

## b) Promotion, encouragement and support for innovative demonstration projects

- *EU Framework Programs* (programs similar to the present FP7 should be launched for another 10 years at least).
- *Projects of cascade uses of the Earth's heat.*
- *Creation of an Insurance Fund* to cover risks connected with innovative projects in the UGS technologies.
- *Selection* (by the EU' Heating and Cooling Platform work-group) *of 8÷10 preferential sites suitable for implementing 3÷5 different European UGS demonstration projects.*
- *Encouragement of joint venture consortia with Partners from different EU countries.*
- *Risk-coverage (through the Insurance Fund) of the above 3÷5 UGS demonstration projects.*
- *EU's promotion and cost-sharing of heating & cooling projects* to be implemented in 15-20 important historical towns of Europe. The Ferrara project and its environmental/economic benefits are a valid example in this regard.
- *Promotion of EU's measures to mitigate the environmental impacts and enhance the social acceptability of geothermal power generation in prospective but critical areas.*

## 3.2) For Italy

### a) Basic activities

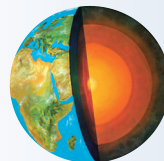
- *National legislation:* updating rules and procedures on permitting, drilling and utilisation of geothermal resources to speed up the implementation of any kind of geothermal project.
- *Regional legislation:* issuing homogeneous rules and procedures on the above in all Italian regions.
- *Setting-up of an "Italian Geothermal Development Master Plan"*, providing guidelines for the National Energy Plan and the Energy Plans of Italian Regions to encourage fast development of the Earth's heat.
- *10-years program of legislative incentives* to foster the use of geothermal resources of any kind.

- *National geothermal R&D program* (coordinated at the central level and implemented in part at the regional level), quantifying the potential of different types of resources in each region and laying the scientific groundwork for harnessing them for practical purposes.
- *National study group with the following tasks:*
  - i) quantifying resources potentially extractable for power generation through prospective UGSs;
  - ii) selecting 2-3 preferential sites for implementing UGS projects; and
  - iii) outlining the work program with a preliminary estimation of the cost of each project.
- *Application of other general measures as suggested in the "Italian Geothermal Manifesto".*

### b) In the field of practical development

- *Utilisation of resources at 90-150 °C for power generation by binary cycles.*
- *Systematic stimulation of low-porosity layers and reinjection of residual fluids.* The possibility should be explored to increase the injection rate by appropriately treating and using waste waters of urban and industrial origin.
- *Projects of heating and cooling of public buildings,* to be implemented in at least 10% public buildings of 1000 Municipalities within 5 years from now, and in about 20% of the public buildings of 4000 Municipalities by 2020.
- *Projects of heating and cooling implemented by private citizens or firms:* to be encouraged and publicly supported even when they are combined with sources different from geothermal energy.
- *Projects of cascade uses and direct uses other than heating and cooling:* to be encouraged and developed, with public support.

Ferrara, 25 Sept. 2009



## THE WARM HEART OF EUROPE

INTERNATIONAL CONGRESS ON  
**GEOTHERMAL ENERGY  
IN ITALY AND EUROPE.  
WHAT FUTURE?**



GEOTHERMEXPO 2009  
FERRARA, 23-25 SEPT. 2009

## TARGETS FOR GEOTHERMAL DEVELOPMENT IN THE EU-27 BY 2020, AND PROPOSALS FOR ACTION ARISEN FROM SESSION FIVE AND THE ROUND TABLE OF 25 SEPTEMBER 2009

### 1. Foreword

To lay the technical groundwork for the Round Table, a Session of the Congress was devoted to the theme **From the Ferrara Declaration (1999) to the EGEC' Brussels Declaration (2009). Development prospects of geothermal energy in Europe.** During the Session, the following contributions were presented and discussed:

- *Historical outline of the Ferrara Declaration (R. Cataldi, UGI);*
- *EGEC' Brussels Declaration (C. Boissavy, EGEC);*
- *From HDR to EGS. An overview of activities carried out from the beginning of the 1970s (G. Cappetti, ENEL- Green Power);* and
- *Forecasts of geothermal energy development in the EU-27 by 2020 (R.Cataldi et al., UGI- University of Pisa).*
- The Round Table was focused on: **Geothermal energy in Italy and Europe: What future. Ideas and Proposals.**

It was attended<sup>1</sup> by:

- **F. Cupini** (former Officer at the EU Commission- EuropeAid, Chairman);
- **C. Boissavy** (EGEC), **G. Cappetti** (ENEL Green Power), **R. Cataldi** (UGI), **M. Fossa** (University of Genoa), **A. Martini** (Ministry of Economic Development), and **R. Pignone** (Geological Survey of Emilia-Romagna).

The main outcomes of Session 5 and the Round Table are outlined below.

<sup>1</sup> Two other experts were invited, but could not attend: A. Antics (IGA Euro-Branch) and R. Bertani (IGA Board).

## 2. Targets of geothermal development by 2020 in the EU-27, with particular reference to Italy

- All speakers agreed that the growth of power generation should be placed in the context of technologies that are already mature<sup>2</sup> vs/ technologies that have not yet reached commercial maturity<sup>3</sup>.
- All speakers recognised that, as the latter technologies are still in the “learning stage”, they need strong and prolonged R&D efforts, both by the EU and all Member Countries.
- However, as regards the timescales that some UGS require to become commercially mature, two different positions emerged, ranging from 4-5 to 10-12 years. Therefore, most experts stated that at least 90% of geothermal power generation in the world will come in 2020 from natural or stimulated high-temperature hydrothermal reservoirs; whereas other experts pointed out that a significant electrical output might come from UGS technologies in 2020.
- As to direct uses<sup>4</sup>, all experts agreed on an average yearly growth rate of about 10 % until 2020.
- In view of the above, the following target ranges were given for the EU-27 by 2020:
  - *Power generation*: 1500-2000 MWe<sup>5</sup> and 6000 MWe<sup>6</sup>, vs. 853 MWe at September 2009;
  - *Direct uses*: 30,000-40,000 MWt, vs. approx. 10,000 MWt at September 2009.

<sup>2</sup> Mature technologies include conventional power plants plus binary power plants.

<sup>3</sup> Not yet mature technologies include: EGS - enhanced geothermal systems (formerly called HDR- hot dry rock), pressurised systems, supercritical fluids, magma systems and hot brines. Altogether they are named UGS - unconventional geothermal systems -.

<sup>4</sup> Direct uses means any kind of direct application of the Earth's heat, with or without water extraction and with or without ground source heat pumps, regardless of the depth(s) from which the heat is extracted.

<sup>5</sup> These targets are shared by all the experts attending the Congress who feel that UGS need 8-10 more years to become mature.

<sup>6</sup> This figure (given by EGEC in its Brussels Declaration for the EU-27 by 2020 and confirmed by the EGEC's representatives attending the Congress) includes 1500 MWe from conventional plus binary plants, and 4500 MWe from the EGS technology.

- **With regard to Italy**, geothermal development targets by 2020 were confirmed to be as follows:
  - *Power generation*: 1200-1500 MWe at the most, vs. 810.5 MWe at September 2009;
  - *Direct uses*: 4000-6000 MWt at the most, vs. approx. 850 MWt at September 2009.

### 3. Proposals for action

Formulated separately for the EU-27 and Italy, they are divided in both cases into base and practical activities.

#### 3.1) For EU 27

##### a) Basic activities

- *Long-term R&D program.* EGEC's Research Agenda could be used as a base for the program. However, it should be revised by EU's work group established within the framework of the *Heating and Cooling Platform*.
- *Relaunch of the ENGINE program* with objectives extended to all systems based on non-mature technologies.
- *Creation of international work group in charge of revising geothermal terminology*, to encourage all experts to use the same terms for the same concepts.
- *Revision of the existing “Geothermal Atlas of Europe”* in the light of the currently broad spectrum of applications of the Earth's heat, integrated by new thematic maps and extended to all the countries of the EU-27.
- *Creation of “feed-in tariffs” valid for all EU-27 countries.*
- *Publication and wide dissemination of a “European Geothermal Manifesto”*: the format adopted by the “Italian Geothermal Manifesto” might serve as a reference in this regard.
- *Systematic communication & awareness campaigns* on the nature and benefits of the Earth's heat, in all the languages of the EU-27.