

Geothermal Energy & the EU

Morgan Biggar, Pablo Felipe & Sara Sahin



What is geothermal energy?

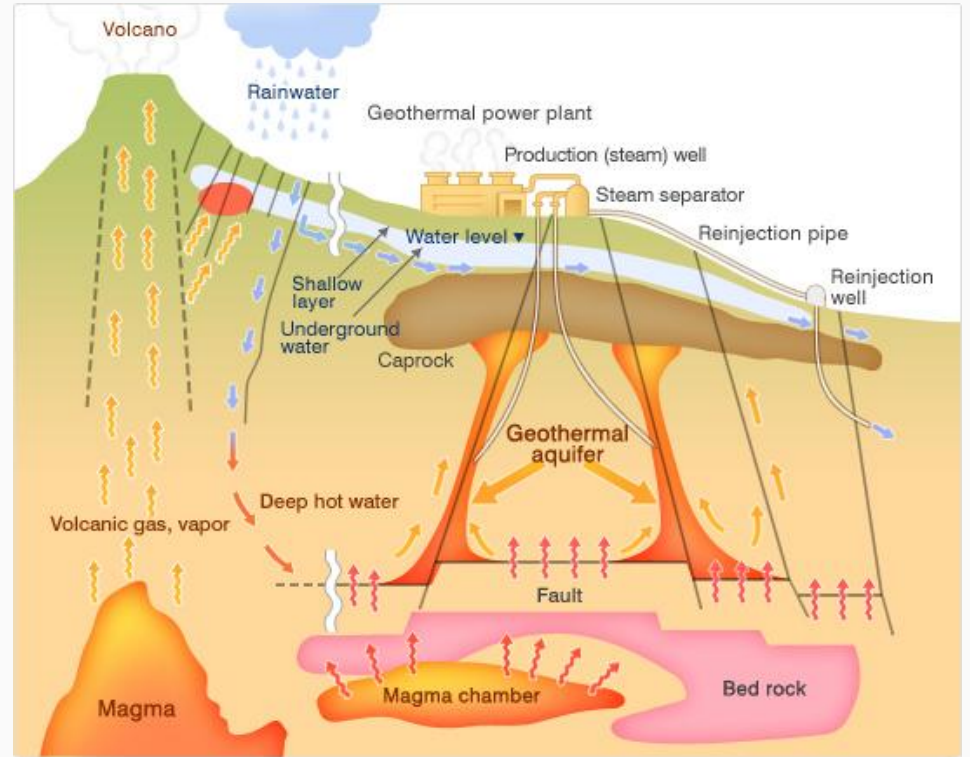
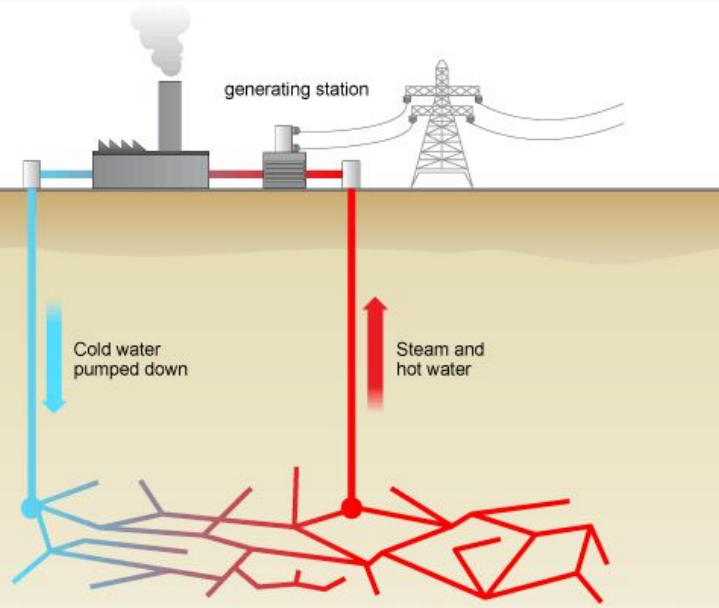
Energy from the Earth's
Rocks & Water at the surface
& several kilometres below

Limitless Resource



Leukerbad springs, Iceland

Geothermal plants



Advantages

- Renewable Energy
- No Fuel Costs
- No Harmful polluting gases are produced
- Not susceptible to price fluctuation (like crude oil)
- Most “green” type of energy (no combustion)
- Lifetime costs lower

Disadvantages

- Not available everywhere
- Initial costs very high
- Extreme drilling is necessary to access the resources
- Maintenance requires extreme care
- Cannot transport the energy

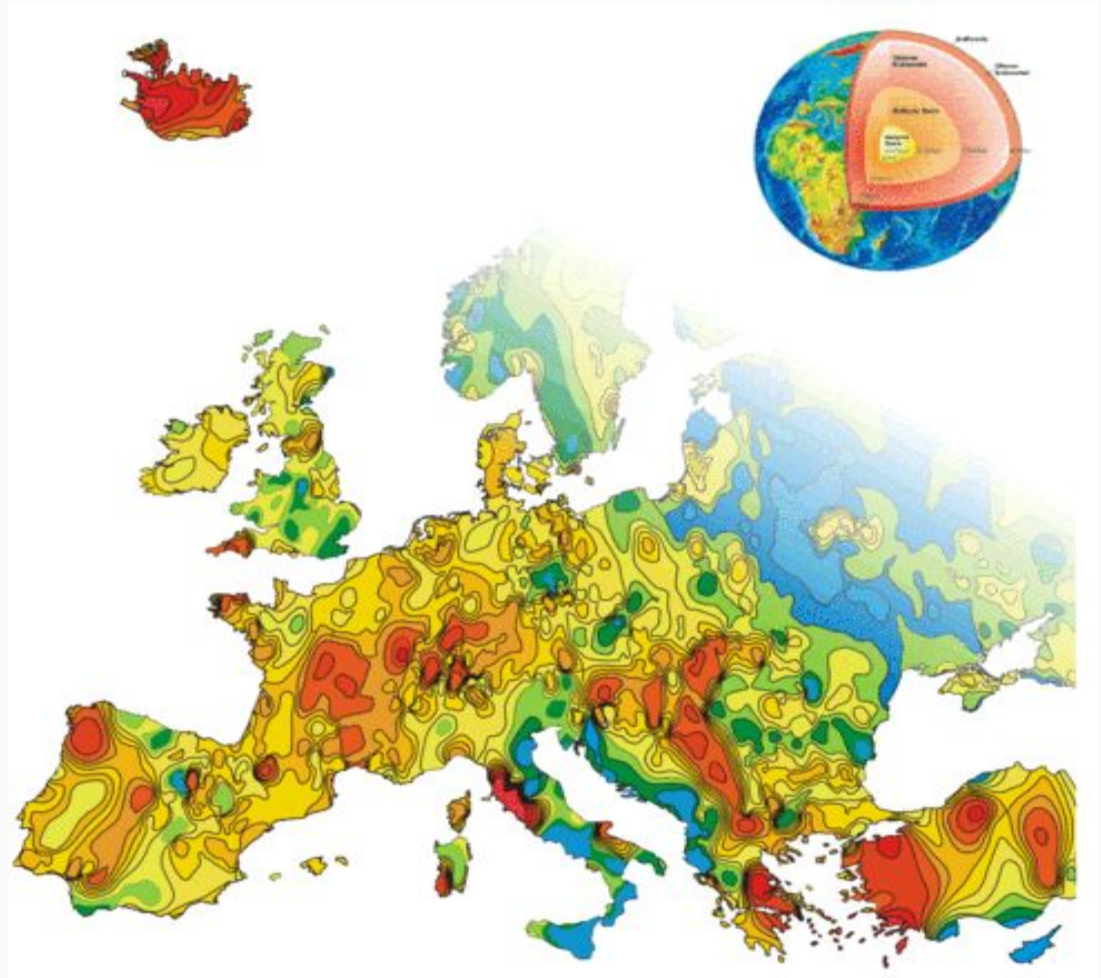
JRC Geothermal Energy Status Report (2014)

- Report provided by **JRC Science Hub** (Joint Research Center)
- The **European Commission's in-house science service**
- States that geothermal projects receive only a **small share of public financial support** from EU & Member States compared to other renewables
 - Geothermal industry still relatively small
 - Market dominated by a few large industrial corporations
 - e.g. Mitsubishi, Ormat, Fuji



Geothermal Energy Resources in Europe

- Limited hydrothermal resources
- Market share of geothermal power in Europe: <2 %
- **Growth of this market uneven** among EU member states
- Cannot be explained by the distribution of natural resources
- **75 % of all geothermal heat pumps installed in 3 EU countries!**
- Sweden, Germany, France



Actions taken

- European Geothermal Congress 2013 in Pisa, Italy
- European Geothermal Congress 2016 in Strasbourg, France
- Most recent event: Geopower & Heat Summit

GeoPower Global Congress 1-2 December in Istanbul, Turkey



GeoPower Global Congress

- First sentence on official website:

“Capitalise on new opportunities around the world”

- **Focus** does not lie on the importance/ potential of the energy source itself
- Does **not** mention benefits for environment/ humans/ the planet/ our future
- **But:** How can we access new markets & make money out of new opportunities

Future Prospects

- The capacity of the geothermal power sector is expected to reach 1 GW in 2020 and 1.3 GW in 2030.
- The estimated maximum potential for geothermal power in the EU-27 is up to 6 GW by 2020 and 8 GW by 2030.
- This represents about 1% and 1.3% of projected EU gross electricity consumption by 2020 and 2030 respectively.
- The geothermal sector is expected to grow, especially in South East Asia and Latin America, but it is unclear by how much.

Funded Projects

- The project started in 2004 and has so far resulted in the creation of three 5 000 m deep wells using improved drilling, simulation and diagnostic methods.
- The project will culminate in the installation and operation of a 1.5 MW geothermal power plant, situated along the French-German border in Soultz-Sous-Forêts.

European Geothermal project for the construction of a scientific pilot plant based on an Enhanced Geothermal System (EGS Pilot Plant)



Environmental Impacts

- Surface disturbances (access roads, pipe and power lines, plant associated land use);
- Physical effects (effect of fluid withdrawal on surface manifestations, land subsidence, induced seismicity, visual effects due to structures)
- Noise (during drilling, construction and operation);
- Thermal pollution (hot liquids and steam released from discharging boreholes and the power plants)
- Chemical pollution (disposal of liquids and solid waste, gaseous emissions, natural radioactivity);
- Impact on protected faunas and floras.

Conclusion - Our opinion

- Very difficult to find figures on current status of geothermal power
- Does that mean there is no real (not enough) progress?
- Other renewables attract more attention, as they are cheaper alternatives
- The level of market opportunity for the EU industry in emerging and developing countries remains unclear