Intelligent Energy Europe

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GEOTHERMAL FINANCE AND AWARENESS IN EUROPEAN REGIONS

A Quarterly Edition of GEOFAR Project

Drilling Rig for a new geothermal doublet in Sucy-en-Brie (Paris' area)

Project gets off to a good start!

With the kick-off meeting attended by all those participating in the project held in Erlangen on 17 and 18 September 2008, the foundation was laid for the European working group in the GEOFAR project. The experts from France, Greece, Portugal, Spain and Germany will be developing programs to simplify investments in geothermal projects during the coming two years. An enormous amount of geothermal potential is lying around waiting to be used. Within the framework of GEOFAR, opportunities for investment are to be presented in line with the characteristics of the different countries and new innovative financing methods are to be sought.

Erlangen AG as the lead partner in the GEOFAR Project is looking forward to exciting collaboration within the project team and with regional operators. In order to guarantee maximum benefit from this project we will be inviting all the companies, investors and body politics who may be interested to an intensive exchange of experience.

For the benefit of the environment we hope that the project will be successful and we wish our associated regions and companies every success in realising future geothermal projects.

Mr. Matthias Hiegl
CEO of Erlangen AG (Leader Partner of GEOFAR)

EDITORIAL

GEOFAR Project
- A New Beginning in Geothermal Energy Sector

The break-out of the global financial crisis and the steep reduction in the international price of oil during the last few months, cast an urgent light on the viability of several alternative energy investment projects. It is well known that a lot of businesses during a financial crisis or an economic recession experience a severe curtailment of their development and investment activities.

They are increasingly prioritizing on cutting expenditures, minimizing operational and personnel costs and effectively leading to significant postponements on project implementation timetable.

Sectors such as Renewable Energy Sources (RES) which are actually high risk businesses are affected the most by this kind of situation. Many energy sector analysts maintain that renewable energy projects will receive a strong blow and will be excluded from the strategy of many energy companies due to the lack of appropriate funding from private and/or state sources.

Geothermal energy investments are not the exception to the above rule. Like all the other forms of renewable energy such as wind and solar, geothermal energy will be find itself in the eye of the storm that has been precipitated by the drastic reduction of international oil prices. But compared to wind and solar energy, the geothermal

investments will experience high level of shrinkage and big delays in the implementation of several pilot and full-scale projects mainly in Europe.

This is not because of the lack of technical means that are needed to exploit the huge geothermal potential existing in several European countries. In fact, the technology and the innovations concerning the geothermal energy sector have advanced by leaps and bounds, while many oil and gas companies are using almost the same technology (drilling rigs) to extract hot water from the ground just as for oil and gas.

There are four major reasons that prevent the development of geothermal energy investments in Europe:

a) the lack of an institutional framework exclusively focused on the geothermal energy sector.

b) the absence of government subsidies to support such kind of investments.

c) the disinclination and hesitation of the banks to fund geothermal projects and the lack of appropriate funding system to support these projects.

d) the ignorance of the local authorities and investors about the benefits of geothermal energy exploitation.

The GEOFAR project was launched during this crucial period in order to encourage geothermal investments. The goal is certainly ambitious and very optimistic; however, this target is neither easy nor simple to achieve mainly due to the aforementioned non-technical obstacles. The GEOFAR project aspires to provide reliable, efficient solutions in order to overcome any impediments, while defining a comprehensive guide for the investors who wish to take action in this very promising sector. GEOFAR intents to achieve its goals by:

a) providing the outlines for the definition of national legal frameworks as well as a new or modified EC directives where geothermal energy is considered, as an appropriate means to secure sustainable, competitive and reliable energy sources for Europe.

b) reducing financial barriers hindering the initial stages of geothermal energy projects through the development and proposal of appropriate financing schemes. Investments in geothermal energy will be boosted.

c) communicating as widely as possible the results and findings of our study in order to ensure that the maximum number of lawmakers, financiers, media, R&D institutes, receive valuable information for evaluating the benefits of geothermal energy for the local/ regional economy and to subsidize this kind of investments.

d) raising the awareness of emerging (industrial) geothermal applications. The awareness raising activities are mainly directed towards local and regional decision makers and potential stakeholders.

By providing these financing and funding schemes and raising awareness among the target group, GEOFAR will support the fostering of the deep geothermal energy sector across Europe.

Institute of Energy
for Southeast Europe (IENE)
Newsletter Editor

GEOFAR Gets Started

The EU-funded project GEOFAR – Geothermal Finance and Awareness in European Regions, which deals with the application and promotion of geothermal energy in Europe, was officially launched on September 1st. The project team met on September 17th and 18th in the German town of Erlangen for their Kick-off Meeting in order to discuss the different project steps in the first part of the project. The contentual work now starts.

GEOFAR is being carried out within the framework of EU's "Intelligent Energy Europe" (IEE) program, which is part of the Competitiveness and Innovation Framework Program. The project GEOFAR aims to unveil the non technical difficulties and barriers which hinder the initial stages of geothermal energy projects and

are responsible for the lack of this kind of investments in Europe. One of the main goals of GEOFAR is to propose workable solutions and to raise awareness on geothermal energy among decision makers, especially at regional level, in order to help boost new investments.

GEOFAR comprises a consortium of 8 European institutes and companies from 5 different European Union countries. The 8 partners include: **Institute of Geology and Mineral Exploration** (IGME-Greece), **Instituto Geologico y Minero de Espana** (IGME-Spain), **Institute of Energy for South East Europe** (IENE-Greece), **Sociedade Geotermica dos Acores** (SOGEO-Portugal), **Rödl & Partner** (Germany), **Energo Group** (Greece), **BRGM** (France) and **Erlangen AG** (Project Coordinator, Germany).

The GEOFAR project will be divided in two parts. The first part will include the analysis, the findings and descriptions of the technologies and financing methods, while the second one will deal with information dissemination. In the first part the expected results will consist of several reports on geothermal activities in selected countries, case studies, proposals for financial instruments, fact sheets about innovative geothermal technologies and the main outcome, financial schemes validated by experts. The second part, which is related to dissemination activity, will include an internet site (which is currently under construction and will be ready by the end of February 2009), a video documentary film, press announcements, the publication of a quarterly newsletter and the regular updating of the GEOFAR website. Furthermore, a series of awareness seminars will be organized in Lisbon, Madrid, Sofia, Budapest and Bratislava. A major conference will be held in Athens where the project participants will announce the final results and conclusions of GEOFAR and other relevant work by geothermal experts and companies will be presented. With this broad dissemination GEOFAR aims at updating on a regular basis the various target groups in the different European countries.

EU's Idle Geothermal Potential*

Geothermal Energy in Germany

In Germany the use of deep geothermal energy is a rather new segment compared to other countries. But the potential is recognized and the bailing of the deep geothermal energy has already started on a large scale.

Out of the currently known resources of hydrothermal energy up to 29 % of the needed heat of Germany could be provided. Up to now already more than 30 installations for district heating with a power of at least 2 MW already exist, especially in the Northern German Basin, the Southern German Molassis Basin and the Upper Rhine Valley. These together perform for already more then 105 MWth. And their number is continuously rising.

In case of electricity generation from geothermal sources Germany is currently at the early beginning. Yet in 2004 less than 0.4 percent of Germany's total primary energy supply came from geothermal sources. This changed after the renewable energy law was launched that introduced a tariff scheme, that now provides 0.20 € per kilowatthour (kWh) for electricity produced from geothermal sources. So a construction boom was sparked and the new power plants are now starting to come online. In 2008 the geothermal power plant in Unterhaching got online with a potential of 3,36 MWe. (which is combined with district heat supply and delivers heat to more than 2500 households). In the next years the share of energy production from geothermal resources is so expected to raise significantly. More plants - some as big as 8-10 MW - are due to go into operation in 2009-2010 i.e. in Sauerlach, Dürrnhaar, Riedstadt, Speyer, Gross Schoenebeck, Kirchstockach and Mauerstetten.

All in all about 150 geothermal power plant projects are in the pipeline representing an investment of 4 billion Euros, according to the German government. The geothermal energy branch calculates with an annual growth rate of at least 14 %. To further increase the use of deep geothermal energy, the geothermal energy sector in Germany is strongly supported by public funding mechanisms.

Geothermal Energy in France

France developed rapidly the geothermal energy sector due to a number of favourable factors main-

ly including attractive economic conditions, appropriate government policies and organizational structure. Geothermal energy is used in France for heating and cooling. All the projects in France are pilot projects. The contribution of geothermal energy to energy production is far greater than solar and wind generated energy and production is now at 200,000 tons of oil equivalent per year. Geothermal energy accounts for 10% of the energy supplied through urban heat generation networks and 0.4% of the global energy consumption. Geothermal activity in France increased dramatically between 1980 and 1985, after the first project that was built in 1969. Especially, during the decade following the two oil price hikes in the 1970s, some 70 geothermal heating facilities were constructed in France, providing both heat and hot water for some 200,000 housing units. Today, Iceland and France dominate the use of geothermal energy in Europe.

Geothermal Energy in Spain

Geothermal resource exploration, assessment and evaluation started through Spain in the seventies with a general geological and geochemical survey of known thermal springs and areas showing signs of thermal activity.. Over the following decades, each of the selected areas has been investigated utilizing techniques from geology, geophysics, geochemistry and related disciplines, the intensity of the investigation depending on each area's geothermal potential. Lastly, deep drilling has been done, enabling the geothermal potential of the more important areas to be evaluated. These major areas are located in the southeast (Granada, Almería and Murcia), northeast (Barcelona, Gerona and Tarragona), northwest (Orense, Pontevedra and Lugo) and center (Madrid) of the Iberian Peninsula. Other, more minor areas located in Albacete, Lérida, León, Burgos and Mallorca have also been investigated.

The geothermal resources evaluated in all these cases exhibit low temperatures, 50-90 ºC. The only area where high-temperature fluids might possibly exist at depth lies in the volcanic archipelago of the Canary Islands. Hot dry rock resources have been evaluated on the islands of Lanzarote and La Palma. On the island of Tenerife, the presence of high-temperature areas has been investigated, but no commercially viable geothermal reservoirs have been found.
Low-temperature geothermal sites are currently being exploited on a small scale. For example, geothermal fluids are being used for heating and to provide hot water to spa buildings in Lugo, Arnedillo (in La Rioja), Fitero (in Navarra), Montbrió del Camp (in Tarragona), Archena (in Murcia) and Sierra Alhamilla (in Almería). In Orense and Lérida, geothermal waters are being used to heat homes and schools. Greenhouses are being geothermally heated at Montbrió del Camp (Tarragona), Cartagena and Mazarrón (in Murcia), and Zújar (in Granada); these facilities cover a total area of over 100,000 m2.

Geothermal Energy in Portugal

The geology of Portugal determines different conditions for geothermal energy occurrences. In the mainland, where crystalline rocks outcrop over 60% of the area, thermal waters are related with active faulting. Twenty-seven springs have discharge temperatures between 25ºC and 75ºC and are used in balneotherapy. Three small, low enthalpy operations for direct use at existing hotels are operating normally. A dozen of feasibility studies already carried out demonstrates adequate conditions for further operations. In the sedimentary basins, particularly in the Lisbon area where important heat consumers are located, Lower Cretaceous reservoirs with temperatures up to 50ºC are adequate for small multipurpose geothermal operations, but technical difficulties resulted in the stoppage of the only two existing operations. The already studied potential for developing geothermal heat pumps over proven aquifers is high all over the country.

However, no reports are available on the application of any kind of geothermal heat pumps. In the volcanic Azores Archipelago, high enthalpy geothermal resources are exploited for power generation since 1980, in São Miguel Island. Pico Vermelho and
Ribeira Grande geothermal power plants, with a total installed capacity of 3+13 MWe, supply over 25% of the electrical consumption of the island. A new geothermal power plant (10 MWe) started production by the beginning of 2006, replacing the existing Pico Vermelho generation unit.

In Terceira Island, a new high temperature geothermal field was identified in the central region of the island, as a result of the exploratory drilling of geothermal gradient holes that revealed a maximum temperature of 234ºC. A confirmation drilling program is being planned with the objective to install a 12 MWe geothermal power plant to supply approximately 50% of the consumption needs of Terceira Island.

Geothermal Energy in Greece

Greece offers due its geological conditions a promising potential for geothermal utilisation of its subsurface matter. Although the geothermal sources are well know, only the direct use of geothermal energy, e.g. for greenhouse heating, is implemented into the Greek Energy Supply. Nevertheless, sufficiently high enthalpies are present to utilise the geothermal potential indirectly to produce electricity.

By the end of 2007 the installed thermal capacity of the direct geothermal uses in Greece amounted to roughly 75 MWt. Approximately, half of this capacity corresponds to thermal spas (in a few cases combined with space heating) and heating of open or closed pools. Two are the current trends of direct uses in Greece: the stagnation of greenhouse and soil heating (the latter showed a considerable increase in the previous five-year period) and the diversification of the uses. New uses include fish farming, spirulina growing and vegetable and fruit dehydration.

Earth-coupled and groundwater (or seawater) heat pumps have shown a significant increase in the past five years, but their market penetration is far away from the corresponding penetration in some central-northern European countries. At present no electric power is produced from geothermal resources in Greece, despite the large high-enthalpy resources in the active Aegean volcanic arc. Moreover, in certain other areas (e.g. Lesvos, Chios and Samothraki Islands) organic Rankine Cycle (ORC) power plants could be installed.

The technical potential (the part corresponding to the existing wells) for direct geothermal uses in Greece exceeds 400 MWt and for electrical uses is about 10 MWe.

Geothermal Energy in Hungary

Central Europe has only low-enthalpy geothermal resources. Hungary, however, due to its unique geological position astride the Pannonian Basin, a “geothermal hot spot,” is the exception to the rule. While all of the country’s geothermal resources developed to date are low- and medium-enthalpy, a few high-enthalpy resources have been discovered. As yet, they remain undeveloped.

Hungary’s geothermal gradient (increase in temperature per unit increase in depth) is higher than the world average, and reaches as high as 58.9ºC in some spots. In places where such high gradients are present, so-called abnormal or geopressured reservoir conditions exist accompanied by high-temperature steam/water phase brines.

The water fee to use geothermal water has increased substantially, becoming a significant operating cost. Proliferation of water and energy saving operations will be one of the most important challenges of the near future in Hungary. Interest-free subsidies, low interest long-term credits, or subsidies for experimental and R&D projects are needed. Although no comprehensive estimates are available for the total economically exploitable geothermal resources in Hungary, it is tentatively estimated that some 10-12% of the heating needs of Hungary’s urban population could economically be met with geothermal energy.

Nevertheless, the proportion of geothermal energy utilization in the energy balance of Hungary, despite the significant proven resources, is low (0.16%). In addition, Hungary has no geothermal power generation facilities. This is not due to a lack of suitable, high-enthalpy resources, however: the existence of high-enthalpy resources in Hungary was dramatically proven by a steam blow out from Fábiánsebestyén-4 in 1985-1986. The best high-enthalpy geothermal area is the south-eastern corner of Hungary, near the cities of Szeged, Szentes, and Hödmezõvásárhely. Wellhead temperatures in this area are 80-90ºC.

Geothermal Energy in Slovakia

Slovakia is a country rich in low enthalpy geothermal sources and there are good conditions for developing and using energy from thermal water. Geothermal water is used for recreation, agriculture and district heating. The efficiency of geothermal use is about 30 percent because of seasonal use. The potential of geothermal energy is about 21,456 TJ/year. In Slovakia, the temperature rises on average 3°C per 100 m of well. Geothermal waters in the Slovak Republic are being utilized at 35 locations offering an aggregate heating capacity of 75 MW and generation of 1,218 TJ/y. Slovakia has 25 prospective areas of geothermal resources with temperatures up to 150°C and in depths up to 5,000 m.
The most abundant of them is the Kosice with potential of about 300 MW, where eight planned pairs of wells with an output of about 100 MWt to be used for central heating of the city of Kosice have hit Phase

One of the implementation. At the present time there are 172 public swimming pools with the total number of 404 pools in Slovakia, including 146 pools with thermal water and 258 without thermal water.

Regarding its geothermal energy resources, Slovakia is one of the perspective European regions. Effective use of this renewable energy resource might have economic significance for the Slovak Republic, considering traditional energy sources conservation and opportunity to enhance tourism and recreational capacities in more Slovak regions.

Geothermal Energy in Bulgaria

Bulgaria has a sizable reserve of geothermal energy and is rich in low enthalpy geothermal waters. The country has been utilizing approximately 30 percent of its total potential, or about 107.2 MWt producing some 1.637 TJ/yr of energy per year, for use in space heating, greenhouses, drinking water, and for balneology purposes.

At the present there are no geothermal reserve sites that generate power. There exist approximately 1000 thermal springs and aquifers in Bulgaria, and generally those identified in the southern regions consist of relatively shallow hot springs, while the northern regions have been developed only through deep well borings. Drill depths for those discovered and evaluated resources in the southern regions range in depth from 100-1500 m, while the northern regions range from 100-5000 m in depth.

The majority of these deep well borings have been implemented and financed over the years by the government, which may have a lowering effect on the overall primary and developmental costs if private sector development of the reservoirs is sought.

Geothermal Energy in Turkey

Turkey is poor in fossil fuel resources but rich in renewable resources such as geothermal, solar, hydraulics, wind, and biomass. Geothermal energy is used for direct utilization and power generation. The wide spread hydrothermal occurrences due to tectonic activities and some young volcanism indicate significant existence of geothermal resources in Turkey.

Nearly 1500 thermal and mineral water springs and more than 170 geothermal fields with a temperature range up to 242 oC have been discovered in Turkey which is located on Mediterranean sector of Alpine-Himalaya belt. Turkey is very active with earth crust movements, tectonic movements of the rock formations, and volcanic activities. The geothermal resources in Turkey are mostly moderate and low temperature ones. Some are distributed mostly at the central and western parts of the country, some at the central and eastern Anatolia volcanic regions, whereas high temperature geothermal resources capable of supporting direct use projects and power generation are discovered primarily in the graben structures of Western Anatolia.

Nearly 274 geothermal occurrences and fields are known to exist in Turkey according to MTA (the state owned directorate) records. About 25 of them are already being exploited at large scale for direct and indirect geothermal energy use, many fields are mainly used for balneological purposes by local public, and while others are still to be developed. Yet hopes also exist to explore and discover new fields.

Taking into account of produced and outflowing geothermal fluids, the total identified geothermal potential is about 3700 MWt (based on a reference temperature of 20 oC) of which nearly 1450 MWt is adequate for power generation from 9 known middle and high temperature fields.

**The main source of information is from the Country Updates of the World Geothermal Congress 2005, organised by IGA*

GEOTHERMAL NEWS

GERMANY

Geothermal Electricity Booming in Germany

The German government announced several geothermal investments in order to give the geothermal sector a strong boost. Plants — some as big as 8-10 MW — are due to go into operation in 2009-2010 in Sauerlach, Dürrnhaar, Riedstadt, Speyer, Gross Schoenebeck and Mauerstetten. Looking 3 to 5 years ahead, there could be more than a hundred plants. About 150 geothermal power plant projects are in the pipeline representing an investment of 4 billion euros.
A €17 million [US $26.7 million] 550-kW plant is due to go into operation in Bruchsal at the end of 2008. The power plant will extract water at temperatures of 128°C from a well 2500 meters deep to generate electricity for 1000 households.

RWE Innogy obtains permit for two geothermal projects in Germany

RWE Innogy has obtained from the relevant mining authority in Munich the permit for two deep geothermal projects at Wildpoldsried and Unterthingau in the Swabian rural district of Oberallgau, Germany. RWE Innogy plans to invest around €34m ($44m) in these projects. The company plans to drill up to 4000m deep into the ground as part of the projects that have just been approved. On the fields covering an area of about 100 sq km, investigations will be carried out concerning the geothermal potential over the next three years. The two fields for which permits have been granted, extend across the rural districts of Oberallgau and Ostallgau, as well as the urban district of Kempten.

FRANCE

France sets plan to double share of renewable energy in electricity market

France published details of plans to double the share of renewable sources in its electricity market to meet a 2020 European Union objective. Ecology Minister Jean-Louis Borloo unveiled the 50-point plan. A “Renewable Heat Fund” will be launched next year to support the production of heat from a variety of sources, including geothermal, biogas and solar thermal collectors, which use the sun’s heat to warm water in rooftop tanks. According to France’s energy agency, Ademe, the market for renewable energy could reach EUR24 billion in 2012 and create 120,000 jobs.

Paris airport to go green with geothermal energy

Orly Airport, one of the two big airports serving Paris, is to extract geothermal energy from deep underground to slash its heating bills. Two shafts each 1,700 metres (one mile) deep will be drilled on the airport’s perimeter to access a water table warmed by heat emanating from the Earth’s hot core. Drawn upwards by natural pressure, the water will emerge at the surface at 74 degrees Celsius (165 degrees Fahrenheit) and then be injected into the airport’s heating system. It will then be pumped back into the ground at a temperature of 45 C (113 F). The project, launched after a technical and financial feasibility study, will cost 11 million euros (17.27 million dollars). The Orly-Ouest terminal, part of Orly-South, the airport’s Hilton Hotel, and two business districts will be hooked up to the system from 2011. The project will meet a third of the heating needs of the airport and coincidentally save 7,000 tonnes of its 20,000 tonnes of its annual emissions of CO2, the principal greenhouse gas.

SPAIN

Geo-Madrid Project commences market demand study

Energesis Geotermia, a large Spanish engineering group, has been engaged by Petratherm Espana to undertake a heating and cooling demand study to accurately quantify the local market demand for the Geo-Madrid project. The 8 MW Geo-Madrid demand study commenced in early November and is due for completion in mid December 2008. Following on from that study, work is planned with Energesis Geotermia to conduct the engineering design of the Geo-Madrid project, together with a detailed financial assessment. The 8 MW Geo-Madrid district heating project aims to service the heating and cooling needs of the nearby University and a number of large

government buildings owned by the Madrid Regional Government.

UK

Aviva creates €500M fund for European cleantech

The U.K.'s Aviva Investors announced plans to raise a €500 million ($625 million) fund for cleantech investing in Europe. Aviva Investors Chief Executive Alain Dromer said the company is looking for institutional investors for the Aviva Investors European Renewable Energy Fund, which is expected to focus on countries new to the cleantech sector. He made the announcement at the TBLI (Triple Bottom Line Investment) conference on sustainable investment in Amsterdam. The fund is planned for biomass, biogas, geothermal, solar and wind projects that will then be managed by German developer SachsenFonds Group. Investment rounds are expected to be €30 million to €75 million

SLOVAKIA

Slovakia wins world's top green tourism prize

Slovakia swept the board in the first World Travel `Green' Awards held on 15th October, its flagship green water park and spa, AquaCity Resort, Poprad, picking up trophies for `Europe's Leading Green Resort' and the `World's Leading Green Resort'. Slovakia was the only destination in Europe to be cited for Green Awards, with much of the recognition and praise spotlighting the Caribbean, South America, Africa and Asia. Around 27 tonnes of CO2 in AquaCity are saving from entering the atmosphere each day by using geothermal water and solar energy to heat and power the resort. This saves millions of euros each year, contributing to profitability and competitiveness. Slovakia is Europe's fastest growing tourist destination and is currently attracting significant investment in its tourist infrastructure, with an 11m euro investment currently underway in the High Tatras to expand the ski facilities in time for winter 2008/9.

IRELAND

Geothermal energy could provide up to 15 percent of Dublin's hot water and heating

During the Ireland's annual conference it was mentioned that tests in the Newcastle area showed 10,000 homes could benefit from heat from deep underground. Extracting heat from 4,000 to 5,000 metres below ground could provide 15 percent of Dublin's heat and hot water needs through a district heating system. Energy minister Eamon Ryan welcomed the test results and said the technology could help reduce the country's reliance on fossil fuels. Speaking at the Plan Expo in Dublin, Mr Ryan said the renewable sector could help Ireland out of the recession and reduce its use of fossil fuels.

TURKEY

Iran, Turkey Seeking to Boost Cooperation

Turkey's Energy and Natural Resources Minister Hilmi Guler met with Iran's Energy Minister Parviz Fattah in Iran and agreed for a further cooperation in the energy sector. Guler said Turkey planned to invest $120 billion in solar, wind and geothermal energy systems before 2020 and noted that the two countries could cooperate in the field of renewable energy.

RUSSIA

Russia and Green Energy

Different regions within Russia offer unique renewable energy resources. Geothermal energy prospects are promising in the Far East, Northern Caucasus and the Far East.
Geothermal energy would come first accounting for about 40% of overall renewable energy potential, small hydro is second reaching 24% and biomass accounts for 13%. These three leading sources account for nearly 80% of the total potential. This could be enough to supply as much as a third of Russia's energy needs. This potential is largely underutilized with less than 1% of "green" electricity and less than 5% of "green" heat in total annual power and heat output.

USA

USA says 'Go West' to geothermal companies

The federal government completed a process recently that made 190 million acres of federal land in the Western states officially friendly to geothermal development. The federal government said in a statement that it estimates this land will produce an additional 6,600 megawatts of geothermal power by 2025,

for a total of 12,100 megawatts, enough to power more than 12 million homes. This block of land includes all the federal government's land that has significant geothermal potential, aside from that protected for wildlife conservation. The federal government wanted to make it easier for geothermal companies to bring this renewable resource online because it's available 24 hours a day, unlike wind and solar, and it's clean. The federal lands have potential for renewable energy and we want to be making that available as part of a responsible process of trying to meet the nation's energy needs.

GEOFAR News

(a) Participation in conferences & other activities

1. Presentation of GEOFAR project in the Workshop "Development and use of energy technology over the participation in EU funding-programmes"

Mr. Matthias Hiegl from the Erlangen AG had joined the workshop "Development and use of energy technology over the participation in EU funding-programmes" at the 30th October 2008 as speaker. The workshop had been organised in cooperation by Haus der Technik e.V. - Munich and Bayerische Forschungsallianz. The Erlangen AG presented the GEOFAR project and exchanged experience with the audience over the project and the opportunities of EU-funded projects in general. The high quality audience of 19 people was very mixed, from representatives of the global player over universities and r&d-institutes to SMEs with different energy backgrounds. In several talks in the networking session the GEOFAR project had been intensely discussed and raised huge interest among the stakeholders dealing with geothermal energy.

2. Presentation of GEOFAR project in the "Energy & Development" Conference in Athens

On the occasion of the 13th "Energy & Development" Conference in Athens organised by IENE, on November the 12th & 13th, Mr. Nicholas Sofianos, European Projects Coordinator of the Institute of Energy in South East Europe (IENE) presented GEOFAR project, outlining its basic points. Mr. Sofianos focused on the importance of boosting geothermal investment in Europe and noted the major role that GEOFAR can play in overcoming the difficulties and obstacles which hider the development of geothermal energy. The presentation was attended by a several number of Greek experts in the domain of RES - geothermal energy and many of them have shown special interest about the project.

3. Presentation of IGME Greece in the Conference "Geothermal Fields of Chios Island and Future Development Perspectives"

Mr. Apostolos Arvanitis, Geologist of IGME – Greece, has joined the Conference "Geothermal Fields of Chios Island and Future Development Perspectives" which take place the 21st of November in Chios. During the Conference, which was organized by the Perfecture of Chios and the Greek Ministry of Development, Mr. Arvanitis presented an analytical study of IGME related to the geothermal potential of Chios and especially of the regions "Nenita" and "Thymiata"

4. The EGS(1) project pilot plant of Soultz by BRGM

By the time this project provides electricity from the subsoil heat, an assessment of the scientific result will have to be issued. For that reason, the EHDRA(2), scientific forum concerning the Soultz project, is going to produce a position paper whose directing lines are going to be presented during the final conference of the European project by the end of September 2008 at Soultz.

The completion of the Soultz project is also going to contribute to the realisation of scientific progress of twenty years of expertise. A several number of theses were supported and about 200 publications were released between 2001 and 2008.

Moreover, the ENGINE(3) European project, a platform of information network, among those involved in geothermal energy sector in Europe, is going to produce a Best Practice Handbook. This document is not only going to summarize facts and methodologies of the EGS project, but also the needs and the shortcomings identified during the exploration, drilling, stimulation and exploitation phases

The Soultz and the EGS are the most well-Known projects in the geothermal energy sector worldwide.
(1) EGS : Enhanced Geothermal System
(2) EHDRA : European Hot Dry Rock Association
(3) ENGINE : Enhanced Geothermal Innovative Network for Europe

(b) Forthcoming activities

1. Organization of two-days seminar by Rödl & Partner

On 11 and 12 February 2009 Rödl & Partner organizes in cooperation with the German Heat and Power Association (AGFW) a seminar on “Geothermal Energy – from Claim to Customer” which takes place in Unterhaching, Germany. The seminar deals with the single project phases of a deep-seated geothermal energy project. Topics amongst others are economic aspects including financing of geothermal projects, legal regulations and technical aspects as well as a guided tour through Germanys first large-scale combined geothermal heat and power plant in Unterhaching.

PUBLICATIONS

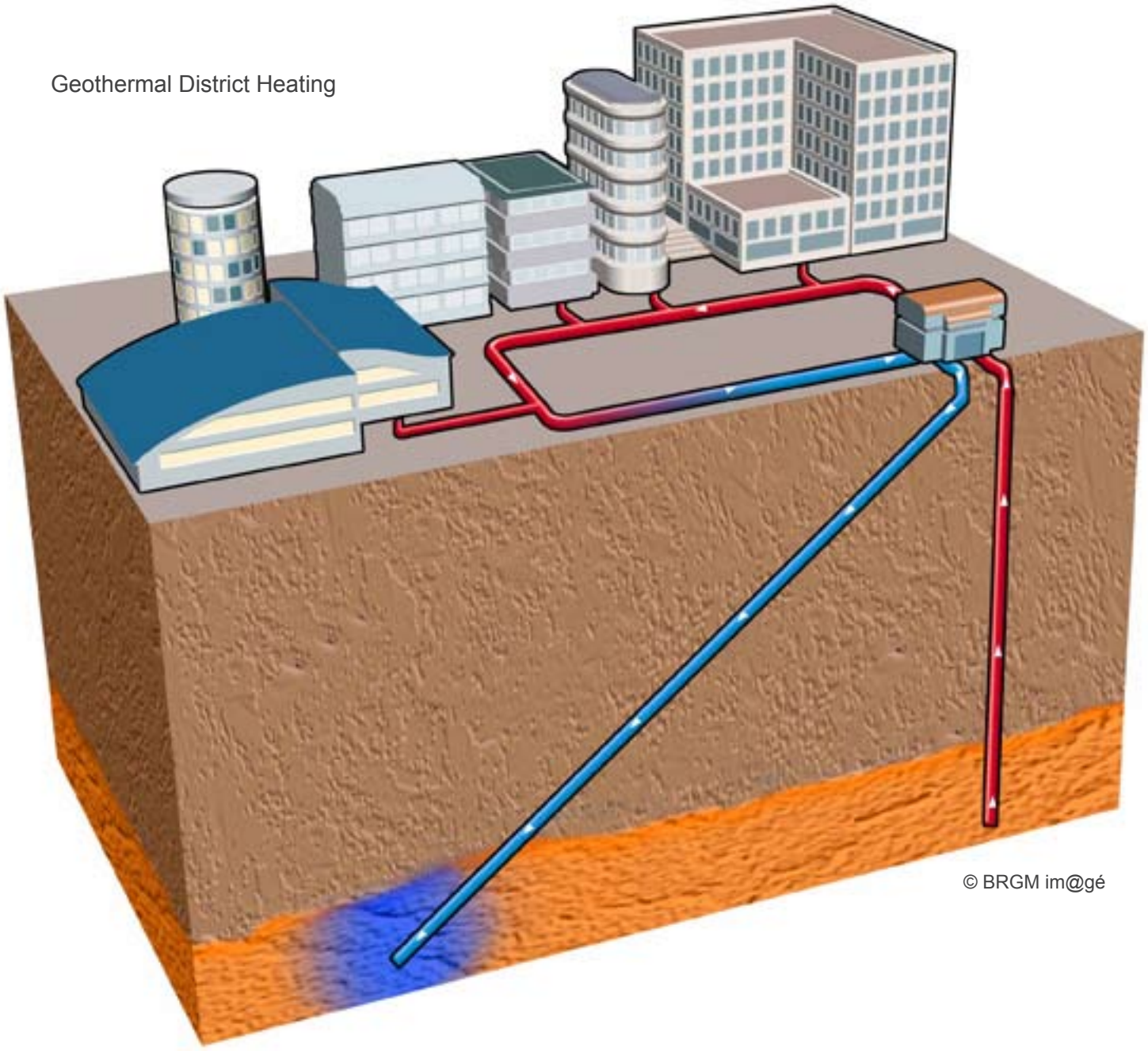
Forseo’s* publication: “The Investor’s Guide to Geothermal Energy”

On September 2008 Forseo realesed „The Investor’s Guide to Geothermal Energy“. This publication provides comprehensive and market driven insight into all important aspects of geothermal business and project development. It serves as a practical reference tool for the financial community, for stakeholders from the industry, and for those ready to enter the geothermal energy market. Many experts share their experience to make this publication the first of its kind.

The Investor’s Guide to Geothermal Energy introduces the most important aspects, challenges and solutions of geothermal business and development. For those new to the industry, the first chapter Geothermal 101 offers concise access to the technology. The chapter Roadmap to Successful Geothermal Project Development describes each geothermal project phase, from site identification to operation and maintenance, looking at geo-scientific, technological, and economical challenges and solutions. The chapter Financing Geothermal Energy Projects highlights financing schemes in all project stages. Every phase has different risk profiles with different equity and financing solutions. The chapter Geothermal Market and Investment Opportunities reviews the current global market development, public policy and legal frameworks. It takes a closer look at the conditions in the United States, Germany, Chile and China, but also spotlights other markets.

**Forseo is an internationally active service promoting and facilitating investment in energy efficiency and renewable energy*

Geothermal District Heating



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