Supporting the rollout of hydrogen energy

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Filling up with hydrogen fuel. Credit: ITM Power

As the UK's first renewable hydrogen refuelling station opens, the Gas Metrology team at the National Physical Laboratory (NPL) is supporting the rollout of hydrogen vehicles through its hydrogen purity laboratory, which provides quality assurance to refuelling stations.

Hydrogen is set to become a crucial part of the UK's future energy mix as the government strives to meet challenging targets for reducing greenhouse emissions. Hydrogen-fuelled vehicles have been identified as a promising technology to help achieve these goals, as they produce no harmful exhaust emissions and are completely carbon free if the

hydrogen is generated from renewable sources.

But the engines that drive hydrogen vehicles, fuel cells, can degrade quickly if even trace levels of impurities are present in the supplied hydrogen. Recognising the significance of this, the European Commission introduced a new Directive in 2014 requiring all hydrogen used to power vehicles to comply with strict purity requirements.

NPL's Gas Metrology team is leading the way in developing novel analytical methods for performing quality assurance of fuel cell hydrogen, to support uptake of hydrogen vehicles. As well as providing traceable measurements against the most accurate gas standards available, the team has developed a device to simplify and speed up purity analysis - the Hydrogen Impurity Enrichment Device. The device, which concentrates the impurities in a sample of hydrogen prior to purity analysis, was featured in a recent article in Automotive Engineer

NPL is keen to apply its expertise and capabilities to support projects that aim to progress hydrogen technologies. One such project NPL is currently involved in is Island Hydrogen, led by ITM Power and supported by Innovate UK, which aims to power the Isle of Wight completely through renewable sources. As part of this project, NPL has supported ITM Power in developing their hydrogen refuelling stations, performing quality assurance at each step of the build in order to assess and prevent the risk of impurity contamination in the final hydrogen product.

A significant outcome of the Island Hydrogen project is the opening of the UK's first renewable hydrogen refuelling station, which took place in Rotherham on 17 September 2015. This is the first hydrogen refuelling station in the UK that produces completely clean hydrogen, using a wind turbine to power the splitting of water into hydrogen and oxygen.

Work is currently under way on a new hydrogen storage and refuelling station at NPL, as part of the Hydrogen for Innovative Vehicles (HyFIVE) project being launched across major cities in Europe.

More information: Find out more about Hydrogen Purity Analysis at NPL: www.npl.co.uk/science-technolo … analysis-and-storage

Provided by National Physical Laboratory