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TOGEOS - Towards Geological Storage of Carbon Dioxide in the Czech Republic

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SUMMARY

TOGEOS is a collaborative research project carried out by the Czech Geological Survey (CGS) and the International Research Institute of Stavanger (IRIS) aiming to continue the work on CO2 geological storage potential of the Czech Republic carried out by CGS since 2003, and especially within the EU-funded projects CASTOR and EU GeoCapacity. The main objectives of the TOGEOS project are to (a) increase significantly the level of knowledge of the most promising structures potentially suitable for geological storage of CO2 in Czechia - i.e. the deep saline aquifers of the Central Bohemian Permian-Carboniferous basins and (semi)depleted hydrocarbon fields of eastern Moravia, and (b) re-assess more accurately their potential CO2 storage capacity.

The first project step was the selection of the most promising structures for further investigation. Based on an extensive literature review, a set of site selection criteria was prepared. The criteria were divided into 4 groups, namely, reservoir parameters, location, data availability and uncertainties. These criteria were applied in basin scale on three partial basins of the Central Bohemian Permian-Carboniferous area that were studied within the earlier EU GeoCapacity project. After a thorough analysis, the Central Bohemian (Roudnice) Basin was selected for a further research including characterization and evaluation.

For the selected basin, a simplified reservoir model is being constructed using Petrel, a commercial geological modelling software, and a sequence-stratigraphic and basin evolution models are being created in conjunction with the PetroMod basin modelling software. To be able to build these models, extensive efforts were made to gather sufficient amount of data on both reservoir and sealing rock properties, basin structure, stratigraphy, etc.

Due to the fact that the costs of drilling of a new well to the selected structure highly exceed the available project budget, other data resources had to be used such as for example, archive core samples stored in the core depository, new, freshly drilled samples from a shallow analogue for the purposes of laboratory analyses (especially in determining formation effective porosity and permeability), petrophysical data from the Czech national geophysical database, archive reports and hydrogeological tests, etc. Archive geophysical data - reflection seismic sections and gravity maps - were also used to specify the basin geometry, layering, faults, etc. in more details.

The project is co-funded by the EEA Grants and Norway Grants, and by the Czech Ministry of Education, Youth and Sports.