



# CO<sub>2</sub>-EOR Joint Industry Project – Phase 2

## CO<sub>2</sub>-Enhanced Oil Recovery for the North Sea

The second phase of this Joint Industry Project (JIP) will reinforce the first collaborative programme of work to further the understanding of Enhanced Oil Recovery (EOR), with the aim of creating a commercial use for CO<sub>2</sub> captured from power plants and industry.

EOR technology, which has been widely applied in North America, could store around 75 million tonnes of CO<sub>2</sub> from Carbon Capture and Storage (CCS) projects and enhance oil production from reservoirs beneath the sea by 10–25 per cent. The process involves injecting CO<sub>2</sub> into partially depleted oilfields to force out additional volumes of oil, with CO<sub>2</sub> being residually trapped and permanently stored. To date there has been no supply of CO<sub>2</sub> to support industrial scale CO<sub>2</sub>-EOR in the North Sea. Recent developments and future commitments to commercial-scale CCS projects could change this.

The project is being led by Scottish Carbon Capture & Storage (SCCS), a partnership of the British Geological Survey, Heriot-Watt University, the University of Aberdeen and the University of Edinburgh. Funding has been secured from five project partners (see below). The project will continue to focus on issues of major importance to project developers looking to link CO<sub>2</sub>-EOR in the North Sea with CCS projects, including:

- **Reservoir modelling sensitivity analysis** on a series of CO<sub>2</sub> injection scenarios and configurations based on Phase 1 work including simple CO<sub>2</sub>; tandem CO<sub>2</sub>; seawater; and Water Alternating Gas (WAG) using CO<sub>2</sub> and seawater injection
- **Stakeholder perceptions, engagement and policy responses** to CO<sub>2</sub>-EOR through a series of focus groups involving stakeholders, including government, industry, academia, NGOs, journalists and the public
- Further development of **carbon budget and carbon balance work** for different CO<sub>2</sub>-EOR scenarios, with analysis of UK Continental Shelf and international venting figures and parameters for amounts of produced gas vented, alongside operational and engineering solutions to limit and mitigate venting
- Interpreting **legal and regulatory issues** surrounding field transference from solely oil and gas production to CO<sub>2</sub>-EOR and then to CO<sub>2</sub> store
- **Issues relating to common carrier pipelines** with new CCS developments looking to connect into existing infrastructure
- Evaluating the **economics pathway of clusters and transfers** to better understand options for tax allowances on investment, phased development of fields and varying tax on incremental production
- Examining **further fiscal incentives for CO<sub>2</sub>-EOR** to develop fiscal models compatible with clean power; considering use of CO<sub>2</sub>-EOR as a driver to develop infrastructure for future CCS projects; and comparing recent onshore tax rule changes with offshore scenario
- **The potential for shipping** to transport CO<sub>2</sub> to offshore oil and gas fields for CO<sub>2</sub>-EOR projects, offloading strategies and buffering
- **Security of storage** will assess the reduction of CO<sub>2</sub> leakage risk through dissolution of CO<sub>2</sub> into reservoir fluids in an EOR setting.

**Partners:** 2Co Energy Limited, Nexen Petroleum UK Ltd, Scottish Enterprise, Scottish Government, Shell

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