

Geothermal Sedimentary Systems: Exploration, Development and Production Principles (G574)



Tutor(s)

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Overview

This course covers all aspects of various sedimentary geothermal systems, from exploration through to production. It is intended as an introduction to the entire lifecycle of sedimentary geothermal resources, covering aspects of geoscience and engineering.

Duration and Logistics

Classroom version: A two-day classroom course comprising a mixture of lectures and exercises. The course manual will be provided in digital format.

Virtual version: Four 3.5-hour interactive online sessions presented over 4 days. A digital manual and exercise materials will be distributed to participants before the course.

Level and Audience

Fundamental. The course is intended for all career stage industry professionals and early career researchers with a geoscience or geo-engineering background, including those with a familiarity in oil and gas production.

Objectives

You will learn to:

1. Understand the basic principles of heat generation within the upper crust.
2. Describe the key characteristics of sedimentary geothermal resources and reservoirs.
3. Examine the geothermal play concept.
4. Establish exploration methods using oil and gas data to assess geothermal resources in sedimentary basins.
5. Illustrate the development and production options for these geothermal resources.
6. Appreciate the principle geological hazards, in relation to geothermal projects, including induced seismicity.
7. Appreciate the range of environmental impacts associated with geothermal developments.
8. Appreciate project risks and uncertainties in developing geothermal resources.

Course Content

Course Details

This course will focus on the lifecycle of sedimentary geothermal resources and the associated project workflows.

Session 1: Principles of sedimentary geothermal resources

- Sedimentary basins: formation and types
- Heat flow in the upper crust
- Geothermal play system types

Session 2: Geothermal resource characterization

- Geological characterization of resources
- Geothermal sedimentary reservoirs characterization
- Demand side importance

Session 3: Exploration to production

- Geothermal exploration and production
- Geohazards and environmental considerations
- Case studies

Session 4: Impacts, risks and uncertainties

- Uncertainties and challenges in developing geothermal resources
- Integration of geothermal resources into energy systems planning