

A vision for hydrogen in the Tees Valley

Our vision is for the Tees Valley to be one of the UK's first hydrogen SuperPlaces. Hydrogen 'SuperPlaces' are industrial regions supporting the production, storage, distribution and end use of hydrogen at a significant scale. The Tees Valley is well placed to achieve this and already has a significant hydrogen economy. Low carbon hydrogen will accelerate its journey towards becoming one of the world's first net zero industrial clusters by 2040, and help to accelerate the UK towards its overarching 2050 net zero goal. The Tees Valley will produce 25% of the government's 2030 hydrogen production target of 10GW.

Due to its significant existing hydrogen capabilities, the Tees Valley has all the necessary components to create a hydrogen economy, supporting the production and local use of hydrogen as a fuel and feedstock for indigenous and new industries, supporting them to decarbonise, adapt, grow, and thrive.

Our vision is for the Tees Valley to maximise its inherent potential and to become a hydrogen SuperPlace. Hydrogen provides a platform for accelerating the Tees Valley's current growth into new industries, giving it the opportunity to rebalance the economic future of the north, especially the East Coast. Transporting hydrogen to the wider UK and abroad will provide a catalyst for industrial decarbonisation and green growth. At home, the Tees Valley's SuperPlace status will see it become a showcase for economic regeneration and inward investment. It will create secure, high value jobs and support up to 3,000 jobs in existing manufacturing and transport sectors, and thousands more during construction.



Why should Teesside pursue a hydrogen powered future?

The Tees Valley already produces hydrogen as chemical feedstock for industry. However this report outlines how a step change deployment of low carbon hydrogen will achieve the 2040 net zero goal. Hydrogen will power transport and industry and provide heat for buildings and local homes, across the UK and beyond.

The steps needed to make that vision a reality, and to reach carbon net zero, extend beyond the Tees Valley. They point to many actions that are already in play and need to accelerate. Across the nation, we will need to retrofit buildings, adapt infrastructure and transform our use of heat and transport.

Expanding hydrogen production capabilities in the Tees Valley will provide multiple benefits. Low carbon hydrogen will provide energy for industries and processes that are hard to decarbonise, such as steel making. Hydrogen storage at scale offers seasonal energy storage and can manage variations in renewable energy production.

In addition to these benefits, developing a hydrogen economy can stem the rise in energy costs. Hydrogen can deliver fuel security, support local manufacturing, meaningful local employment and industrial regeneration.

Policy and governance

Teesside already has the components needed for successful deployment; strategically located, it has pre-existing hydrogen production and mature infrastructure and markets. To transform the Tees Valley into a hydrogen SuperPlace, boosting local industries, several practical steps are needed.

Firstly, all aspects of the hydrogen ecosystem need to coordinate efforts. TVCA's re-energised Net Zero Hydrogen Leadership Group will lead regional coordination efforts. This will create increasing demand for hydrogen and hydrogen products, support skills development across the supply chain and ensure the benefits of their efforts are effectively communicated.

On the policy side, robust local policies must compliment national regulations, fully utilising appropriate subsidies and decision-making. The Tees Valley has an opportunity to go beyond the government's Low Carbon Hydrogen Standards, demonstrating leadership in full-lifecycle hydrogen emissions governance. In practice, this will require measuring and minimising all emissions from construction, operation, maintenance and demolition.

Making the vision a reality

This ambitious vision for the Tees Valley to become a hydrogen SuperPlace will need strong leadership, purposeful action, and sustained effort.

Business models that will set the strategic direction for the growth of hydrogen use in the UK are being developed. Design for one of the UK's first hydrogen for heat projects is underway in Redcar. A swift conclusion to these and other efforts, with funding ready to support the next stages, will be a positive step.

Industry partners can move forward with projects, providing secure supplies of hydrogen. Current hydrogen feedstock producers will utilise a variety of methods to decarbonise. This production will meet the demand from industrial consumers seeking low-carbon energy, create new commercial opportunities from new processes, whilst reducing the growing burden of carbon emissions.

The growth of hydrogen as an energy supply will lead gas network operators to build new pipelines and infrastructure, as well as converting existing networks to transport hydrogen. New infrastructure in the Tees Valley and improved transport links will supply customers directly, bringing new industries and export opportunities.

Looking to the future

Looking ahead to 2040, it is easy to envisage the Tees Valley as a thriving hub of clean industry with a global impact, exporting low carbon hydrogen and hydrogen products across the world. The key steps in that journey are outlined in the roadmap below.

The fundamental components to a hydrogen SuperPlace are already in the Tees Valley; these include a history of industrial excellence with legacy assets suitable for repurposing, strategic location around major transport links and a skilled workforce.

Regional stakeholders are coming together across the Tees Valley behind a shared vision of a hydrogen-powered regeneration of the area. By collaborating around investment, skills, infrastructure and support mechanisms, the Tees Valley will pioneer a low carbon hydrogen-based economy. This will empower the region to deliver on the ambitious decarbonisation targets set by TVCA and national government, while improving the livelihoods of local communities.

There stands before the people of the Tees Valley an opportunity to create a sustainable future with significant economic benefits. It is a collaborative future, well within reach, and worth fighting for.

2022

Regulations in place to build hydrogen industry.

Present day

- The seeds of the hydrogen revolution are being planted right now. Government is putting in place the regulations and financial support to make this happen.
- Government's plans are attracting the interest of businesses looking to play a part in the hydrogen future. Potential producers are starting to develop hydrogen projects to produce hydrogen for fuel at large-scale and consumers are looking to the future, advancing plans to move to low carbon energy.
- Hydrogen is currently produced in the Tees Valley for use as a chemical feedstock.

2025

Hydrogen projects begin construction.

Early steps

- With a regulatory framework and business support in place, confidence in a hydrogen future grows. Carbon capture utilisation and storage (CCUS) projects continue to develop.
- Large-scale hydrogen projects begin construction, moving from the drawing board into reality. Some smaller-scale green hydrogen projects already commencing production.
- Consumers and businesses have the confidence to contract for hydrogen supply and convert their processes to consume it.
- Hydrogen for home heating trials are successful, pointing the way forward for widespread adoption. Hydrogen for transport is ramping up across transport fleets, especially heavy duty transport.

2030

Hydrogen production at scale.

Production accelerates

- Momentum grows, decarbonisation is becoming a reality as offshore wind, CCUS and hydrogen production are now operating at large scale.
- More hydrogen capacity under construction, and current feedstock production has largely decarbonised.
- With experience in producing and selling hydrogen, businesses plan for expansion and the next stage in their growth.
- Scale-up of green hydrogen capacity continues as costs fall and hydrogen demand increases.
- Businesses can clearly see the advantages of moving to hydrogen and more seek to convert to maintain competition.
- People can see the advantages of hydrogen for heat and transport, creating significant demand.

2035

Green hydrogen production expands capacity.

Green growth

- Building on their experience and falling construction costs, hydrogen businesses expand hydrogen production.
- Infrastructure is now in place to store and distribute hydrogen, and business, industry and consumers become more focused on low carbon energy and fuels.
- Hydrogen is playing a major role in the Tees Valley Industrial Cluster's overall decarbonisation plan.

2040

One of the world's first net zero industrial clusters.

Net zero Tees Valley

- Tees Valley becomes one of the world's first net zero industrial clusters, supported by the deployment of low carbon hydrogen.
- The Government's focus on radically reducing all GHG emissions has been achieved in Teesside 10 years early. The few remaining unabated emissions face a regime of rising taxes and restrictions in operation.
- The renewable electricity and green hydrogen industries march forward in lock step, working to deliver demand for low carbon energy.
- Existing energy intensive industries thrive and others are attracted back to the Tees Valley, owing to the availability of clean fuel and feedstocks.
- Hydrogen vehicles are common place and the natural gas network moves to deliver 100% hydrogen across the country to buildings and industry.

2045

The Tees Valley accelerates the UK's net zero target.

Destination zero

- Five years ahead of the UK's 2050 net zero target, Teesside has not only achieved net zero but is also, along with other industrial clusters, helping the rest of the country achieve this goal.
- The Tees Valley's position as a global location for low carbon industry is secured as businesses meet consumer and regulatory demands for sustainability for sustainability.
- Teesside International Airport runs scheduled zero emissions flights based on locally produced hydrogen and sustainable aviation fuels.