



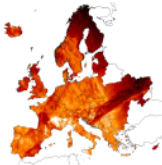
2nd European Underground Energy Storage Workshop

Paris, 23 - 24 May 2023



This workshop is dedicated in the memory of our colleague from the Czech Geological Survey

Vit Hladik



ENOS
Enabling Onshore CO₂ Storage



Great loss in the ENeRG family



On 3rd February 2023 we lost Vit Hladik, our great colleague and friend

- We cooperated during 20 years:
- in the ENeRG network
- in international projects
- in CO2 GeoNet, COST Actions, etc, etc...
- We were co-authors of unique publications and reports
- We spent together nice evenings after the condensed working days at conferences, workshops and meetings, at concerts, in small restaurants or just investigating new historical sites and castles during excursions between or after these events



Svět geologie 2/2023 Aktuálně

Nečekaný odchod našeho kolegy Víta Hladíka

Ve středu 1. února 2023 se Víťův [projekt CO2-SPICER](#) přehoupal do druhé poloviny doby řešení. Ve čtvrtek 2. února jsme se s Vítem pustili do přípravy detailního přehledu letošního pokračování projektu s tím, že v pátek 3. února přehled dokončíme. Nedokončíme, Víť nečekaně odešel. Nejen přípravu, ale celý projekt budeme muset dotáhnout bez něho – bude to hodně náročné. A netýká se to jen projektu CO2-SPICER, Víť byl zapojen v mnoha dalších projektech a aktivitách, tam všude nám bude moc chybět!

Víť ukončil studium užité geofyziky na Přírodovědecké fakultě Univerzity Karlovy v roce 1986, v roce 1988 složil rigorózní zkoušku a získal titul RNDr. V roce 1986 nastoupil do firmy Geofyzika Brno, kde pracoval na oddělení komplexních geofyzikálních metod. Komplexnost přístupu k řešení problémů se pro něj stala typickou v celém jeho dalším profesním životě. Díky své pečlivosti, zájmu o nové metody geofyzikálního průzkumu, znalosti jazyků, úžasné paměti a zásadovosti se brzy dostal do povědomí kolegů – geofyziků a získal si i pozornost vedení. Již v roce 1994 byl jmenován ředitelem divize obecné geofyziky, nejmladším v historii této firmy!

Na začátku milénia se noví vlastníci rozhodli majetek firmy Geofyzika rozprodat a firmu zlikvidovat. Víť v tomto období učinil mnoho pro záchranu archivu geofyzikálních zpráv i samotných, často neopakovatelných geofyzikálních dat. Společně s několika kolegy se mu podařilo těsně před likvidací Geofyziky převést cenná data do Geofondu. I v tomto těžkém období se Víť zajímal o nové způsoby použití geofyzikálních metod a začal se vážně zabývat možnostmi geofyziky z hlediska ukládání oxidu uhličitého do geologických struktur jako jednou z cest, jak snížit dopad klimatických změn.

V září roku 2003 nastoupil Víť do České geologické služby. Svůj zájem o ukládání oxidu uhličitého zde mohl prohloubit a stal se jedním z prvních českých odborníků na toto téma. Byl autorem průkopnické studie o možnostech ukládání oxidu uhličitého na území České republiky. Vedl několik národních a mnoho evropských projektů (nebo na nich spolupracoval), jež byly zaměřené nejen na samotné ukládání oxidu uhličitého, ale na celý řetězec jeho zachytávání, přepravy a ukládání (CCS). Byl autorem a spoluautorem mnoha odborných článků na toto téma. Díky svým jazykovým znalostem se podílel i na překladech odborných termínů evropské legislativy z oblasti CCS do češtiny. Byl členem a představitelem mnoha mezinárodních organizací zaměřených na problematiku CCS. Poslední dva roky se věnoval i možnostem ukládání vodíku jako paliva bezuhlíkové budoucnosti.

Jeho diář zůstal zaplněný až do konce března letošního roku, bohužel se plánovaných aktivit již nebude moci zúčastnit...

Autor: Vladimír Kolejka

Vit Hladik background

- Vit had MSc degree in applied geophysics from Charles University in Prague
- Master in Business Administration from Nottingham Trent University / Brno Business School
- In 1994-2003 he was working as a Division Manager in Geofyzika, Brno and
- Since 2003 in Czech Geological Survey (Brno Division) as a Senior project manager.




Vit Hladik in ENeRG

- Vit represented the Czech Republic as a Steering Committee member in ENeRG since 2002
- He was in charge of the GEO ENeRG newsletter of ENeRG from 2004-2011
- Vit worked as an editor of the ENeRG website from 2012-2017
- First Newsletter produced by Vit in 2004

Table 1: Main parameters of extended hydrocarbon production of certain o

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GEO ENeRG Country Profile – Croatia



ENeRG member: University of Zagreb – Faculty of Mining, Geology and Petroleum Engineering

The Faculty of Mining, Geology and Petroleum Engineering is one of 29 Faculties of the Zagreb University, founded in 1669. Scientific activities at the faculty are performed within 25 research projects, fully or partly supported by the Ministry of Science & Education (http://www.mzos.hr/), related to the fields of mining & geotechnics, industrial minerals, petrography, structural geology, petroleum geology, engineering geology, hydrogeology, drilling, well fluids, reservoir engineering, production engineering, gas management, EOR studies, CO₂ capture and storage, geothermal energy, and waste disposal in oil industry. The research projects often include collaboration with the respective industry as well as government bodies and agencies.

Other institutions

On the state level, geo-energy issues, especially greenhouse gas management are coordinated by the Ministry of Environmental Protection and Physical Planning (http://www.mzopu.hr). Environmental pollution studies are performed and inventory of greenhouse gases emission made by state agencies and institutes dealing with national energy programmes: Energy Institute "Hrvoje Požar" (http://www.eihp.hr) and EKONERG Ltd. – Energy and Environmental Institute (http://www.ekonerg.open.hr). Strategic documents, e.g. *Environmental Strategy with Action Plan, Priority Action Plan and National Environmental Activity Plan* have been made public and can be found at the above web sites. A lot of activities associated with specific environmental protection and management issues are carried out in the relevant energy sectors, e.g. Croatian Electricity Power Co. (www.hep.hr) and INA Oil Co. (http://www.ina.hr).

National geo-energy issues

Croatia has moderate hydrocarbon production (mature declining oilfields and natural gas/gas-condensate reservoirs inland, as well as gas fields off-shore), no coal production, some geothermal production potential and ample CO₂ underground storage potential.

Croatia territory is geologically complex, including both the Dinarides and the Pannonian Basin. Sedimentary rocks prevail by far – Palaeozoic sediments are found in Northern Croatia, and in the NW Dinarides, while Mesozoic to Palaeogene carbonates make most of the Dinaric region. The Croatian part of the Pannonian basin is filled with Neogene and Quaternary sediments. A total of over 50 small and medium-sized hydrocarbon gas or oil fields were discovered in the area. Production from the oilfields is in decline.

Croatia is among the European countries with the lowest total emission of greenhouse gases

as well as per capita emissions of both greenhouse gases and acid gases. Total CO₂ emissions in Croatia in 2002 were 22,500 kt/yr, the major part of it being related to electricity production (4700 kt CO₂/yr) and oil industry activities (2800 kt CO₂/yr). The main point sources of CO₂ are 9 thermal power plants and large gas processing facility –CPS Molve–, located close to Hungarian border, which presently releases approximately 600 kt of clean CO₂ per year into atmosphere.

Possibilities of decreasing CO₂ emissions in Croatia:

- Practices combining CO₂ capture with EOR are being developed for 3 mature tertiary oilfields and associated CO₂ storage aspects are being evaluated.
- Hydrodynamic CO₂ trapping in depleted gas or oil fields is being considered in terms of identification and selection of candidate reservoirs.
- Storage in deep saline formations is yet to be evaluated.

Bruno Satic & Bogdan Gorcinic

The ENeRG Network

COUNTRY REPRESENTATIVES	HUNGARY	SERBIA AND MONTENEGRO	Researches Technologiques sur les Hydrocarbures – GERTH (France)
AUSTRIA Prof Karl Millahn University of Leoben karl.millahn@unileoben.ac.at	Endre Hegeđus Eötvös Lorand Geophysical Institute (ELGI) hegedus@elgi.hu	Prof Miroslav Starovec University of Belgrade star@Elinet.yu	Hellenic Petroleum S.A. (Greece)
BULGARIA Prof Georgi V. Georgiev Sofia University gigeor@gea.uni-sofia.bg	ITALY Ing Sergio Persoglia National Institute of Oceanography and Experimental Geophysics (OGS) spersoglia@ogs.trieste.it	SLOVAKIA Dr Ludovit Kucharic Dionyz Stur State Geological Institute kucharic@gssr.sk	Hungarian Geological Survey (Hungary)
CROATIA Prof Bruno Satic University of Zagreb bsatic@rgi.hr	LITHUANIA Dr Viktor Nasedkin Geological Survey of Lithuania (LGT) viktor@lgt.lt	SLOVENIA Dr Zeljko Vukelic University of Ljubljana zeljko.vukelic@uni-lj.si	Institute for Mining, Geotechnology and Environment – IRGO (Slovenia)
CZECH REPUBLIC Dr Vit Hladik Czech Geological Survey (CGS) hladik@gbf.cz	NETHERLANDS Drs Ipo L. Ritsema Netherlands Institute of Applied Geoscience TNO – National Geological Survey l.ritsema@nitg.tno.nl	SPAIN Gerardo Ramos Gonzales Geological and Mining Institute of Spain (IGME) g.ramos@igme.es	Instituto Superior de la Energia (Spain)
DENMARK Niels Peter Christensen Geological Survey of Denmark and Greenland (GEUS) npc@geus.dk	NORWAY Prof Jan-Erik Karlisen RF – Rogaland Research jan-erik.karlisen@rf.no	UK – England Dr Nick Riley British Geological Survey nrj@bgs.ac.uk	KEANE Offshore Integrity Ltd. (Ireland)
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EUROPEAN COMMISSION Dr Jan Erik Hansen jan-erik.hansen@cec.eu.int	PORTUGAL Virgilio Cabrita da Silva Ministry of Economical Activities and Work – Directorate General for Geology and Energy virgilio.cabrta@gpep.min-economia.pt	Other members AGH University of Science and Technology (Poland)	National Observatory of Athens (Greece)
FRANCE Georges D. Mosditchian Institut Francais du Petrole (IFP) georges.mosditchian@ifp.fr	ROMANIA Dr Constantin S. Sava National Institute for Marine Geology and Geoecology – GeoEcoMar savac@b.astral.ro	ARMINES (France)	National Technical University of Athens (Greece)
GERMANY Dr J. Peter Gerling Federal Institute for Geosciences & Natural Resources (BGR) peter.gerling@bgr.de	GREECE Dr George H. Hatzilyannis Institute of Geology & Mineral Exploration (IGME) ghatzilyannis@igme.gr	Chalmers University of Technology (Sweden)	NIS-Naftagas (Serbia and Montenegro)
ENeRG EneRG Institu the Ne Conta EneRG Geosc Conta			Odegaard A/S (Denmark)
			PETROM – Geological Exploration Research and Design Center (Romania)
			Polish Geological Institute (Poland)
			Premogovnik Velenje d.d. (Slovenia)
			Romanian Academy – Sabba S. Stefanescu" Institute of Geodynamics (Romania)
			RTH – Rudnik Trbovlje-Hrastnik d.o.o. (Slovenia)
			Technical University Clausthal (Germany)
			Technical University of Denmark (Denmark)
			University College Dublin (Ireland)
			University of Aberdeen (UK)
			University of Durham (UK)
			University of Milano (Italy)
			University of Patras (Greece)
			Gasunie Trade & Supply (The Netherlands)
			University of Porto (Portugal)
			University of Trieste (Italy)
			Vrije University Amsterdam (The Netherlands)

Vit Hladik in ENeRG

- Vit represented the Czech Republic as a Steering Committee member in ENeRG since 2002
- He was in charge of the GEO ENeRG newsletter of ENeRG from 2004-2011, and worked as an editor of the ENeRG website from 2012-2017
- Last Newsletter produced by Vit in 2011




GEO ENeRG

ENeRG D

In the previous issue of GEO ENeRG (No 23), the title page article introduced the involvement of ENeRG members in the EU Demonstration Programme for CO₂ Capture and Storage (CCS). Engagement of ENeRG partners from France, the Netherlands and Poland in their national CCS demonstration projects was described. We are now continuing with this overview with information from a further three European countries.

Romania
The Romanian CCS Demo project, GETICA CCS (www.getica-ccs.ro), is a project run under the co-ordination of the Ministry of Economy, Trade



and Business Environment (METBE), with support from the Global CCS Institute. Following the completion of the feasibility study of the project, METBE submitted to the European Investment Bank the application forms for the NER 300 competition.

The project intends to store 1.5 Mt CO₂ captured (using post-combustion technology) from the unit no. 6 of Turceni power plant, into a deep saline aquifer in a major structural unit called Getic Depression, from which the name of the project has been derived. Turceni is a local-lignite fired plant located in the Oltenia Region, which is responsible for 40% of the CO₂ emissions at national level. Turceni was selected from several large emission sources in the area in the context of retrofitting and extending the operational life of unit no. 6 and


SiteChar – FP7 project dedicated to set the criterion for site characterisation for the geological storage of CO₂

Launched in January 2011, the European SiteChar project (http://www.sitechar-co2.eu) aims to provide a valuable tool for the roll-out of geological storage on an industrial scale in Europe by developing a methodology for the preparation of storage license applications, incorporating all the technical and economic data, as well as the social dimension. SiteChar will examine the entire site characterisation work flow, from the initial feasibility studies up to the final stage of licensing, on the basis of criteria defined by the relevant European legislator: storage capacities, modelling of aquifers at basin or reservoir scale, injection scenarios, risk assessment, development of the site monitoring plan, technical and economic analysis, and public awareness.

The technical core of the project is dedicated to testing specific aspects of the developing site characterisation methodologies at five European potential storage sites, representative of various geological contexts: a North Sea offshore multi-store site (hydrocarbon field and aquifer) in the United Kingdom, an onshore aquifer in Denmark, a pair of onshore gas fields in Poland, an offshore aquifer in Norway and a carbonate aquifer in the Southern Adriatic Sea in Italy.

A key innovation will be the development of internal 'dry-run' licence applications at two sites that will be evaluated by a regulatory advisory panel. This iterative process will refine the storage site characterisation workflow and identify gaps in site-specific characterisation needed to secure storage licences under the EU CCS Directive, as implemented in the 'host' Member States.

Parallel to technical site characterisation, SiteChar will perform social site characterisation and public



engaged activities via the internet and information meetings. Site-specific information will be made available, tailored to the assessed levels of public awareness, knowledge, and information needs.

Results of public engagement will be evaluated to contribute to the evidence base of effective public engagement strategies.

SiteChar outcomes will be practical guidelines for technical and social site characterisation for use by storage site operators, regulatory bodies and the communication teams of the relevant stakeholders.

SiteChar will advance a portfolio of sites to a (near-) completed feasibility stage, ready for detailed front-end engineering and design.

Coordinated by IFP Energies nouvelles, the project gathers another sixteen partners from research and industry, as well as the consultancy sector, from ten EU countries: AGH, ECN, ENEL, GEUS, GFZ, IMPERIAL, BGSS, OGS, POWIG, Statoil, TNO, SINTEF-PR, UniRoma1-CERI, URU, Vattenfall and the Scottish Government. The SiteChar project is also supported by Veolia Environnement and Gassnova.

Florence Delprat-Jannaud
(SiteChar coordinator)
florence.delprat-jannaud@ifpen.fr

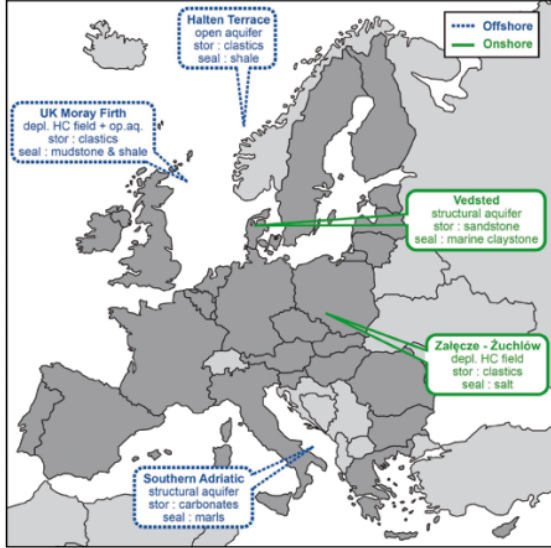


Fig. 3 The SiteChar site portfolio

ENeRG – European Network for Research in Geo-Energy

ENeRG – European Network for Research in Geo-Energy is an informal contact network open to all European organisations with a primary mission and objective to conduct basic and applied research and technological activities related to the exploration and production of energy sources derived from the Earth's crust.

ENeRG president for 2011 is Marjeta Car from Geoinženiring, d.o.o., Ljubljana, Slovenia. Contact: m.car@geo-inz.si

ENeRG secretariat is run by the Faculty of Mining, Geology and Petroleum Engineering, University of Zagreb, Croatia. Contact person: Zeljka Kurelec <zeljka.kurelec@rgn.hr>

ENeRG website: <http://www.energn.eu> is maintained by the Institute of Geology at Tallinn University of Technology, Estonia. Contact person: Dr. Alla Shogenova <alla@gi.ee>

ENeRG Newsletter – GEO ENeRG
The Newsletter is published by the Czech Geological Survey (CGS), Prague, Czech Republic.
Editor: Dr. Vit Hladik <vit.hladik@geology.cz>
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Computer typesetting: Oleg Man
Language review: Sarah Mackintosh (NCCCS)

23/05/2023

2nd European Underground Energy Storage Workshop, Paris, 23-24 May

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Vit Hladik in ENeRG

- Vit represented the Czech Republic as a Steering Committee member in ENeRG since 2002.
- He was the ENeRG president for 2018-2019, when he organized, together with BRGM, the First European Underground Energy Storage (UES) Workshop in Paris.



ENeRG Presidency ENeRG

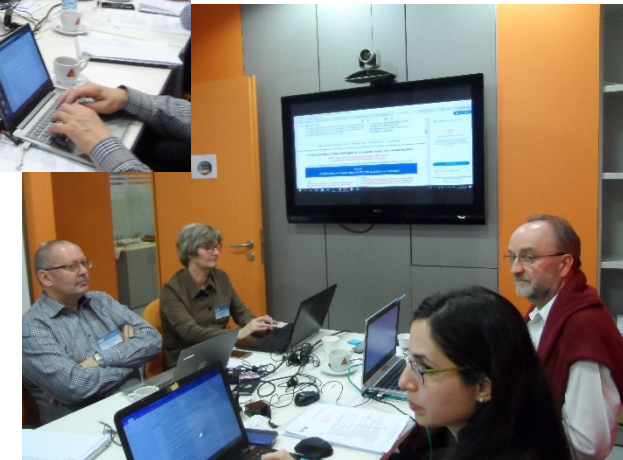
- ENeRG meeting in Bucharest 2018



ENeRG Presidency 2019



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ENeRG Meeting in Madrid, March, 2019

2nd European Underground Energy Storage Workshop, Paris,
23-24 May

Project Coordinator EU Project: CO2NetEast 2006-2009

- CO2 capture and storage networking extension to new member states (Coordinator Vit Hladik, CGS)
- European Union, FP6 No. FP6-038946
- CO2NET EAST is a coordination action co-funded by the EC within the 6th Framework Programme for research, technological development and demonstration activities.
- The main goal of the project is to extend the existing European CO2 capture and storage (CCS) networking activities to new EU Member States and Associated Candidate Countries.

GEO ENeRG

Promoting R&D capability in the service of European Industry

CO2NET EAST – Expansion of European Carbon Dioxide Knowledge Transfer Network

On 1st May 2004, the EU was enlarged to current 25 member states and a further enlargement (to 27 members) will take place on 1st January 2007. This enlargement has further intensified the challenge of reducing CO₂ emissions in Europe. The Kyoto Protocol obligates the EU to cut CO₂ emissions by 8 % by 2008–2012 (compared to 1990) and larger reductions may be required thereafter. At the same time energy demand is rising and our reliance on fossil fuels is unlikely to diminish in the near future. As a result of this paradox, the big challenge is to reduce carbon dioxide emissions from fossil fuels using CO₂ capture and geological storage (CCS), a technology capable of making huge cuts in CO₂ emissions to atmosphere in the near future.

CO2NET EAST is a new project co-funded by the European Commission within the 6th Framework Programme (FP6). It is a Co-ordination Action proposed as a mechanism to involve the new EU Member States and Associated Candidate Countries in the current European CCS networking activities, particularly in the existing Carbon Dioxide Knowledge Transfer Network (CO2NET), which was initiated and funded by the EC 5th Framework Programme as the leading European CCS networking forum.

CO2NET EAST will contribute to the European CCS networking by:

- Providing membership support to new CO2NET member organisations from EU new Member States and Associated Candidate Countries to enable them actively participate in annual seminars and other networking activities;
- (Co-)organising several CO2NET events (seminar, workshops) in new Member



- and Candidate Countries;
- Disseminating knowledge and raising awareness of CO₂ capture and storage technologies in new Member and Candidate Countries;
- Establishing links amongst CCS stakeholders in new Member and Candidate Countries and with other EU countries using the existing

networks, i.e. CO2NET, ENeRG and links with the Technology Platform for Zero Emission Fossil Fuel Power Plants.

The project will be built on East-West cooperation, helping the new Member States to add to the co-ordination effort to fast-track the development

and commercialisation of CCS technology for Europe.

CO2NET EAST was started on 1 October 2006 for a period of 3 years. The project consortium is composed of 7 R&D institutions representing 5 new EU Member States and 2 Associated Candidate Countries + 1 strong industrial partner (Statoil) responsible for mainly organisational tasks. The 7 Central & Eastern European partners are:

- Czech Geological Survey (Czech Republic – project co-ordinator)
- University of Zagreb - Faculty of Mining, Geology and Petroleum Engineering (Croatia)
- Eötvös Loránd Geophysical Institute (Hungary)
- Dionýz Štúr State Geological Institute (Slovakia)
- Institute of Geology at Tallinn University of Technology (Estonia)
- PBG - Geophysical Exploration Company (Poland)
- National Institute for Marine Geology and Geoecology (Romania)

These institutions can be designated as the pioneers in implementing the CO₂ capture and storage concept in their countries. They are also representing their countries in ENeRG, where their mutual cooperation resulted in the development and submission of this proposal.

The EC funding was used to initiate the project where further industrial sponsors will be sought. The industrial funds will be used to encourage participation of more stakeholders from new EU Member States and Associated Candidate Countries (in addition to project consortium members), especially SMEs, research institutions, universities and governmental bodies, in European CCS networking activities.

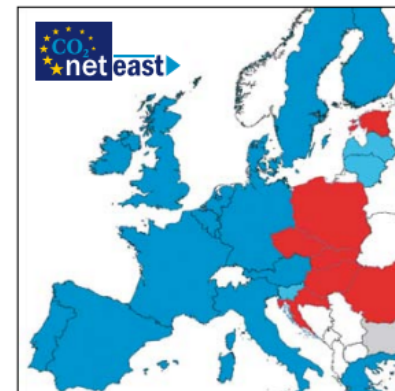
Vit Hladik

**CO2NET EAST
workshop**

Introduction to Carbon Capture
and Storage Principles

27–28 February 2007, Zagreb, Croatia

<http://www.co2neteast.rgn.hr>



Geographic impact of CO2NET EAST

Project Coordinator EU Project: CO₂NetEast

Warsaw - 2008



Zagreb - 2007



Project Coordinator EU Project: CO₂NetEast



Lisbon, 2007, CO₂net east at CO₂Net
Conference
23/05/2023

2nd European Underground Energy Storage Workshop, Paris,
23-24 May

Project Coordinator EU Project: CO₂NetEast

8 national CCS information websites (Czech, Slovak, Polish, Estonian, Hungarian, Croatian and Russian) as well as an English project website have been established by 31 March 2007. The websites bring up-to-date CCS-related information and are regularly updated.

Language	Institution responsible	Website address
Czech	CGS	http://nts1.cgu.cz/co2net-east
Croatian	RGN	http://www.co2neteast.rgn.hr
Hungarian	ELGI	www.elgi.hu/co2net_east/index.htm
Slovak	SGUDS	http://www.geology.sk/co2neteast/co2net-east.htm
Estonian	IGTUT	http://www.gi.ee/co2net-east
Russian	IGTUT	http://www.gi.ee/co2net-east/r
Polish	PBG	http://www.pbg.com.pl/CO2_net_east.htm
Romanian	GeoEcoMar	http://www.co2net.ro
English	GeoEcoMar	http://co2neteast.energnet.com

Tab.1 – List of national CO₂NET EAST websites



23/05/2023



2nd European Underground Energy Storage Workshop, Paris,
23-24 May



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INFORMAČNÍ PORTÁL PRO TECHNOLOGIE ZACHYTÁVÁNÍ A UKLÁDÁNÍ CO₂

Vítejte na českém národním informačním portálu pro technologie zachytávání a ukládání CO₂. Tento portál byl zřízen Českou geologickou službou v roce 2006 v rámci projektu [CO₂NET EAST](#) a dále rozvíjen v rámci projektu [CGS Europe](#) (2010-2013). Od ledna 2015 je rozvoj portálu součástí projektu [REPP-CO₂](#), podpořeného grantem z Norska.

Zachytávání a ukládání CO₂ (CO₂ capture and storage / CCS) je jednou z perspektivních možností, jak dosáhnout zmírnění globálního oteplování a související změny klimatu. Více o technologiích CCS můžete najít [zde](#).

Cílem tohoto portálu je mj. poskytovat zájemcům aktuální informace z oboru, z domova i ze zahraničí. Tyto informace najdete v sekci [Novinky](#).

Informace o připravovaných událostech najdete v sekci [Kalendář](#).

Secce [Odkazy](#) obsahuje obsáhlou databázi internetových adres, kde najdete velké množství dalších informací z oboru.

Login

Kontakt:
RNDr. Vít Hladík, MBA
Česká geologická služba
Leitnerova 22
602 00 Brno

Stránky jsou umístěny na [portálu České geologické služby](#)



Informační brožura 'Co to vlastně je geologické ukládání CO₂?' je k dispozici v češtině

Stáhnout

Interaktivní výstava 'Vraťme CO₂ pod zem' v centru VIDA!

Více informací



CO₂NetEast in Brno, CGS



Amsterdam 2010 – Last year of CO₂NetEast

GHGT10 Conference in Amsterdam, 19-23
September 2010



Alla, Vit and my colleagues from TalTech



FP6 Project - EU GeoCapacity

GEO ENeRGY

This issue is dedicated to CO₂ capture and storage activities in Europe

Results of the EU GeoCapacity project

EU GeoCapacity is drawing to a close.

The EU GeoCapacity project, involving 25 European partners and 1 Chinese partner, is rapidly approaching the end of its three-year contract due to finish 31 December 2008. The data collection and input process for the GIS database is now completed and, over the past few months, final checking and fine tuning of the capacity estimates have been performed according to the standards developed throughout the duration of the project. The GeoCapacity GIS database contains updated data on CO₂ emissions, infrastructure such as pipelines, and the location of potential geological storage capacity in deep saline formations, hydrocarbon reservoirs and coal fields.

The emission data include technical information on the type of industry (power, cement, iron and steel, paper), fuel, technology, capacity, etc. The pipeline data include properties such as type (oil, gas, etc.), diameter and length. The storage data include geological information and physical properties of the reservoir and sealing formations, as well as estimates of the storage capacity of each of the identified potential storage possibilities. Figure 1 shows an example of the content of the GeoCapacity GIS database.

The Decision Support System economic evaluation method
The DSS software tool for the economic evaluation of

developed under the GESTCO project. GeoCapacity has provided further development of the GIS, plus improved functionality and a more user-friendly system. The database now covers 25 countries in Europe (including two countries covered in GESTCO but not updated in GeoCapacity), and a web-based GIS is available to the project partners. The GIS database also includes input data for the economic evaluations carried out using the Decision Support System (DSS) and, overall, the aim was to produce work of sufficient quality and detail to set the standard for building this type of GIS system.

'source-transport-storage' scenarios was also initially developed under the GESTCO project. It has already set standards for the evaluation of source-sink scenario economics. New facilities developed under GeoCapacity include multi-source and multi-sink evaluations, a stochastic approach for calculations and web application of the tool.

Site selection criteria and storage capacity estimation standards
An understanding of the basic geological/technical site selection criteria is important. A set of criteria has been produced for the selection of potential storage sites along with descriptions of the related geological/physical parameters.

Previous assessments of the geological storage capacity of different countries, areas and regions vary tremendously in terms of detail and quality. One aim of GeoCapacity was to adapt and define common standards in order to produce uniform assessments of geological storage capacity. The work of establishing internationally recognized standards for capacity assessments was initiated by the Carbon Sequestration Leadership Forum (CSLF) about a year before the start of the GeoCapacity project. A CSLF Task Force has been active since then and GeoCapacity has contributed to the work in addition to continuing progress on this issue in Europe. The application of the methodologies described by CSLF has already led to the initiation of further work by the Task Force, reflecting the synergistic effects between projects.

International cooperation
Last but not least, GeoCapacity has also been focusing on international cooperation, particularly knowledge transfer and capacity building in China. GeoCapacity has thus pioneered storage capacity estimation and GIS mapping in China through a comprehensive study of the Hebei Province (near Beijing and located in the Bohai Bay sedimentary basin). A GIS database of the Hebei Province was built in parallel with the GIS work in Europe. Other provinces around Beijing will be covered as various projects evolve, such as the EU-funded COACH project and the UK-NZEC project.

Please visit our project website at www.geocapacity.eu for more information.

Thomas Vangkilde-Pedersen

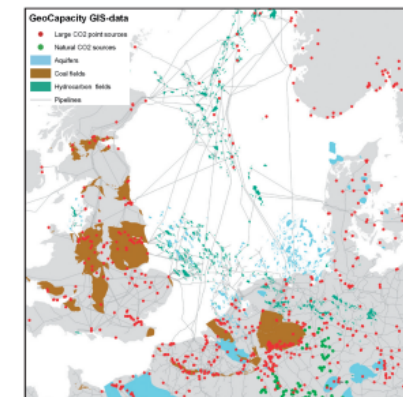


Fig. 1: Example of the content of the GeoCapacity GIS database

The GeoCapacity project was designed specifically to provide contributions to CCS standards within the following areas.

GIS-based inventorying & mapping
The basic methodology for GIS-based inventorying and mapping of CO₂ emissions and geological storage capacity was



Assessing European Capacity for Geological Storage of Carbon Dioxide

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Home page

www.geocapacity.eu

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EU GeoCapacity Assessing European Capacity for Geological Storage of Carbon Dioxide

Welcome to the website of the EU GeoCapacity Project. The main objective of the project is to Assess the European Capacity for Geological Storage of Carbon Dioxide. The project will include full assessments of a number hitherto not covered countries, and updates of previously covered territory. Also a priority is the further development of innovative methods for capacity assessment, economic modelling and site selection criteria. Finally, an important mission is to initiate scientific collaboration with China and possibly other CSLF members.

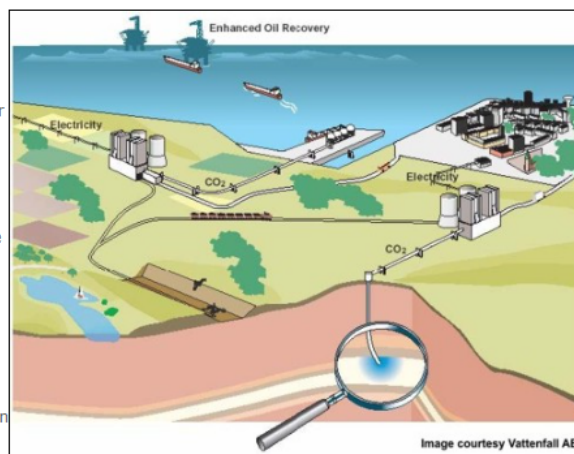


Image courtesy Vattenfall AB

Co-ordinator:
Thomas Vangkilde-Pedersen
GEUS Denmark
E-mail: tvp@geus.dk
Phone: +45 3814 2714

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Feedback to this page
Feedback to website
Website hosted by the Czech Geological Survey Portal

The GeoCapacity project will comprise all or parts of the sedimentary basins suitable for geological storage of CO₂ and located within the EU and the Central and Eastern European new member states and candidate countries. In areas, which were part of the GESTCO project completed in 2003, the work will include only supplementary updates.

The project is co-funded by the EU within FP6 - the 6th Framework Programme of the European Community for Research, Technological Development and demonstration activities, contributing to the creation of the European Research Area and to innovation (2002 to 2006).

For more information not included in this web please contact

Project Co-ordinator

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DENMARK

phone: +45 3814 2714
fax: +45 38142050
e-mail: tvp@geus.dk
www.geus.dk



EU GeoCapacity

Estonia, 2008, Excursion to the oil shale mining museum



Spoletto, 2007

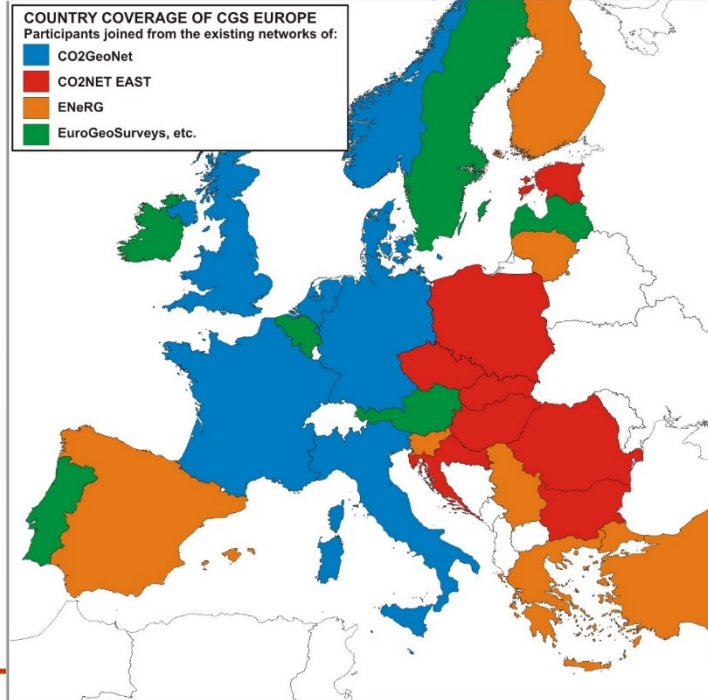


CGS Europe

Pan-European coordination action on CO₂ Geological Storage
(Coordination and support action)



THEME [ENERGY.2010.5.2-2]
[Trans-national cooperation and networking
in the field of geological storage of CO₂]



CGS Europe - Pan-European coordination action on CO₂ Geological Storage

WP1 - Management

Leader: **BRGM**, France

Main objective:

- to execute smoothly and efficiently the operational, legal, financial and administrative management of the CGS Europe consortium

Management Board:

- Isabelle Czernichowski-Lauriol (BRGM)
- Anna Korre (CO2GeoNet - Imperial)
- Roberto Martinez Orio (S-IGME)
- Vit Hladik (CzGS)



WP5 - Knowledge Dissemination

Leader: **Czech Geological Survey**, Czech Republic

Objectives:

- to stimulate **knowledge transfer** and information dissemination
- to **educate** CCS stakeholders
- to **raise** general **awareness** of CCS as a climate change mitigation measure
- to facilitate the implementation of the **European Industrial Initiative** on CCS mentioned in the SET plan
- to support implementation of the **EU Directive** on the geological storage of carbon dioxide
- to **reduce** the arising **gap** between the 'forerunner' countries (those with higher CCS awareness, demo and/or pilot projects and extensive R&D activities) and the 'follower' countries



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Pan-European coordination action on CO₂ Geological Storage

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NEWS & EVENTS
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ABOUT
CGS Europe - the "Pan-European coordination action on CO₂ Geological Storage" is a project funded within the 7th Framework Programme of the European Community for research, technological development and demonstration activities. CGS Europe pools together the expertise of the key research institutes in the area of CO₂ geological storage in European Member States and Associated Countries. It sets up coordination and integration mechanisms between the CO₂GeoNet Association - the European Network of Excellence on the Geological Storage of CO₂ - and 23 other participants, thus covering most of Europe with 24 EU Member States and 4 Associated Countries. CGS Europe provides an independent platform and reference source where national, European and international experts, institutes and regulators are able to access the most up-to-date results of CO₂ storage-related studies, share experiences and good practices, discuss the implementation of regulations, identify research needs to face upcoming challenges and build new contacts.

HOT OFF THE PRESS
The report "Opportunities for CO₂ storage pilot projects across Europe" provides an overview of the many potential pilot projects across Europe, by considering 22 potential pilot projects in 15 European countries.
The report "State of CO₂ geological storage in 28 European countries" reflects the current situation and achievements regarding geological storage of CO₂ in the 28 European countries covered by CGS Europe.

CGS Europe Awareness-raising workshop Vilnius CO2 Capture and Storage - Response to Climate Change" Vilnius, Lithuania, 13-14 April 201

Presentations (both oral and posters) were posted on the CGS Europe project website for public access at <http://www.cgseurope.net/NewsData.aspx?IdNews=57&ViewType=Actual&IdType=478>.

- The structure of 70 represented stakeholders was:
 - industry (19 participants),
 - research institutions (43 participants),
 - ministries (6 participants),
 - international agencies (2 participants)
 - ZEP platform (1 participant).
- In addition to the oral presentation, a general poster session was organised as well. Altogether, 29 oral presentations and 16 posters were presented during 2 days



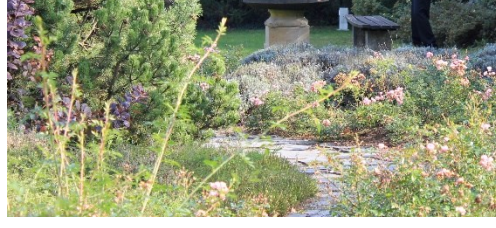
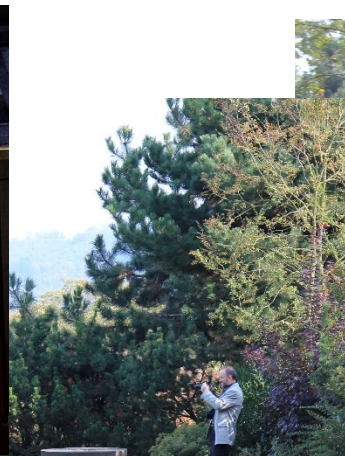
Participants of the Vilnius workshop

2. Involvement of CGS Europe project participants in workshop activities

- Organising Committee – GTC (Lithuania), CzGS (Czech Republic), TTUGI (Estonia);
- On-site organisation – GTC (Lithuania);
- Oral presentations – TTUGI (Estonia, 3 talks), BRGM (France), CzGS (Czech Republic), CO2GeoNet – GEUS (Denmark, 3 talks), PGI-NRI (Poland, 2 talks), GTC (Lithuania), GTK (Finland), SGUDS (Slovakia), UNIZG-RGNF (Croatia), CO2GeoNet – URS (Italy);
- Posters – LEGMC (Latvia), GTC (Lithuania), TTUGI (Estonia, 3 posters), CzGS (Czech Republic), GTK (Finland), SGU (Sweden) ;
- Sessions chairing – CzGS (Czech Republic, 2 sessions), GTC (Lithuania), CO2GeoNet – GEUS (Denmark), TTUGI (Estonia), GEO-INZ (Slovenia);
- Moderatorship of Round-table discussions – TTUGI (Estonia), CzGS (Czech Republic).



**2nd CGS Europe Knowledge Sharing
Workshop “Natural Analogues”
Maria Laach, Germany, Monday
17th - Wednesday 19th October
2011**



23/05/2023

Underground Energy Storage Workshop, Paris,
23-24 May



CGS Europe, Venice, Open Forum

CGS Europe, Venice, April 2012



6th CGS Europe Knowledge Sharing Workshop: Other promising options for CO₂ storage Bratislava, Slovakia, 16-17 September 2013 in Bratislava, 2013





Horizon 2020 project ESTMAP, Prague 2015



GEO ENeRGY

The ESTMAP project: Energy Storage Mapping and Planning



The ESTMAP project was funded by the EC Horizon 2020 programme in 2015-2016 (<http://www.estmap.eu/>). The project consortium led by TNO included BRGM, CGS, ECOFYS and VITO. The project investigated the distributed potential to deploy large-scale energy storage across Europe and demonstrated how this information can be used for analysing future energy scenarios.

The project included three main elements: 1) collection and compilation of publicly available spatial information on existing energy storage sites and future storage potential (subsurface and above ground); 2) development and population of a harmonized spatial database that is capable of maintaining, integrating and disseminating this information; and 3) demonstration of how the database can be used for pan-European and regional energy system modelling studies. ESTMAP covered all types of storable energy carriers for gas-, heat- and electricity-related services. The project focused primarily on larger-scale technologies that are relevant for either centralized energy grids or national to local energy distribution networks (Fig 1).

Geological research institutes associated under ENeRG and EuroGeo-

Surveys collaborated as partners in ESTMAP to deliver available knowledge and information on subsurface-related energy storage development as well as characterization and evaluation of reservoirs potentially suitable for future storage development. Additional information was gathered from publicly available European databases. All collected data were checked for quality and consistency and integrated in a consistent, harmonized and documented ESTMAP database.

In the database, an energy storage site is described by two interlinked components: 1) the actual storage facility or storage plant that is connected to a grid or distribution network and operates intake, conversion and output of energy; and 2) one or more natural or artificial reservoirs that act as a physical containment for the energy carriers. These reservoirs can either be situated in the subsurface (porous formations, caverns,

etc.) or above ground (lakes).

The ESTMAP database contains information on more than 4200 subsurface and above ground reservoirs and formations spread over 33 European countries. These reservoirs are either deployed for storage, or represent a potential for future storage development. In addition, information was gathered on approximately 700 existing or planned storage facilities. Each entry is characterized by a comprehensive set of attributes that describe the geographical, geological and physical aspects as well as the current utilization and assessed potential for various energy storage technologies (underground gas storage, hydrogen storage, compressed air energy storage, underground thermal storage and pumped hydro storage). In the subsurface, the dominant types of reservoirs are aquifers, hydrocarbon fields and salt formations (caverns). A detailed evaluation of the available data and storage potential is described on a country-by-country basis.

The ESTMAP database provides a first-time comprehensive overview of energy storage potential across Europe. The project has successfully demonstrated that this information can be used in energy system analyses, on both pan-European and regional levels. But maybe more importantly, by maintaining and upgrading the information, the ESTMAP database may become a common agreed standard for future energy modelling studies.

The evaluation of subsurface energy storage potential is still an evolving research area and the progress differs regionally. The ESTMAP project results help in identifying knowledge gaps and prioritizing new areas of research in order to achieve a more levelled and state of art insight of energy storage potential across Europe. Harmonization of assessment methodologies, implementation of common workflows across borders, as well as a more detailed and site-specific assessment of critical subsurface attributes are important aspects for improvement.

The ESTMAP team would like to thank all subcontracted partners for their essential contributions in collecting the crucial information and performing analyses.

Serge van Gessel
TNO

Vít Hladík
CGS

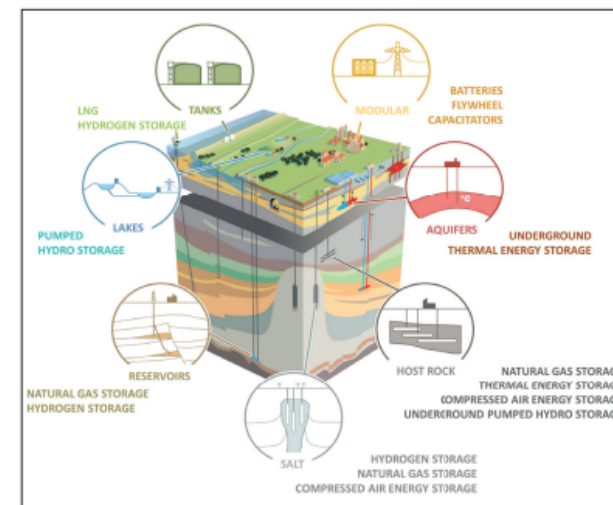
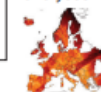


Fig.1 Subsurface and above-ground energy storage technologies





ENOS

Enabling Onshore CO₂ Storage

Horizon 2020 project ENOS



Czech Geological Survey

Czech Republic

DESCRIPTION OF THE ENTITY:

Czech Geological Survey (CGS / Czech Republic) is the leading geological research institution in the Czech Republic. It is a state research institute supervised by the Ministry of Environment. Its staff counts about 300 people, round 200 of them being university graduates.

Geo-energy related activities of CGS have developed a significant knowledge in the field of CO₂ geological storage, monitoring of CO₂ and methane migration, formation water geochemistry, mineralogical, optical and geochemical characterisation of the reservoir rocks and seals.

CGS has rich experience with participation in international research projects in many areas of geoscience, including European Framework Programmes (FP6, FP7, Horizon 2020) and other types of multilateral cooperation. CGS is member of EuroGeoSurveys and the Czech national country representative in ENeRG (European Network for Research in Geo-Energy). Since 2013 CGS has been a member of CO₂GeoNet.

CONTRIBUTION TO THE WORK PLAN AND EXPERTISE BROUGHT TO ENOS:

CGS was the leader of REPP-CO₂, a Czech-Norwegian research project focusing on screening an assessment of the LBr-1 depleted oilfield as potential site for a pilot CO₂ storage project in the Czech Republic. Results and achievements of this project have been provided to ENOS as input information for further research work, especially in WP3 and WP4.

Moreover, CGS' project management skills and experience in co-ordination of activities at international level are used in WPs 6-9.

In ENOS, CGS is leader of WP6, is represented in the Management Board and is responsible for liaising project activities with the LBr-1 pilot site in the Czech Republic.



Vít Hladík¹, Dimitrios G. Hatzignatiou², Oldřich Krejčí¹, and Juraj Franco¹

¹ Czech Geological Survey, branch Brno, Leitnerova 22, 658 69 Brno, Czech Republic

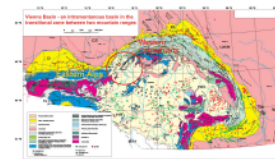
² International Research Institute of Stavanger, Professor Olav Hanssens vei 15, 4021 Stavanger, Norway

REPP-CO₂ – Czech-Norwegian research project to prepare a CO₂ storage pilot in the Czech Republic

INTRODUCTION

REPP-CO₂ is a Czech-Norwegian research project focusing primarily on the development of the CO₂ geological storage technology in the Czech Republic. The project represents a major step in the advancement of the Technology Readiness Level (TRL) of CO₂ geological storage in the Czech conditions from TRL4 (technology validated in laboratory) to TRL5 (technology validated in relevant environment). For CO₂ storage, TRL5 means its validation by means of a pilot project in geological settings similar to possible future commercial storage sites.

The project builds on a long-term partnership between the Czech Geological Survey and the International Research Institute of Stavanger that form the core of the project consortium. This comprises five more Czech institutions, mostly research-oriented, with complementary competences. In total, more than 100 researchers and technicians from 7 institutions participate in the REPP-CO₂ project.



General overview and distribution of oil and gas fields in the Circum-Carpathian Region of Central Europe (Golovka & Picha 2005); Vienna Basin marked by a circle

PROJECT OBJECTIVES

The main project objectives include:

- Assessing the selected geological structure (a depleted and recently abandoned oilfield) as a possible geological storage site for a research CO₂ storage pilot project, utilising the methodology according to the Czech national law No 85/2012 Coll. on the storage of carbon dioxide in natural geological structures (equivalent to the EU CCS Directive);
- Strengthening the Czech-Norwegian cooperation in the area of CO₂ geological storage and related research and development that was initiated from our previous TOGEOS research collaborative effort, which investigated the feasibility of storing CO₂ in deep saline aquifers in the Czech Republic;
- Testing the methodology, procedures and criteria for the 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 (field) conditions of a concrete storage site preparation;
- Integrating existing geological, geophysical, well, reservoir data and knowledge into developing an upgraded geological (static) model of the storage site;
- Conducting laboratory measurements and modelling to investigate rock/fluids interactions in terms of geochemical evaluations and geomechanical behaviour of both the storage formation and overlying cap rock;
- Utilizing the new static model to developing a dynamic full-field simulation model that integrates geomechanical and geochemical knowledge (data) that will be used to history match the past field performance using available production data and subsequently apply it to conduct numerical simulation studies of CO₂ injection into the given oilfield;
- Performing 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;
- Developing a monitoring program to monitor the post-CO₂ injection storage site behaviour to identify timely any potential unwanted CO₂ leakage out of the geological storage formation;
- Modelling any unwanted potential CO₂ leakage to overburden strata either through an existing abandoned wellbore or through the cap rock and assess any risks of contaminating potable water resources or reaching the atmosphere;
- Re-assessing the potential of the Czech Republic Carpathian rock formations from the point of view of CO₂ geological storage.

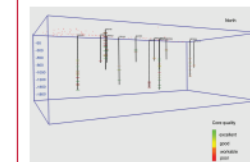
MAIN PROJECT COMPONENTS

The core part of the project focuses on the first preparatory phase of the research pilot project on CO₂ geological storage. This consists of obtaining the necessary data (geological, geophysical, well log), constructing a three-dimensional geological model of the storage complex, subsequently conducting a dynamic modelling of the storage complex behaviour during the site's operational (CO₂ injection) phase and post-injection one, executing a risk analysis, and compiling a monitoring plan. In future stages of the pilot project development, these outcomes will be used – after any necessary replenishment – as a basis for a future Storage Site Permit Application.

Further project activities focus on methodological research on important aspects of CO₂ geological storage, professional capacity building at Czech project partner institutions, and knowledge dissemination activities.

All project results including legacy and newly gathered data, maps, models, text reports, etc., will be stored into the project's geo-database, in a transparent and structured manner, so that they are ready for further utilisation in subsequent stages of the pilot project development.

STORAGE SITE

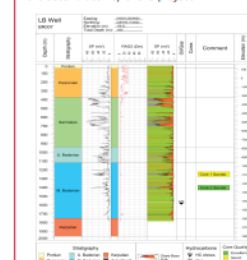


3D image of selected legacy wells penetrating the LBr-1 fluid well marks showing available cores and their quality

The LBr-1 site, chosen for the prepared storage pilot, is a depleted hydrocarbon field situated in the Vienna Basin, in the south-eastern part of the Czech Republic. The research geological target for CO₂ storage is the Miocene (Badenian and Sarmatian) oil- and gas-bearing sandstone sediments that were exploited for oil and gas production in the 1960s – 1970s, as well as the adjacent saline aquifer. The reservoir is laterally bound by impermeable faults, while on the top it is sealed by an impermeable clayey caprock.

LEGACY WELLS

More than 100 legacy wells exist in the vicinity of the LBr-1 site. All these wells have been abandoned, and some of them are currently subject of a re-abandonment procedure. In any case, the archive well data and cores represent important input to the construction of the static geological model that will be performed in the second activity of the project.



Example of processing of a typical legacy well data for sequence stratigraphy analysis and models of the field

MODELLING AND SIMULATIONS

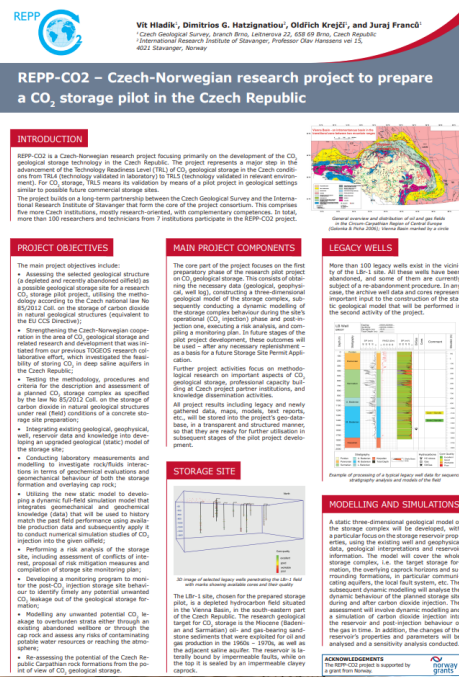
A static three-dimensional geological model of the storage complex will be developed, with a particular focus on the storage reservoir properties, using the existing well and geophysical data, geological interpretations and reservoir information. The model will cover the whole storage complex, i.e. the target storage formation, the overlying caprock horizons and surrounding formations, in particular communicating aquifers, the local fault system, etc. The subsequent dynamic modelling will analyse the dynamic behaviour of the planned storage site during and after carbon dioxide injection. The assessment will involve dynamic modelling and a simulation of carbon dioxide injection into the reservoir and post-injection behaviour of the gas in time. In addition, the changes of the reservoir's properties and parameters will be analysed and a sensitivity analysis conducted.

ACKNOWLEDGEMENTS
The REPP-CO₂ project is supported by a grant from Norway.



REP-CO2 project coordinated by Vit Hladik

BASRECCS-ENOS Workshop,
Tallinn - 2018



REPP-CO2 – Czech-Norwegian research project to prepare a CO₂ storage pilot in the Czech Republic

INTRODUCTION
REPP-CO2 is a Czech-Norwegian research project focusing primarily on the development of the CO₂ geological storage technology in the Czech Republic. The project represents a unique step in the advancement of the Technology Readiness Level (TRL) of CO₂ geological storage in the Czech conditions from TRL2 (technology capture is validated) to TRL3 (technology validated in relevant environments). For CO₂ storage, TRL3 means its validation by means of a pilot project in geological settings similar to possible future commercial storage sites.

PROJECT OBJECTIVES
The main project objectives include:
• Assessing the selected geological structure (a depleted and recently abandoned oilfield) as a possible geological storage site for research CO₂ storage pilot project, utilising the methodology according to the Czech national law No. 85/2002 Coll. on the storage of carbon dioxide in selected geological structures (approved by the Czech government);
• Strengthening the Czech-Norwegian cooperation in the area of CO₂ geological storage and related research and development that was initiated from our previous TOGETHER research laboratory effort, which investigated the feasibility of storing CO₂ in deep saline aquifers in the Czech Republic;
• Testify the methodology, procedures and actual field observation and assessment of carbon dioxide in natural geological structures under near field conditions of a concrete storage site preparation;
• Integrate existing geological, geophysical, and reservoir data and knowledge into developing an up-dated geological (static) model of the storage site;
• Conducting laboratory measurements and modelling to investigate rock-fluid interactions in terms of geochemical evolution and geochemical behaviour of both the storage formation and overlying cap rock;
• Utilising the new static model to developing a dynamic full-field simulation model that compares experimental and geochemical simulation results that will be able to history match the past field performance using available production data and subsequently apply it to conduct numerical simulation studies of CO₂ injection into the given oilfield;
• Performing a risk analysis of the storage site, including assessment of conflicts of interest, potential of the existing reservoirs and compilation of storage site monitoring plan;
• Developing an monitoring program to monitor the post-CO₂ injection storage site behaviour to identify finally any practical unmet CO₂ leakage out of the geological storage formation;
• Holding any unmet potential CO₂ leakage to overburden areas either through existing abandoned wellbore or through the caprock and necessary risk of overpressure mitigation measures; HSE, CO₂ TRL, and all others;
• Re-assessing the potential of the Czech Republic Carboniferous rock formations from the point of view of CO₂ geological storage.

MAIN PROJECT COMPONENTS
The core part of the project focuses on the first preparatory phase of the research pilot project on CO₂ geological storage. This consists of obtaining the necessary data (geological, geophysical, well log), constructing a three-dimensional geological model of the storage complex, subsequently conducting a dynamic modelling of the storage complex behaviour during the site's operational CO₂ injection phase and post-injection one, including a risk analysis, and compiling a monitoring plan. In future stages of the pilot project development, these activities will be about after any necessary re-optimisation.

LEGACY WELLS
More than 100 legacy wells exist in the vicinity of the site. All these wells have been abandoned, and some of them are currently subject of a re-abandonment procedure. In any case, the archive well data and core represent important input to the construction of the static geological model that will be performed in the second activity of the project.

STORAGE SITE
The site is chosen for the proposed storage pilot, as a depleted hydrocarbon field adjacent to the Czech Republic. The research geological model for CO₂ storage to the reservoir (Bekve and Sarmasund) oil- and gas-bearing sandstones and necessary risk of overpressure mitigation measures; HSE, CO₂ TRL, and all others.

MODELLING AND SIMULATIONS
A static three-dimensional geological model of the storage complex will be developed, with a particular focus on the storage reservoir properties, using the existing well and geophysical data, geological interpretations and reservoir information. The model will open the whole range of possibilities, in the target storage formation, the overlying caprock horizons and surrounding formations, in particular communication caprocks, the local fault systems, etc. The subsequent dynamic modelling will analyse the dynamic behaviour of the planned storage pilot, as a depleted hydrocarbon field adjacent to the Czech Republic. The research geological model for CO₂ storage to the reservoir (Bekve and Sarmasund) oil- and gas-bearing sandstones and necessary risk of overpressure mitigation measures; HSE, CO₂ TRL, and all others.

Preparation of a Research Pilot Project on CO₂ Geological Storage in the Czech Republic (REPP-CO2)



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REPP-CO2

Preparation of a Research Pilot Project on CO₂ Geological Storage in the Czech Republic.

REPP-CO2 is a Czech-Norwegian research project focusing on the development of technologies for geologic sequestration of carbon dioxide in the Czech Republic. The main goal of the Project is to verify the applicability of this approach in the actual geological environment of the Czech Republic.

Laying the groundwork for the planned development of Czech Republic's pilot carbon dioxide storage to be subsequently used for research purposes, the [Project](#) involves a broad range of preparatory activities, such as the selection and assessment of a suitable storage complex site; preparation of a geological model of the site; simulations of the injection process and subsequent CO₂ migration and interaction within the storage complex; risk analysis; and development of a monitoring plan. Additional project activities include an assessment of the practical applicability of CCS (CO₂ Capture and Storage) projects in the Czech Republic as well as CCS-focused awareness-raising campaigns targeted on the Czech civil service and public at large.

A continuation of a long-lasting Czech-Norwegian research partnership, the Project is spearheaded by the Czech Geologic Survey and the International Research Institute of Stavanger. Apart from these two key players, the [Project consortium](#) includes five other stakeholders from the Czech Republic: VŠB–Technical University of Ostrava (VŠB-TUO), ÚJV Rež, a.s., Miligal, s.r.o., Centrum výzkumu Rež, s.r.o. and the Institute of Physics of the Earth of the Masaryk University in Brno. In total, the Project involves more than 100 researchers and engineers working for 7 different partners.

The Project is supported by Norway Grants from the [CZ-08 Carbon Capture and Storage programme](#) (Activity Code: 0808-004-0).

CURRENT EVENTS

[Unexpected passing of our colleague Vit Hladik](#)

February 7, 2023

[CO2-SPICER presented at the Trondheim CCS conference](#)

June 30, 2021

[CO2-SPICER project information leaflet for download](#)

March 25, 2021

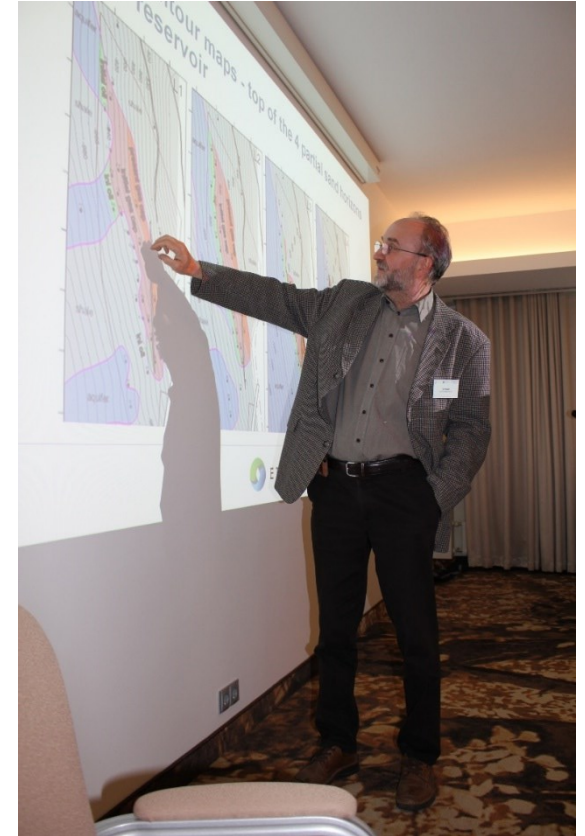
[Czech-Norwegian web-conference on CO2 capture and storage](#)

February 25, 2021

[Conference CO2 Capture and Storage in the Conditions of the Czech Republic - Cooperation of Czechia and Norway](#)

October 12, 2016

[More events](#)



Horizon 2020 project ENOS – Education activities – WP8

E-books



E-BOOKS
ENOS Ca
Promoting
aspects of
change and

E-BOOKS

E-lecture 1: Climate change and ene

by Alla Shogenova and Kazbulat Shogenov (CO₂GeoNet-GEUS)

E-BOOKS

E-lecture 2: CCS as an option for CO₂

by Vit Hladik (CGS)

E-BOOKS

E-lecture 3: Geological storage and

by Karen Kirk (BGS)

E-BOOKS

E-lecture 4: Storage potential and c

by Niels E. Poulsen (CO₂GeoNet-GEUS)

E-lecti reduc



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ENOS

Enabling Onshore CO₂ Storage

lecture 2

CCS as an option for CO₂ emissions reduction

by Vit Hladik,
Czech Geological Survey 



CO2 SPICER project coordinated by Vit Hladik

Presented in Lyon, 2022, GHGT6



CO₂ SPICER

CO₂-SPICER (CO₂ Storage Pilot in a CarbonatE Reservoir)

The project is being implemented under the KAPPA Programme for applied research, experimental development and innovation, which was announced by the Technology Agency of the Czech Republic and which is co-funded by the Norway Grants.



Photo: M. Pajac, MHD

Norway grants Programme **Kappa** T A
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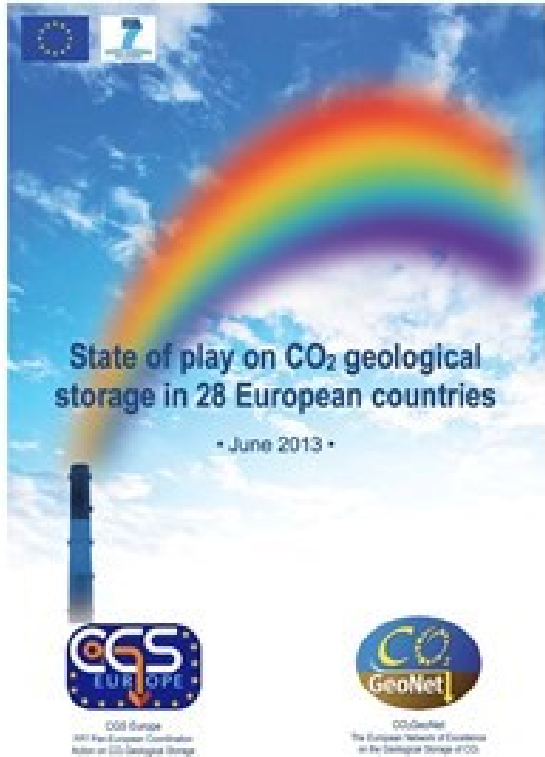


Presented in Venice, 2022

2nd European Underground Energy Storage Workshop, Paris,
23-24 May



CO₂GeoNet – STATE-OF-PLAY ON CO₂ GEOLOGICAL STORAGE IN 32 EUROPEAN COUNTRIES



CO₂GeoNet (2021): State-of-play on CO₂ geological storage in 32 European countries — an update, CO₂GeoNet Report. 325 p

This report was prepared by the CO₂GeoNet Association under the coordination of the drafting team consisting of Heike Rütters (BGR), Vít Hladík (CGS), Aleksandra Koteras (GIG), Cornelia Schmidt-Hattenberger (GFZ), Jan Tveranger (NORCE), Ceri Vincent (BGS) and Walter H. Wheeler (NORCE). The report was reviewed and edited by Rowena Stead (BRGM) and Isabelle Czernichowski-Lauriol (BRGM); Gillian Pickup (HWU) contributed to language checking of the annex and Stefan Knopf (BGR) provided all figures except for Figure 5. The CO₂GeoNet Association would like to acknowledge particularly contributions from countries not represented in the Association. Country-specific information was provided by:

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Continued on next page

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Vit Hladik in ENeRG

- Vit was the ENeRG president for 2018-2019, when he organized, together with BRGM, the First European Underground Energy Storage (UES) Workshop in Paris.





Towards Decarbonized
Heating and Cooling!



CA18219 Geothermal-DHC kick-off meeting,
Brussels, October 2019



Workshop in Torino University, May 2022

The last social event we have spent together in Venice, October, 2022



Last memories from October 2022, Venice



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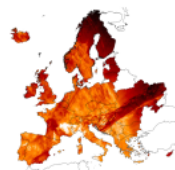


Funded by
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Towards Decarbonized
Heating and Cooling!



Thank you for attention!



ENOS
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