



Newsletter

*ENhanced Geothermal
Innovative Network for Europe
co-ordination action*



N°8 – August 2007

<http://engine.brgm.fr>

Editorial – Reykjavik workshop	1
New R&D challenges and international prospective	3
Next ENGINE meetings	4
Athens workshop announcement	5

Editorial – Reykjavik workshop



Participants at Thingvellir National Park (Field trip).

Workshop 4 of the ENGINE project “Drilling cost effectiveness and feasibility of high-temperature drilling” was organised by Iceland GeoSurvey (ISOR) in Reykjavik. The Workshop took place from 2nd to 5th July 2007 with 67 participants from 13 European countries and additional participants and contributions from El Salvador, Philippines, and Canada. The scope of the workshop was to bring together experts from the ENGINE-consortium and others to discuss state of the art of effectiveness of drilling into geothermal reservoirs and to work out needs and gaps for forthcoming developments for improving drilling cost effectiveness.

Four thematic sessions were defined (Case histories of EGS and high-temperature drilling; Innovative technology and drilling effectiveness; Well design and cementing; Reservoir assessment, stimulation, testing and logging).

Each session had invited speakers with time for discussion. The abstracts, PowerPoint presentations, posters and the main conclusions of the workshop are already available on [the workshop Web page](#). The final contributions will be published in September 2007 on a CD-ROM.



Workshop meeting.

The 30 contributions covered experiences in geothermal drilling into high-temperature

reservoirs in deep horizons built up by granitic or sedimentary rocks and in shallower depths in volcanic rocks. Further papers were presented related to stimulation techniques and reservoir assessment. Another topic of the discussion was the importance of getting access to existing knowledge by means of collaboration with further active partners in other countries with considerable geothermal activities and the International Energy Agency – Geothermal Implementation Agreement (IEA-GIA).

The workshop aimed at outlining a base and a framework to describe the economics of geothermal drilling. However, due to the extremely rapidly changing costs for drilling, energy supply for the operations, and the enormous rising material costs (e.g. for casings) within the last few years, we were not able to compare prices for drilling activities in the different countries. Instead it was decided to compare the performances of drilling operations and services by, for example, looking for drilling depth vs. time curves, with respect to diameter, geology and depth, which requires a related rig size. It is important to note the different levels of experiences with geothermal drilling that exist, with numerous wells in the high enthalpy countries like Iceland and the Philippines in comparison to Middle Europe with a few case studies only. The latter must be taken care of by capitalizing on the experiences in hydrocarbon exploitation without neglecting the special requirements of the geothermal utilisation. The Research and Development (R&D)-demand is widely spread and the discussion was on what may be the “low hanging fruits”. Most important seems to be to focus on the reliability of drilling operations. In that context, all requirements have to be fulfilled in order to keep the borehole stable and to prevent the loss of the well. Drilling instruments and tools must also be improved, such as bit performance in various geological environments.

The discussion at the workshop was targeted to provide best practices for different geological settings, which means reaching the target depth with a sufficient casing diameter at the lowest cost, highest degree of safety, and minimal damage to the formation.

**Hjá ENGINE ríkir ógnarstand
þeir ódýrt vilja bora,
En það er nokkuð langt í land
Að lukkist þar að skora.**
By Friðrik Steingrímsson



At drillsite on Hellisheidi.

Most of the workshop participants joined the field trip on the 4th of July to the Hellisheidi power plant (90 MWe) and the Golden Circle tour. About half of the participants took part in the optional day trip to the north of the country “Geothermal Jewels of the North” with visit to a Kalina plant and the Krafla power plant on 5th of July. Many geothermal power plants have recently been commissioned in Iceland and several are under construction. The geothermal scene is currently very active in Iceland and the field trip allowed the participants to witness some of this activity. While bathing in the Mývatn lagoon the lifeguard on duty, Friðrik Steingrímsson a resident of Mývatn, heard about the efforts ENGINE is making in reducing geothermal drilling costs and presented the group once out of the water with a poem. He seems to think that we are “up to our necks in hot water”, even out of the pool!



Geothermal bakery at Mývatn. “Hverabraud” dark rye bread baked in the ground.

**ENGINE is in a dreadful state
They want to drill at small cost.
A long time will pass until fate
Will not see that as a cause lost.**
English translation by Halldór Ármannsson

New R&D challenges and international prospective

From an ENhanced Geothermal Innovative Network for Europe to a European geothermal drilling program?

The possible contribution of the ENGINE coordination action to the definition of new R&D challenges and of an international prospective will become a major objective of all partners within the next months. Since the project started, there has been a renewed interest for geothermal resources of deep origin that ENGINE has accompanied during its conferences and workshops. There is a growing interest of industry and investors worldwide for EGS, marked by a "heat rush" in Australia and Germany. Private companies and research institutes have invested in new rigs for deep drilling, new data acquisition including 3D seismic and deep drilling are planned in the Rhine Graben and in the Alpine foreland Molasse while a pilot plant is expected in 2008 in Australia. This rush is linked, among other causes, to the expected development of renewable energies as an alternative to fossil and nuclear energies and to the dynamism of private investors. Elsewhere, after several years of drastically reduced budget, the US Department of Energy has been funded again in 2007 and has decided to support grants for electric power generation using geothermal energy co-produced with oil and/or gas wells. Several private initiatives are in progress following the report of the MIT panel of experts and signs of interest of the US industry are more and more visible. It is worth to underline that most of these projects refer to the Soultz-sous-Forêts experiment and to stimulation technologies of natural reservoirs. In this sense, ENGINE falls at the right moment, being designed to coordinate initiatives related to the development of non-conventional geothermal resources. High-temperature geothermal resources exploration is also very active in Tuscany in Italy, where 3D seismic has been recently performed by ENEL and has provided a 100% success for exploration wells, while, in Iceland, the aluminium industry has new power requirement that justifies a full-time use of deep drilling facilities. This panorama must be also completed by the reappraisal of activities for developing district heating from medium-enthalpy resources of the Paris basin.

This renewed interest for geothermal resources of deep origin creates a favourable context for preparing new ambitious R&D projects for which ENGINE can play a significant role.

- ENGINE, along with other coordinating initiatives from IEA-GIA, MIT expert panels, IGA or EGEC... contributes to the construction of an international R&D strategy by consolidating the

available information systems and defining best practices from available experiences.

- There is a need for a R&D task force for defining innovative research projects resulting from the identification of bottlenecks and of a prioritisation of research needs. ENGINE was defined on these bases and will be evaluated on its ability to face this scientific challenge. Many of its core partners with few others active in other R&D projects are natural candidates for building this task force.

- There is a need for a political exchange platform, i.e. an appropriate consortium joining R&D institutes and private investors. This consortium, that could be a European Economic Interest Group, should be in charge of promoting past and on-going experiences by making them visible and reproducible. It should also act in order to help to the design of shared risk exploration projects, enhance market access for geothermal innovative technologies and foster incentive policies to favour energy production from geothermal sources. The ENGINE stakeholder committee represents a first attempt to build such a political platform and could help for the creation of a legal entity in charge of these tasks.

From these statements, which new R&D challenges and international prospective can we formulate? The R&D task force must propose, within the next months, spin-off projects that should receive the support of stakeholders, decision makers and private investors and conduct to the design of a European geothermal drilling program in order to evaluate how EGS can provide continuous base load-power for Europe. Such program, that could consist of several tenths of deep geothermal wells, and involve extensive geophysical surveys, could then be realised during the next 15 years and provide a complete reassessment of the geological and geophysical infrastructure of Europe that will be profitable to all matters concerning the management of the underground (CO₂ storage, long term monitoring of georesources, decision-support for conflict of interest...). Such ambitious program requires a clear understanding of the expected benefit of both the scientific community and stakeholders as well of a political support of decision makers on such long term issue. This is an objective for guiding the preparation of the deliverables of the ENGINE Project and for the next meeting of the Stakeholder Committee planned on the 20 September 2007, in Brussels.

Next ENGINE meetings

[Athens, workshop 6, 13-14/09/2007](#)

Deadline for registration: 30/08/2007

The ENGINE workshop 6 “Increasing policy makers’ awareness and public acceptance” will be held at Hotel Holiday Inn, 50 Michalacopoulou street, 11528, Athens, Greece, September 13 – 14.



Athens

The aim of the workshop is to bring together experts to exchange ideas on policy makers’ awareness and public acceptance on geothermal projects that face strong opposition nowadays from politicians, neighboring communities or environmental pressure groups. The focus will be on:

- a. Case studies on policy makers’ awareness and public acceptance (the cases of Milos and Nisyros, of the Indian community in Nevada, of geothermal projects in Iceland, of the power generation plant of Unterhaching -Germany, of geothermal

[Leiden, workshop 7, 8-9/11/2007](#)

The Engine-Workshop 7 on Risk Analysis for Development of Geothermal Energy will take place 8th and 9th of November in the historical city of Leiden- The Netherlands. The anticipated themes include

- 1) Assessment of critical underground uncertainty in terms of exploration risk and reservoir properties, in conjunction with
- 2) Underground and surface development options for enhancing performance and
- 3) Surface energy demand and
- 4) Socio-economic issues/public acceptance

The workshop will focus in particular on lessons learned and best practice guidelines for Decision and Risk management for scenario and parameter uncertainty in asset

projects in Philippines, in El Salvador and in Paris Basin).

- b. Measures towards the increase of knowledge and flow of information in order to increase the public perception and acceptance.



Geyser, the energy of earth erupts

- Registration for the workshop is mandatory, deadline August 30, 2007. The [online registration form](#) is provided on the [workshop website](#).

- Deadline for abstract submission: August 30, 2007. Please use the [online abstract submission form](#).

- Further information: <http://engine.brgm.fr> following the link Conferences & workshops.

- The announcement of the Athens workshop is on the next pages.

development. The themes will largely build on results from WP 6, 7 and 8.

The first day is dedicated to presentations followed by brainstorm sessions. The second day is targeted at delivering a framework for the foreseen European Reference Manual.

We invite you to submit an abstract on Decision and Risk management for scenario and parameter uncertainty in geothermal asset development. The deadline of abstract submission is on 30 September 2007 and the deadline of registration is on 15 October 2007.

More information will be available on the [workshop 7 Web pages](#).



Engine Workshop 6

Increasing policy makers' awareness and public acceptance



Meeting Announcement and Call for Papers

September 13-14, 2007

**Hotel Holiday Inn,
Athens, Greece**



Geothermal Energy, policy makers' awareness and public

It is widely known that the geothermal energy is a versatile renewable energy source that is among the cleanest of the commercially viable technologies available today. Towards this direction, there has been a lot of literature attestation. However there has not been the predictable development in this field. An important reason is that many geothermal projects face strong opposition from politicians, neighbouring communities or environmental pressure groups. This is why there is a global tendency for geothermal companies to develop their policy and their social responsibility.

Geothermal companies should be aware that paying careful attention to public acceptance issues and encouraging public support is in the best interest of the geothermal industry. In facing the coming decade, geothermal proponents should consider why public support has been lukewarm and how it can be strengthened.

Some of the benefits of geothermal energy that can be used as arguments in order to contribute to the increase of public acceptance is that geothermal does not involve large-scale land disruption to extract the resource as does coal, it does not produce massive air pollution, it does not have to be imported, it does not pose risk of major catastrophe as in the nuclear power industry and environmental impacts can be mitigated.

Public response to previous large-scale geothermal and other energy developments can provide useful insights. These earlier experiences may be applicable to public acceptance of future geothermal projects.

The aim of the workshop *"Increasing policy makers' awareness and public acceptance"* is to make policy makers' aware of the need of a strategy and examine the policy that should be followed in order to eliminate any social opposition.



Join us for discussions in the historical city of Athens



The Workshop Location - Hotel Holiday Inn

Holiday Inn Athens hotel is situated in the heart of Athens, very close to the historical sites of Athens, only 10min. from Acropolis, the traditional Plaka area (old town) and Syntagma (Constitution) square. The hotel is only 5min. walking distance from metro station and 30min. by car from El. Venizelos International airport. In the summertime at the roof garden pool, you may enjoy the panoramic view of Lycabettus hill and the Acropolis.



50 Michalacopoulou st, 11528, Athens,

Tel: 00800 3122 1211

<http://www.ichotelsgroup.com/h/d/hi/925/en/hd/athgr>

Meeting Topics, Abstract submission & Registration Information

We invite you to present your latest work on the state of the art concerning policy makers' awareness and public acceptance of geothermal projects at the ENGINE workshop 6 that will be held in Athens, Greece on September 13 and 14, 2007.

The aim of the workshop is to bring together experts to exchange ideas on policy makers' awareness and public acceptance on geothermal projects that face strong opposition nowadays from politicians, neighbouring communities or environmental pressure groups.

Deadlines

Submission of abstracts: August 30, 2007

Registration: August 30, 2007

>Please find more information about online abstract submission and registration forms at <http://engine.brgm.fr> following the link *conferences&workshops*.

Meeting Topics

- a. Case studies on policy makers' awareness and public acceptance.
- b. Measures towards the increase of knowledge and flow of information in order to increase the public perception and acceptance.
- c. Environmental impact assessment and public acceptance.
- d. Miscommunication between companies and public.
- e. Non-technical barriers and possible ways to overcome them (difficulties with funding, financing and insuring of geothermal projects and solutions to overcome them, improvement of the funding conditions for specific geothermal projects with challenging or unproven technologies, governmental policy in several countries and measures taken towards the development of geothermal projects, difficulties with regulation and legal framework governing the use of geothermal energy in several countries).

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