



30 de novembro 2010

# 1º CONGRESO DE XEOTERMIA DE GALICIA

Xeotermia, por un futuro eficiente

## Potencial, mercado e políticas para a enerxía xeotérmica de baixa entalpía na UE

Potential, market and policy for  
shallow geothermal energy in the EU

Burkhard Sanner  
European Geothermal Energy Council  
63-67, Rue d'Arlon, 1040 Brussels, BE  
[www.egec.org](http://www.egec.org)



Colabora:



Organiza:





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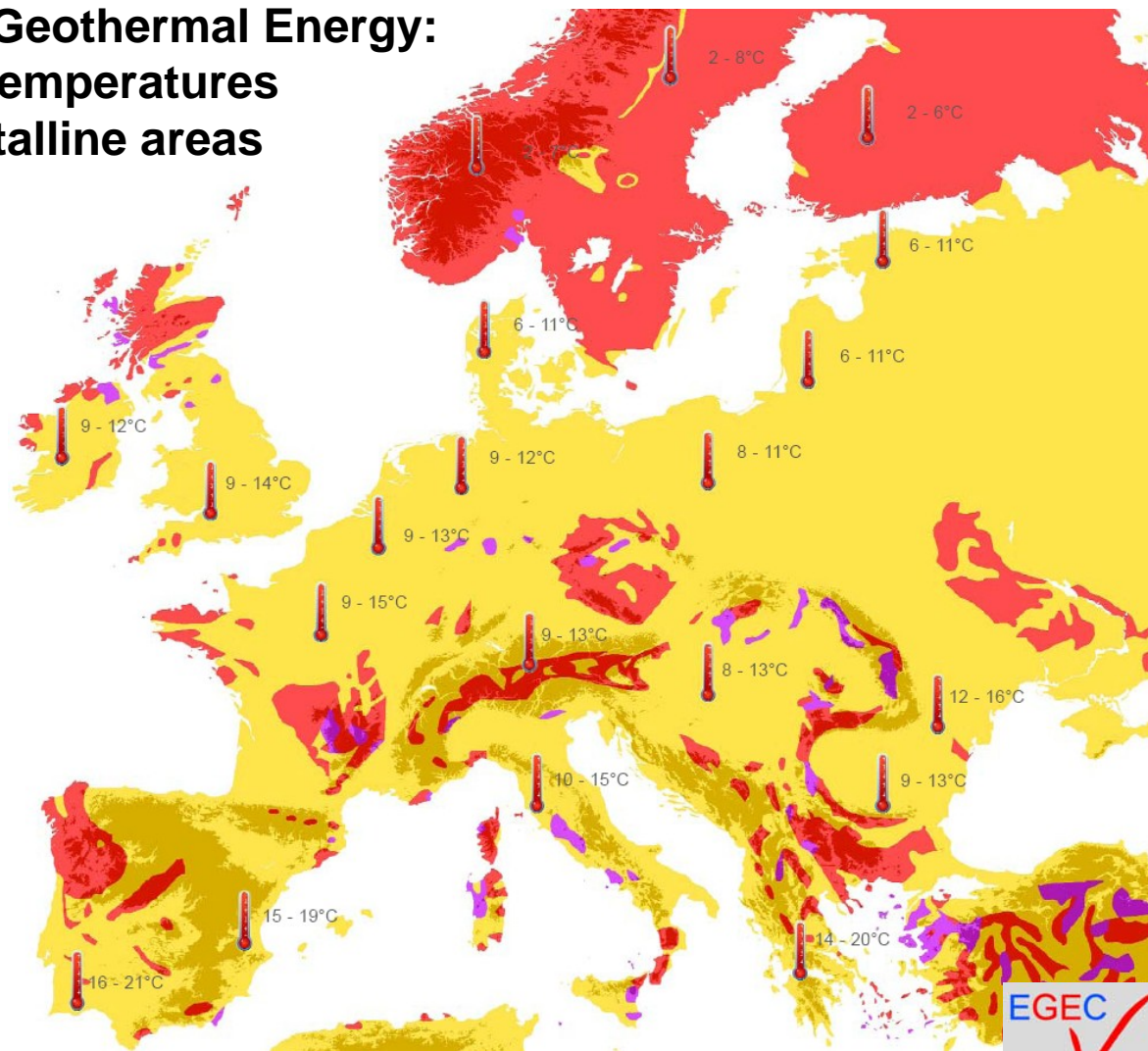
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## Shallow Geothermal Energy: Ground temperatures and crystalline areas



Map prepared by  
BRGM for the  
Geotrainer project





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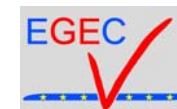
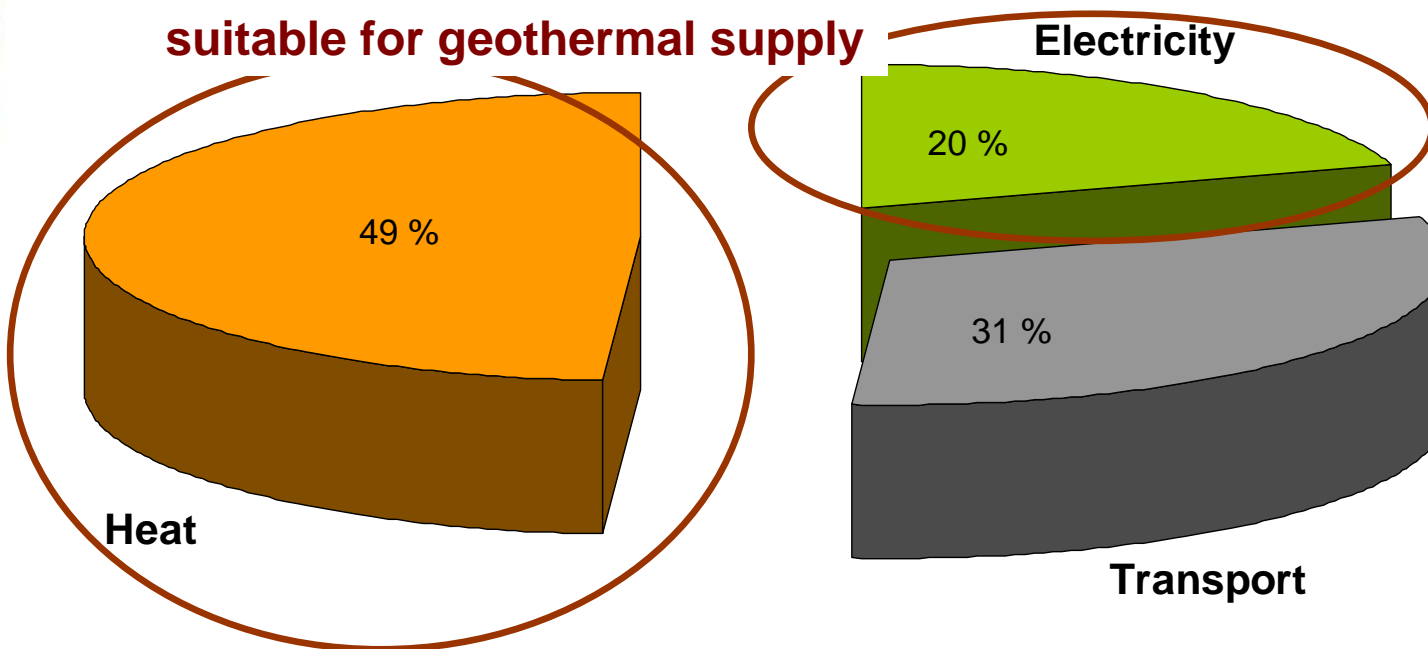


In 2006, a share of 49 % of the final energy consumption in EU 27 was in the form of heat.

Heat accounted for:

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

**suitable for geothermal supply**





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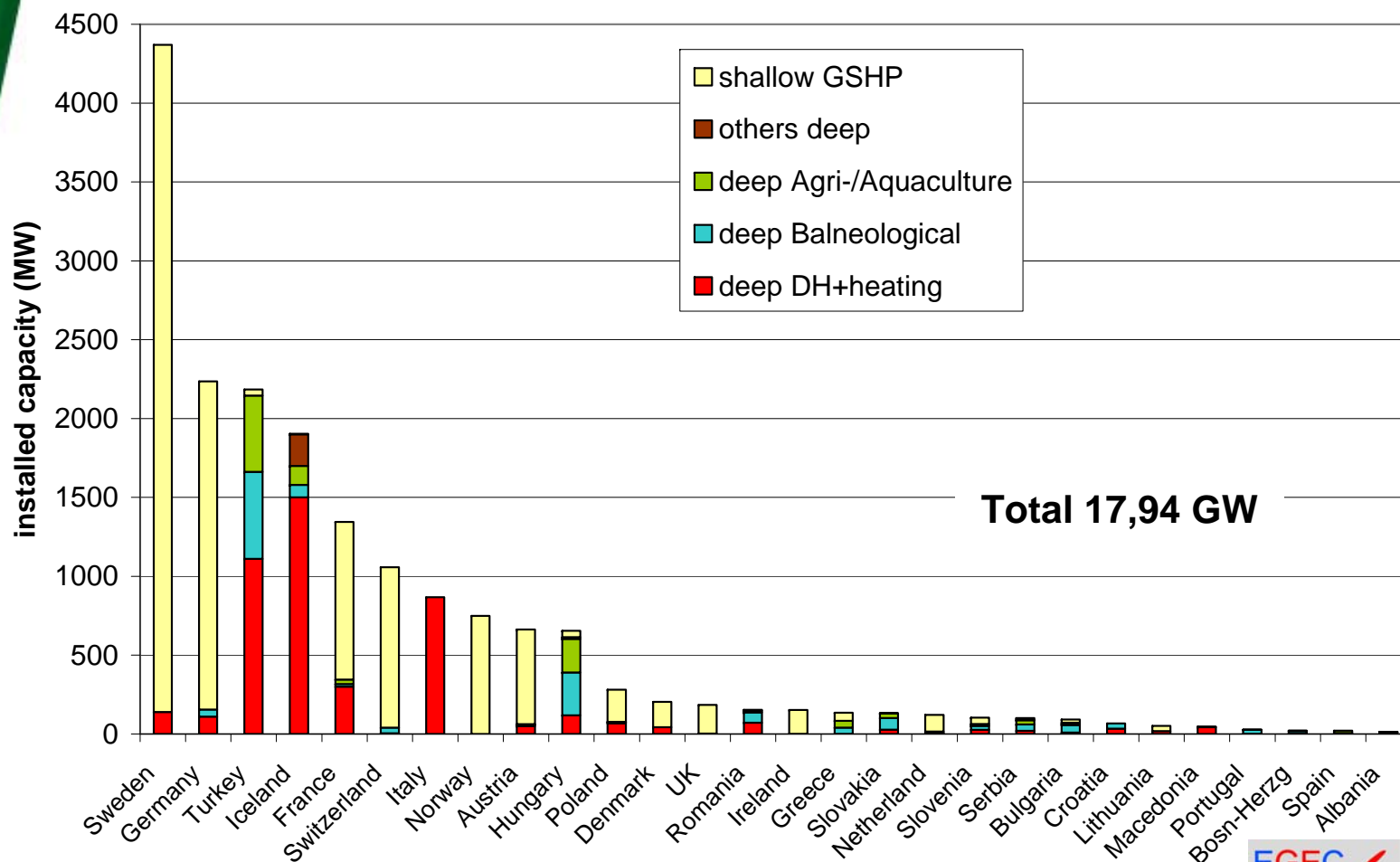
Coletores:  
acluxega

Organiza:  
Instituto para o Planificación do Calentamento e Resfriamento  
Sustentable de Galicia

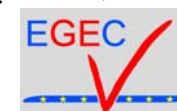
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## Geothermal Energy Use for Heat in Europe



Installed heating capacity, after data from WGC 2010





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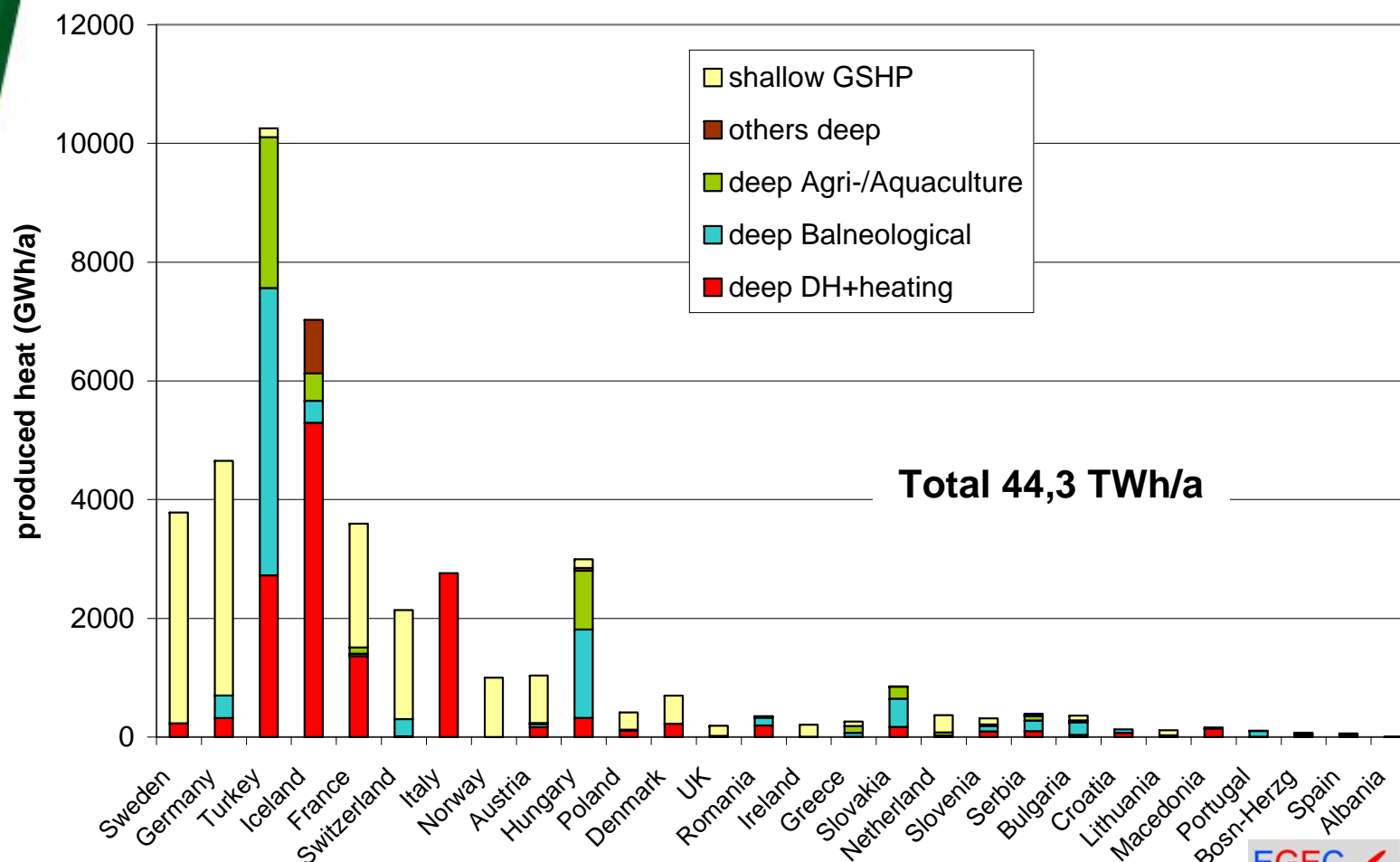
Colabora:  
acluxega

Organiza:  
Servizo para o Plan de Calor Urbano de Galicia  
Servizo de Edificación

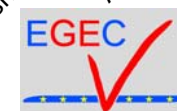
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## Geothermal Energy Use for Heat in Europe



Produced heat, after data from WGC 2010





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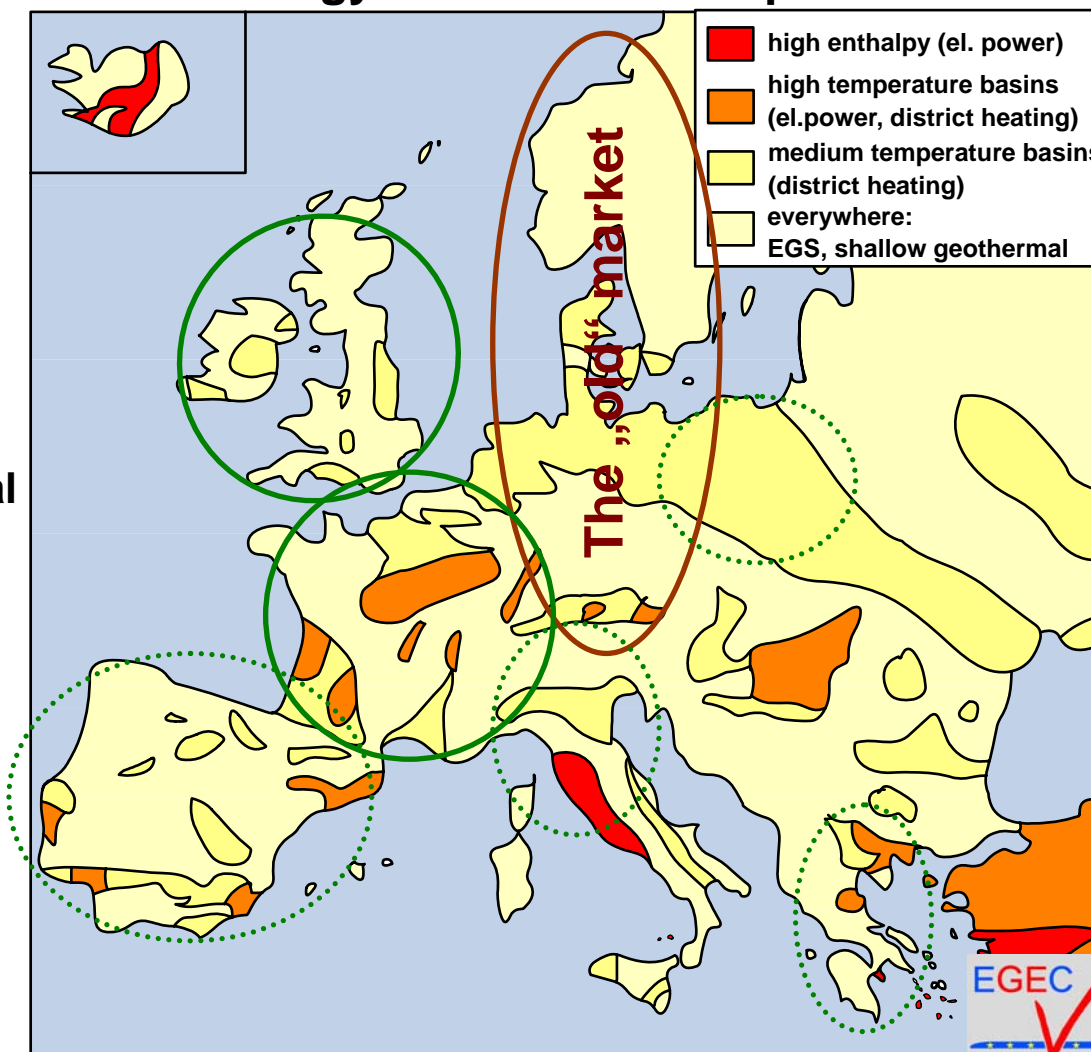
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## Shallow Geothermal Energy: Markets in Europe

Map showing main basins and high-enthalpy geothermal areas

New growth regions for Geothermal Heat Pumps (Ground Source Heat Pumps, GSHP) in Europe





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## All material for GSHP today available from manufacturers

Borehole heat  
exchanger  
(BHE, right)



Material for BHE  
and grouting on  
site (below)



Austria

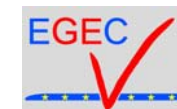


France



Germany

Brine-water  
heat pumps





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## Subsurface investigation for planning: TRT-equipment in various countries

Germany



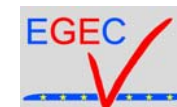
Finland

Sweden



Greece

Spain





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## Drilling equipment in various countries



Germany



Portugal



Hungary



Switzerland



Sweden



Romania





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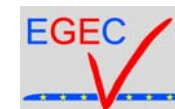
## EU Policy related to Shallow Geothermal Systems



### Directives:

**EU Directive 2009/28/EC  
on the Promotion of Renewable Energy Sources**

**EU Directive 2010/31/EC  
on the Energy Performance of Buildings**





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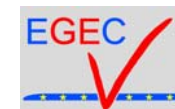
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## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources



- 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
- European Parliament decision on amendments in ITRE committee in September 2008
- Agreement between EP, Council and Commission in December 2008
- Published in OJ in June 2009
- Member States had to submit National Renewable Action Plans (NREAPs) by end of June 2010





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## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources



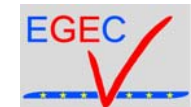
### Definitions:

#### Art. 2:

- (a) “energy from renewable sources” means renewable non-fossil sources, namely wind, solar, **geothermal**, aerothermal, hydrothermal and ocean energy, hydropower, biomass, snow, landfill gas, sewage treatment plant gas and biogases;
- (c) “**geothermal energy**” means energy stored in form of heat beneath the surface of solid earth;

en castellano:

- (c) «*energía geotérmica*»: *la energía almacenada en forma de calor bajo la superficie de la tierra sólida;*





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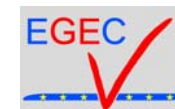
## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources



### Inclusion of shallow geothermal:

#### Art. 5.4:

Aerothermal, **geothermal** and hydrothermal heat energy **captured by heat pumps** shall be taken into account for the purposes of paragraph 1(b) provided that the final energy output significantly exceeds the primary energy input required to drive the heat pumps. The quantity of heat to be considered as energy from renewable sources for the purposes of this Directive shall be calculated in accordance with the methodology laid down in Annex VII.





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## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources



### Inclusion of shallow geothermal:

#### Annex VII:

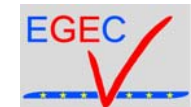
Heat pumps must fulfill the criterion:

$$SPF > 1,15 * 1/\eta \quad (\eta \text{ is the electricity production efficiency per country})$$

Then all energy from the ground to the system is counted:

$$E_{RES} = Q_{usable} * (1 - 1/SPF)$$

(SPF and  $\eta$  have to be determined by EC / Eurostat)





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## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources

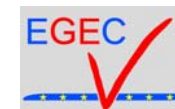


### Licensing procedures:

#### Art. 13.1:

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 governing authorisation, certification and licensing are objective, transparent, proportionate, do not discriminate between applicants and take fully into account the particularities of individual renewable energy technologies;





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## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources

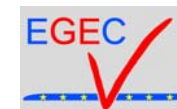


### Licensing procedures:

#### Art. 13.1:

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

- (e) administrative charges paid by consumers, planners, architects, builders and equipment and system installers and suppliers are transparent and cost-related;
- (f) simplified and less burdensome authorisation procedures, including through simple notification ... are established for smaller projects and for decentralised devices for producing energy from renewable sources, where appropriate.





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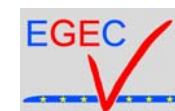
## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources



### Training and certification:

#### Art. 14.3:

Member States shall ensure that certification schemes or equivalent qualification schemes become or are available by 31 December 2012 for installers of small-scale biomass boilers and stoves, solar photovoltaic and solar thermal systems, **shallow geothermal systems** and heat pumps.





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## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources



### Training and certification:

- For a sustainable market, quality of material and services is paramount
- To guarantee the necessary knowledge and skills, training and certification has to be established
- Some countries have national schemes:

Switzerland



Germany

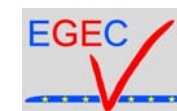


Sweden



Geo-Education  
for a sustainable geothermal  
heating and cooling market

The new project GEOTRAINET (supported by IEE / EU) aims at providing harmonised material and curricula





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do Consello Insular  
de Pontevedra

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## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources



Training and certification:  
**GEOTRAINET**

Coordinator EFG,  
in cooperation with EGEC

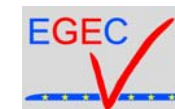
Partners are associations,  
research centers and  
universities

Good coverage of EU  
member states



Geo-Education  
for a sustainable geothermal  
heating and cooling market

Network of further  
contacts, from Portugal  
to Estonia and from  
Iceland to Greece





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Servizo de Saúde

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## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources



Training and certification:  
**GEOTRAINET**

First course June 2009  
in Uppsala, Sweden,  
last course 24.-26. Jan.  
2011 in Brussels, Belgium

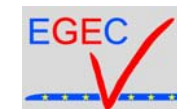
Final conference on  
27.1.2011 in Brussels

Training activities shall  
continue, national actors



Geo-Education  
for a sustainable geothermal  
heating and cooling market

[www.geotrainet.eu](http://www.geotrainet.eu)





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## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources



The main tool for national actions: NREAPs

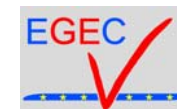
Currently 23 of 27 NREAPs submitted  
(missing are Belgium, Estonia, Hungary and Poland)

Spain has submitted a very well prepared and conclusive  
action plan, very ambitious and with good coverage of  
geothermal



IDAEE Instituto para la  
Diversificación y  
Ahorro de la Energía

### PLAN DE ACCIÓN NACIONAL DE ENERGÍAS RENOVABLES DE ESPAÑA (PANER) 2011 - 2020





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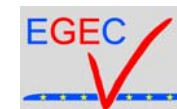
## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources



### The Spanish NREAP

#### Medidas específicas en el sector geotérmico

1. *Desarrollo de programas de ayudas y reducción de riesgo para las actividades de las fases de exploración e investigación, necesarias para la evaluación del recurso de un proyecto geotérmico*
2. *Desarrollo e implementación de un modelo formativo y de certificación en los diferentes ámbitos de la geotermia*
3. *Promover la mejora del conocimiento del subsuelo para la evaluación del potencial geotérmico y detección de zonas favorables*





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Institución de Galicia

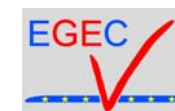
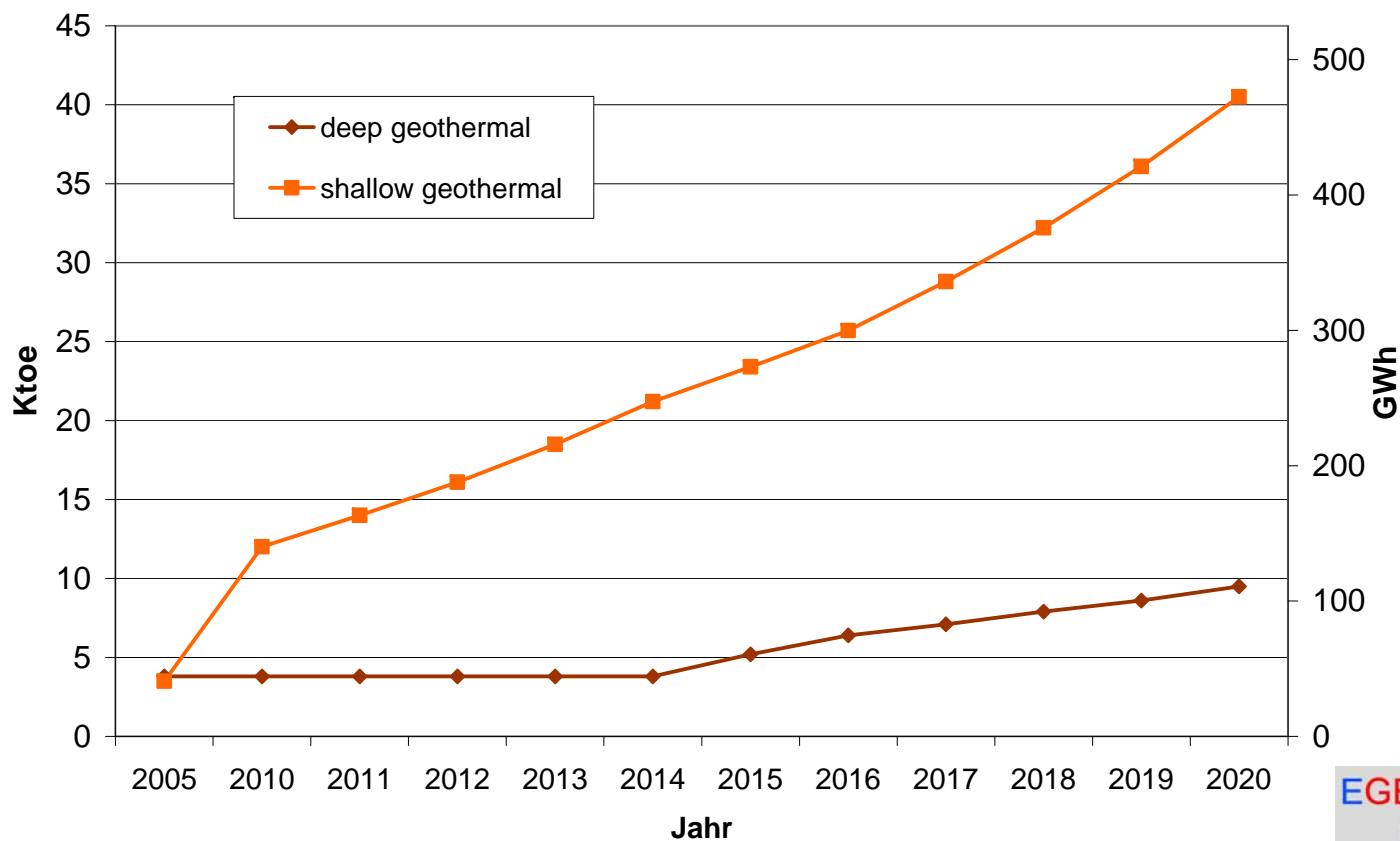
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## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources



### The Spanish NREAP





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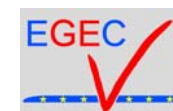
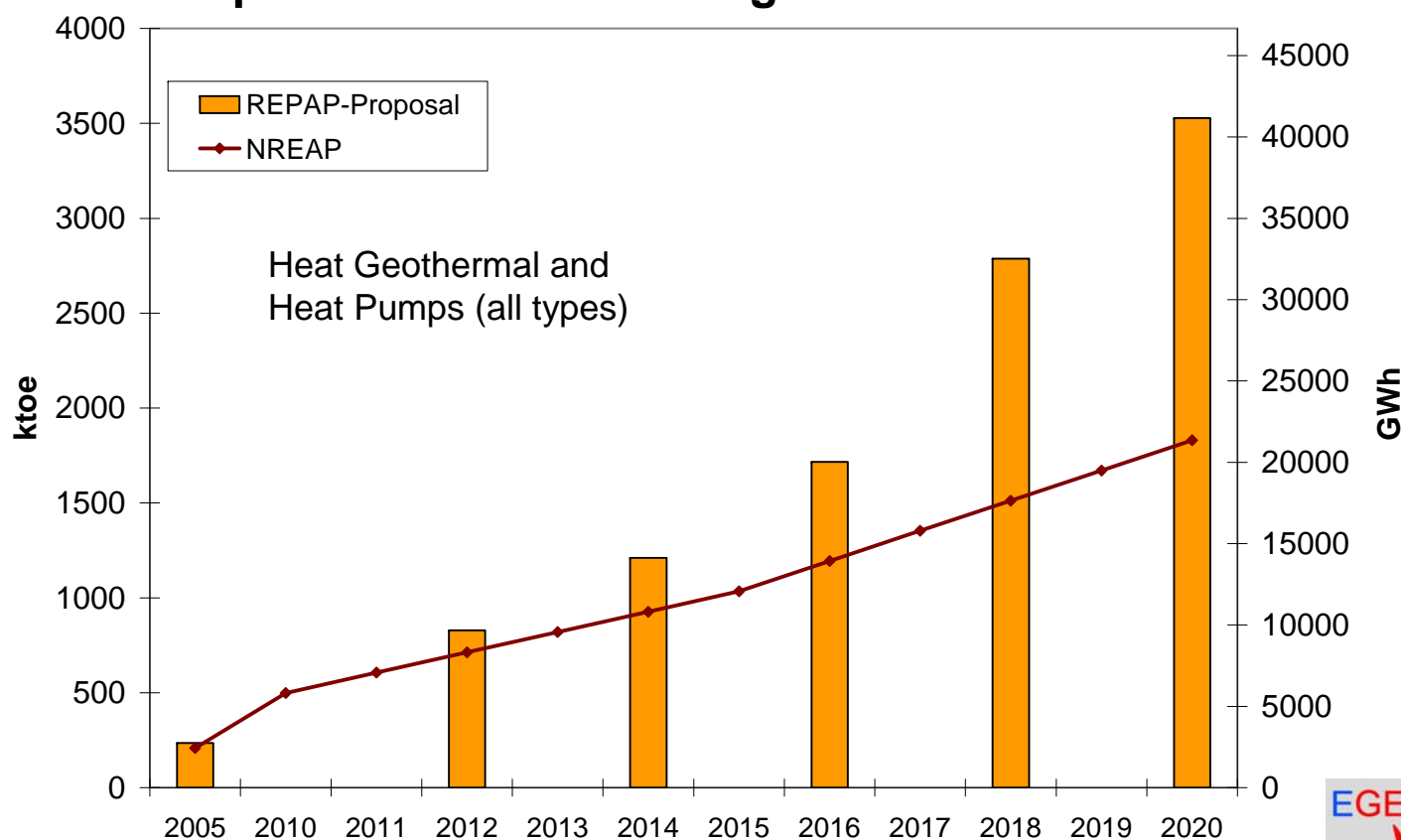
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## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources



### Example: Geothermal heating in the German NREAP





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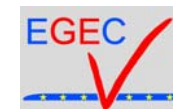
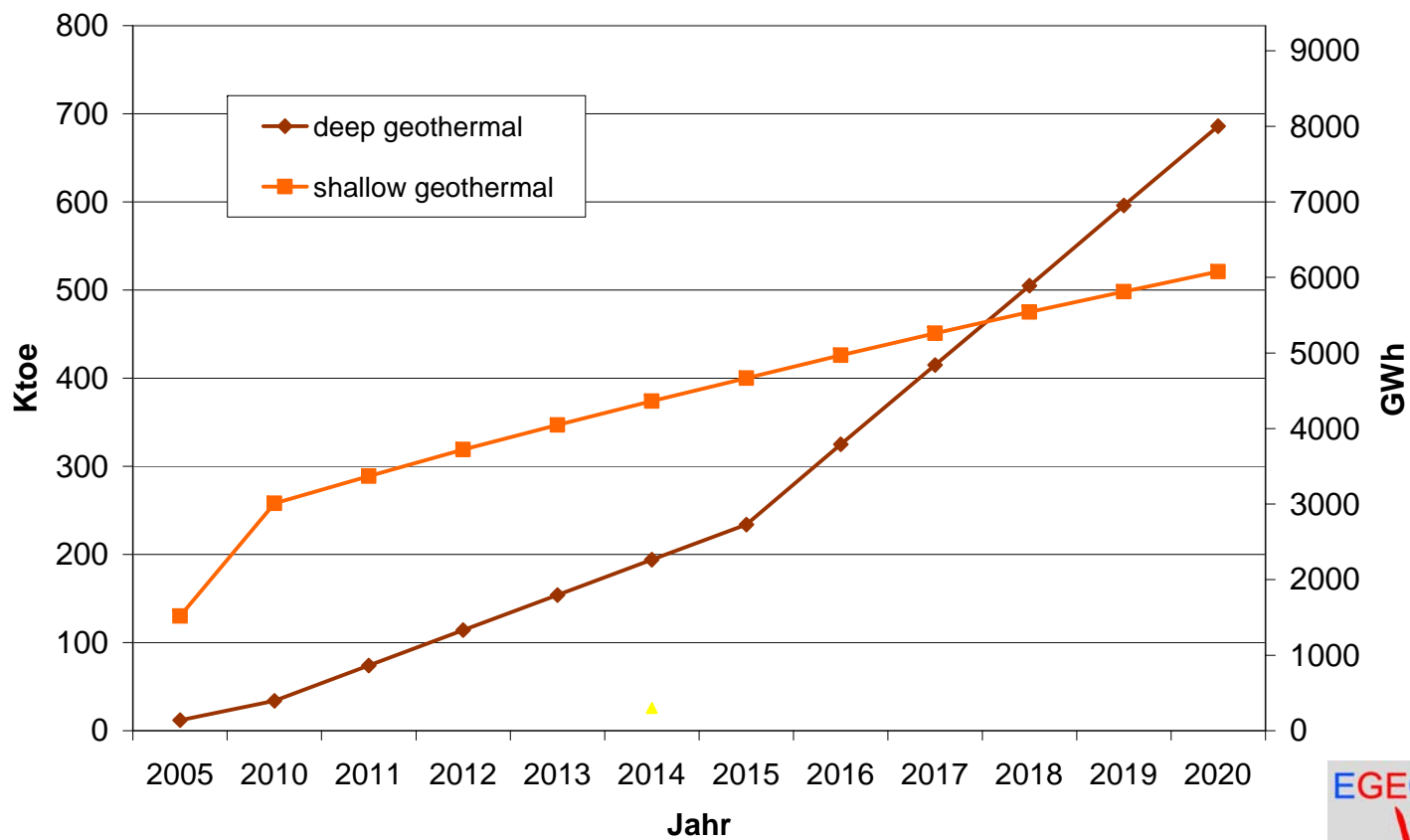
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## EU Directive 2009/28/EC on the Promotion of Renewable Energy Sources



### Example: Geothermal heating in the German NREAP





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## EU Directive 2010/31/EC on the Energy Performance of Buildings



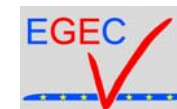
- in Art. 2, the definition of renewable energy sources from directive 2009/28/EC is repeated.

- In Art. 6 is stated:

For new buildings, Member States shall ensure that, before construction starts, the technical, environmental and economic feasibility of high-efficiency alternative systems such as those listed below, if available, is considered and taken into account:

...

- (c) district or block heating or cooling, particularly where it is based entirely or partially on energy from renewable sources;
- (d) heat pumps.





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e o Cambio Climático  
Ministerio de Xustiza

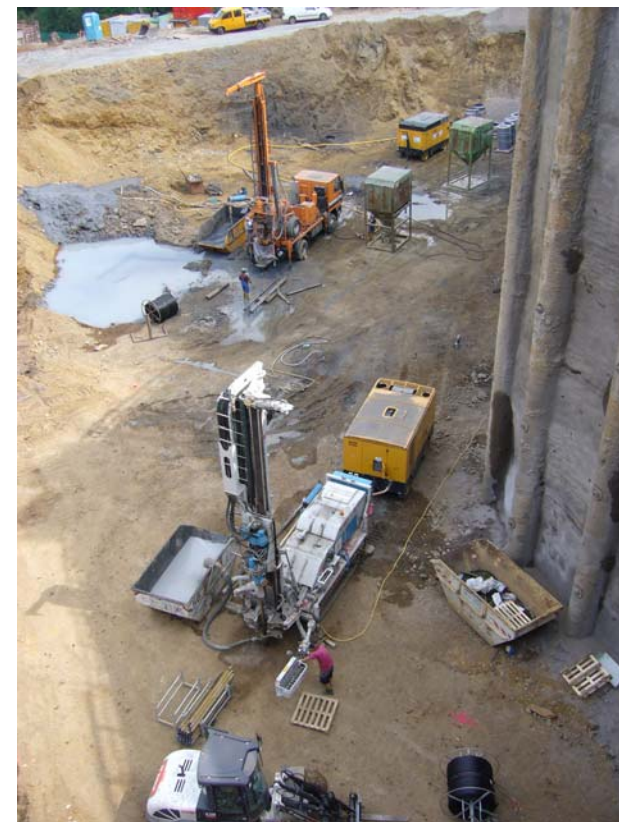
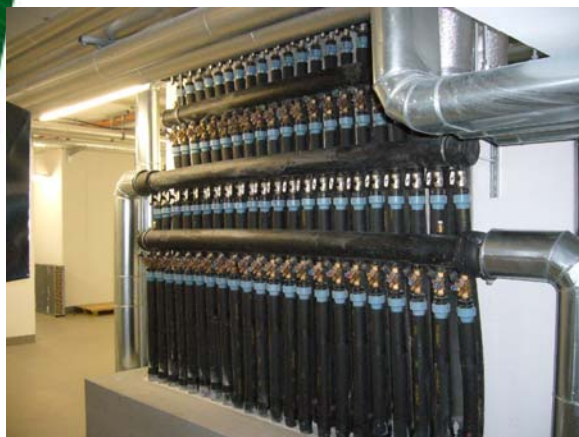
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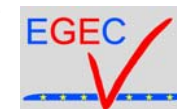
## Large GSHP projects



**Heat pump and  
BHE manifold  
for county  
administration  
Gelnhausen  
(86 BHE)**



**Drilling in granite for  
educational centre**





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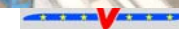
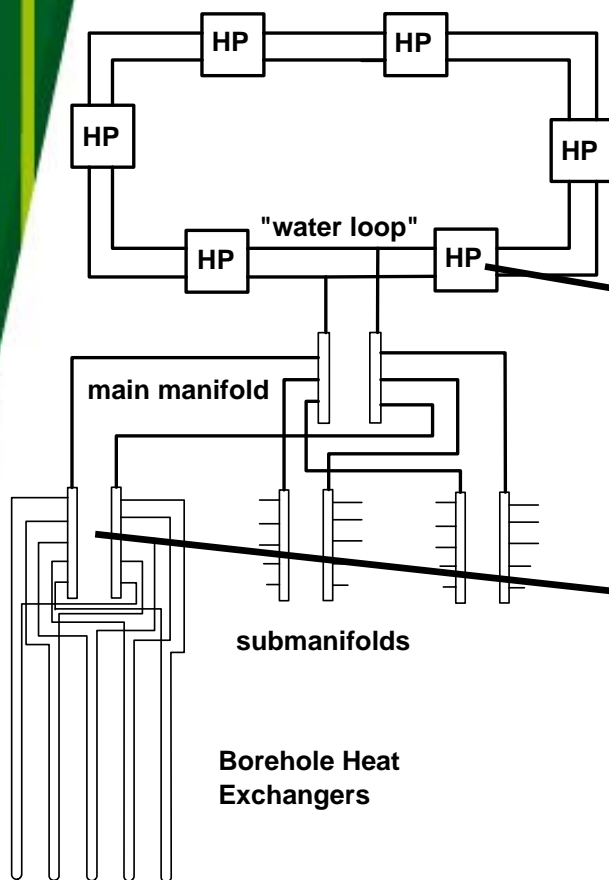
Colabora:  
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Organiza:  
Instituto para o Patrimonio e a Cultura  
Instituto de Investigación e Tecnoloxía

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## Large GSHP projects Ümraniye Meydan Shopping Center (Metro), Istanbul





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**Thank you for your attention!**

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Organiza:

