



COSTAIN

Shaping our energy future:
Hydrogen



H₂



Smart thinking,
improving people's lives

Our leading edge strategy

We offer our clients leading edge solutions that are digitally optimised across the whole life cycle of their assets by integrating the following five services.



Our culture and values underpin everything we do.

OUR SERVICES



ENERGY We power communities sustainably



WATER We keep water clean and flowing



TRANSPORTATION We connect and keep the national moving



DEFENCE We keep our people safe



ENERGY



Energy networks and storage

We play a significant role in safely delivering the energy infrastructure that will satisfy the UK's future needs.



Oil & gas and hydrocarbon generation

We are a leading provider of full life-cycle services in the development, design, delivery and maintenance of oil and gas infrastructure.



Clean energy and decarbonisation

We work with clients and industry to drive new solutions for a decarbonised energy future.

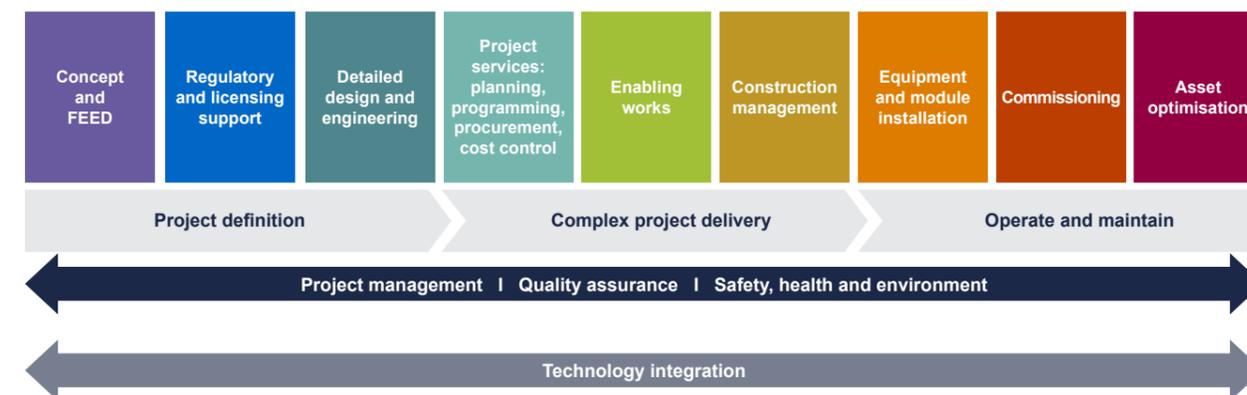
We are playing a leading role in the deployment of solutions to develop the hydrogen market.

We are an engineering consultancy with a heritage of over 70 years in gas separation and processing. We are helping to realise the transition to hydrogen through our work on hydrogen production and transportation concepts and carbon capture and storage schemes.

Our experience encompasses the entire hydrogen value chain, including hydrogen production, underground storage, grid injection, transportation and integration into existing gas infrastructure, and usage. Our technical knowledge of carbon capture and storage includes intellectual property to reduce the cost of carbon capture from hydrogen.

Our capabilities

Our multi-sector engineering capabilities enable us to deliver value and innovation across all phases of the project lifecycle, from initial feasibility, through design and build to operation and maintenance.



Why hydrogen?

If the UK is going to achieve net zero carbon emissions by 2050 and make a real impact on climate change, we need to fundamentally change the energy market.

At Costain, we believe one of the most practical options for clean energy growth is hydrogen.

We are working with industrial, academic and governmental partners to propose safe, cost effective approaches to the use of hydrogen across the energy market, for industrial and domestic power and heat as well as an alternative fuel for transport.

Hydrogen economy

Our expertise



Experience of design and construction of hydrogen processing equipment

Extensive offshore subsea and topsides experience

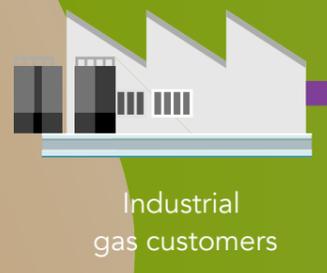


CO₂ storage

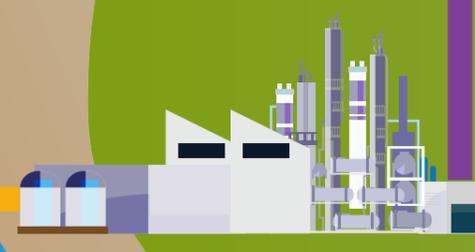
Expertise in carbon capture, usage and storage

A prominent player in the development of gas storage projects, with experience in salt strata and depleted field storage

Underground storage



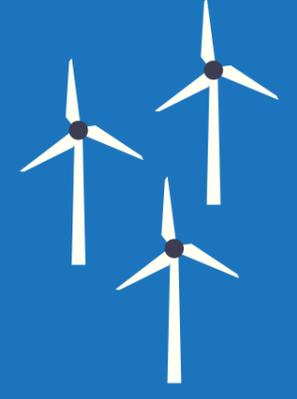
Industrial gas customers



Production of hydrogen by electrolysis

Helping industrial hydrogen producers monetise their product

Surplus power from renewables



Power to gas

NATURAL GAS PIPELINE

Steam methane reformation

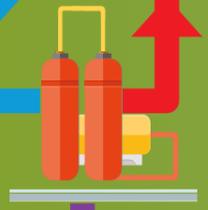
HYDROGEN PIPELINE

Blend



Residential gas customers

In depth knowledge of the gas transmission and distribution networks and gas compression



Deblending



H₂ powered vehicles

Transportation consultancy and smart places expertise



H₂ powered transport

Our work

We are committed to the emerging hydrogen and decarbonised energy sector, providing expertise across the value chain from defining strategy and shaping technology solutions, through to complex delivery and asset optimisation.

Developing opportunities for offshore hydrogen generation

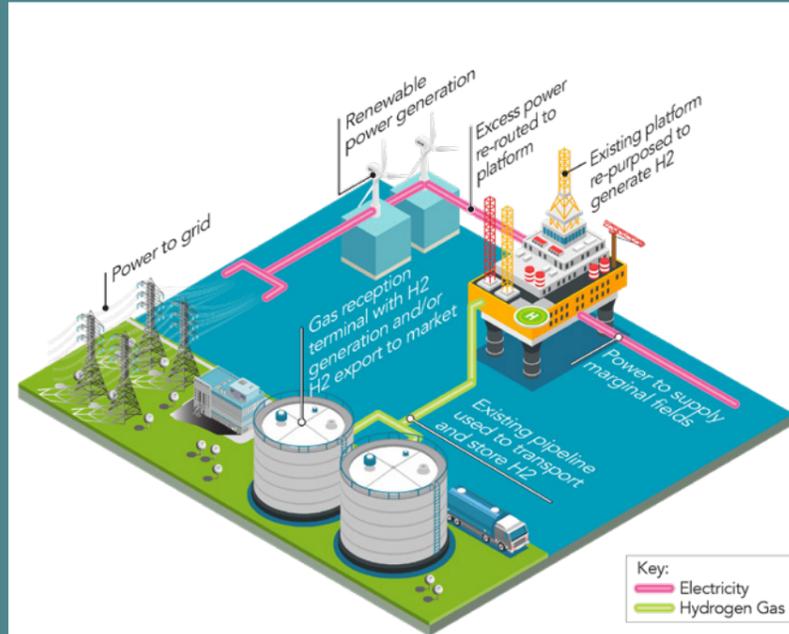
Project: Hydrogen supply and its opportunities in marginal fields and facilities re-use

Client: The Oil & Gas Technology Centre

Costain worked with the OGTC and environmental consultancy Aquatera to investigate the viability of hydrogen generation in the offshore environment as well as potential applications for hydrogen offshore.

Our role: Our experts undertook a scoping study to investigate opportunities for hydrogen within the offshore oil and gas sector.

Outcomes: The study identified three scenarios as being worthy of more detailed evaluation.



Enabling clean hydrogen production

Project: Carbon capture and storage project

Client: Masdar Clean Energy, UAE

Design of 0.8 million tonnes per annum carbon capture facility and delivery of dense phase CO₂ for use in enhanced oil recovery.

Our role: Delivery of technical and engineering assessments, detailed engineering design, procurement, construction and project management, for the UAE's first carbon capture and storage project.

Outcomes: Carbon capture facility design, encompassing CO₂ compression, dehydration and metering, cold vent relief, control systems and relevant infrastructure.

We were also responsible for the design of a 45km 8-inch pipeline and associated facilities to deliver

Demonstrating hydrogen distribution

Project: Hydrogen 100 project

Client: SGN

The Hydrogen 100 project is a feasibility study looking to develop site specific evidence to support the construction of a physical 100% hydrogen demonstration.

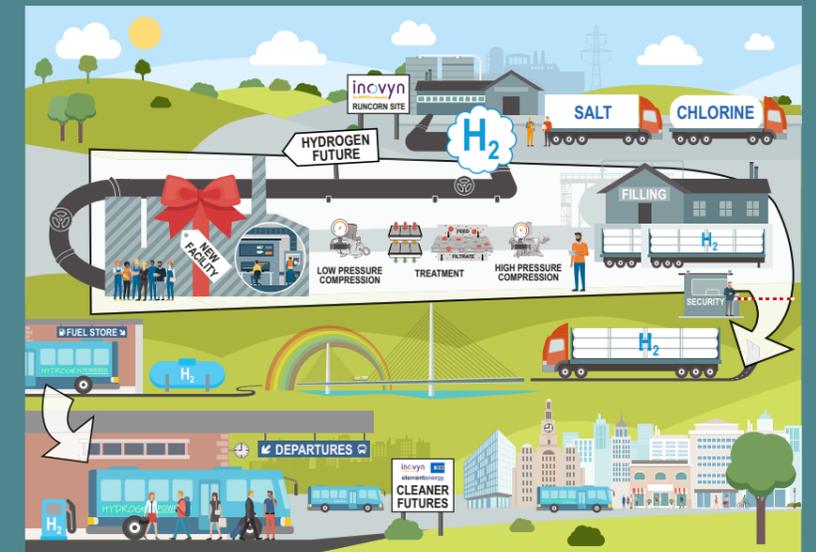
Our role: We are working with SGN on the groundbreaking H100 project, which aims to demonstrate how hydrogen can be distributed in a safe, secure and reliable way. Our feasibility and front end design work will help to identify the optimum location for the construction of a first of a kind hydrogen demonstration facility. This can make a major contribution to meeting the UK's decarbonisation targets by establishing the evidence base required to support the use of hydrogen for decarbonisation.

Producing hydrogen to fuel transport

Project: Hydrogen buses

Client: INOVYN

Our role: We collaborated with INOVYN on a feasibility study to shape an engineering solution to bring hydrogen buses to the streets of Liverpool to help improve air quality and meet UK emissions targets. The scheme was designed to process hydrogen already being produced in Runcorn and deliver it in line with fuel grade specifications. Our work on this scheme demonstrates our drive to influence the future energy landscape by developing solutions to support decarbonisation.



Investing in research and development

Hydrogen PhD



Research Title: Decarbonising gas in NW England through a hydrogen network

Partner: University of Chester

This PhD will evaluate various hydrogen technologies which could aid the transition to a low carbon economy in the North West of England, specifically CCS infrastructure.

The initial focus of the research is to examine four key interrelated areas:

Infrastructure requirements for CCUS

Ways in which such technologies may gain a social license to operate

Opportunities to stakeholders afforded by delivering such projects

Mechanisms by which projects can be resourced.

Driving industry collaboration

North West
Hydrogen
Alliance



Costain is a founding member of the North West Hydrogen Alliance (NWhA). The aim of the alliance is to bring together the relevant organisations to highlight how the North West of England could make hydrogen energy a reality in the UK, helping to bring down the region's CO₂ emissions and supporting clean growth.

NWhydrogenAlliance.co.uk
@HydrogenNW
LinkedIn/North West Hydrogen Alliance

Meet the team



Our multi-discipline, multi-sector team can advise on the best approach to develop your hydrogen project. Contact us to learn more.



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