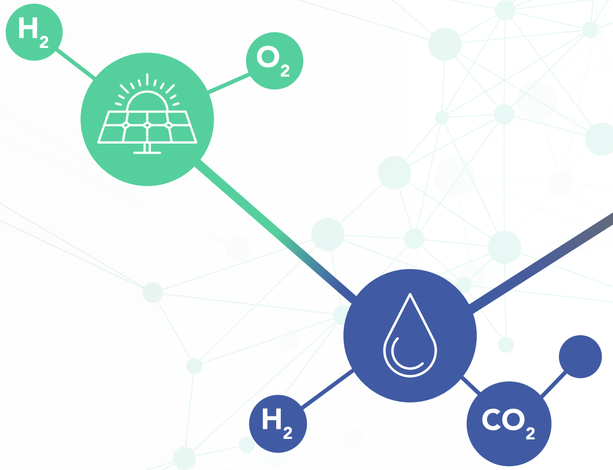
EXPLAINING THE HYDROGEN RAINBOW

The 'hydrogen rainbow' is a term that is being used increasingly when it comes to developing the hydrogen that could potentially run through our gas networks in the future. Hydrogen is a colourless gas, so what does it mean?

The 'colours' all refer to the way in which that hydrogen is produced, and different production methods have differing greenhouse gas levels associated with them. This means that some forms of hydrogen are considered more sustainable than others.

GREEN HYDROGEN

Green hydrogen is the one that does not produce any harmful greenhouse gas emissions. It's made by using excess renewable electricity (from solar or wind, for example) to electrolyse water. This splits the water into hydrogen and oxygen, emitting zero carbon dioxide in the process.



BLUE HYDROGEN

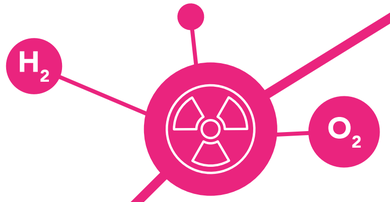
A process called steam reforming is used, which brings natural gas and heated water together in the form of steam. Hydrogen is produced, but so is carbon dioxide. This means that carbon capture and storage must be available to trap and store the carbon.

GREY HYDROGEN

Like blue hydrogen, steam reforming is used to produce hydrogen from natural gas. However, greenhouse gases are not captured and stored during the process.

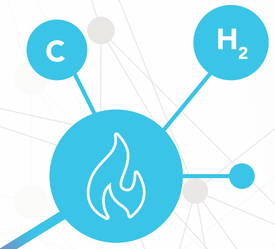
BLACK AND BROWN HYDROGEN

This is the least environmentally-friendly option, with black coal or lignite (brown coal) used to produce hydrogen.



PINK HYDROGEN

Hydrogen is produced via electrolysis, using nuclear electricity. This is sometimes also known as purple hydrogen or red hydrogen.



TURQUOISE HYDROGEN

This is a new technology that is yet to be scaled up. A process called methane pyrolysis is used to produce hydrogen and solid carbon.

The carbon intensity of different types of hydrogen is likely to become increasingly important for organisations looking to use hydrogen as a means of fulfilling their own sustainability goals. National Grid is currently developing a hydrogen Guarantees of Origin scheme, which would enable companies to trace and evidence the kind of hydrogen they are using and confidently report their carbon footprint.

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