Danube Region geothermal concept „DanReGeotherm”

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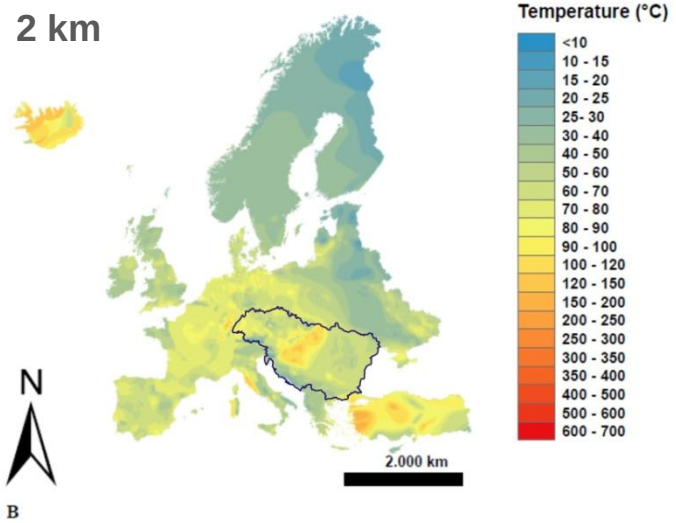
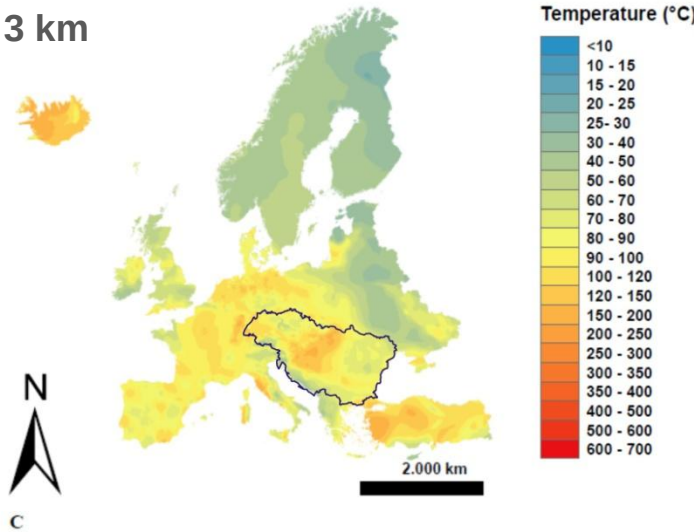
Workshop on the Danube Region geothermal concept, November 28, 2013, Budapest

Why? The geothermal potential of the Danube Region is very good

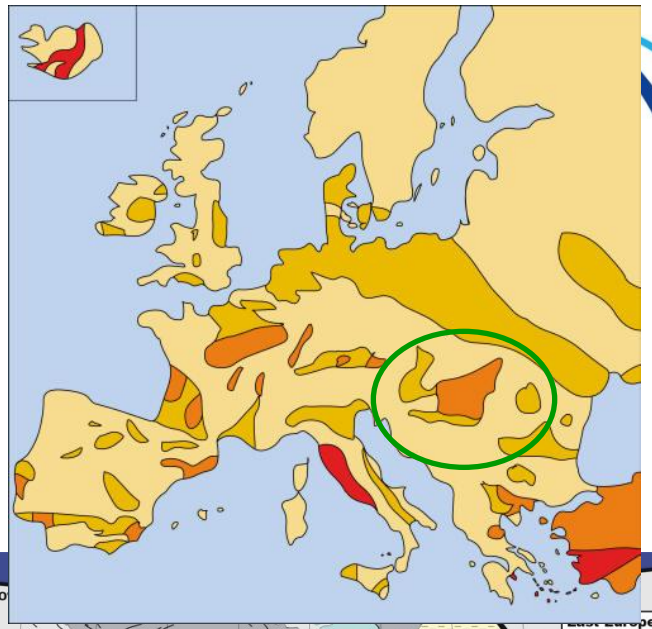
2 km

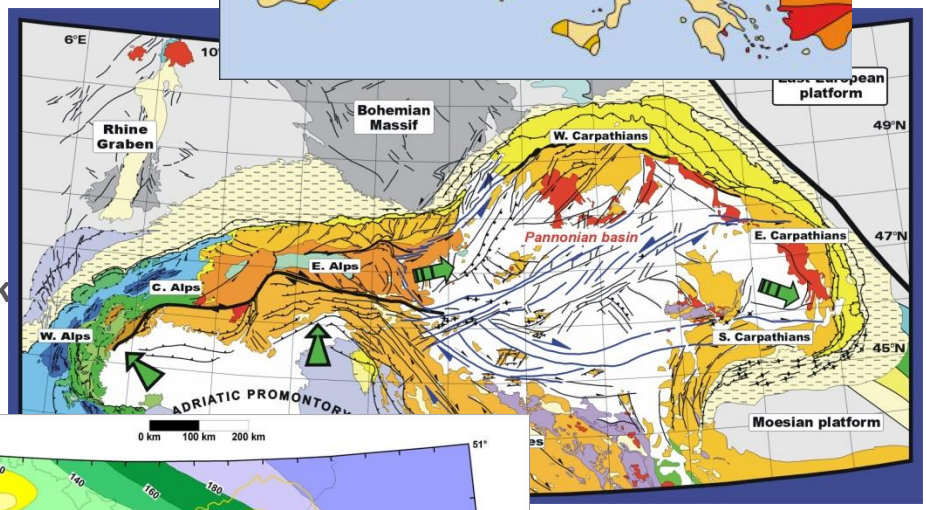


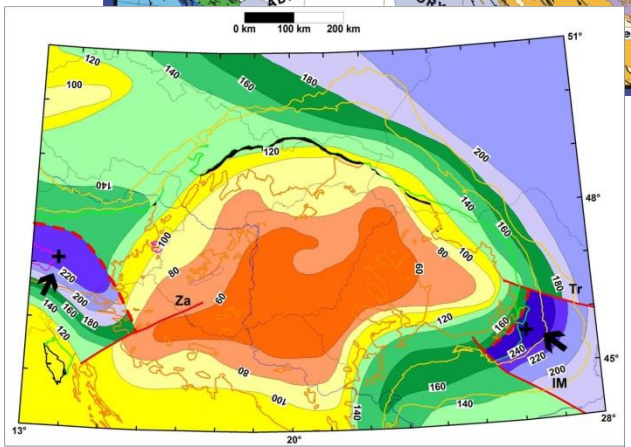
3 km



4 k

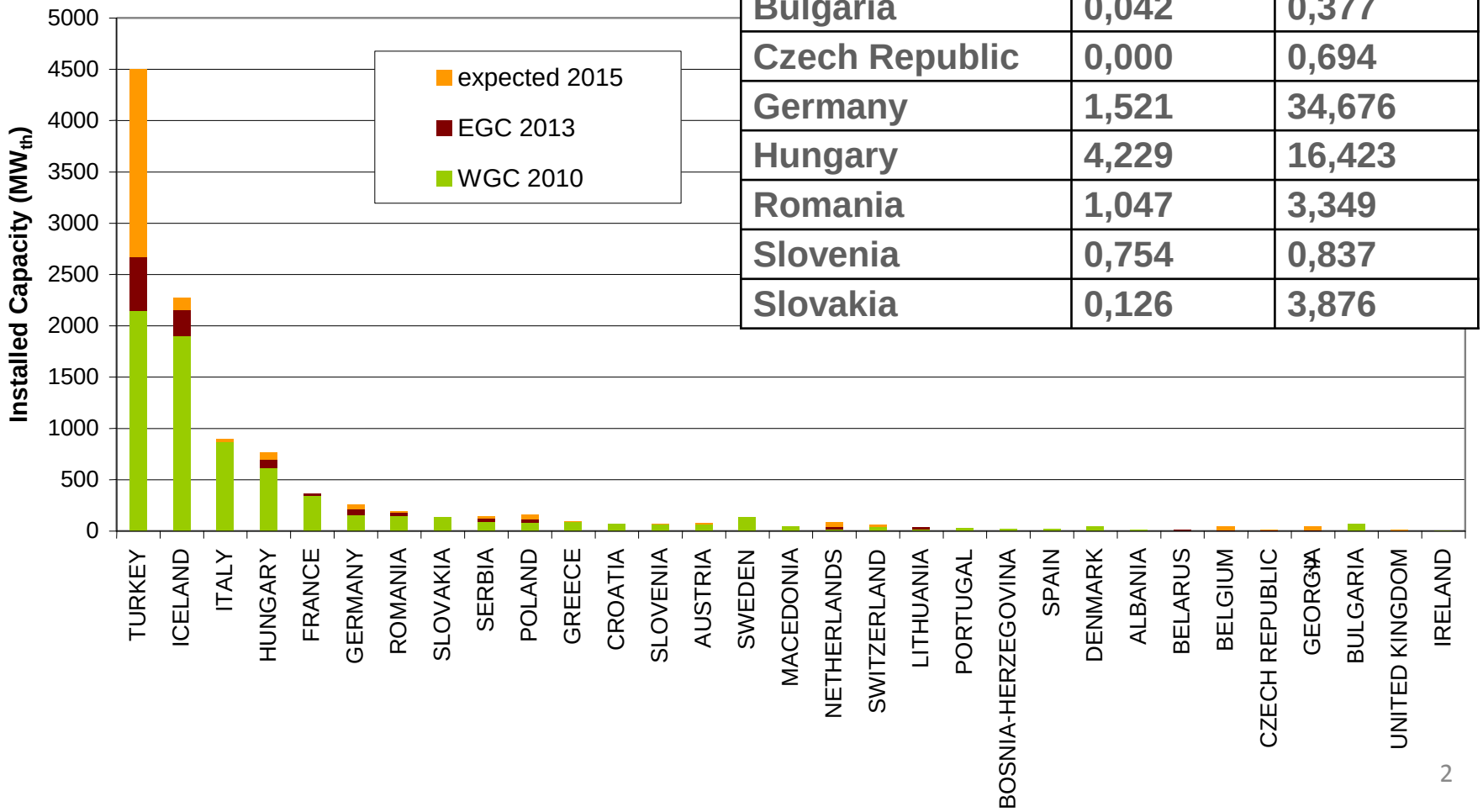






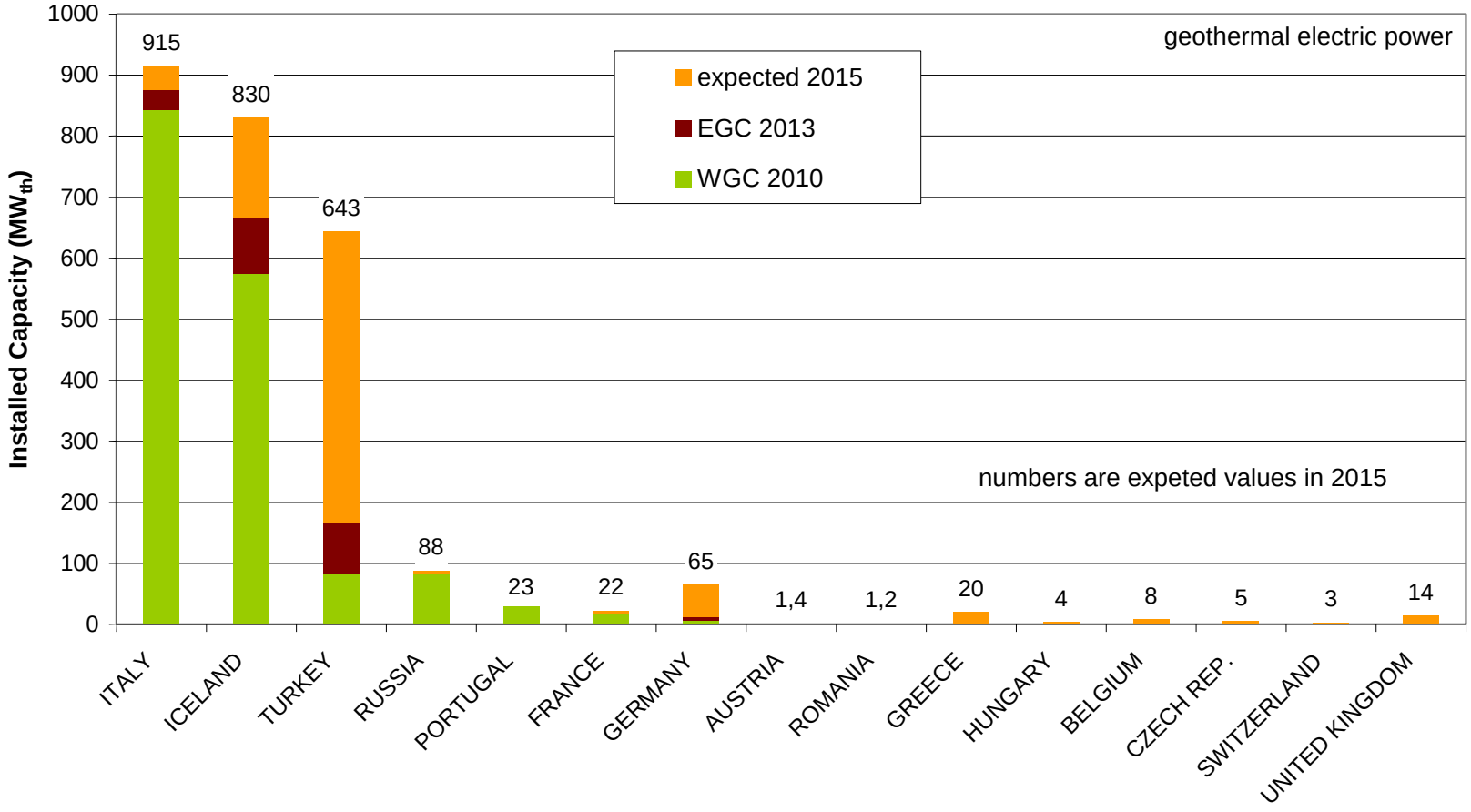
Why? Many DR countries advanced utilization and ambitious NREAP targets

INSTALLED CAPACITY IN GEOTHERMAL DIRECT USE IN EUROPE



	Geothermal energy in NREAP (PJ)	
Country	**2010**	**2020**
Austria	0,803	1,682
Bulgaria	0,042	0,377
Czech Republic	0,000	0,694
Germany	1,521	34,676
Hungary	4,229	16,423
Romania	1,047	3,349
Slovenia	0,754	0,837
Slovakia	0,126	3,876

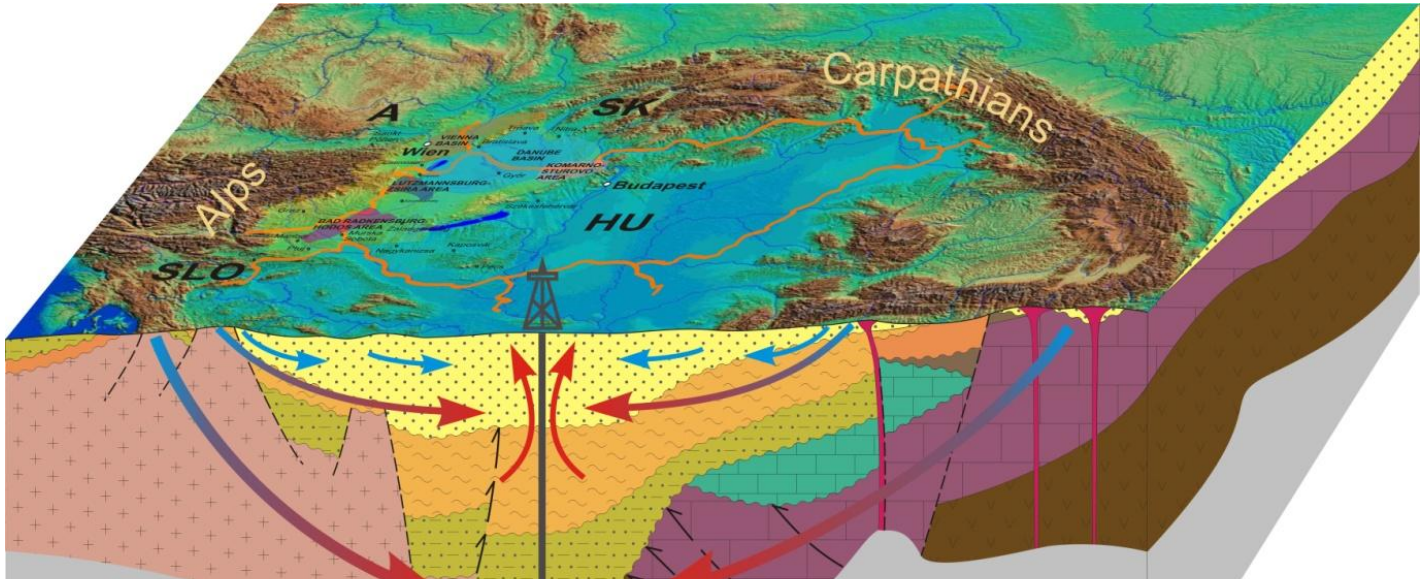
INSTALLED GEOTHERMAL POWER IN EUROPE 2010-2015



Why? Transboundary issues

Exploitation of geothermal energy = abstraction of thermal groundwater

Geothermal reservoirs do not stop at state borders: majority of the users exploit the same aquifers in the transboundary regions without harmonized management strategies between the neighbouring countries



Recommended project for 2014-2020 „DanReGeotherm" Main aims

- ✓ **Raise the awareness on the untapped** deep geothermal energy **potential** of the region
- ✓ Provide scientifically based information on the available resources, current utilizations and technical and non-technical barriers → **attrack investors to the region**
- ✓ Information should be organized into a **joint geothermal information platform** (INSPIRE compliant)
- ✓ **Policy recommendations** (national, trans-national and EU) for the enhanced utilization of geothermal energy
- ✓ Preparation of the **non-EU** members for the adaption and implementation of relevant EU directives (WFD, RES, INSPIRE)

Phase 1 – establishment of a project consortium and basic concepts in 2013

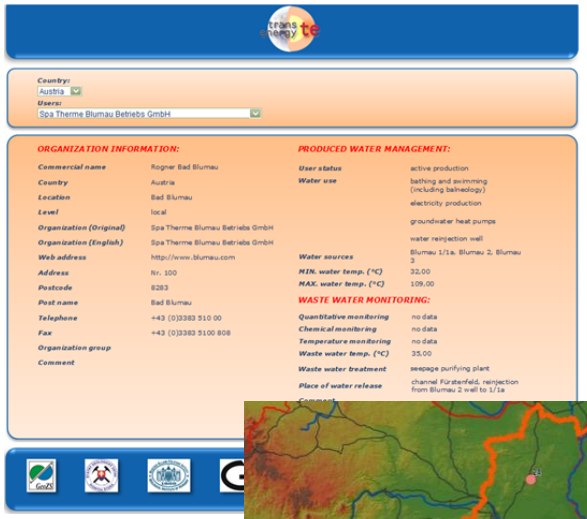
Phase 2 – application and execution of the project from 2014 onwards supported by the funds of the 2014-2020 Multiannual Financial Framework.

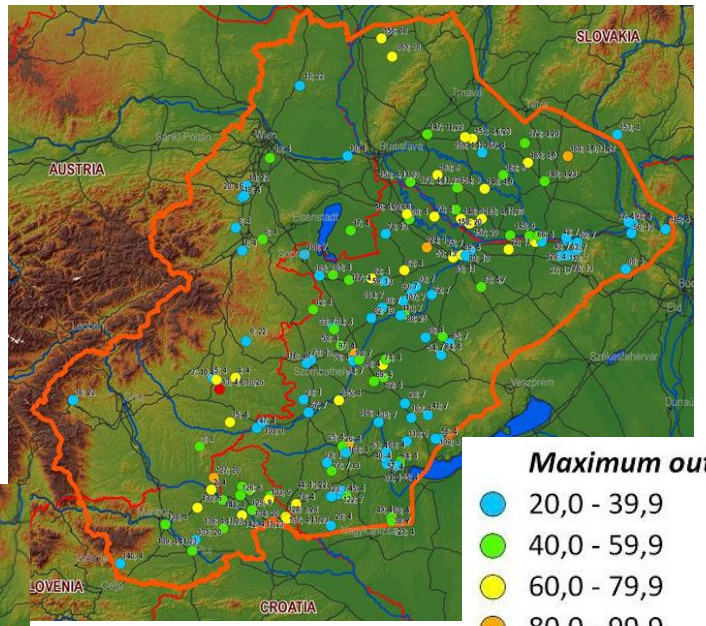
Phase 1 activities

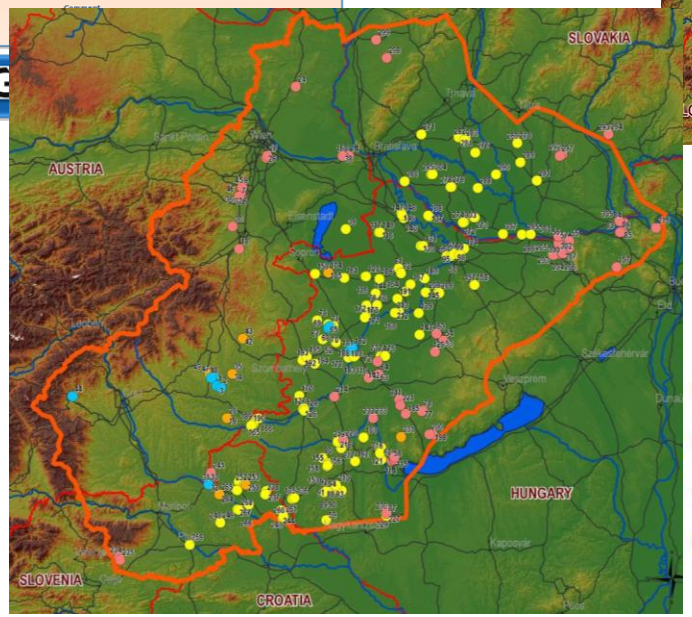
Task	Output	Expected delivery*
Preliminary overview of EUSDR countries' geothermal profile based on literature studies	"State of the art" report: selection of countries to be involved, preliminary overview on their geothermal condition	September 15
Searching for partners in each participating country (based on EUSDR PA2 Steering Group) with an additional focus on governmental institutions.	Contact list	October 18
Organizing a workshop: introduction of the "State of the art" report, joint discussion of a project concept	Workshop: Establishment of a project consortium, elaboration of basic project concept	November 28
Complementing the "State of the art" report with outcomes of the workshop, and assessment of country profiles based on processing of infilled questionnaires, amend project concept	Feasibility study for a Danube Region Geothermal project	December 15
Discussion with EC, launch for call	Consultation in Brussels	2014?

Suggested main project activities

1. Overview and database of current utilizations for the entire DSR complemented with specific information required by benchmark evaluation) (c.f. TRANSENERGY)







Maximum outflow temperature (°C)

- 20,0 - 39,9
- 40,0 - 59,9
- 60,0 - 79,9
- 80,0 - 99,9
- 100,0 - 110,0

Main geothermal aquifer

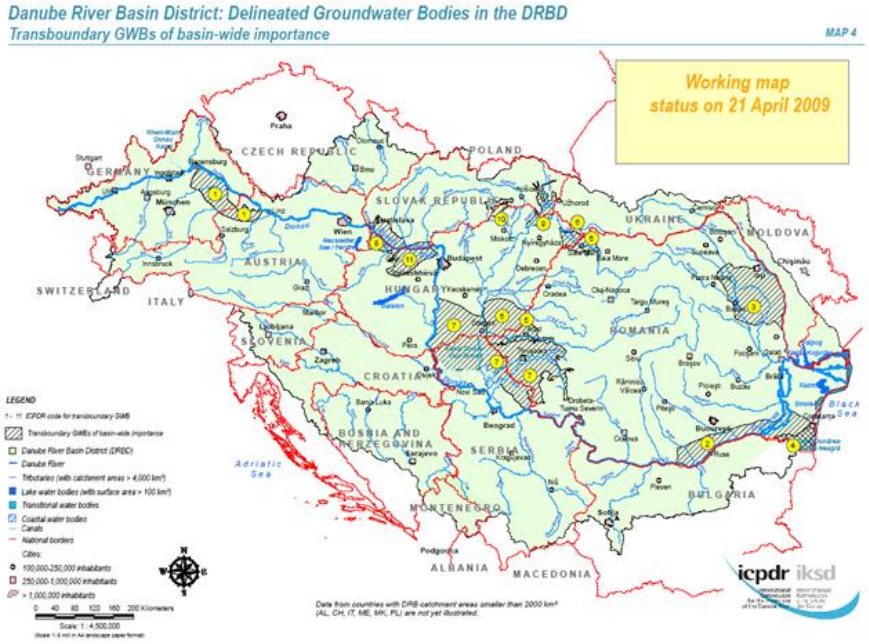
- M6-M7 clastic rocks and sediments
- M4-M5 clastic rocks and sediments
- MZ carbonate rocks
- PZ carbonate rocks

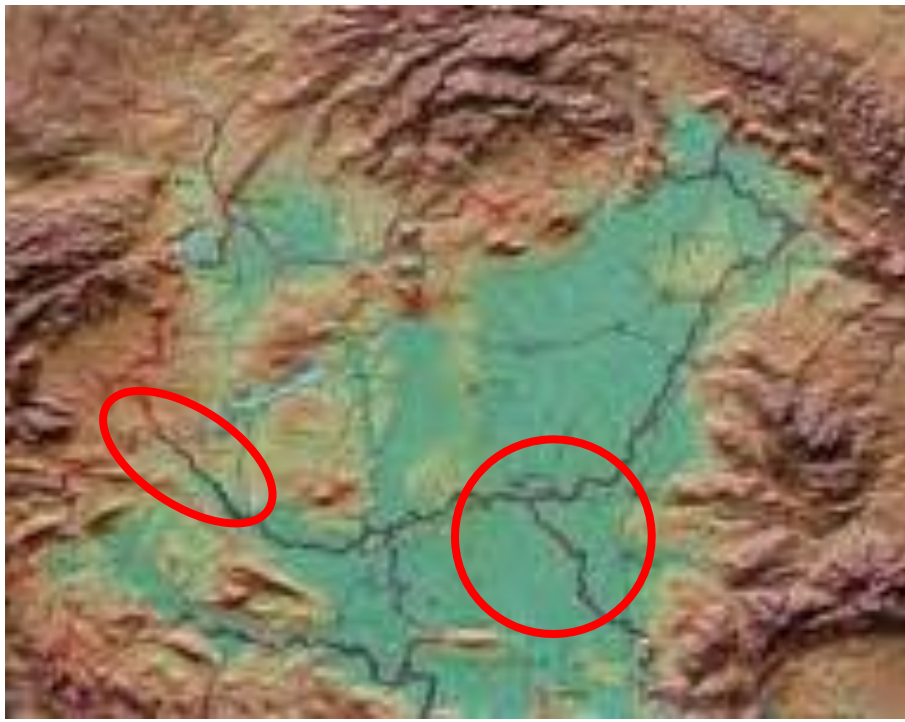
Suggested main project activities

2. Detailed hydrogeothermal models (based on harmonized joint database) on selected cross-border pilot areas (transboundary issues)

Suggested areas:

1. **Drava basin (SLO-HR-HU),**
2. **SE-Pannonian basin (RO-SRB-HU / HR-BH)**





Web-based visualization of results (interactive portal, WMS)

Where and which depth are the most important potential reservoirs?

GEOLOGICAL MODEL

How much thermal water can be abstracted which has natural recharge? (quantify free water resource)

To which extent abstraction can be increased without threatening environmental targets ? Impacts?

HYDROGEOLOGICAL MODEL

Which are the main flow-directons? Any cross border? Water-budgets among the main aquifers?

Chemical composition of thermal waters: Gases, dissolved content that might restrict utilization (scaling, corrosion)? Can associated gases be utilized? Is water treatment necessary?

HYDROGEOCHEMICAL INVESTIGATIONS

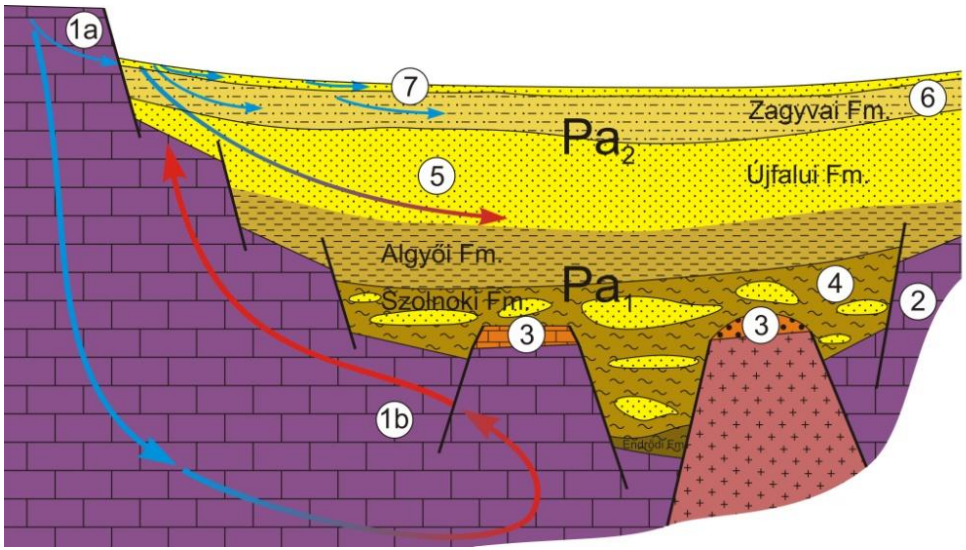
What is the temperature at certain depths? How much heat is available (resources, reserves)? What sort of utilizations are feasible?

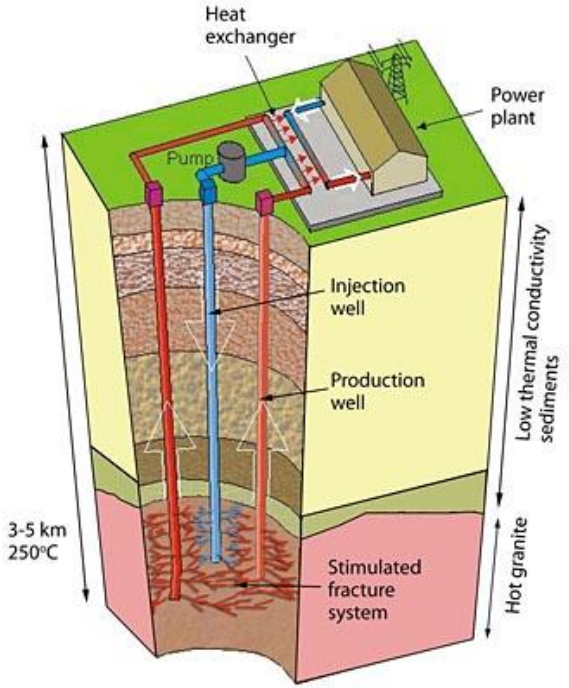
GEOTHERMAL MODELS

Suggested main project activities

3. Technical barriers:

- Re-injection into porous aquifers („Pannonian”)
- Environmental costrains of EGS (hydraulic fracturing, induced seismicity, interactions with groundwaters)





Suggested main project activities

4. Non-technical barriers:

- Legal framework
- Financial incentives

SLO	HU	AT	SK
With water abstraction: Environmental Ageny of Slovenia (ARSO)	Above 2500 m (with water abstraction): green authorities (also as valid permission for utilization of geothermal energy)	Local: < 5l/s State authorities: > 5l/s Transboundary: Federal Ministry of Agriculture, Forestry, Environment and Water Management	Hydrogeological Commission of Ministry of Environment : approval for water sources, advisory authority for the minister Licence: Regional Environmental Office
On water protection area, or for drillings deeper than 30 m	Below 2500 m: concession Mining Inspectotae Abstraction of thermal water: based on water licence issued by green authority	On water protection areas: water licence	Reporting to Inspectorate of Spas and Springs (under Ministry of Health) in case of: T>20 C TDS>1000 mg/l CO_2 >1000 mg/l H_2S >1 mg/l

Thank you for your attention!

DISCUSSION OF PROJECT IDEAS IN THE AFTERNOON

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