Re-purposing Oil and Gas Infrastructure for the Energy Transition (G541)

Tutor(s)

Bob Harrison: Director, Sustainable Ideas Ltd.

Overview

Attaining net zero greenhouse gas emissions by 2050 will require strategies to use existing and emerging low- or zero-carbon technologies. One potential opportunity is to repurpose existing hydrocarbon facilities to help meet net zero targets in the UK. This course investigates the technical challenges around this topic and examines whether integrating such infrastructure could lower costs and accelerate the energy transition while simultaneously postponing the decommissioning of ageing assets.

Duration and Logistics

Classroom version: A 2-day course comprising a mix of lectures, case studies and exercises. The manual will be provided in digital format and participants will be required to bring a laptop or tablet computer to follow the lectures and exercises.

Virtual version: Four 3.5-hour interactive online sessions presented over 4 days. Digital course notes and materials will be distributed before the course. The tutor will also work through a series of exercises with the group

Level and Audience

Intermediate. The course is intended for professionals working in energy transition, those involved in energy policy and energy sector investors.

Objectives

You will learn to:

1. Understand how repurposing hydrocarbon infrastructure may aid energy transition.
2. Appreciate how the handling of CO2, hydrogen and heat differs from oil and gas.
3. Select sites for potential underground storage and sources of geothermal energy.
4. Determine the suitability and availability of infrastructure for re-use.
5. Evaluate the pros and cons of using captured CO2 for enhanced oil recovery rather than storage.
6. Appreciate how repurposed wells and co-produced water may help potential geothermal development.
7. Characterize risks and uncertainties in energy transition projects and discuss possible mitigation strategies.
8. Estimate potential cost savings from hydrocarbon infrastructure re-use.

Course Content

Course Details

- The integration of transport, utilization and storage operations of CO2 and/or hydrogen with reused offshore oil and gas infrastructure will be introduced.
- As the properties and behavior of CO2 and hydrogen are different from those of oil and gas, their impact on operations will be discussed.
- A workflow is presented to identify potential storage sites and suitable adjacent infrastructure in the North Sea. In addition, a cost benefit analysis of utilizing CO2 for enhanced oil recovery offshore is debated.
- Moving into the geothermal sector, there will be an assessment of the potential for harvesting such energy more cheaply by reusing existing UK onshore wells and for harvesting the heat from water co-produced with oil.
- Finally, the estimated operational risks and corresponding mitigations associated with repurposed hydrocarbon infrastructure are contrasted with the potential lowering of costs and postponement of abandonment expenditure outlay during energy transition.
- Examples from the public domain will be reviewed to highlight some of the issues raised.