Geothermal Communities

NEWSLETTER

CONTENT

INTRODUCTION 1

PROJECT DEMONSTRATION SITES 2

PROGRESS AT THE DEMO SITES 3

PROJECT NEWS 4

UPCOMING EVENTS 6

INTRODUCTION

This is the second, joint edition of our Geothermal Communities project newsletter which is designed to briefly introduce you to the project's main objectives and research components and at the same time to update you on the demonstration activities and research which have been carried out since the last issue in May 2011.

Geothermal Communities is a project of the CONCERTO initiative co-funded by the European Commission within the FP7.

The GEOCOM project *(full name: Geothermal Communities – demonstrating the cascading use of geothermal energy for district heating with small scale RES integration and retrofitting measures)*, joint action of 16 individual partners including municipalities, universities and other technological organisations as well as private companies, is a 5 year long CONCERTO Phase III action within the FP7, started in January 2010.

It is to demonstrate the best available technologies for the use of geothermal energy combined with innovative energy-efficiency measures and with the integration of other renewable energy sources in three different pilot sites (Hungary, Slovakia and Italy). The overall objective of the project is to promote the use of geothermal energy as a reliable renewable energy source through demonstration activities and innovative energy-efficiency measures carried out in three different towns involved in the project as Concerto Areas. In addition to the demonstration elements, there is also a strong complementary component of research focusing on making geothermal projects more cost efficient and technologically sound.

Furthermore, the project integrates a large number of cities as project partners (from Serbia, Romania, Poland and Macedonia) that either already have ongoing geothermal initiatives and are keen on adopting the latest technologies (e.g. Oras Sacueni, Romania) or they would like to realise brand new systems by taking advantage of the project's results and its competent consortium (e.g. Subotica, Serbia).

PROJECT DEMONSTRATION SITES

MÓRAHALOM

Mórahalom is a small town of 5500 inhabitants, located in South-East Hungary. It has been one of the most dynamically improving communities in Hungary. Despite the underlying geothermal potential there were no district heating in the town before based on that resource. The private homes were and most of them are still heated by mains gas, gas bottles, coal, wood, or oil stoves while most of the public institutions used to have their own heating stations.

Mórahalom

The core work of the Mórahalom Geothermal Cascade System was financed by the Hungarian Structural Funds while the priority of this CONCERTO project component was to further utilise the energy content of the low-enthalpy heating medium, which aspect has not been fully addressed during the previous development financed from ERDF resources.

The improvement of the cascade system includes a high-performance heat pump heating station to supply the brand new neighbourhood of the „New Town Center". As an innovative element of the project, the auxiliary power demand of the high performance heat-pump heating station is produced on-site by trapping the high methane content waste gas from the Cascade System's new abstraction well. In addition to the system development a set of energy efficiency measures combined with full retrofitting were planned (facade insulation, replacement of doors and windows, solar thermal based DHW etc) aiming to significantly reduce the operational costs of the local cultural center and school-kindergarten-sports hall complex which are described by very poor thermal parameters. The retrofitting actions are expected to reduce the buildings need of energy by 28-35%. Furthermore the modernisation of the complete public lighting of the town centre and the changeover to a solar powered LED lighting system is planned to be implemented.

GALANTA

Galanta of 16 500 citizens is a regional commercial and cultural centre, situated approximately 50 km from Bratislava. The main aim of the geothermal system development project element is to improve the environmental performance of the existing geothermal heating system which has been operating since the early 1980's as one of the first example of renewable energy utilisation in the ex-Iron Curtain countries. As part of the project activities, a geological survey, additional studies and the full documentation of a reinjection borehole will be developed. Furthermore Galantatherm's geothermal heating system is to be expanded to supply newly build public and private buildings in the neighbourhood. Energy efficiency activities include the retrofitting of three 8-storey blocks of flats (facade and roof insulation, replacement of door and windows at the common places) and an elementary school (by means of facade insulation and replacement of doors and windows), all of them heated by geothermal energy. Objectives to combine the geothermal energy with other renewables will be realised by the installation of a total 11,08 kW solar PV capacity at the multi-storey buildings and the school as well.

Galanta

MONTIERI

The medieval village of Montieri (1250 inhabitants) is part of the Lardarello Geothermal District with a significant proportion of housing to be renovated.

The Montieri Geothermal Community Project focuses on the town as a whole. The main activity is the realisation of a highly innovative geothermal district heating network and power generation system, using high enthalpy fluid. A preliminary investigation highlighted the feasibility of a geothermal district heating network, exclusively devoted to the city of Montieri, for a total of 425 residential units to be served by the system, with a total heated volume of 110 000 m^3. The GEOCOM project supports the cost of the buildings' connection to the district heating network and upgrading the existing heating system of residential houses. Additional funding is provided by the Tuscany Regional Development Fund to cover the bills for the realisation of the heating network itself. Montieri represents a challenging site for defining and testing a qualitative architectural integration of renewable energy technologies and retrofitting measures due to its architectural heritage. The retrofitting demonstration will conserve the town's high cultural and artistic value. Twenty percent of the total dwellings in Montieri will be retrofitted during the project! Additionally, the building refurbishment will be matched with eco-measures to improve on the new 2006 Italian code for heating demand by 50%. These buildings will make use of geothermal heating to obtain 100% free fossil fuel.

Montieri

Montieri will also act as a demonstration site for photovoltaic and solar thermal technology integration. The photovoltaic plant is expected to provide 8.5 kWp, and will be integrated with the buildings of the two heat-exchange stations of the geothermal district heating network. Furthermore, solar thermal collectors with an area of 42,5 m^2 will be installed in order to directly supply heat for DHW where the district heating net cannot reach.

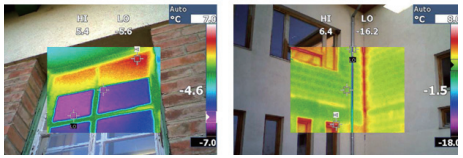
PROGRESS AT THE DEMO SITES

MÓRAHALOM

Gas composition evaluation of the local thermal water

In the summer of 2011 a detailed gas-composition study of the thermal water abstracted at the Hunyadi-liget B-45 well has been conducted. The total gas content came GVV=524 [l/m3] of which the total methane content was MVV=455 [l/m3]. Two CHP gas turbines were planned to utilize this methane extracted from the local thermal water, which is currently produced at the city's wells. Excess energy derived from the combustion of this methane is expected to power the heat pumps. One of these CHP engines at the Hunyadi-liget grove had been installed and function tested during the course of 2012. The other one at the Szent Erzsébet Thermal Spa is slightly lagging behind schedule due to a required modification of the initial technical plans. The updated plans are ready now and the installation of the engine is on its way. Once ready a series of function tests need to precede the actual operational stage. All testing and commissioning is expected to be finished during 2013. As mentioned before two public buildings were subjects of retrofitting. The Mora Cultural Centre, Elementary School and Dormitory used to spend 82% of its annual budget on heating (natural gas) due to extremely poor qualities of the external walls and windows. Similar figures applied to the Kindergarten and Day-care Centre Complex, too. For both buildings an intelligent system was to be installed in order to control ventilation and shading (during the summer).

CHP engine at Hunyadi-liget



Thermal images of the school before retrofitting

Step-by-step retrofitting of the Móra Elementary School

During 2012 all the planned construction works on the target buildings have been concluded and commissioned. Thermal insulation was applied on the buildings' facades and all the doors and windows had been replaced. In addition solar thermal collectors were installed on the rooftops of both buildings for domestic hot water generation purposes.

Solar thermal collectors installed on both of the target buildings

After the installation thorough function tests have been conducted for quality control. Now the local, building-scale DHW demand is covered by these solar thermal panels.

The energy audit of the public lighting system of Mora-halom covered the number and types of the street lights at the CONCERTO area, their installed capacity and the amount of energy they generally use in a calendar year. It also contains the operational costs of the system for 2010 and 2011. The document provides suggestions regarding the modernization of the system, too. The total amount of possible savings via the upgrade of the system (including the stand-alone PV modules on the top of designated bus-stops in the area) may reach up to 3 Million HUF (approx 10,000 EUR) per year. Total energy consumption of the public lighting system was calculated before (32.096 kWh/a) and after (18.637 kWh/a) the refurbishment. The total amount of energy saved is expected to be in the range of 13.400 kWh/a.

GALANTA

In 2012 two new multi-storey houses were connected to the city's existing geothermal heating network. In order to carry out the realization of this new junction a new pipe-line and measurement system was developed. A newly built elderly home was also connected to the geothermal system of which DHW distribution capacity had to be improved and extended for this reason. The installed capacity of this junction for heating and DHW production is 264 kW.

New residential building supplied by the extended geothermal loop

In 2012 Galantatherm successfully finished all of its geo-thermal system development related obligations within budget and ahead of schedule.

In 2012 the municipality successfully finished the deploy-ment of photovoltaic panels at the previously selected demonstration sites. A 2,16 kWp photovoltaic system was installed on the top of each retrofitted multi-storey house and a single 4,86 kWp photovoltaic unit was commissioned on the rooftop of the retrofitted elementary school. The overall installed capacity of the photovoltaic panels are 11,08 kWp.

Connected building through GEOCOM	Installed capacity in kW	
	For DHW	For heating
Multi-storey house – 1.	124	176
Multi-storey house – 2.	124	176
Multi-storey house – 3.	118	157
Microbiological accessories producing company	35	65
Elderly house	64	200
OVERALL	**465**	**774**
OVERALL INSTALLED CAPACITY		**1 239**

MONTIERI

The town of Montieri represents a challenging site for the integration of energy saving measures because of the architectural relevance of the medieval buildings in the historical town centre. Documents of official local urban regulation and historical maps were analyzed to assess the historical value of the edifices and to establish the level of architectural integration of new technologies allowed for different building types.

By the analysis of building elements of local architecture a showcase of technologies for energy retrofitting was de-

Laying pipes for the disctrict heating system

fined in which the proposed technologies respect the historical value of the buildings and mainly natural insulating materials were chosen.

The project at the Montieri demo site covers a range of retrofit interventions which can be funded at neither national nor local level. Moreover locally the choice of building retrofitting is mainly motivated by the need of replacing deteriorated building elements (such as windows, roofs, facades) rather than by the will to improve energy efficiency of the building envelopes and to reduce heating costs, due to the high availability of low cost of energy in the area. Thus promoting feasible technological solutions on one hand is useful to improve the adhesion to the project, while on the other hand this approach limits the possibility of damaging the cultural character of the local architecture by keeping the architectural quality of retrofit interventions under control, too.

To conclude, the overall energy efficiency of the retrofitting measures along with the linked CO2 savings in the case of the selected buildings an estimated calculation have been performed based on the proposed retrofitting strategy 2012 concluded the tendering procedure for the award of the contract work of the district heating network, which began in November 2011 the construction of the in-

Historic value matrix for the buildings in Montieri

ternal distribution network of the historic center in Vicolo del Romito and Vicolo di Castello has begun. This phase is very complex because of the small size of the alleys of the old town within which the pipes should be laid together along with the new underground utilities. In addition, as the works proceeded it became evident that it is necessary to replace the existing underground utilities which are very old and no longer functional. In early 2013 the construction was extended to Via di Castello, the last part of Via Verdi and on the SP5 "Delle Galleraie" aiming to connect the heat exchange station B to the town centre. In the meantime the two heat exchange stations "A" and "B" are under continuous improvement and construction.

Conceptual design for the heat-exchanger stations

PROJECT NEWS

THE GA AMENDMENT PROCEDURE - UNIT-SCALE FLAT-RATES

In February 2011 the Project Officer informed us that legal unit of DG ENER wishes to amend GEOCOM's GA, since - due to technical and legal issues - the unit-scale flat-rates table of ANNEX D was left out from the GA. The coordinator had a phone-meeting with the PO where we agreed to start this amendment procedure once the first period report is accepted and the payment arrived. Another meeting was held in Brussels, at the PO's office in November 2011, where Mr. Kitley of Geonardo and the officers (Mr. de Royer-Dupré and Mr. Vitucci) agreed to start the amendment process, in which we shall include the unit-scale flat-rates into the GA, as ANNEX D. The NEF was opened mid-December. Due to some technical problems, the updated DoW and GPFs were submitted only end of January 2012. The official request to approve the amendments was sent to the Head of Unit and after some month of a really time consuming procedure the GA was amended in September 2012.

RELATED EVENTS

Geothermal Communities was presented at the **European Commission's Innovation Convention 2011** event in Brussels between 5-6 December 2011.

http://ec.europa.eu/research/innovation-union/ic2011/index_en.cfm

Our project had been selected from among 450 applications and was one of the 50 projects on display in the exhibition. It also featured as the sole representative of the CONCERTO initiative. The GeoCom stand was located at the Reliable, clean, efficient energy theme of the Research and Innovation Projects section.

GEOCOM stand at the IC 2011 in Brussels

GeoPower Europe

GEOCOM was also presented in Milan at the **GeoPower 2011 conference** on the 6-7th December 2011. Mr. Kitley represented the Coordinator at this event where leading companies of the geothermal industry were informed about the project results, and many municipal representatives all over Europe were met. Copies of the updated brochure were distributed among the interested parties.

GeoTHERM expo & congress

The GeoCom project was represented at the **7th GeoTHERM Expo & Congress** which took place in Offenburg, Germany between 28 February - 1 March 2012. Hundreds of stakeholders were reached at the event, where a great variety of technical issues were discussed and papers on different relevant subjects were presented.

Over the past six years, GeoTHERM has become Europe's leading event for geothermal energy, combining trade fair and congress. This is where the dynamics and quality standards of shallow and deep geothermal energy can enjoy a perfect setting.

The third interim meeting was held in Budapest, Hungary with great success. Half-way through the 5 years of the project's duration provided an excellent opportunity for gathering and discussing all of the project's achievements so far and the tasks which still lie ahead.

Day zero was for internal discussions among the WP leaders, in a brief afternoon session. During the first day of the two-days meeting, short presentations by the project partners updated all members of the consortium on the actual status of the running work packages, and other general project management related topics had also been discussed.

On the second day, participants visited the Galanta demo site to have first-hand experience on the investment components which have already been implemented, and to understand the impact of these actions on the local community.

The consortium was happy to welcome our special guests, Ms. Silke Rubel and Mr. Milan Marinov from the CONCERTO initiative and our two guest lecturers Ms. Ildiko Bodnar from the University of Debrecen, Hungary and Mrs. Teodora Szocs from the Geological and Geophyisical Institute of Hungary birefing us on other relevant geothermal related projects (GEOREN and TRANSENERGY respectively) at the meeting.

GeoCom project featured in the poster session of the WIRE 2012 on 4-5 June 2012. The event was organised in close cooperation with the European Commission and took place in Krakow, Poland

The **Week of Innovative Regions (WIRE) 2012 Conference** had been a flagship discussion forum dedicated to regional development based on knowledge and innovation addressing main current issues related to the effective implementation of EU headline targets at the regional level.

WIRE2012 focused on smart regional development based on knowledge and innovation; it addressed main current issues related to the effective implementation of the Innovation Union at regional level for the next period of 2014-2020.

As a 3rd generation CONCERTO project, GEOCOM was invited to attend the **annual coordinators meeting** organised by the CONCERTO Premium team and which is to bring together the CONCERTO project consortia. The different stakeholders used this event to exchange their experiences made during the lifetime of their projects and the CONCERTO Premium Team got the opportunity to present the status of work as well as the first assessment results. The discussion on the methodology and visualisation of assessment results was one focus of this event. For more on the CONCERTO Premium Team's work please visit their website as www.concerto.eu

Within the limit os this meeting many of the coordinators were interviewed for their experience. On behalf of the GEOCOM project, István Pári briefed the press on the latest achievements of the initiative. For more on this please read at

http://concerto.eu/concerto/blog/355-exchanging-experiences-in-brussels.html

UPCOMING EVENTS

4TH EUROPEAN CONFERENCE ON RENEWABLE HEATING AND COOLING

22-23 Apr 2013 Dublin, Ireland

The European Technology Platform on Renewable Heating & Cooling (RHC-Platform) brings together stakeholders from the biomass, geothermal and solar thermal sector - including the related industries - to define a common strategy for increasing the use of renewable energy technologies for heating and cooling.

One of the four panels of the platform, the Geothermal Technology Panel aims at formulating a vision 2030 for the geothermal heating and cooling sector, presenting the contribution of the geothermal sector towards a 100 % Renewable heating and cooling scenario in Europe.

The Geothermal Panel intends also to elaborate a detailed research strategy to reach ambitious objectives notably for costs reduction.

GEOCOM is going to be presented to the conference participants via a roll-up banner available to visit during the full lenght of the event. In the meantime the latest project brossure will be made accessible for those who are interested.

INTERNATIONAL ASSOCIATION OF HYDROGEOLOGISTS CENTRAL EUROPEAN GROUNDWATER CONFERENCE 2013

8-10 May 2013 Mórahalom, Hungary

The aim of the Central European Groundwater Conference series is to provide a forum for teachers, researchers, experts, students, decision makers and other stakeholders to be involved in groundwater related issues in Central Europe and in other parts of the world.

Furthermore national chapters will have an opportunity to present their activities, this way enhancing the ability for scientific co-operation between Central European countries. The hosting community of Mórahalom happens to coincide with being one of the demonstration sites within the GEOCOM project. rdinator was invited by the organisers to present the project objectives and its achievements so far to the international scientific community on the second day of the conference.

EUROPEAN GEOTHERMAL CONGRESS 2013

3-7 June 2013 Pisa, Italy

EGC 2013 is a joint activity, organised by the European Geothermal Energy Council (EGEC) under the auspices of the European Regional Branch of the International Geothermal Association IGA (IGA-ERB), and in cooperation with the national Italian Geothermal Association (UGI). Main sponsor of EGC 2013 is the Italian renewable power producer ENEL Green Power (EGP).

An exhibition for geothermal equipment, services, etc. will be held parallel with the congress.

Currently there are negotiatons with the organisers in order to include a brief side trip to Montieri, Italian demonstration site of the GEOCOM project combined with the field trip to Larderello on Day 5 of the Congress. This extended sitevisit would provide the 200 participants a good insight into the ongoing construction works of the Montieri Geothermal District Heating System.

4TH INTERIM MEETING IN MONTIERI

to be announced

The next annual meeting is scheduled to take place in Montieri sometime during the summer of 2013 on the occassion of the delivery of the new geothermal district heating system. Apart from the regular meeting schedule the consortium members will be briefed on the many aspects (engineering, architectural, social etc) of the construction phase.