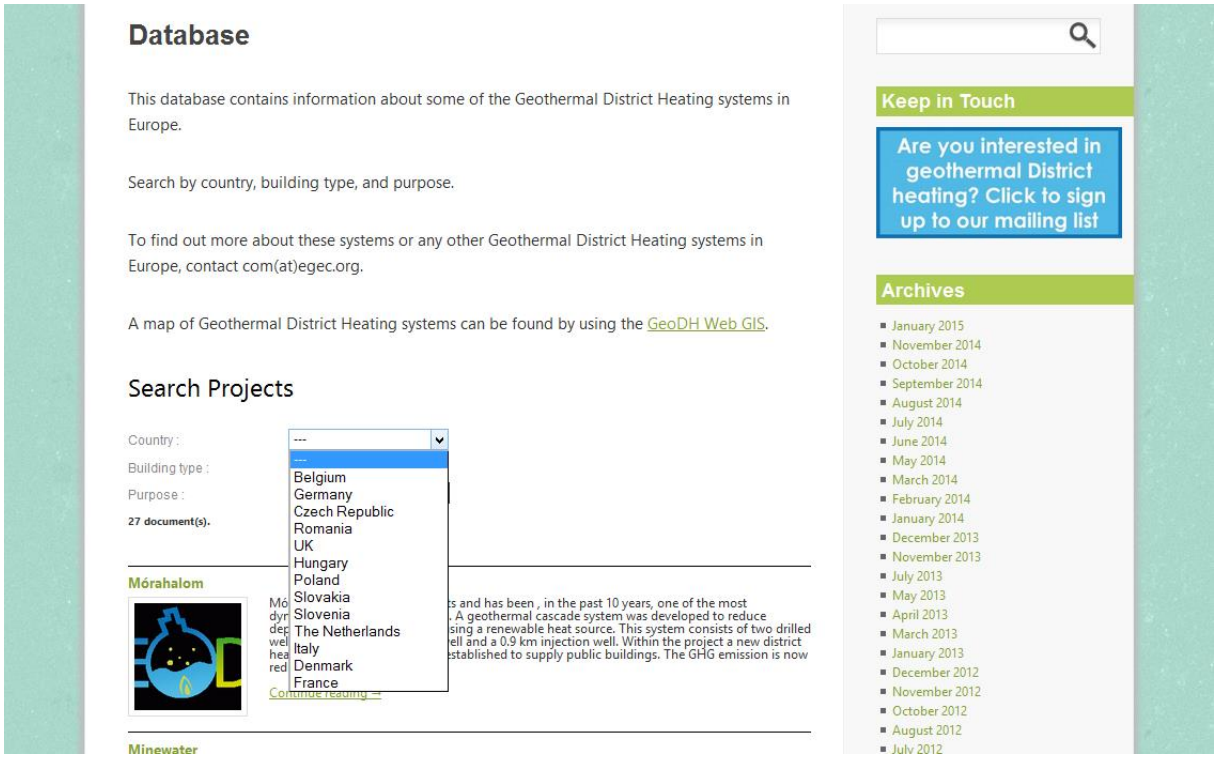
The database was officially published in October 2014. This database contains information about some of the Geothermal District Heating systems in Europe. The search can be done: by country, building type, and purpose.

A map of Geothermal District Heating systems can be found by using the GeoDH Web GIS.

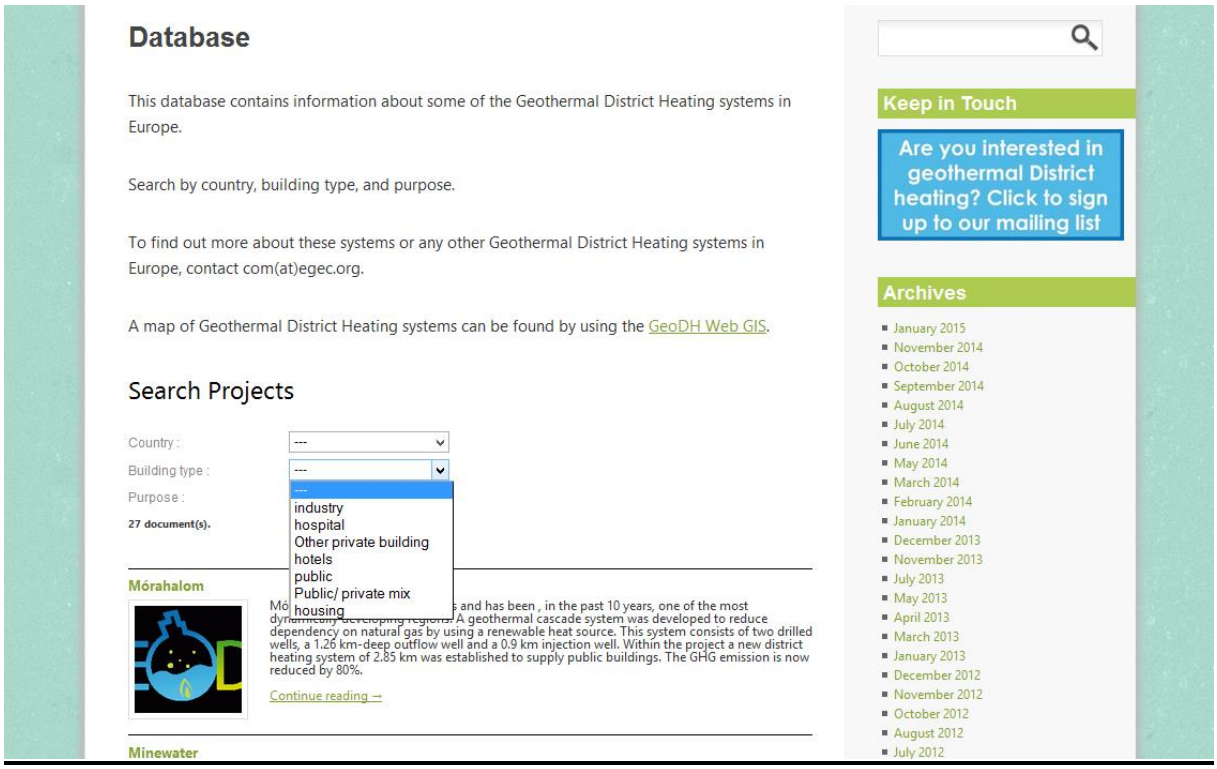
At the end of the project**,** 27 case studies were presented online.



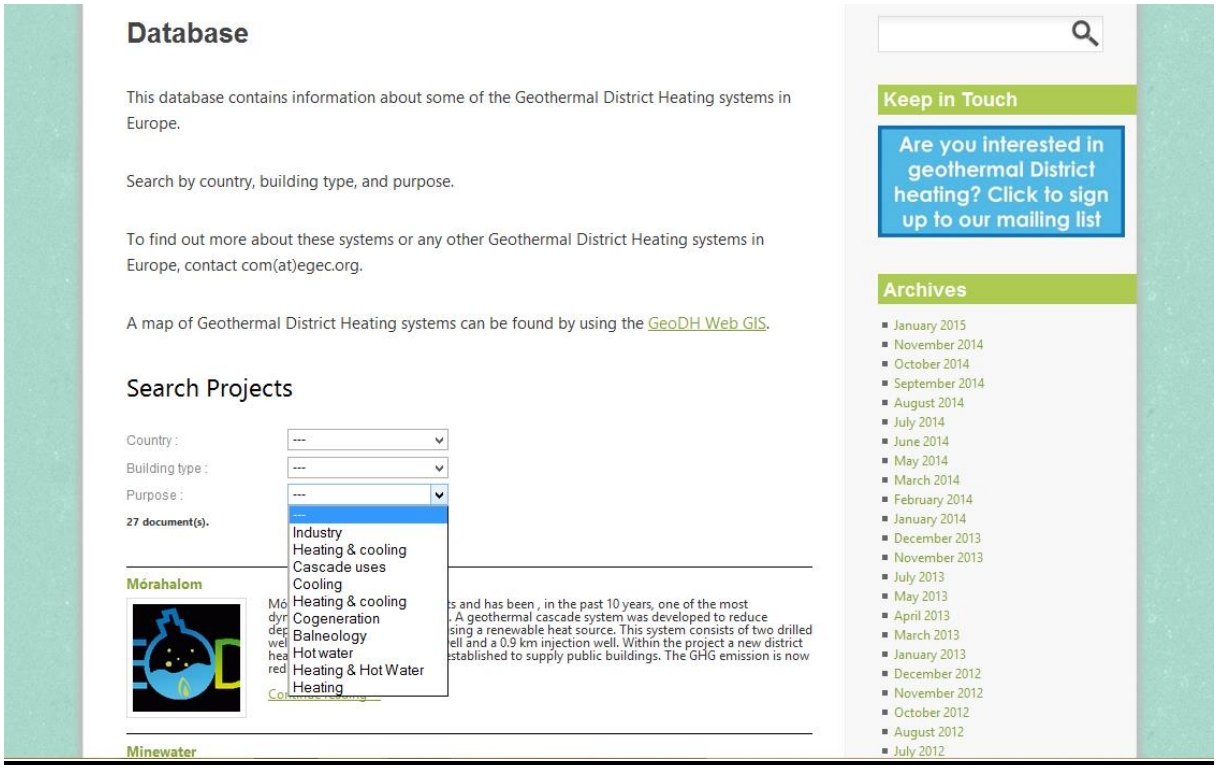
by country



building type



Purpose


Database
This database contains information about some of the Geothermal District Heating systems in Europe.
Search by country, building type, and purpose.
To find out more about these systems or any other Geothermal District Heating systems in Europe, contact com(at)egec.org.
A map of Geothermal District Heating systems can be found by using the GeoDH Web GIS.
Search Projects
Country :
Building type :
Purpose :
27 document(s).
Industry
Heating & cooling
Cascade uses
Cooling
Heating & cooling
Cogeneration
Balneology
Hot water
Heating & Hot Water
Heating
Mórahalom
Minewater
Keep in Touch
Are you interested in geothermal District heating? Click to sign up to our mailing list
Archives
January 2015
November 2014
October 2014
September 2014
August 2014
July 2014
June 2014
May 2014
March 2014
February 2014
January 2014
December 2013
November 2013
July 2013
May 2013
April 2013
March 2013
January 2013
December 2012
November 2012
October 2012
August 2012
July 2012

4- Lessons learnt

General overview

It was problematic to collect data as some of them on costs and technical details are sensitive and sometimes confidential. Project developers are not always willing to disclose private data.

Moreover, it was time consuming to collect all data needed for fulfilling all the cases of the database.

It was not an easy task to find case studies in all target countries.

Trends

.it is interesting to underline the trends in the geoDH sector to highlight that geothermal, can provide heating and cooling anywhere in Europe.

- Deep geothermal, with doublet system, are very competitive in medium and high enthalpy areas
- With the development of triplet system, when possible, lifetime is 50 years
- Large heat pumps allow to produce heat also in low enthalpy areas
- A technological trend is to use resources at shallow depth to decrease drilling costs
- Deviated wells and horizontal wells start to be developed also for geoDH
- Scaling and corrosion remain an important issue
- There is the need to develop more efficient production pumps
- geoDH systems can be sizable
- we can find more and more small deep geothermal DH systems
- and large shallow geothermal systems, assisted by heat pumps

Technological challenges

- Towards low temperature GeoDH systems with HP
- Large versus Small GeoDH installations
- Increase operational time: from doublet to triplet
- GeoDH from CHP: new opportunities with EGS
- EGS purely for industrial heating: case of ECOGI project
- Geothermal District Cooling
- GeoDH for smart cities= intelligent thermal grid
- To which source combine the GeoDH ? Biomass, solar etc

Technologies