Contribution ID: **553** Type: **Poster (+) Presentation**

Optimising site selection for hydrogen storage in porous rocks in the North Sea & Irish Sea

Monday, 31 May 2021 19:35 (1 hour)

Hydrogen for clean energy is in the national and international spotlight. Offshore wind presents an extensive renewable energy source in the UK, and a large green hydrogen resource, positioning the UK to be a major player in the emerging global hydrogen market. In the UK and around the globe there's a handful of likely subsurface hydrogen storage sites and it is widely recognised that hydrogen storage in porous media (rocks) will be necessary to support the scale of production, storage and use anticipated for a global hydrogen economy.

A key component of subsurface risk management is the suite of geological controls needed to ensure that storage is efficient and secure (i.e. that injected fluids do not leak from the storage formation). The project will characterize, translate and test a suite of geological controls (including caprocks and hydraulic barriers) and explore the sub-processes which govern their ability to trap hydrogen. The aims is to better understand hydrogen flow through porous media (rocks) and hydrogen behavior in underground settings. In order to achieve the goal, the first approach was to map possible distribution of hydrogen density within the North Sea. A database of pressure, temperature, salinity and depth measurements for 191 gas and oil reservoirs within the North Sea was collected. Hydrogen density, brine density and buoyancy was calculated in order to understand its special variation in relation to pressure and temperature distribution. Sensitivity analysis were carried out to understand relationship and influentiality extent between the selected parameters.

Understanding of geological controls is critical to inform the selection of appropriate reservoir sites as well as designing safe and effective storage and recovery schemes. The project outcomes will inform (a) criteria to site selection, monitoring and assessment approaches for hydrogen geological storage, and (b) potential for engineered barriers for enhanced containment or leak remediation.

Time Block Preference

Time Block B (14:00-17:00 CET)

References

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Student Poster Award

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