UTILIZATION OF GEOLOGICAL FORMATION FOR ENERGY AND STORAGE PURPOSES

The subsurface area, the range of technologically achievable depths of the earth's crust, is affected by several energy production and storage, raw material mining, waste and pollutant disposal processes. The media used in the technological processes (gas, liquid and solids) cause reversible and non-reversible changes from the intact condition: chemical, physico-chemical, geochemical, etc. of the geological formation.

Perhaps the most significant challenges of our time are climate change, security and stability of energy supply, protection of drinking water resources, decarbonisation efforts, and responsible management of mineral resources. All this induces a rethinking of the focus areas of R&D tasks, which require the study of the whole chain process, focusing on achieving the smallest ecological footprint and keeping in mind the social need for sustainable development. One of the basic building blocks of this can be the conscious, environment-oriented, complex and synergistic utilization of the geological formations for energy and storage purposes.

SERVICES

FOR THE ABOVE OBJECTIVES, WE CAN PROVIDE EFFECTIVE SUPPORT BY THE FOLLOWING ACTIVITIES:

- Project generation
- Project preparation
- Compilation and design of special measurement programs and device prototypes (eg performing experiments related to the injection and storage of CH, CO2, H2, heat and other fluids in a formations)
- Creating analog models
- Computer modeling (heat transport, rock mechanical model, utilization and accumulation of precipitation and surface water in underground reservoirs)
- Construction management and supervision
- Investigation of the rock mechanical aspects of the radioactive waste storage formations on the basis of analogous and nuclear-derived rock cores (extreme low permeability test)

TOOLS

- Nano-K – measurement of extreme low permeability
- PermeaMaster – measurement of gas permeability
- LiquiPerm – rock fluid compatibility
- Quantachrome 1200e – measurement of helium porosity
- Pascal 140, Pascal 440 – measurement of mercury injection porosity and pore size distribution
- CorExport Western Atlas – measurement of pore volume compressibility
- Ultra Rock Centrifuge, devices for displacement measurements

REFERENCES

- http://pulse.afki.hu/hu/, PULSE GINOP project, Development of enhanced engineering methods with the aim at utilization of subterranean energy resources
- http://www.afki.hu/geocore.html, GEOCORE geological knowledge center
- In the preparatory phase of the implementation of the MOL Szőreg underground gas storage facility, design and manufacture of a prototype of a model equipment operating in the 180 bar pressure range suitable for testing the physical stability of core samples. Carrying out measurements to determine the stability of core samples and to assess the suitability of the area

MISKOLCI EGYETEM
UNIVERSITY OF MISKOLC

Technológia- és Tudástranszfer Igazgatóság
techtransfer@uni-miskolc.hu

AZ NKFI ALAPBÓL MEGVALÓSULÓ PROGRAM