



equinor

H2H Saltend

Kick-starting a Zero Carbon Humber

About Equinor

Equinor is a major international energy company, originating from Norway and formerly known as Statoil, it employs over 22,000 people across thirty six countries.

It is the largest single supplier of traditional energy to the UK, where it has operated for over 35 years, including providing 25% of the UK's gas requirements – enough to heat eight million British homes every day.

Equinor has bold ambitions to be a net zero business by 2050 and is investing heavily in low carbon and renewables projects, particularly on the UK's East Coast. Equinor and partners SSE Renewables and ENI are developing the world's largest offshore windfarm, Dogger Bank, off the Yorkshire Coast, and multiple hydrogen and carbon capture proposals in the Humber region.

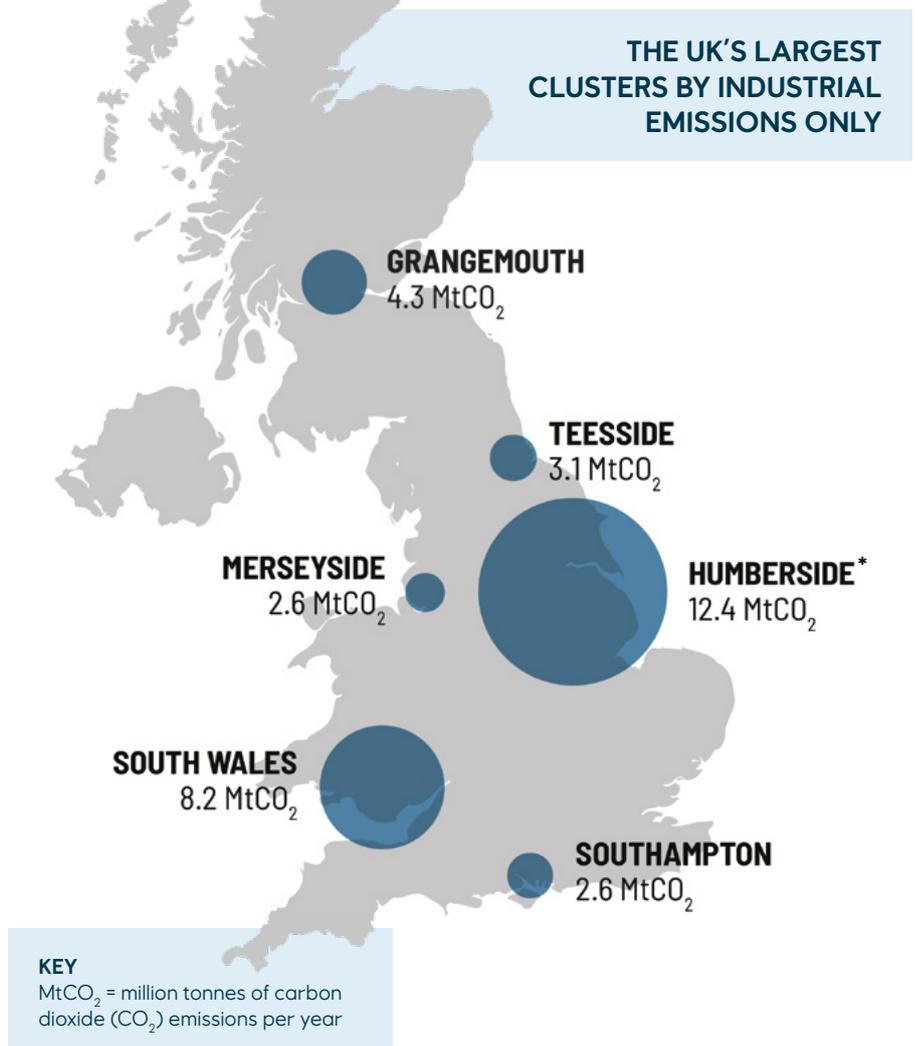


The Challenge: Decarbonising the Humber

The Humber is the most carbon intensive industrial region in the UK due to its high concentration of energy intensive industries such as refineries, chemicals, steel, glass and cement manufacturing. Many of these sectors are major employers in the region but hard to decarbonise using electricity or renewables.

In order for the UK to reach its net zero targets, whilst also ensuring a 'just transition' which avoids job losses or offshoring such sectors, it must seek alternative methods to decarbonise regions like the Humber. Low carbon hydrogen and carbon capture are the leading technologies available to address this.

* Updated Humber industrial emissions provided in the "Humber Cluster – update to the 2020 Business Local Emissions Assessment" report are 14.6MtCO₂/yr



H2H Saltend

H2H Saltend is located at Saltend Chemicals Park, on the north bank of the Humber Estuary. It is one of the region's most carbon intensive sites, responsible for more emissions than the entire Merseyside region.

H2H Saltend is Equinor's flagship 600 megawatt low carbon hydrogen production plant with carbon capture, which offers to reduce the site's CO₂ emissions by nearly one million tonnes annually, representing a 30% reduction in the Saltend Chemicals Park's total current carbon emissions.

The plan is backed by at least six local industrial operators who could potentially use this hydrogen to lower the carbon footprint of their processes and products. For example, the on-site Triton Power Station will seek to fuel switch from natural gas to hydrogen, enabling low carbon power and steam to be supplied to local users,

and consequently enable low carbon chemicals and other products to be produced in the Chemicals Park. Others could use hydrogen in heating, power generation or chemical processes.

Given its location near to the coast, H2H Saltend can act as the first site to link into regional hydrogen and CO₂ pipelines, kick-starting the development of this infrastructure across Yorkshire and northern Lincolnshire, and ultimately leading to a Zero Carbon Humber.

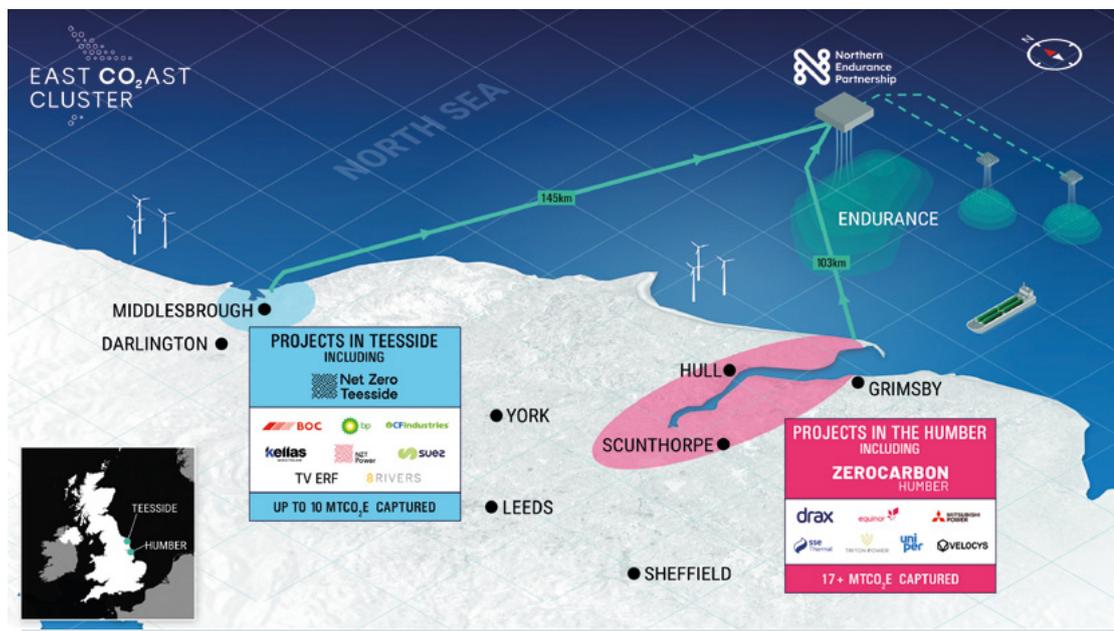
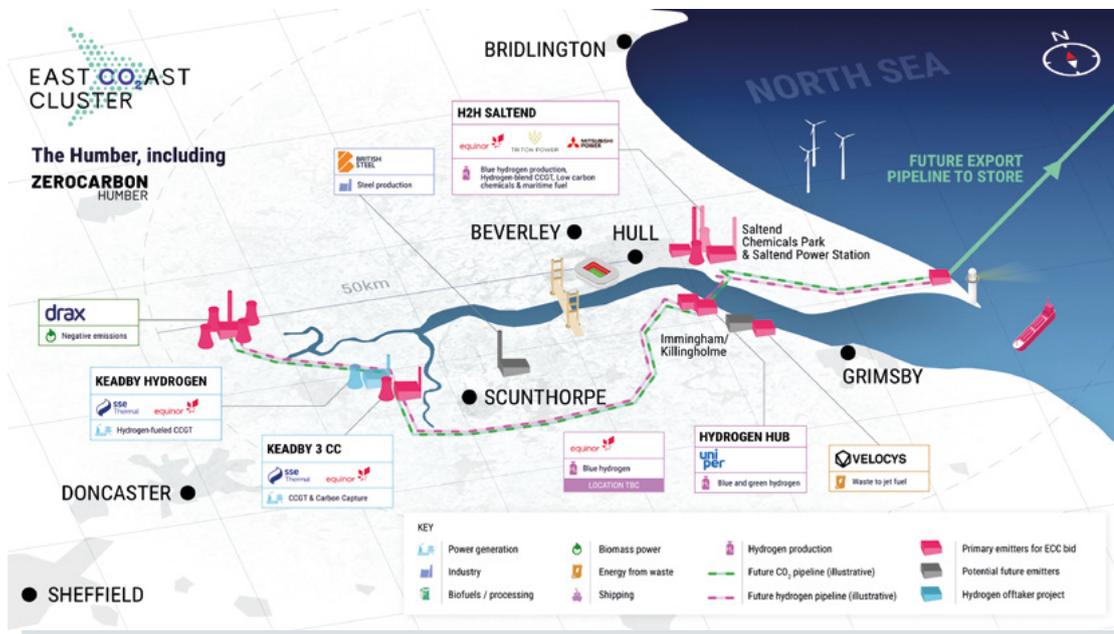


The Bigger Picture: East Coast Cluster & Zero Carbon Humber Partnerships

H2H Saltend is the kick-starter project for the wider Zero Carbon Humber (ZCH) scheme, a UKRI grant co-funded project for dual CO₂ and hydrogen pipelines connecting industries across the region. The ZCH partnership includes fourteen leading organisations committed to making the Humber the world's first net zero region by 2040.

This builds on The Humber's existing reputation as the UK's Energy Estuary, creating a world-leading SuperPlace where CCS and hydrogen unite with existing renewables and other low carbon technologies across multiple sectors in the region.

ZCH, together with Net Zero Teesside and the proposed offshore CO₂ pipelines and sub-sea carbon dioxide storage, constitutes the East Coast Cluster (ECC), which was selected by the Department for Business, Energy & Industrial Strategy (BEIS) as one of the UK's first two Carbon Capture Use and Storage Clusters to advance its carbon capture and storage plans within the 2020s.



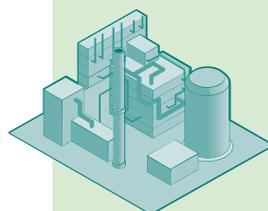
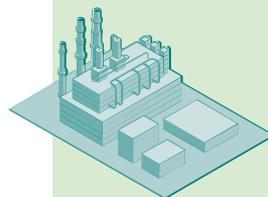
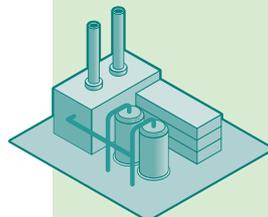
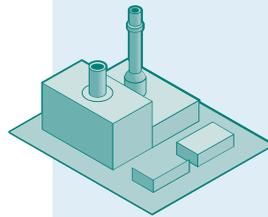
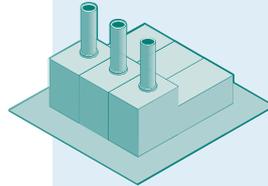
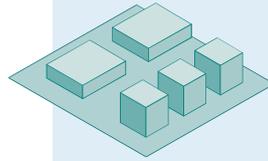
Equinor's H2H Roadmap

H2H Saltend is just the start of Equinor's hydrogen ambitions in the Humber, and it has set out a Roadmap to deliver at least 1.8 Gigawatts of hydrogen as early as 2028 – over a third of the Government's UK-wide 2030 5GW ambition.

The wider roadmap includes the Aldbrough Hydrogen Storage Project on the East Yorkshire coast and the world's first at-scale 100% hydrogen power station at Keadby Hydrogen Power Plant in North Lincolnshire (both in collaboration with SSE Thermal), as well as exploring options for hydrogen in domestic heating trials in towns in Lincolnshire and East Yorkshire, with East Coast Hydrogen partners Cadent and Northern Gas Networks.

Equinor will continue to work with partners and potential users of hydrogen across a range of end-use sectors to explore concepts for hydrogen use including power, industrial fuel switch, industrial feedstock, maritime and aviation fuel, transport, gas network and domestic heat decarbonization.

With H2H Saltend as the kick-starter for low carbon infrastructure, pipelines can expand across the Humber, transporting hydrogen for use by multiple industry and power customers. As demand increases, more hydrogen production units can be built at appropriate industrial locations across the Humber.



LOCAL RESULTS

2021-2023

Project matured to final investment decision through private and public support.

2024-2026

Engineering and build of H2H Saltend anchor project and low carbon infrastructure.

2026

H2H Saltend producing low carbon hydrogen for use as fuel at Triton Power and Saltend Chemicals Park. Low carbon chemicals production underway. CO₂ transport and storage infrastructure taking captured CO₂ and storing it safely offshore.

REGIONAL IMPACT

2024-2028

Design and development of additional production plants to expand hydrogen production in the Humber.

2027-2029

Expansion across the Humber with additional hydrogen production from H2H Production 2 to support growing hydrogen use from both industrial users and power, such as the Keadby Hydrogen Power Plant, supported by pipeline infrastructure and Aldbrough Hydrogen Storage.

2030-2035

Saltend Chemicals Park reaches net zero carbon emissions as Triton Power converted to 100% hydrogen. Hydrogen in use across the region from a range of end use sectors including industry, power, domestic heat town trials and transport.

Economic Benefits

Reducing emissions using hydrogen and carbon capture can not only help to tackle climate change and achieve the UK's net zero targets, but can also deliver new jobs, opportunities and investment to the region.

These technologies can also help to future-proof major local employers in high emitting sectors like the steel industry and offshore oil and gas, helping to transition skills and jobs towards greener alternatives. Products made using low carbon techniques also have higher demand on an international market.

The East Coast Cluster expects to create an average of 25,000 direct and indirect jobs per year until 2050, with an additional 25,000 induced jobs and £2 billion Gross Valued Added to the economy.

Equinor is working with local organisations and contractors to ensure that local businesses of all shapes and sizes can benefit from these opportunities. We have already held Supplier Information Days to give local businesses direct access to the project teams and ensure they can prepare for the opportunities that will be available, and we plan to deliver more of these events throughout the coming years.

We are also working with local institutions like Ron Dearing University Technical College, Hull University, Aura Innovation Centre and nearby schools to ensure that we inspire young people and equip them with the right knowledge and skills to work within these low carbon technologies over the coming decades.

Establishing first-of-a-kind projects like H2H Saltend can make this region an international beacon for low carbon investment, supporting the Humber's reputation as the UK's Energy Estuary.



25,000+

Jobs up to 2050
(average per annum)



~ 41,000

Jobs peak in 2026



Operations:

2,200 direct jobs/yr
13,300 indirect jobs/yr



25,000

Additional induced jobs/yr



£2bn +

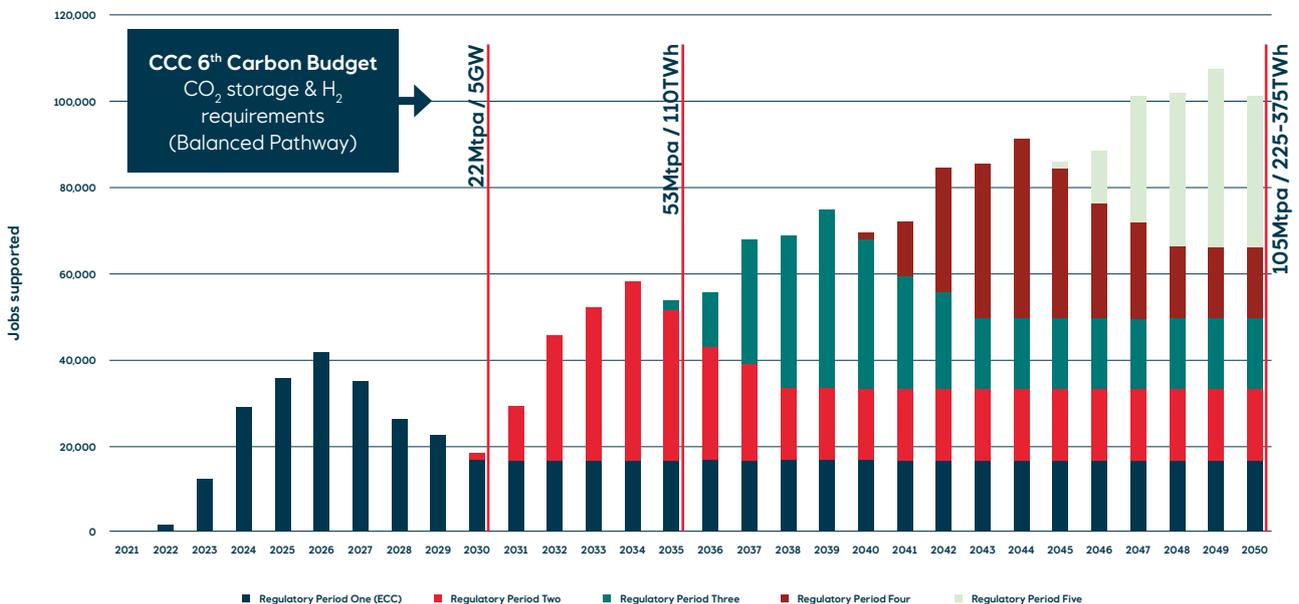
Average GVA up to 2050

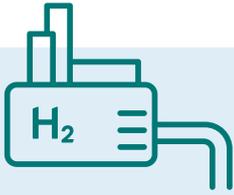


Construction:

9,400 direct jobs/yr
12,300 indirect jobs/yr

Economic Impact across the East Coast Cluster

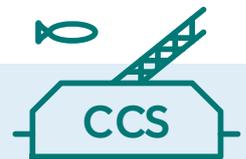




What is Hydrogen?

Hydrogen (H₂) is the simplest, lightest and most abundant element in the universe but usually only found in other compounds such as water and fossil fuels. It can either be used to produce energy or as feedstock for industrial/chemical processes. It produces no carbon emissions when used, but they can be released during its production.

There are different classifications of hydrogen depending on production method. H2H Saltend will produce what is known as 'Blue Hydrogen' which is made by extracting the hydrogen contained within natural gas, and uses carbon capture and storage (CCS) to capture and store the CO₂ emitted. This is the quickest, easiest and currently cheapest method to produce hydrogen on a large scale and is used worldwide.

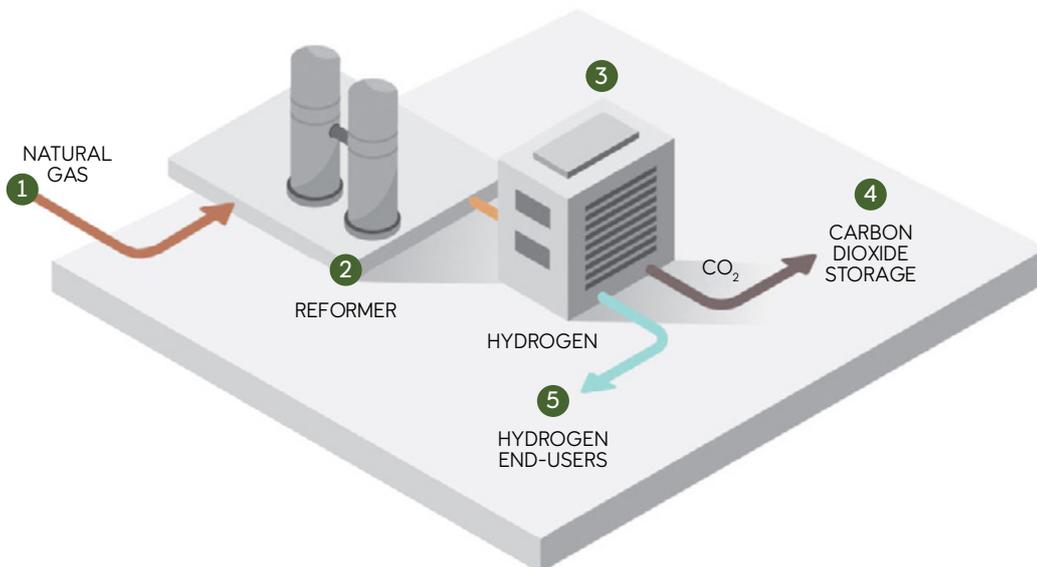


What is CCS?

Carbon Capture and Storage (CCS) refers to preventing the emissions of CO₂ into the atmosphere by trapping it at source and either using it for other purposes (such as in fizzy drinks) or safely storing it underground.

In the case of H2H Saltend, carbon emissions from the hydrogen production process would be captured and transported by pipeline for safe storage in a sub-sea aquifer over 100km off the coast, using the East Coast Cluster infrastructure described below.

Equinor is the only commercial CCS operator in Europe, with over 25 years of experience capturing carbon emissions from industrial sources and storing them under the Norwegian continental shelf.



- 1 Natural Gas is fed into a reformer
- 2 A partial oxidation reaction takes place, with the output flowing through a catalyst bed which performs the reformation
- 3 The synthetic gas produced is then separated, creating pure streams of hydrogen (H₂) and carbon dioxide (CO₂)
- 4 The CO₂ is transported by pipeline to be permanently stored under the southern North Sea
- 5 The hydrogen is transported for use in power, industry, heat and transport

