VI. (Kisteleki)
Budapest
Nemzetközi
Geotermikus
Konferencia

4 March 2010

Aims, plans and options for the geothermal energy in the EU

Az Európai Unió geotermikus céljai, tervei, lehetöségei

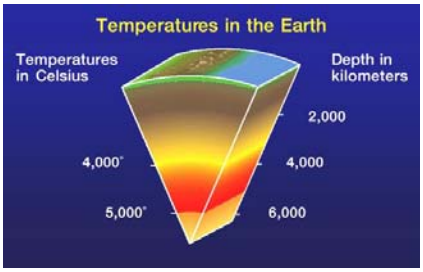
Dr. Burkhard Sanner

European Geothermal Energy Council, Brussels

Geothermal Energy

Geothermal Energy is energy stored in the form of heat beneath the surface of the solid earth

(Definition used by EGEC)



Graph from Geothermal Education Office, California

And now from Directive 2009/28/EC on the promotion of the use of energy from RES:

Art. 2
The following definitions also apply:

(c) "geothermal energy" means energy stored in form of heat beneath the surface of solid earth;

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Directive 2009/28/EC, Art. 2:

DE *„geothermische Energie“ die Energie, die in Form von Wärme unter der festen Erdoberfläche gespeichert ist;*

EN *‘geothermal energy’ means energy stored in the form of heat beneath the surface of solid earth;*

ES *«energía geotérmica»: la energía almacenada en forma de calor bajo la superficie de la tierra sólida;*

FR *«énergie géothermique»: une énergie emmagasinée sous forme de chaleur sous la surface de la terre solide;*

IT *«energia geotermica»: energia immagazzinata sotto forma di calore sotto la crosta terrestre;*

HU *„geotermikus energia”: a szilárd talaj felszíne alatt hő formájában található energia;*

NL *„geothermische energie”: energie die in de vorm van warmte onder het vaste aardoppervlak is opgeslagen;*

SE *geotermisk energi: energi lagrad i form av värme under den fasta jordytan.*

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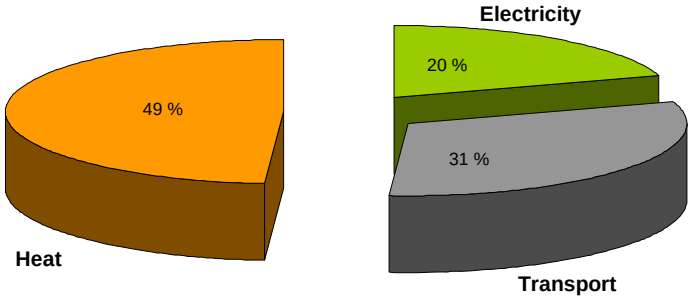
Energy demand in EU

In 2006, a share of 49 % of the final energy consumption in EU 27 was in the form of heat.

Heat accounted for:

86 % of the final energy consumption in households,
76 % in commerce, services and agriculture, and
55 % in industry.



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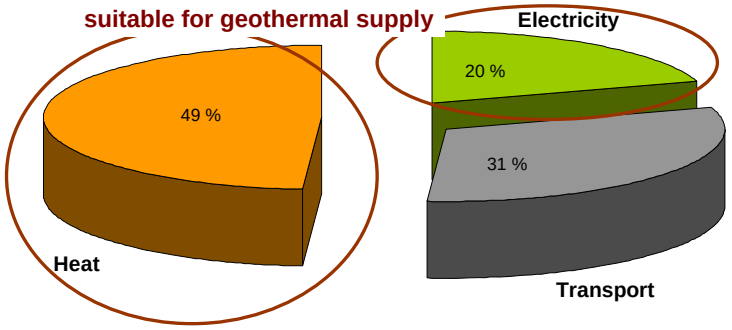
Energy demand in EU

According to the EU Council decision in March 2007, a share of 20 % of final energy consumption in EU must come from renewable energy sources by 2020 (for Hungary, 13 %).

The Directive 2009/28/EC, in force since June 2009, sets the policy framework to achieve the 2020 mandatory target.



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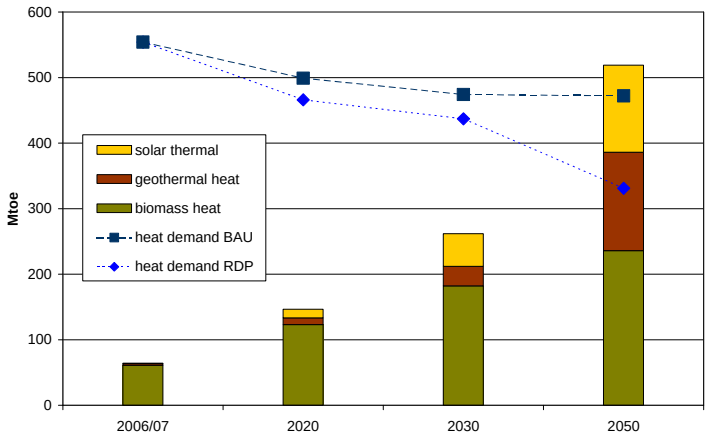
Vision of the ETP RHC

Renewable Heating & Cooling
European Technology Platform

The renewable heating and cooling contribution to the European energy market could add up to well over 100 % of the heating and cooling demand!

www.rhc-platform.org



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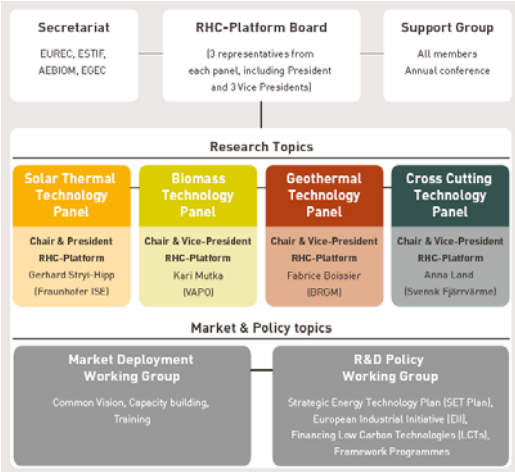
Geothermal Panel of the ETP RHC

Renewable Heating & Cooling
European Technology Platform

First meeting of the Geothermal Panel on 26.6.2009 in Brussels
First conference of the ETP-RHC on 23.-24.2.2010 in Bilbao



www.rhc-platform.org

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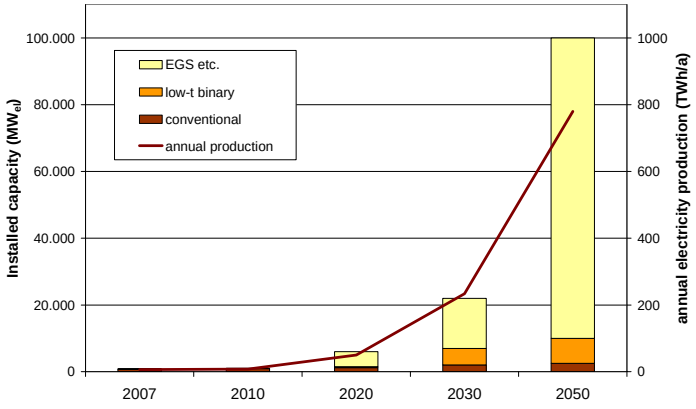
ETP on Geothermal Electricity

EGEC vision for 2050 on geothermal power (discussed in ETP)



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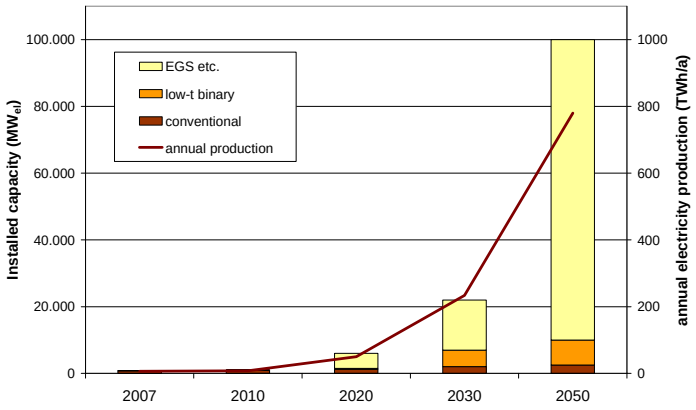
ETP on Geothermal Electricity

First meeting on 2.12.2009 in Munich
Next meeting on 24.3.2010 in Brussels **www.egec.org**
Goal: Create an officially endorsed platform for renewable base-load electricity



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The following definitions also apply:

(a) 'energy from renewable sources' means energy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases;

Ezen irányelv alkalmazásában továbbá:

(a) „megújuló energiaforrásból előállított energia": a nem fosszilis megújuló energiaforrásokból származó energia: szél-, nap-, légtermikus, geotermikus, hidrotermikus, valamint az óceánból nyert energia, vízenergia, biomassza, hulladéklerakó helyeken és szennyvíztisztító telepeken keletkező gázok és biogázok energiája;

http://eur-lex.europa.eu/JOHtml.do?uri=OJ:L:2009:140:SOM:EN:HTML

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Article 4 National renewable energy action plans

1. Each Member State shall adopt a national renewable energy action plan …

2. Member States shall notify their national renewable energy action plans to the Commission by 30 June 2010.

4. Cikk Megújuló energiaforrásokra vonatkozó nemzeti cselekvési tervek

(1) A tagállamok elfogadják a megújuló energiaforrásokra vonatkozó nemzeti cselekvési tervüket. …

(2) A tagállamok 2010. június 30-ig bejelentik a Bizottságnak a megújuló energiaforrásokra vonatkozó nemzeti cselekvési tervüket.

http://eur-lex.europa.eu/JOHtml.do?uri=OJ:L:2009:140:SOM:EN:HTML

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Article 13 Administrative procedures, regulations and codes

Member States shall, in particular, take the appropriate steps to ensure that:

(c) administrative procedures are streamlined and expedited at the appropriate administrative level;

(d) rules … are objective, transparent, proportionate, do not discriminate between applicants …

(e) administrative charges … are transparent and cost-related …

13. Cikk Közigazgatási eljárások, szabályok és törvények

A tagállamok megteszik a megfelelő lépéseket különösen a következők biztosítása érdekében:

c) a közigazgatási eljárások korszerűsítése és gyors ügyintézés a közigazgatás megfelelő szintjén;

…

http://eur-lex.europa.eu/JOHtml.do?uri=OJ:L:2009:140:SOM:EN:HTML

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Article 14 *Information and training*

3. *Member States shall ensure that certification schemes or equivalent qualification schemes become or are available by31 December 2012 for installers of small-scale biomass boilers and stoves, solar photovoltaic and solar thermal systems, shallow geothermal systems and heat pumps. …*

14. Cikk *Tájékoztatás és képzés*

(3) *A tagállamok biztosítják, hogy legkésőbb 2012. december 31-én álljanak rendelkezésre képesítési rendszerek vagy azokkal egyenértékű minősítési rendszerek a kisméretű biomasszabojlerek és -kazánok, a fotovoltaikus napenergia és a termikus napenergia rendszerek, a sekély geotermikus rendszerek és a hőszivattyúk üzembe helyezői tekintetében. …*

http://eur-lex.europa.eu/JOHtml.do?uri=OJ:L:2009:140:SOM:EN:HTML

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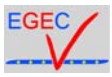

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Projects to help in implementing the Directive:

REPAP 2020 ***Art. 4***	**Renewable Energy Policy Action Paving the Way to 2020** **http://www.repap2020.eu**
GTR-H ***Art. 13***	**Geothermal Regulations for Heat** **http://www.gtrh.eu (finished 2009)**
Qualicert ***Art. 14***	**Common quality certification and accreditation for installers of small-scale RES systems** **www.qualicert-project.eu**
GEOTRAINET ***Art. 14***	**Training and Certification of GSHP planners and drillers** **http://geotrainet.eu**

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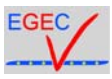

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Summary on Directive:

- **Based upon the „20/20/20 by 2020“ decision of the EU spring 2007 summit (incl. 20 % renewables by 2020)**
- **European Commission draft published January 2008**
- **Agreement between EP, Council and Commission in December 2008**
- **Publication in the OJ on 5th June 2009**
- **Now the member states have to submit the National Renewable Energy Action Plans, until June 2010 Template: EC Decision C(2009) 5174-1 of 30.6.2009**

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The Member States had to submit a forecast to the NREAPs by the end of 2010. In the text from Hungary it is stated:

- **Hungary fundamentally strives to be self-sufficient in increasing the use of renewable energy sources.**
- **The national target for use of renewable energy sources for 2020 is 135 PJ from renewable energy sources per year.**

Hungary has to fulfill 13 % in 2020.

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Tables from NREAP Template:

Electricity (Table 10)

	2005		2010		2011		...	2019		2020	
	MW	GWh	MW	GWh	MW	GWh		MW	GWh	MW	GWh
Geothermal							...				

Heat (Table 11)

	2005	2010	2011	2012	...	2019	2020
Geothermal (excluding low temperature geothermal heat in heat pump applications)					values in Ktoe		
Renewable energy from heat pumps: - of which aerothermal - of which geothermal - of which hydrothermal					...		

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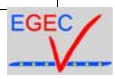

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EGEC has prepared a suggestion for the geothermal contribution from the Member States. For Hungary it states:

Electricity, by 2020

Conventional	Binary	EGS	total	Annual Work
0 MWel	80 MWel	300 MWel	380 MWel	2964 GWh

Heat, by 2020

	Direct Uses	CHP	total	Annual Work	
deep	1500 MWth	300 MWth	1800 MWth	8100 GWh	696 ktoe
shallow			770 MWth	1694 GWh	146 ktoe

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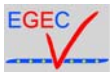

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EU Directive on Promotion of Renewable Energy Sources

A lot of support from the EP was required to get the Directive right!

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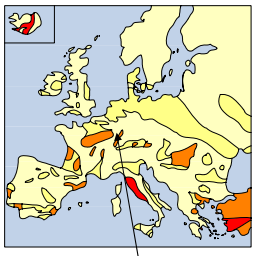
Geothermal Electric Power

EGS: Enhanced Geothermal Systems



Status end of 2009:

- **Power production in Soultz inaugurated in June 2008**
- **DHM-project in Basel (CH) cancelled after seismic events Dec. 2006 and Jan. 2007 => Research on induced seismicity**
- **New activities in Germany, England, Spain and elsewhere**
- **EGS is crucial for achieving 2020 targets for geothermal power**
- **Transferring EGS from Soultz to other sites will be a strategic technology step !**

Soultz wellheads in June 2008

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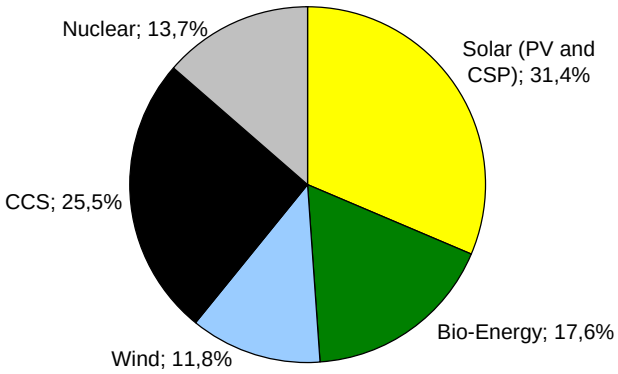
The SET-plan R&D financing



and:
- improved grids,
- smart cities

No geothermal!

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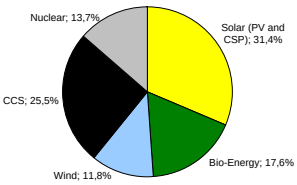
Carbon disposal, the problem for geothermal

If CCS will be forced and will be used widely, a tremendous amount of rock layers for disposal of CO_2 will be required.
(The question is not, how much we need, but for how long it will last, if we get all)



There is a clear conflict between geothermal energy and carbon disposal.

Some efforts are made to show that CCS and geothermal should be compatible; that is mainly wishful thinking.

CCS creates a massive inflow of cash and creates jobs for Geosciences and the relevant authorities and institutes.

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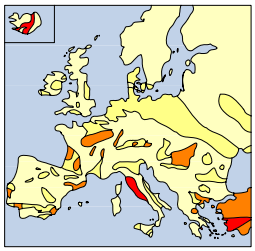
Geothermal Heating



The supply of heat and cold is a well-proven achievement of geothermal energy.

Heat from deeper ground water, the temperature of which varies between 25°C and 150°C according to depth and geothermal gradient, can supply energy to a district heating or a combined heat and power installation, can be used in agriculture (greenhouses, drying, fish-breeding, etc.), in industrial processes, in balneology, for snow melting, seawater-desalination, and for much more. Also cold production through absorption chillers is a proven concept.

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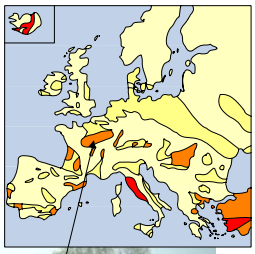
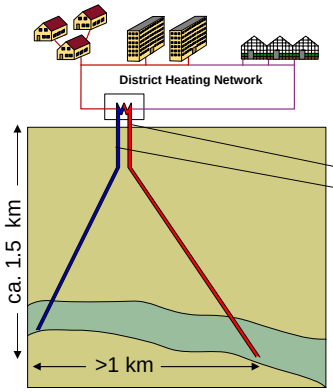
Geothermal District Heating



doublet systems, used since the late 1970s in France and since 1984 in (Eastern) Germany, Hungary, etc.



Geothermal central in Chevilly-la-Rue, south of Paris, France (photo 1995)

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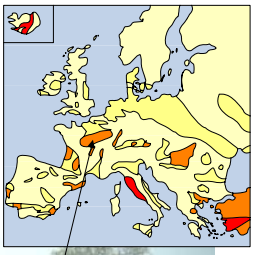
Geothermal District Heating

doublet systems, used since the late 1970s in France and since 1984 in (Eastern) Germany, Hungary, etc.



Situation in 2008, with additional gas-turbine powered CHP (building to the left)

Geothermal central in Chevilly-la-Rue, south of Paris, France (photo 1995)

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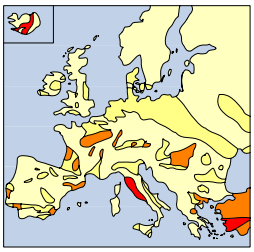

Existing geothermal DH systems in Europe

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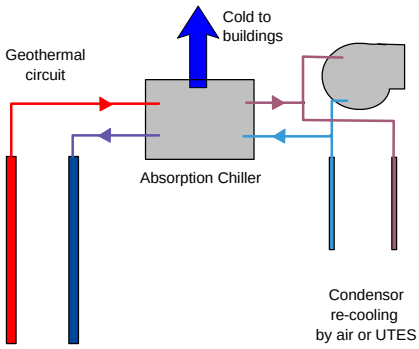
Geothermal Cooling

Absorption Chiller
(example Barcelona, driven by waste heat from waste incineration)



Absorption cooling driven by hydrogeothermal energy can cover cooling loads; condensor re-cooling by air or UTES

First example in Zakopane, Poland (45 kW cooling)

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Szentes, Hungary: Geothermal community since >50 yr

Agriculture

District heating

Well for hospital

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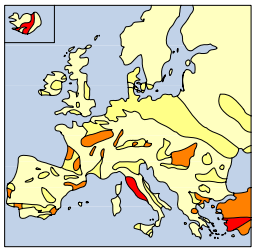
Conclusions



Geothermal energy, used in the form of electric power and of heating and cooling, has several benefits for society, including:

- **positive externalities of private investments,**
- **reduction of CO_2 and other emissions,**
- **security of energy supply,**
- **local economic development.**

Furthermore, geothermal energy can help to improve the competitiveness of industries, at least in the long run, and can have a positive impact on regional development and employment.

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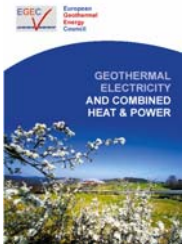
Thank you for your attention!



For more information: www.egec.org

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