An ECCSEL ERIC project

## Wednesday, 13th December 2023, 14-15 CET

# WEBINAR

## Multi-disciplinary laboratories for $CO_2$ geological storage monitoring

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## Speakers

**Philippe Pezard** – Geosciences Montpellier, CNRS, France

**"SHAGAL (Languedoc, France): a shallow experimental site to study subsurface gas storage processes"**

**Michael Jordan** – SINTEF, Norway

**"Experience from the Svelvik $CO_2$ Field Lab"**

Q&A session chaired by:

**Barbara Merson**, project manager, National Institute of Oceanography and Applied Geophysics –OGS, Italy

# WHAT WILL YOU LEARN

## Multi-disciplinary laboratories for $CO_2$ geological storage monitoring

The monitoring of geological gas storage involves a multi-disciplinary approach at a variety of scales. In the near field, downhole monitoring is central to guarantee well integrity and reservoir evolution imaging during injection and long-term $CO_2$ storage. The SHAGAL shallow experimental site was developed to test new downhole monitoring multi-physics instruments to provide continuous, real-time and cost-effective monitoring strategies needed to (1) minimize the number of monitoring holes, (2) provide a real-time and multi-physics view of reservoir changes, (3) improve storage safety from timely operational decisions during the injection phase and later, in response to unexpected behaviors.

During the webinar, it will also be presented the Svelvik $CO_2$ Field Lab, which was designed as a quantification laboratory, where water or $CO_2$ can be injected at 65m depth. The injection well is surrounded by four 100m-deep monitoring wells, which are instrumented behind casing (e.g., DAS, DSS, DTS cables or ERT electrodes). The inside of the wells is available for non-permanent monitoring equipment e.g., seismic sources and receivers, or for the development and testing of novel monitoring systems. We present an overview of the experience from several injections, including repeatable migration of the $CO_2$ in the subsurface, the formation of a $CO_2$ plume, and observed leakage along the injection well.

**ECCSEL ERIC (European Research Infrastructure Consortium)** was established in June 2017 as a permanent pan-European distributed research infrastructure, with the main objective of enhancing European science, technology development, innovation and education in the field of CCUS, in order to combat climate change.

**ECCSELERATE project** is aimed at increasing the accessibility to the excellent network of facilities already established in ECCSEL ERIC for a wider user group, part of the research and industrial community.

**For further information visit our website**

**eccsel.org**

**eccsel.org/about/eccselerate/**

# KEYNOTE SPEAKERS

**Philippe Pezard** is a CNRS scientist with a background in borehole geophysics and petrophysics. With an engineering degree in ocean engineering, he worked as a logging engineer with Schlumberger, then got his Master and PhD from Columbia University in the context of the Ocean Drilling Program (ODP). After that, he founded a borehole research group in France. He produced more than 250 papers and his research interests span from the electrical properties of rocks, downhole geophysical monitoring, the structure of the ocean crust, geothermal energy, gas geological storage, seismogenic faults, slope instabilities and saltwater intrusion in coastal aquifers.

**Michael Jordan** is a geophysicist with a doctoral degree in Geophysics from the University of Göttingen, Germany. His work as a senior research scientist at SINTEF, Norway, has been mostly related to monitoring of $CO_2$ storage. He has over 20 years of experience in the development and application of methods for imaging the subsurface and combining different data types. He has a special interest in exploiting the information contained geophysical data and has been involved in establishing and operating SINTEF's Svelvik $CO_2$ Field Lab.

# WHAT IS CCUS?

Carbon capture, utilisation and storage, or CCUS, is an important emissions reduction approach that can be applied across the energy system, in both power generation and industrial sectors.

CCUS encompasses methods and technologies to remove $CO_2$ from the flue gas and from the atmosphere, followed by recycling the $CO_2$ for utilisation and determining safe and permanent storage options:

- **Capture** technologies allow the separation of $CO_2$ from gases produced in electricity generation and industrial processes.
- After capture, carbon dioxide must be **transport**ed to the storage or utilisation site. $CO_2$ is an inert gas and can be easily handled and transported in high-pressure pipelines. Alternatively, it can be transported in industrial tanks by ship, rail and truck.
- There are several possibilities for long-term $CO_2$ **storage** in safe conditions. Generally, $CO_2$ is stored in carefully selected geological rock formations that are typically located several kilometres below the earth's surface.
- **Utilisation** technologies allow the use of $CO_2$ to make valuable products, such as clean fuels, building materials or consumer goods. A clear example of a circular economy, where the $CO_2$ becomes a raw material rather than a waste by-product.