



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.

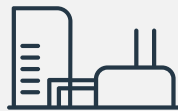


- We are committed to develop our company in support of the Paris Agreement's goal
- By 2030 we aim to spend 50% of all investment into renewables and low-carbon solutions
- Our low-carbon solutions are based on CCS targeting hard-to-abate part of the energy system

CCS Ambitions:
15-30 Mtpa
CO₂ transport and storage
capacity by 2035
Equinor share

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



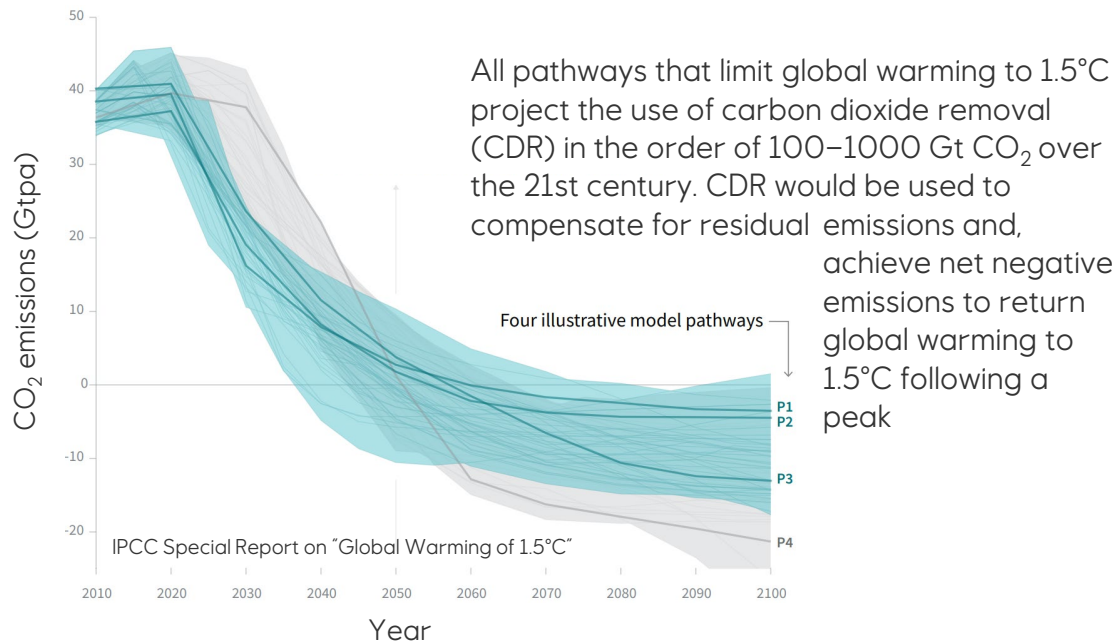
The CO₂ is injected and safely
stored at depths typically > 1 km

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

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

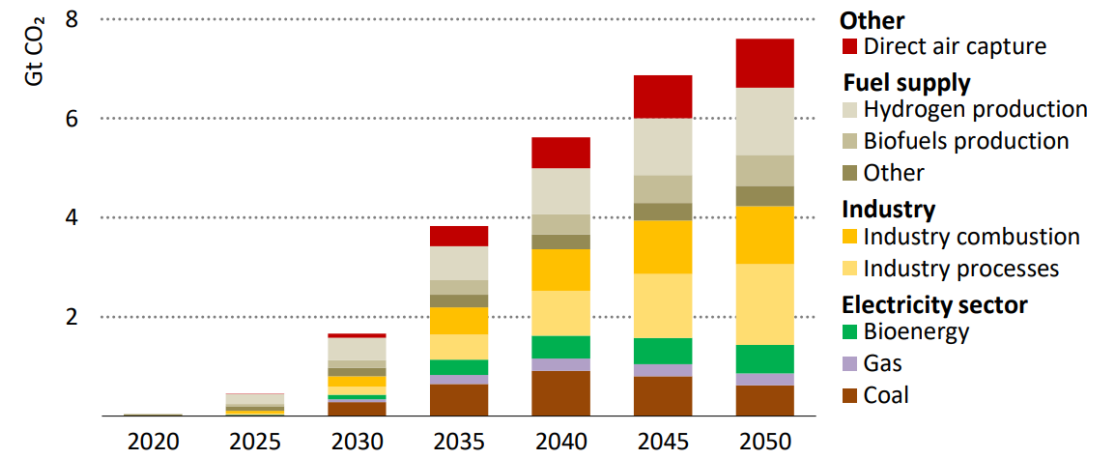
From IPCC Special Report on "Global Warming of 1.5°C" ([link](#))



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

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](#))



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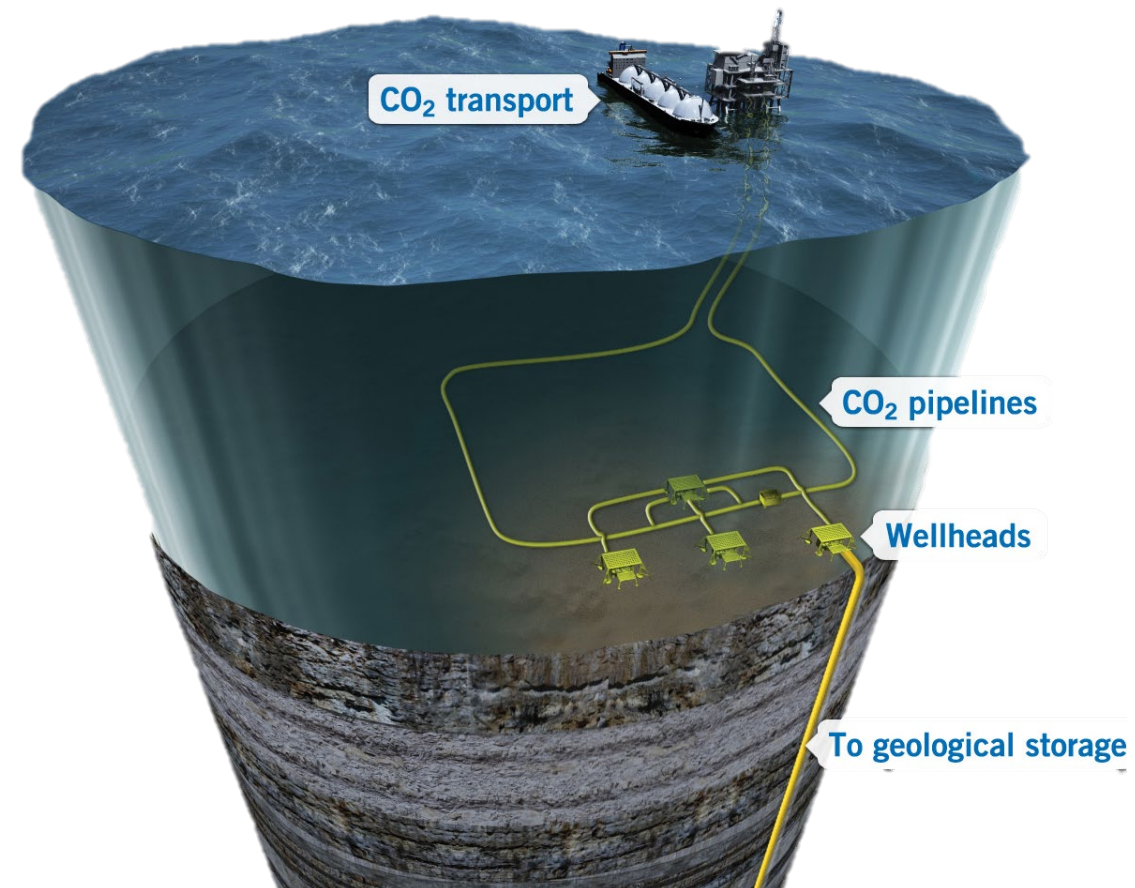
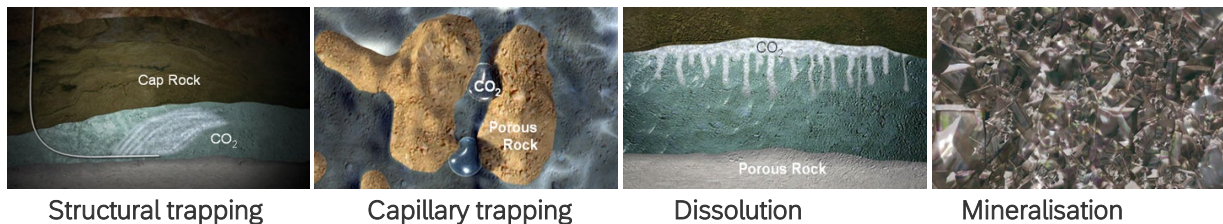
By 2050, 7.6 Gt of CO₂ is captured per year from a diverse range of sources. A total of 2.4 Gt CO₂ is captured from bioenergy use and DAC, of which 1.9 Gt CO₂ is permanently stored.

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)



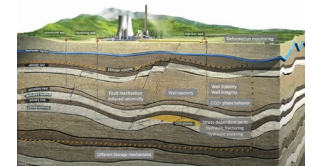
Technology maturity | We have 27 years experience



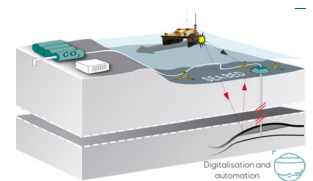
- Equinor is a leading pioneer in this technology and has been storing CO₂ offshore the coast of Norway since 1996
- Operator of two of three existing full-scale offshore projects (Sleipner & Snøhvit)
- 15 years of piping CO₂ offshore for storage (Snøhvit)
- 7 years of onshore CO₂ injection (In Salah, 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 | September 2023

USA



Project name	Project type	Country
Northern Lights (NL)	CO ₂ transport & storage	NO
Northern Endurance Partnership	CO ₂ transport & storage	UK
Smeaheia	CO ₂ transport & storage	NO
CO2 Trunkline	CO ₂ transport & storage	DE,NO,BE
H2H Saltend	Blue hydrogen	UK
Aldbrough H2 storage	Hydrogen storage	UK
Net Zero Teesside (NZZ)	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
Cheyenne	Blue ammonia	US
Bayou Bend	CO ₂ transport & storage	US

NORTHWEST EUROPE & UK



Northern Lights | First open access CO₂ T&S

NORTHERN LIGHTS SCOPE

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.



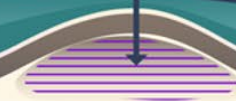
Permanent storage

CO₂ is injected into a saline aquifer.

100 km



2 600m

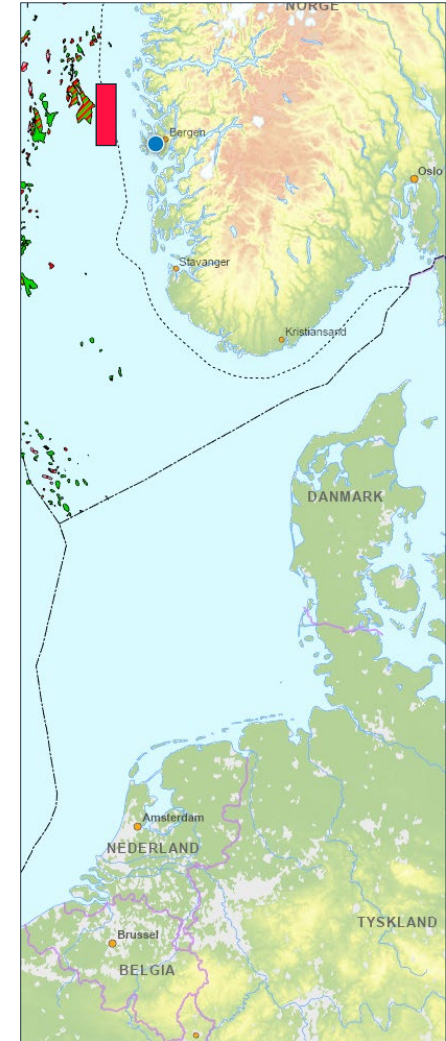


- Equinor together with Shell and TotalEnergies, are developing **Northern Lights** which is offering a CO₂ transport and storage service to industry
- Industry can capture their emissions and bring it to the harbor where the Northern Lights will collect it by ship and bring it to Norway for geological **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
- Up to 20 Mtpa storage potential
- A CO₂ pipeline can **reduce cost for transport sufficiently** compared to what is offered today

Map indicating position of Smeaheia



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