

Danish Offshore Technology Centre  
Technology Conference 2022

**Detection and Monitoring of CO<sub>2</sub> Leakage in Sub-seabed CCS: Current Status and Beyond**

*Zongsu Wei, Ph.D., Assistant Professor, Aarhus University*

*Chizoba Ignatius Ezugwu, Ph.D., Postdoc, Aarhus University*

*Mikkel Holmen Andersen, Ph.D., CTO, Unisense A/S*

*Lauge Christensen, Ph.D., Senior Development Physicist, Unisense A/S*

In 2019, Denmark adopts an ambitious climate law to cut CO<sub>2</sub> emissions by 70% in 2030 setting a clear direction to mitigate the global warming. While Denmark embrace Carbon Capture and Storage (CCS) as one attractive option to reduce the CO<sub>2</sub> emission, reuse of existing and abandoned offshore oil and gas reservoirs in the DUC fields for CO<sub>2</sub> storage represents a key step towards the carbon reduction goal in Denmark. The CO<sub>2</sub> mineralization to carbonates below subsurface rocks provides a long-term carbon storage solution and thus rebalances the global carbon cycle. However, the CCS in the DUC reservoirs must be both cost-effective and safe, with low or no potential leaking in a long term.

In this talk, we will review and analyze the techniques to detect and monitor CO<sub>2</sub> leaked from the seafloor, including seismic, infrared, electrochemical, and optical sensors. Comparison of these methods will help prioritize research on CO<sub>2</sub> monitoring and develop cheap, reliable, optimal sensors (CROSS) to verify the CCS integrity in the sub-seafloor. Built upon current state of the art, perspectives and prospects of future CO<sub>2</sub> sensor development will also be discussed, inspiring system-specific applications to accelerate research translation in this critical area.



AARHUS UNIVERSITY

