

WHAT YOU NEED TO KNOW ABOUT HYDROGEN

Hydrogen is a gas that can be produced from a range of sources including fossil fuels, renewable energy and biomass such as trees. The UK and Scottish Governments are backing it as a way to cut climate emissions across society in areas like transport and heat, but hydrogen is not a climate solution.

Hydrogen production is expensive, inefficient and far from a low carbon solution. It's being pushed by the oil and gas industry as a distraction tactic to keep using fossil fuels.

Grey Hydrogen

Globally, three quarters of all hydrogen produced is made from high carbon fossil fuel gas, this is sometimes called grey hydrogen.

Blue Hydrogen

Is made from fossil gas and is a process that still releases climate-changing carbon dioxide emissions. Blue hydrogen, sometimes called fossil hydrogen, relies on a technology called Carbon Capture and Storage (CCS) to capture carbon produced from this process.

However, the CCS necessary to reduce emissions at the level required has not been demonstrated anywhere in the world. For decades CCS has been pushed by the fossil fuel industry as a solution to cut emissions but it has never appeared as promised.

There is worrying potential for any reliance on fossil hydrogen to not only lock us into high carbon emission pathways from continued fossil fuel production, but actually increase demand for fossil gas in Scotland.

Recent research has also uncovered that whilst carbon dioxide emissions are lower for blue hydrogen than grey (fossil hydrogen without CCS), the methane emissions for blue hydrogen are actually higher than grey because of an increased use of fossil gas to power CCS.

Further, the greenhouse gas footprint of blue hydrogen is actually more than 20% greater than burning natural gas or coal for heat.¹

Hydrogen and hot air

Fossil hydrogen is often talked about as a way to cut emissions from the way we heat our homes and buildings. However, research shows that producing and burning hydrogen-based fuels in home gas boilers requires 6 to 14 times more electricity than heat pumps providing the same warmth.²

There is worrying potential for fossil hydrogen to lock us into a high pollution path from continued fossil fuel production, and actually increase demand for gas in Scotland.³

Green Hydrogen

Green hydrogen is made from a process called electrolysis, using an electric current to split water into its component elements of oxygen and hydrogen - this is a highly inefficient process.

Large scale production of green hydrogen demands huge volumes of cheap renewable electricity which currently does not exist in Scotland.

While the top priority for renewables should be to create electricity for direct use in heating our homes or powering our transport, there will be exceptional circumstances where using renewable power to make green hydrogen might make sense. These could be in remote areas or to supply hard-to-decarbonise industries such as making steel.

However, the expansion of green hydrogen nationwide represents a real risk of diverting efforts away from cheaper and more readily available options such as electric buses, trains and heat pumps. What we need to focus on is justly ending our reliance on fossil fuels and delivering transformational change across our society by choosing solutions we have now and which we know work.



1. onlinelibrary.wiley.com/doi/full/10.1002/ese3.956

2. nature.com/articles/s41558-021-01032-7

3. <https://www.gov.scot/publications/scottish-energy-strategy-future-energy-scotland-9781788515276/pages/4/>