

Key Facts

1. The H2H Saltend pilot plant

- Hydrogen to Humber Saltend (H2H Saltend) is a proposed hydrogen production facility that will convert natural gas to hydrogen whilst capturing the associated carbon dioxide emissions (blue hydrogen). It will be one of the UK's and the world's first blue hydrogen plants.
- The facility will be a 600 megawatt (MW) auto thermal reformer (ATR) with carbon capture, the largest in the world. It will be located at Saltend Chemicals Park just east of Hull on the north bank of the Humber estuary. It will be able to produce up to 5.1 terawatt hours per year.
 - As a comparison, the UK Committee on Climate Change's (the CCC) Net Zero report called for ~270 terawatt hours per year of hydrogen production by 2050.
- Saltend Chemicals Park is managed by px group and includes Triton Power's 1200 MW gas power plant. Its annual emissions are c. 3.5 million tonnes of carbon dioxide (CO₂) per year, greater than those of the Teesside, Merseyside or Southampton industrial clusters.
- Equinor has worked closely with AB Ports, Centrica Storage, Mitsubishi Hitachi Power Systems, px Group, Triton and other users at the Chemicals Park to establish a technically deliverable concept to deliver an expanding hydrogen economy in the Humber and the UK.
- Subject to supportive UK policy, Equinor and its partners will mature the project towards a final investment decision during 2023 with potential first production by 2026.
- In its initial phase, H2H Saltend will enable industrial customers in the Chemicals Park to fully switch over to hydrogen, and the power plant to move to a 30% hydrogen to natural gas blend. As a result, total emissions from the Chemicals Park will fall by c. 900,000 tonnes to c. 2.6 million tonnes of CO₂ per year.
 - The carbon dioxide produced from the production of blue hydrogen will be captured, transported by pipeline to Easington (c. 25km away) and then to offshore storage in the Endurance aquifer in the Southern North Sea c. 75km off the east coast.
 - The carbon capture efficiency will be a minimum of 95%, while the efficiency of the hydrogen production process is expected to be a 80%.
- Half of the hydrogen produced will be used to produce low carbon chemicals and fuels, e.g. ammonia which can be used as low carbon fuel in the maritime sector or as a medium to trade hydrogen internationally.
- In its later phases, H2H Saltend can expand through the building of additional ATRs to serve other industrial users in the Chemicals Park making Saltend Chemical Park emissions free, and elsewhere in the Humber region, contributing significantly to the wider Humber region reaching net zero by 2040.
- Equinor believes the large-scale hydrogen value chain in the area around Saltend could have capacity for up to 3 gigawatts (3,000 megawatts) of blue hydrogen and green hydrogen (produced from electrolysis of water using renewable power).
- Later expansion of H2H Saltend will make Saltend Chemicals Park emissions-free and decarbonise other energy intensive industries across wider Humber region. This could lead to:
 - fuel switching to hydrogen by industry, requiring up to 13TWh of hydrogen by 2030
 - fuel switching in power, requiring up to 165TWh by 2030
 - start the decarbonisation of heat across the north of England, as set out in the H21 North of England report, converting over 17 million homes and businesses
 - supply and export of the world's first low carbon products, for example maritime fuels
- The project is therefore in line with the UK government's aim as set out in the Industrial Clusters Mission, to establish at least one low carbon industrial cluster by 2030 and the world's first net zero cluster by 2040.

2. The Humber region, Zero Carbon Humber and hydrogen

- H2H Saltend is also a first step in the Zero Carbon Humber alliance's vision to build the world's first zero carbon industrial cluster and decarbonise the North of England. It will be part of the alliance's application for public co-funding in the second phase of the Industrial Strategy Challenge Fund which was launched on 23 June 2020.
- The Humber industrial cluster region is the largest by geography, energy use and emissions. Total emissions are c. 12.4 million tonnes of CO₂ per year, one a half times more than those of the next largest cluster (South Wales).
- The Humber region contributes £18 billion each year to UK GVA. A quarter of this comes from the manufacturing industry, which employs 55,000 people.
- The CCC's recommendation in its Net Zero report that should capture at least 10 million tonnes of CO₂ per year by 2030, and at least one of them should involve substantial production of low carbon hydrogen. H2H Saltend and the Humber represents the UK's best opportunity to develop the world's first hydrogen economy.
- It has been estimated that fuel switching to hydrogen could create 43,000 new job opportunities across the UK in five energy-intensive industrial sectors, and that a further 25,000 jobs could be created by building a world-leading low carbon economy.
- The CCC's analysis estimated that in a Net Zero scenario around 80% of the UK's hydrogen needs would be met from blue hydrogen. Aurora Energy's recent analysis suggest that

3. Equinor's related activities in hydrogen and CCS

- Equinor has been capturing and storing carbon dioxide under the seabed offshore Norway since 1996. To date, we have captured and safely stored over 23 million tonnes of carbon dioxide from our Sleipner and Snøhvit gas fields. We have also been producing hydrogen at its Tjeldbergodden industrial facility in Norway since 1997.
- Equinor with its partners in the Northern Lights project took a final investment decision in May 2020 on Europe's first commercial-scale carbon transportation & storage project. If the Norwegian government makes a positive final investment decision in 2020, Phase 1 (transporting, injecting and storing 1.5 million tonnes of CO₂) is expected to be operational by 2024.
- In collaboration with the maritime industry, Equinor has started developing the world's first supply vessel for offshore activities to run on zero-emission ammonia. This is part of its ambition to escalate its production and use of low-carbon and zero-emission fuels (ammonia and hydrogen).

UK:

- In 2018 Equinor, Northern Gas Networks and Cadent, published the H21 North of England report showing how blue hydrogen could be produced and supplied to homes and business across the north of England.
- Equinor is also a partner in the Net Zero Teesside development which proposes to build a new-build gas-fired power station with carbon capture, and extending the CCS infrastructure to the neighbouring industrial cluster. Equinor is working with its partners in both the Humber and Teesside in developing a common CCS transport infrastructure to storage on the UK Continental Shelf, reducing costs and risk for both projects.

Rest of Europe:

- In the Netherlands, Equinor is working on the production of blue hydrogen for the conversion of Vattenfall's Magnum gas-fired power. The resulting carbon dioxide will be stored in underground facilities off the Norwegian coast. We are also a partner in the first phase of a project to produce blue hydrogen for local industry in Rotterdam to substantially reduce their CO₂ emissions.

- In Germany, we are working with Open Grid Europe on the H2morrow project. The project is working with thyssenkrupp Steel Europe on a feasibility study to switch Germany's largest steel plant in Duisburg from natural gas to blue hydrogen.

4. About Equinor in the UK

Equinor has been operating in the UK for over 35 years. Headquartered in Norway, the company employs 22,000 people globally, and over 650 in the UK. As a broad energy company, Equinor is committed to long term value creation in a low carbon future, and targeting carbon neutral operations globally by 2030.

Equinor is the UK's leading energy provider and supports the UK economy by investing billions in crucial energy infrastructure, working with over 700 suppliers across the country. Its energy supplies from Norway meet more than one quarter of the UK's demand for natural gas and around one fifth of its demand for oil, both produced with one of the lowest carbon footprints in the industry. It operates the Mariner oil field, one of the largest and most digitally advanced offshore investments in the UK over the last decade, and is progressing Rosebank, the largest undeveloped field in the UK. Both projects support hundreds of jobs and economic activity in Scotland.

Equinor also operates two offshore wind farms off the East Coast of England, Dudgeon and Sheringham Shoal. It is a pioneer in floating wind technology with Hywind Scotland, the world's first floating wind farm off the coast of Peterhead, which is partnered with Batwind, the world's first battery for offshore wind. And with its partner SSE Renewables, Equinor is building the largest offshore wind farm in the world, Dogger Bank, off the North East coast of England with its operations base at the Port of Tyne.