

As one of the original energy transition organisations, AREG is championing the supply chain to enable net zero.

This fact sheet is designed to provide a brief overview on the different types of hydrogen available and highlight how it is being used. It is AREG's view that the North East of Scotland is an exemplar for both the development and use of hydrogen and should be a priority for fiscal support and commercial investment plans.

The Colours of Hydrogen

Green Hydrogen

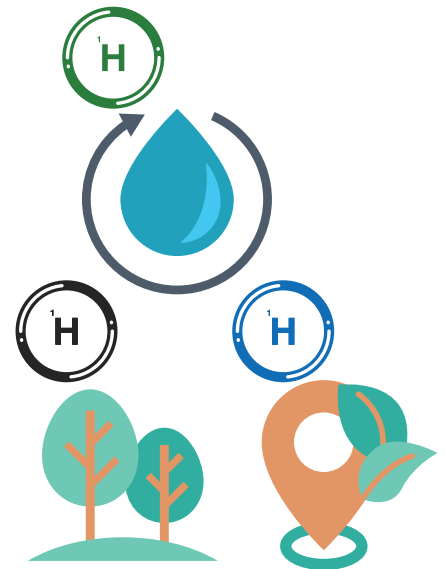
Green hydrogen is produced by electrolysis of water, using only electricity from renewable energies. The hydrogen is produced free of CO₂, since the electricity used comes 100% from renewable sources.

Grey Hydrogen

Grey hydrogen is extracted from fossil fuels. Grey hydrogen is mainly produced by reforming natural gas for industrial applications. CO₂ is a by-product which is vented to atmosphere.

Blue Hydrogen

Blue hydrogen is extracted from fossil fuels and is produced by reforming natural gas. CO₂ is a by-product which, in the UK, is liquified and stored underground (carbon capture and storage or CCS). It is expected that depleted gas fields under the North Sea will be used for CCS and the production of blue hydrogen. It is expected that existing natural gas networks will initially use a blend of blue hydrogen, initially 2% increasing to 20%, to reduce CO₂ emissions from a standard gas boiler before the shift to a truly carbon neutral solution with the growth of the production and use of green hydrogen.



Colour Change

The North East of Scotland is already a front-runner through the early adoption of hydrogen for transport and use of fuel cells and storage technologies and the proposed development for CCS and green hydrogen hub.

The region is well placed with the skills and supply chain expertise to deploy the infrastructure required to harness the

potential of hydrogen and support the growth of the hydrogen economy.

Although depleted gas fields under the North Sea present opportunities for CCS and blue hydrogen, longer term it is expected there will be a shift to a truly carbon neutral solution with the growth of green hydrogen.

Green hydrogen will become significantly more cost effective as a fuel as the price of generating renewable electricity becomes competitive and the cost of electrolyzers decreases. It is expected that direct wire connections from renewables electricity generation will be part of this cost reduction solution.

Research Facts

- According to a study by the Offshore Wind Industry Council (OWIC), in partnership with the Offshore Renewable Energy Catapult, green hydrogen projects could generate £320 billion for the UK economy and sustain up to 120,000 jobs by 2050.
- A RenewableUK report from May 2020 found that high renewable energy capacity, coupled with strong climate targets, make it likely that green hydrogen will become cost-competitive in the UK faster than in other parts of the world.

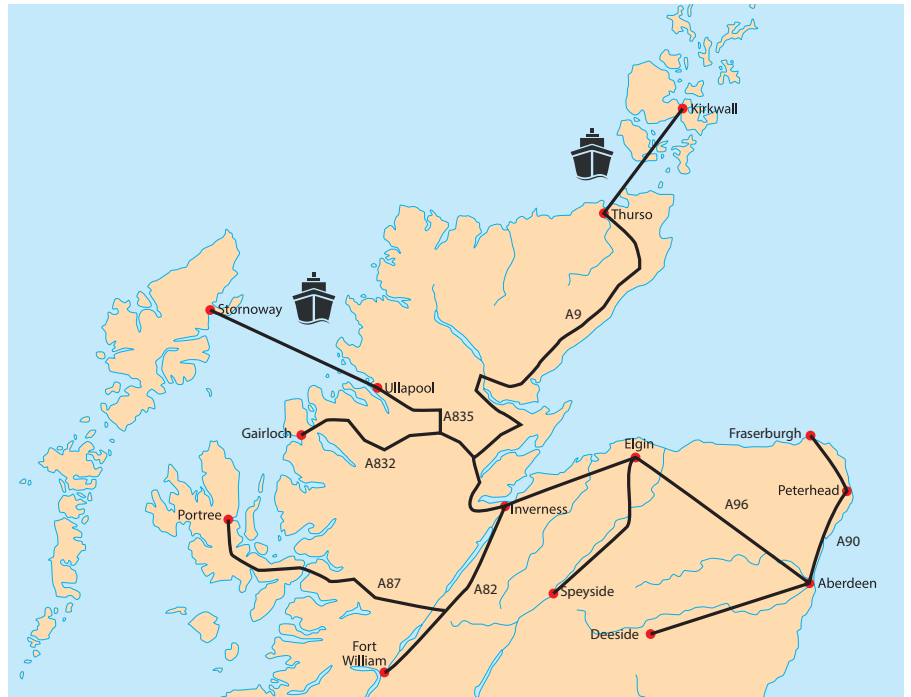
Scaling H2

In the pipeline 1 – Highland Hydrogen Highway (H3)

AREG is working with Aberdeen International Associates (AIA) to explore the possibilities of establishing a Hydrogen Highway in the North of Scotland, initially between Aberdeen, Inverness and the Black Isle.

A key area of future hydrogen use is likely to be the bulk transport of goods and people, such as the larger distances that exist in the North of Scotland, however initial hydrogen fuelling infrastructure needs to be put in place.

Building on existing facilities already in place in Aberdeen and Kirkwall, AREG and AIA are proposing the establishment of 12 hydrogen fuelling points across the North of Scotland between 2021-2025, together with a pilot HGV proposal.

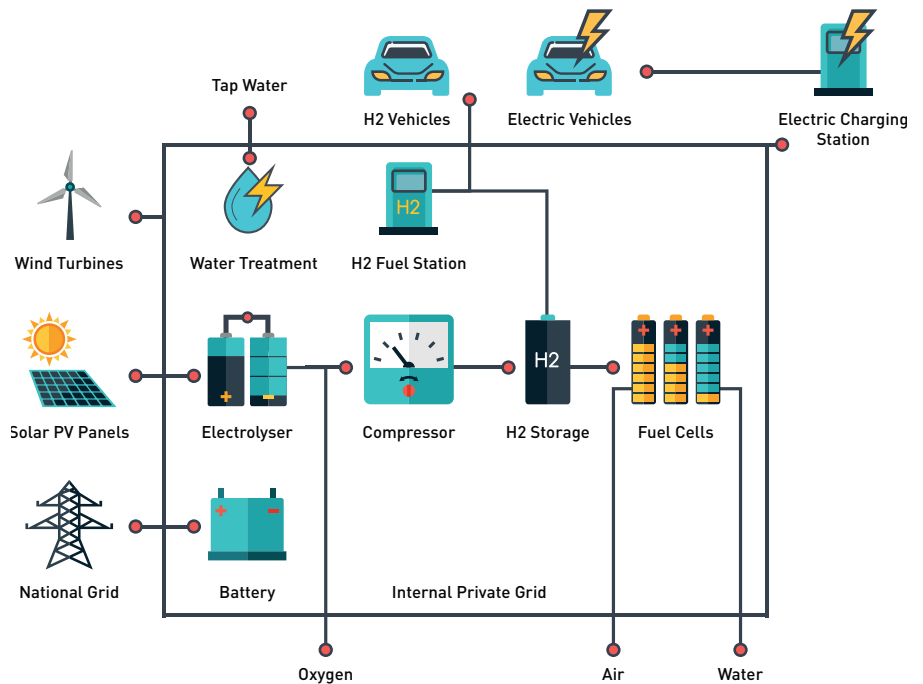


In the pipeline 2 – HydroGlen

HydroGlen is a proposed green hydrogen-powered farming community project at the James Hutton Institute’s research farm and residential community at Glensaugh in North East Scotland.

A feasibility study determined the possibility of retrofitting a rural farm and associated community to become energy-independent, using hydrogen as both an energy storage medium and a source of power.

[More information here](#)



About AREG

AREG wants the north east of Scotland to be a world-leading centre of excellence for the production and use of renewable energy. Our 180+ members represent every facet of the supply chain from multinational oil and gas producers and energy developers to technology specialists and professional services.

AREG aligns opportunities with capabilities in the supply chain, supports renewable energy businesses and facilitates the transfer of technology, skills, and expertise from oil & gas. We promote the region and our members nationally and internationally, as well as enabling, supporting, and promoting local renewable projects.