An Introduction to the Principles of Geology for the Modern Energy Industry (G067)

Tutor(s)

Jonathan Evans: Director, GeoLogica; Chair of Trustees, Lyme Regis Museum.

Overview

A successful modern energy system will depend on sustainable and careful stewardship and use of geological resources and sub-surface geology. This fundamental course is intended for all interested in learning the basics of geology in relation to the modern energy industry. Irrespective of background knowledge or skills, the course will introduce you to the key geological terminology and concepts in order to gain a better understanding of subsurface geology.

Duration and Logistics

Classroom version: A 1-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: Two 4-hour online sessions presented over 2 days, comprising lectures and exercises. A digital manual will be distributed to participants before the course.

*A day in the field can be included where logistics allow, to observe a variety of rock types and for participants to gain a better understanding of key geological themes.

Level and Audience

Awareness. The course is intended to introduce the principal themes of geology for the modern energy industry. No previous knowledge is assumed and hence the course should also appeal to those without a science/geoscience background.

Objectives

You will learn to:

1. Understand the future of energy provision and the role that geoscience plays.
2. Recall the fundamental principles of geology including different rock types, geological time and stratigraphy.
3. Understand how a sedimentary basin is formed and the different types of clastic depositional systems.
4. Understand the basics of a geoscience subsurface toolkit including seismic imaging and other types of subsurface geological data.
5. Appreciate the key elements of petroleum systems analysis with a focus on reservoirs.
6. Recall the geological principles to be considered for carbon capture and storage (CCS) as well as hydrogen projects.
7. Appreciate how a well is drilled into the subsurface and the types of wells that can be drilled.

Course Content

Session 1: Fundamental Principles of Geology

- Structure of the Earth
- Earth history
- Basin formation and fill
- Rock types
- Sedimentary rocks
- Sedimentary depositional systems
- Principles of stratigraphy
- Geological structures
- Subsurface geoscience toolkit – seismic and other geological data

Session 2: Geology in the Modern Energy Industry

- Petroleum systems analysis
- Petroleum reservoir rocks
- Principles of drilling into the subsurface
- Reservoir geology for CCS and hydrogen projects