Hi – we’re Equinor

We energise the lives of 170 million people. Every day.
Equinor | A broad energy company

Equinor is an international energy company committed to long-term value creation in a low-carbon future.

Our purpose is to turn natural resources into energy for people and progress for society.

Equinor’s portfolio of projects encompasses oil and gas, renewables and low-carbon solutions, with an ambition of becoming a net-zero energy company by 2050.

Headquartered in Stavanger (Norway), Equinor is the leading operator on the Norwegian continental shelf. We are present in around 30 countries worldwide.
We are committed to develop our company in support of the Paris Agreement’s goal.

By 2030 we aim to spend 50% of all investment into renewables and low-carbon solutions.

Our low-carbon solutions are based on CCS targeting hard-to-abate part of the energy system.

**Carbon Capture & Storage (CCS) Value Chain**

**Capture**
- CO₂ is captured at the emission source - power, industry, waste, DAC etc.

**Transport**
- The CO₂ is transported, usually by ship or pipeline to the injection facility.

**Storage**
- The CO₂ is injected and safely stored at depths typically > 1 km.

**CCS Ambitions:**
- 15-30 Mtpa
- CO₂ transport and storage capacity by 2035
- Equinor share
Why CCS | A requisite to meet climate goals

UN Intergovernmental Panel on Climate Change (IPCC) points to CCS as a necessity to keep global warming to 1.5°C.

The International Energy Agency (IEA) states that we will need to store billions of tones of CO₂ every year to reduce global warming.

Global total net CO₂ emissions | Pathways to reach 1.5°C

From IPCC Special Report on “Global Warming of 1.5°C” (link)

Global CCS by source | Scenario to achieve net zero by 2050

From IEA’s Net Zero by 2050 | A roadmap for the Global Energy Sector (link)

All pathways that limit global warming to 1.5°C project the use of carbon dioxide removal (CDR) in the order of 100-1000 Gt CO₂ over the 21st century. CDR would be used to compensate for residual emissions and achieve net negative emissions to return global warming to 1.5°C following a peak.

By 2050, 7.6 Gt of CO₂ is captured per year from a diverse range of sources. A total of 2.4 Gt CO₂ is captured from bioenergy use and DAC, of which 1.9 Gt CO₂ is permanently stored.
Is CCS safe? Yes, several mechanisms in place

Several trapping mechanisms assuring safe containment

• **Structural trapping**: sealing cap rock preventing the CO₂ to escape upwards

• **Capillary/residual trapping**: large part of the CO₂ is trapped and immobilized in pore throats between sand grains

• **CO₂ dissolution**: with time, the injected CO₂ will dissolve in the salt water in the reservoir and sink down

• **Mineralization**: Some dissolved CO₂ will form minerals, thus becoming completely immobile

The CO₂ is also monitored during and after injection with a variety of proven technologies (as demonstrated at Sleipner)
Technology maturity | We have 26 years experience

- Equinor is a leading pioneer in this technology and has been storing CO₂ offshore the coast of Norway since 1996
- Operator of two of three existing full-scale offshore projects (Sleipner & Snøhvit)
- 14 years of piping CO₂ offshore for storage (Snøhvit)
- 7 years of onshore CO₂ injection (In Salah, Algeria)
- Operator of Technology Centre Mongstad (CO₂ capture) since 2012
- Project developer of the world’s first open-source transport and storage infrastructure project (Northern Lights)

Continuing technology focus:

- CO₂ Storage Resource Maturation & Optimization
- CO₂ Storage Integrity and Monitoring
- Cost Effective CCS Wells
- CO₂ Transport Technology
- CO₂ Capture Technology
### Equinor’s low carbon portfolio | October 2022

#### Project name | Project type | Country
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Northern Lights (NL) | CO₂ transport & storage | NO
Northern Endurance Partnership | CO₂ transport & storage | UK
Smeaheia | CO₂ transport & storage | NO
Polaris | CO₂ transport & storage | NO
European CO2 Trunkline | CO₂ transport & storage | DE, NO, BE
H2H Saltend | Blue hydrogen | UK
Aldbrough H2 storage | Hydrogen storage | UK
Net Zero Teesside (NZT) | Power + CCS | UK
Keadby 3 | Power + CCS | UK
Peterhead | Power + CCS | UK
Keadby Hydrogen Power Station | Hydrogen to power | UK
H21 | Hydrogen fuel switch | UK
H2M Eemshaven | Blue hydrogen | NL
AquaSector | Green hydrogen | DE
H2GE Rostock | Blue hydrogen | DE
H2BE | Blue hydrogen | BE
NorthH2 | Green hydrogen | NL, BE, DE
Clean Hydrogen to Europe | Blue hydrogen | NO
Barents Blue | Blue ammonia | NO
US Tristate | Power+CCS+H₂ | US

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#### NORTWEST EUROPE & UK

- **Blue H₂ / NH₃**
- **Green H₂**
- **CCS**

- **Keadby Hydrogen**
- **H2GE Rostock**
- **H2M Eemshaven**
- **H21**
- **Keadby 3**
- **Peterhead**
- **Aldbrough H2 storage**
- **Net Zero Teesside (NZT)**
- **H2H Saltend**
- **Keadby Hydrogen Power Station**
- **Clean Hydrogen to Europe**

- **Tri-state Energy Hub**
- **Barents Blue**
- **Polaris**
Northern Lights | First open access CO₂ T&S

**CO₂ capture**
Capture from industrial plants. Liquefaction and temporary storage.

**Transport**
Liquid CO₂ transported by ship.

**Receiving terminal**
Intermediate onshore storage. Pipeline transport to offshore storage location.

**Permanent storage**
CO₂ is injected into a saline aquifer.

**NORTHERN LIGHTS SCOPE**

- Equinor together with Shell and TotalEnergies, are developing Northern Lights which is offering a CO₂ transport and storage service to industry.
- Industry can capture their emissions and bring it to the harbor where the Northern Lights will collect it by ship and bring it to Norway for geological offshore storage.
- The construction work is well ahead, and first CO₂ injection will start in 2024.
- Northern Lights is part of a full CCS value chain called Longship which is heavily funded by the Norwegian government.
- Two Norwegian industrial CO₂ capture projects are part of Longship, one cement factory and one waste to energy plant.
- This ensures progress along the full value chain; capture, transport and storage, we are solving the 'chicken and egg' problem.
- Northern lights is marketing spare capacity and the interest from industry in Europe is overwhelming. Capture projects are being matured by a broad range of industries, such as cement, steel, waste to energy and power.
Smeaheia | Form basis for a European CO₂ trunkline

- The “Smeaheia” CO₂ storage license awarded Equinor in April 2022
- 20 Mtpa storage potential
- A CO₂ pipeline can reduce cost for transport by more than 50% compared to what offered today

A European CO₂ trunkline

- Urgent need to accelerate development of European CO₂ transport and storage capacity
- Equinor partnering with Wintershall DEA and Fluxys to develop CO₂ pipeline systems (see map)
- Capacity to transport 20 to 40+ Mtpa
- Operational before end of this decade (ambition)
Most people are talking about a low-carbon future, but we are building it here and now.

Sverre J. Overå, Project Director, Northern Lights