Hi – we’re Equinor

We energise the lives of 170 million people.
Every day.
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.
Hydrogen Ambitions:

3-5 Major industrial clusters
Clean hydrogen projects by 2035

>10%
Clean hydrogen market share in Europe by 2035

- A net zero carbon future will need hydrogen at scale
- We are developing both renewable-based (green) hydrogen and low-carbon (blue) hydrogen by using low emission natural gas from the Norwegian Continental Shelf (NCS)
- We believe both are needed to meet the projected demand for hydrogen in line with decarbonization targets

**Hydrogen Value Chain**

- **Feedstock**
  - Electricity from renewable sources
  - Low emission natural gas from the NCS

- **Production**
  - Electrolysis
  - Natural Gas Reforming

- **Output**
  - Hydrogen ($H_2$)

- **Link to CCS value chain**
  - The $CO_2$ is transported to the injection facility, injected and safely stored at depths typically > 1 km below the sea bed
Why H₂ | A requisite to meet climate goals

The International Energy Agency (IEA) states that now is the time to scale up technologies and bring down costs to allow hydrogen to become widely used. Hydrogen offers ways to decarbonise a range of sectors – including long-haul transport, chemicals, and iron and steel.

Global hydrogen use | Scenario to achieve net zero by 2050

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

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

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

All pathways that limit global warming to 1.5°C project the use of carbon dioxide removal (CDR) on the order of 100–1000 GtCO2 over the 21st century.

Hydrogen plays a considerable role as a substitute for fossil based non-electric energy demands.
Norway | Best place in the world to produce low carbon H₂?

NCS gas versus blue H₂ to end use in Germany as example

GHG intensity of natural gas supply from Norway to Germany: Upstream / Midstream / Downstream 1.3 / 0.3 / 0.9 g CO₂e/MJ (LHV) (Equinor, 2021). Gas reforming carbon capture ratio 96%, natural gas input to reformer 3.25 kg/kg H₂, electricity need of reformer 3.5 kWh/kg H₂. Future (2030) grid electricity in DE assumed at 150 g/kWh, NO at 17 g/kWh. Including 2% loss in ship-based CO₂ transport from DE to NO.
H₂ is safe

H₂ has some challenging properties but with safety in design and operation it can be done in a safe manner.
A broad pipeline of H₂ projects targeting to supply the German market

**H2M Eemshaven**
- Low-carbon H₂ from natural gas for hard-to abate industry and power.
- Transport to off-takers by pipeline.

**NorthH2**
- H₂ production from offshore wind.
- Power to shore via cable – electrolyzer onshore.

**AquaSector**
- H₂ production from offshore wind.
- Transported to shore via pipeline.

**H2GE**
- Large scale low-carbon H₂ production from NCS gas
- Transported to off-takers by pipeline.

**Clean H₂ to Europe**
- Large scale low-carbon H₂ production from natural gas for export.
- Transported via pipeline to continental Europe and off-takers.
Large Scale H₂ Production in Norway enabling exports to Europe

- Step by step scale up to manage market risk
- Blue hydrogen can be provided at scale earlier than green hydrogen
- Steps of ~2 GW every ~2 years
- ~2 GW blue hydrogen gives ~4 Mt CO₂ which will be stored safely
- Accelerate green H₂ by establishing the transport infrastructure early
Low-carbon H₂ from natural gas produced in Norway serving industrial off-takers in GER/NWE.

New or partly new and partly repurposed natural gas pipeline. Feasibility study with Gassco ongoing.

PCI process initiated seeking to connect with the EU Hydrogen Backbone.

Built for future expansion and tie-in of H₂ from offshore wind along route.

PCI Interactive map (europa.eu)