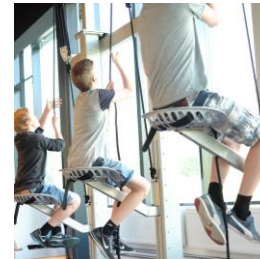


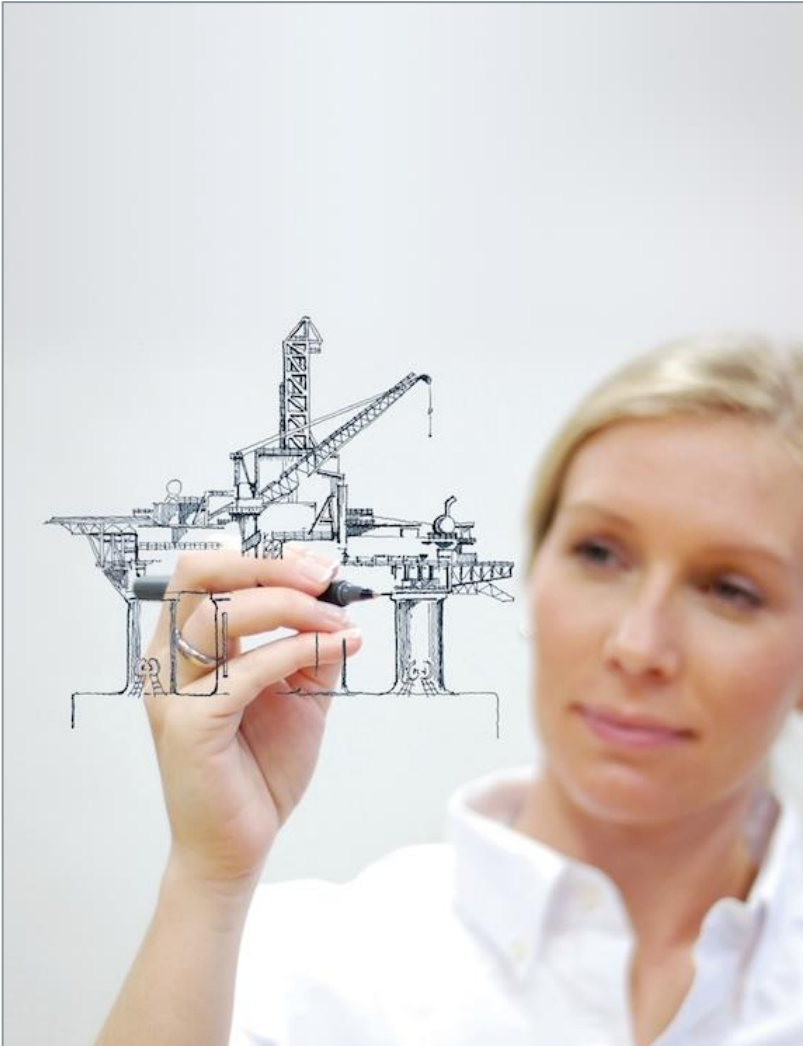


Engineering
Challenge
– an interactive
learning game
about
engineering



An introduction to the oil and gas industry

Content



- The world needs energy
- What is oil and gas?
- The lifecycle of a reservoir
- Oil and gas in Norway
- About the oil- and gas industry
- Exciting opportunities

The world requires energy



Every inhabitant living on this earth has a need for energy. It is used for lights, heating and in production processes. Energy is also needed for transportation.

What is oil and gas?



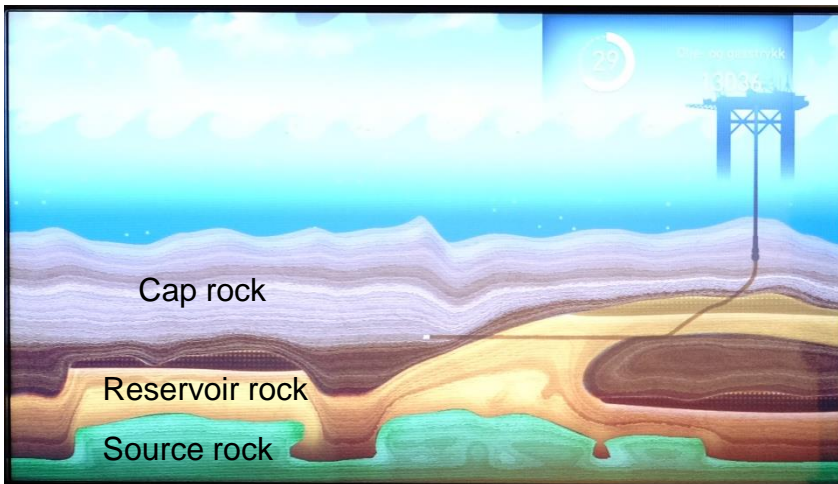
- Oil and gas are two types of **energy sources** used for heating, production of electricity, gasoline and diesel.
- In addition, oil and gas can be used as the raw material in the making of f.ex.:

- Plastic
- Nylon
- Paint



How is oil and gas formed?

- Algae, plankton and organic material deposited at the seabed with sludge and clay millions of years ago



- High pressure and temperature in an anoxic environment transform the organic matter into oil and gas (petroleum).
- The formation of petroleum occurs in source rocks (a layer of black clay several thousand meters under the seabed) .
- Petroleum rises up into reservoir rocks where it gathers, because these are porous rocks.
- In order to form a reservoir the petroleum needs to be stopped by an impermeable layer called cap rock.
- This creates a trap in the area where the petroleum can be recovered from.

The life of an oil field

The time from a field is found until it is closed varies by several decades and involves many different occupational groups.

- **Exploration** - Geologists explore and inspect the seabed with seismic techniques in order to localize oil or gas. The data collected is analysed into maps of rock formation, which make the foundation for where to drill an exploration well.
- **Development** - Engineers work out a platform solution with detailed solutions, and equipment and materials are ordered. The platform is built, tested and installed.
- **Production** - Oil and gas must be handled, transported and processed at facilities on/offshore before being delivered to the costumers.
- **Decommisioning** - When the life of a production field is coming to an end, all installations must be removed, the reservoir plugged, and as much as possible of the machines and materials are recycled or reused.

Petroleum in Norway

Norway's seabed in the North Sea, the Norwegian Sea, and the Barents Sea seems to be quite abundant with oil and gas.



*private sector

- The oil and gas industry in Norway goes back more than 50 years back in time.
- Norway is the world's 3rd largest exporter of natural gas.
- Approx. 2 million barrels of petroleum are produced every day, as the world's 13th largest petroleum nation.
- This industry employs more than 205 000 people in Norway, contributing to about 10% of the national workforce*.
- The value of Statens pensjonsfond utland is over 11,5 trillions NOK
- About 1/4th of the CO₂ emissions in Norway comes from this industry

Exciting opportunities in technical professions

We are increasingly required to use energy smarter, and create solutions for petroleum recovery that are more efficient and environmentally friendly.



- The oil and gas industry needs creative and innovative people that can contribute to the development of the futures smart solutions.
- In this industry there are possibilities for many different occupational groups. The largest need is for engineers who works with the technical solutions.
- In Engineering Challenge you will have the opportunity to be an engineer, working in a team to design an oil platform in order to win a contract as a supply company.

Sources:

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Check out www.engineerium.no/skole for more ideas and suggestions for teaching resources.