

28 September 2023

Study visit in Poland

On September 5-7, 2023, a study visit to Poland took place as part of the project "Optimal management of low-temperature geothermal reservoirs – Polish-Icelandic cooperation on reservoir modelling" (GeoModel). The visit was attended by project partners from the Iceland Geological Survey (ÍSOR) and the Mineral Energy and Economy Research Institute of the Polish Academy of Sciences (MEERI PAS).

GeoModel is one of the pre-defined projects co-financed by the European Economic Area Financial Mechanism and Norway Grants under the Environment, Energy and Climate Change Program, 2014–2021. Its goal is to improve the quality of management of low-temperature geothermal resources in Poland and Iceland, and ultimately also in other countries. This will be possible by facilitating access to appropriate reservoir modelling tools and promoting the benefits resulting from regular and careful monitoring of resource exploitation. The project will create tools that will, among others: support calibration of numerical models, enable modelling of heat transport and the flow of highly saline water in reservoirs and will be helpful in calculating parameters achieved at the outflow from wells (at wellheads). Moreover, outputs from GeoModel will be useful in supporting decision-making processes regarding the optimal location of next geothermal wells. The developed computational tools will be tested on real data from monitoring geothermal systems in Poland and Iceland.

On the first day of the study visit (5 September), a conference dedicated to the GeoModel project was held in Krakow. It was attended by partners, as well as representatives of scientific and research institutions from Poland and the Polish Geological Institute.



On September 6, representatives of ÍSOR and MEERI PAS visited the Carpathian Branch of the Polish Geological Institute – National Research Institute in Krakow. The guests were welcomed and the meeting started by Dr. Eng. Izabela Laskowicz – director of the Carpathian Branch. A historical outline of the Institute, current activities and research conducted by the State Geological Survey and the State Hydrogeological Survey were presented. The guests also had the opportunity to familiarize themselves with the museum collections of the Carpathian Branch of PGI-NRI.



On the last day (September 7), a technical visit to Podhale (South Poland) was organized by the MEERI PAS team. Guests from ÍSOR were introduced to the installations of the Geothermal Laboratory of MEERI PAS in Bańska Niżna. The laboratory has been operating since 1993, being the first installation of this type in Poland. The purpose of its establishment was, among others, conducting research on the comprehensive use of

geothermal heat for various purposes in Poland, assuming gradual (cascade) heat recovery (space heating, domestic hot water preparation, wood drying, breeding of thermophilic fish and greenhouse farming). Some of these methods of using geothermal heat are still in use today. In the center of the Laboratory is Bańska IG-1 well (5261 m deep), drilled in 1979–1981. This well was the basis for launching the first geothermal heating installation in Poland used for space heating (first nearby households were connected in 1993). The Laboratory also conducts research on the treatment of geothermal water in order to obtain water intended for consumption, for agricultural purposes and to recover chemical substances that can be used, for example, in cosmetology or for the production of nutrients for plants crops.



Then, the participants visited the installations of PEC Geotermia Podhalańska S.A. – the largest company in Poland providing geothermal heat, with annual sales of approximately 533.3 TJ in 2022 (1,870 buildings connected to the network; www.geotermia.pl). Almost the entire volume of heat sold annually (in 2022 it was 99%) comes from geothermal water extracted from three production wells (with the largest total exploitable resources in Poland), while only about 1% of the heat sold in 2022 came from fossil fuels burned in peak boilers (gas or heating oil).



The next stage of the visit was to learn about the drilling of Bańska PGP-4 well in Szaflary. The target depth of this well is 7,000 m (TVD). The hosts at the drilling rig and those who provided explanations were the drilling manager, as well as the mayor and deputy mayor of the Szaflary commune (the commune is a beneficiary of the program supporting the development of the energy use of geothermal resources in Poland; it received a subsidy for drilling the above-mentioned well). The research goal of this drilling is to identify the deeper parts of the Mesozoic substrate of the Podhale Basin and, above all, to reach the crystalline basement (rocks analogous to those that make up the Tatra massif). It is also expected that geothermal water will be extracted from this well in after drilling completion: from a depth of approximately 3.2–3.5 km, at a temperature of approximately 90°C, or from the deeper potential reservoir (from a depth of approximately 5 km, with an expected temperature even above 120°C). On the day of the visit, drilling was at a depth of approximately 3 km.



The last stop during this visit was Chocholowskie Tery – currently the largest geothermal recreation center in southern Poland. Participants met with the representatives of the Management Board, learned about geothermal wells and other installations, including water treatment station for the swimming pool complex.



The study visit to Poland as part of the GeoModel project was an excellent opportunity to discuss the current progress of work, so-far results and to specify methods and directions of further cooperation in order to achieve the assumed goals of this project.

More about the GeoModel project:
<http://geomodel.pl>
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