REPP-CO2 – project achievements and future plans

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REPP-CO2

- Preparation of a **RE**search **P**ilot **P**roject on **CO2** Geological Storage in the Czech Republic
- Příprava výzkumného pilotního projektu geologického ukládání CO2 v České republice

REPP-CO2

- Coordinator: Czech Geological Survey (CGS)
- Partners: IRIS, VŠB – Technical University of Ostrava, ÚJV Řež, a.s., Research Centre Řež, Miligal, s.r.o., Institute of Physics of the Earth, Masaryk University (UFZ)
- Funding: Norway Grants
- Budget: 77 mil. CZK ≅ 2.85 mil. €
- Grant provider: Ministry of Finance
- Project partner: Ministry of Environment
- Project duration: 23/1/2015 – 30/11/2016

Project objectives

(i) **Assess the selected geological structure** (a depleted oilfield) as a possible geological storage site for a research CO2 storage pilot project;

(ii) **Test the methodology**, procedures and criteria for description and assessment of a planned CO2 storage complex as specified by the **law No 85/2012 Coll.** on the storage of carbon dioxide in natural geological structures under real conditions of a concrete storage site preparation;

Project objectives

(iii) Perform **geological modelling** of the storage site and subsequent **numerical simulation of CO2 injection**;

(iv) Perform a **risk analysis of the storage site**, including assessment of conflicts of interest, proposal of risk mitigation measures and compilation of **storage site monitoring plan**;

(v) Newly **assess the potential of the Carpathian** rock formations in the area of the Czech Republic from the CO2 storage point of view;

Project objectives

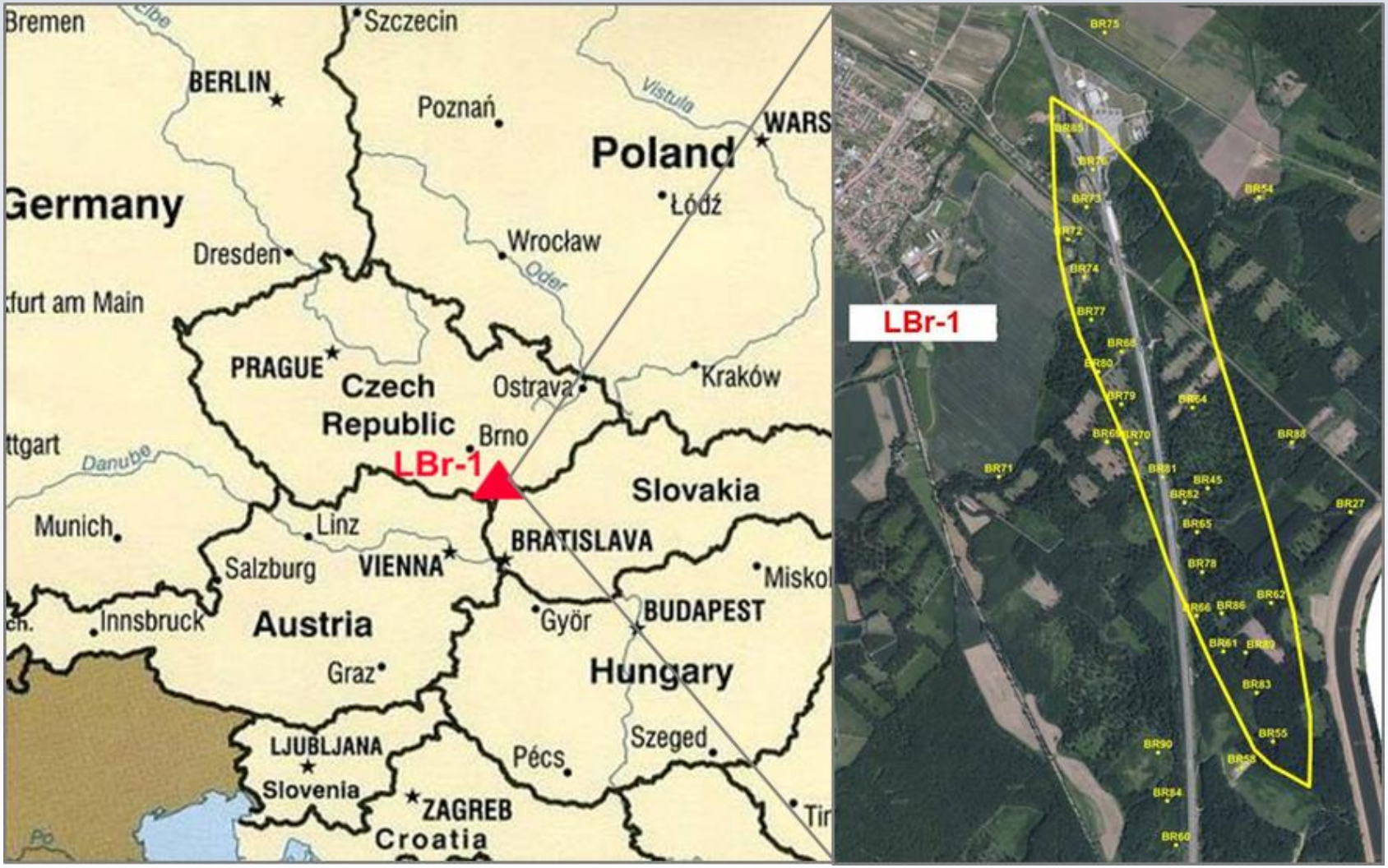
(vi) Strengthen the **Czech-Norwegian cooperation** in the area of CO_2 geological storage and related research and development.

Project complexity

Team work, cooperation and keeping deadlines are essential:

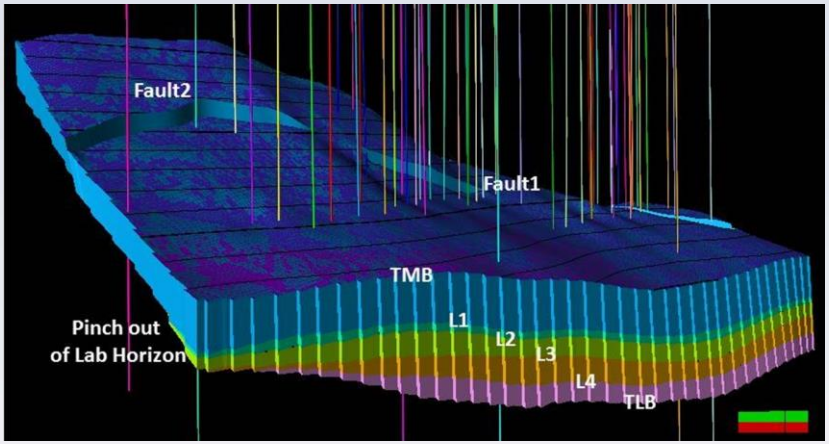
- 10 Activities
- 54 Tasks
- 106 deliverables
- >130 researchers and technicians from 7 institutions

LBr-1 location

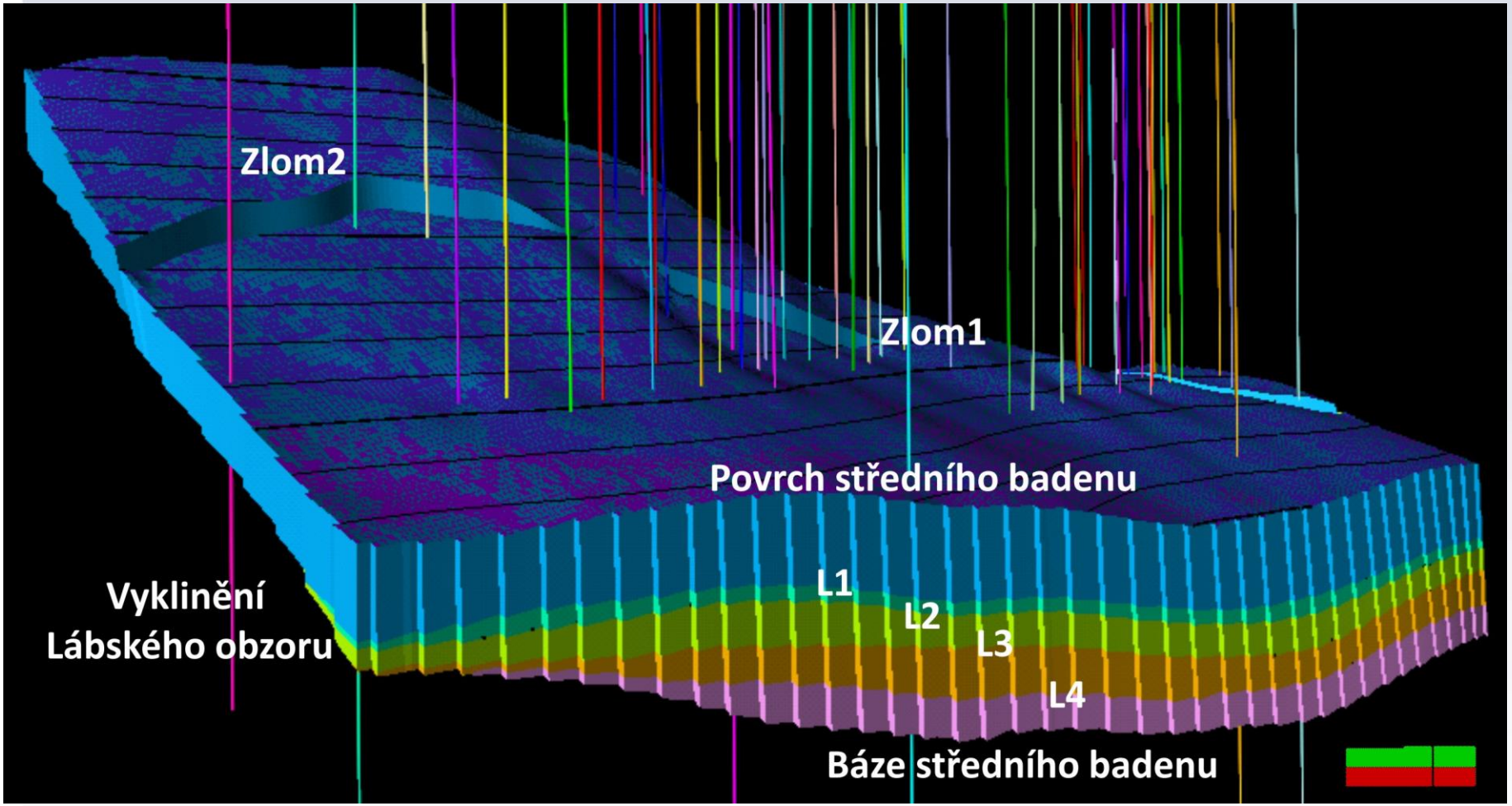


All objectives achieved

- 3D geological model of the storage complex in place
- Dynamic simulations and CO_2 injection simulations performed
- Risk assessment finalised
- Final monitoring plan ready
- Scenarios for further development of the pilot project drafted



3D geological model

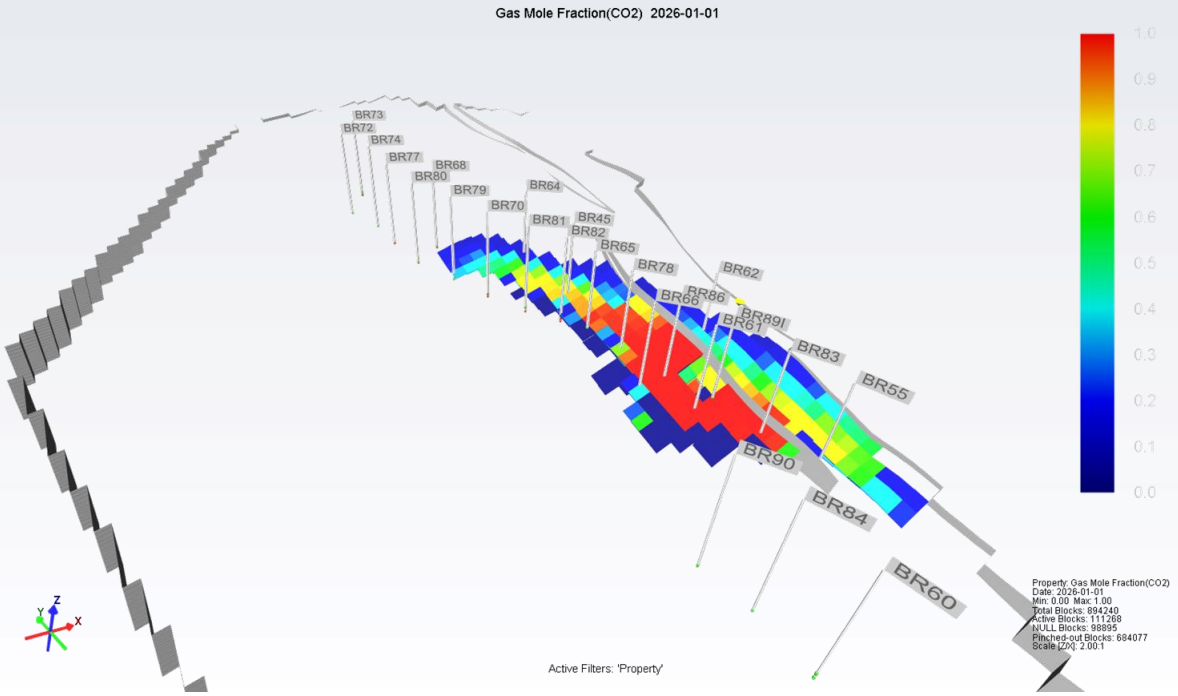


Lessons learned

- „Digging“ for information from old archive data is time consuming and requires specific „local“ knowledge but results can be excellent
- Supplementary site investigation is necessary, especially to get fresh cores for geomechanical and geochemical experiments and allow in-situ borehole tests (stress field, permeability)
- Local conditions need to be taken into account for choice of monitoring methods (high seismic noise level, periodical flooding, etc.)
- Big issue = source of CO_2 (a promising CO_2 source revealed /95.5 % purity/ – 240 th. t/yr released into the atmosphere, but no compression facility)

Pilot case – basic scenario

- 6 years of injection, 70 000 tons: 17 600 sm^3/day
- No injection issues expected, pressure increase is small and local
- Cost estimation 7.85 M€ + cost of CO_2



Sustainability

- All project data and results are stored in project geodabase in structured way
- Activity 6 is focused on further development of the LBr-1 site, several scenarios for further development elaborated
- Advisory Panel composed of stakeholders (regulators, policy makers and industry) provided feedback to project results
- Continuation of work is secured in the H2020 ENOS project (2016-2020)

Work in ENOS project

- Next steps within the H2020 ENOS project (CGS, IRIS + new partners SGIDS, TNO):
  - detailed risk analysis of faults and legacy boreholes + comparison with other sites
  - simulations of worst case scenario - possible leakage along old wells
  - scenarios combining storage with EOR (Enhanced Oil Recovery)
  - trans-boundary issues (CZ-SK)
  - EOR potential of the Vienna Basin (CZ-SK-AT)

Possible funding

- Possible additional funding opportunities:
  - next round of Norway Grants (phase II framework proposal elborated)
  - European funds (Horizon 2020, SET Plan)
  - Innovation Fund
- Progress towards CO_2 injection also depends on national support industrial & governmental co-funding; recovery of oil prices would support interest in scenarios that include enhanced oil recovery (CO_2-EOR)

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www.geology.cz/repp-co2
www.enos-project.eu