

APPG ON HYDROGEN PANEL SESSION – TRANSPORT

MINUTES

Date	Tuesday 28 th January
Chair	Dr Jeevun Sandher, MP for Loughborough and Chair of the APPG on Hydrogen
External Witness Panel	<ul style="list-style-type: none"> • Jon Hunt, Senior Manager in Hydrogen Transformation, Toyota • Dr Lee Roberts, Policy, Sustainability and Funding Manager, Ryze Power • Professor Adrian Spencer, Director of the Caterpillar Innovation and Research Centre, Loughborough University • Dan Hooper, Vice President, UK Government Relations, Rolls Royce • Dan Sadler, Director of Hydrogen for Low-Carbon Solutions Business, Equinor • Chris Wright, Hydrogen Development Manager, Centrica
Parliamentary Panel	<ul style="list-style-type: none"> • Henry Tufnell MP (Lab, Mid and South Pembrokeshire) • Lord Cameron of Dillington (Crossbench) • Wera Hobhouse (Lib Dem, Bath) • Andrew Cooper MP (Lab, Mid Cheshire) • Lord Ashcombe (Conservative) • Baroness Hooper (Conservative)
Context background information	<p>The transport sector offers a unique avenue for hydrogen adoption, emerging as the most high-profile facet of the net-zero transition. One instance of this is in the UK's 2030 phase-out of diesel and petrol cars, applying pressure to automakers and consumers. Hydrogen-powered Road vehicles, supported by fuelling stations, could offer the path to a ZEV future. The APPG's previous findings have suggested that hydrogen cars can be even more efficient than EVs, highlighting the need for hydrogen hubs that can rival current petrol and diesel fuelling station infrastructure.</p> <p>However, the discussion of hydrogen's role in decarbonising transport is not limited to road vehicles. Air travel has been scrutinised for its considerable contribution to the UK's carbon footprint. Hydrogen-fuelled aircraft could allow for the net-zero transition to be realised, offering a feasible alternative for fossil fuels in short haul aviation. This is bolstered by the UK's strong R&D in aviation, allowing for hydrogen to be used as fuel for aircraft without producing carbon emissions.</p>

Dr Jeevun Sandher MP (Labour, Loughborough): opened the session by providing an overview of the session's topic of discussion and by welcoming the guest speakers.

Jon Hunt, Senior Manager in Hydrogen Transformation, Toyota: highlighted that Toyota's production system focuses on eliminating waste and driving efficiency, and that it has 90 million

customers across the world. Customers are the principal drivers of a company's success, and that cutting edge technology needed to be rolled out to them to foster demand. Hydrogen is a central way through which emissions can be drawn down. Toyota is committed to invest in hydrogen technologies, but that it was fundamentally restricted due to a lack of a government plan and/or framework for hydrogen.

Toyota has invested in its Deeside Engine Plant in Wales, which helps to create the modules which go into, among other things, buses and trains. Toyota has also invested in the world's first hydrogen pick-up truck, which was aided by British Government funding. The manufacturer would encourage further national investment into hydrogen, but warned that, if a serious hydrogen strategy was not developed, that the UK would be an "also ran", and not at the "vanguard".

Dr Lee Roberts, Policy, Sustainability and Funding Manager, Ryze Power: Ryze is a low-carbon fuel supplier, and an infrastructure provider and distributor. A core of the business is now hydrogen supply, and Ryze has seen tremendous growth.

Ryze had observed a surge in demand for hydrogen for new applications—namely in industries such as aviation. The sister company is Wrightbus, a world-leading zero emissions bus provider. Ryze also supplies half of all operational hydrogen buses in the UK and works alongside Vauxhall too. The organisation also works closely with JCB on hydrogen non-road mobile machinery. Ryze also supplies hydrogen to ZeroAvia for engine testing.

Dr Roberts outlined two core obstacles:

- Hydrogen needs to become cheaper because it needed to be able to compete with cheaper, dirtier alternatives.
- The Government needs to provide clarity and certainty. This spans from the Hydrogen Allocation Round to the standardisation and harmonisation of the as-of-yet fledgling UK hydrogen industry.

Professor Adrian Spencer, Director of the Caterpillar Innovation and Research Centre, Loughborough University: The University has been home to the Rolls-Royce Technology Centre since 1991, and through its various departments, continues to be a leader in hydrogen research. The National Centre for Combustion and Aerothermal Technology (NCCAT) is also a collaborative project between the University, Rolls-Royce and EasyJet. Professor Spencer also pointed to Intelligent Energy Ltd, a spinout company, which develops and manufactures zero emission hydrogen fuel cell products, which is also based in Loughborough. R&D is being held up by the lack of availability of green hydrogen.

Professor Spencer added that attracting skilled graduates into hydrogen research is an issue—mainly because of the poor reputation of hydrogen. Safety and standards—particularly in setting up facilities—is also a burden. Contrails in aviation is an added area of environmental concern.

Dan Hooper, VP, UK Government Relations, Rolls-Royce: Hydrogen is a cross-group endeavour and is a core component of its power generation and power systems businesses respectively. Rolls-Royce is currently looking at electrolysis as a means through which to generate hydrogen via small module reactors as a power source. Rolls-Royce is actively trying to ensure the UK is competitive when it comes to aeroengine hydrogen capabilities. However, this is a big technical challenge—and it is a long-term technological process.

On the global challenges - the UK principally lacks hydrogen supply, and neither does it have the necessary infrastructure for testing. Importantly, given that aviation is a global industry, having the



resources and capacity to adapt to hydrogen in aerospace will be vital to the UK's long-term success. If the UK does not take the necessary steps now, the 2035 benchmark will not be hit – with 2040 being more likely.

Dan Sadler, Director of Hydrogen for Low Carbon Solutions Business, Equinor: Equinor is a growing wind major, and a leading carbon capture expert. Mr Sadler suggested that the “ship had sailed” for hydrogen in transport in Britain. The large-scale adoption of hydrogen cars would experience difficulties in uptake, but instead greater uptake could come via hydrogen buses, haulage, aviation and maritime. Mr Sadler also argued that scale—particularly for transport—would be difficult to grow. The lack of finance is a potential roadblock. Echoing other speakers, Mr Sadler claimed that a lack of Government clarity may also prove to be a barrier.

Chris Wright, Hydrogen Development Manager, Centrica: Centrica is committed to decarbonising its business operations, especially from a whole-systems perspective. It is also developing what could be the first regional hydrogen transmission pipeline. A core objective of Equinor, is to drive the costs of hydrogen down. Centrica's van fleet—it currently operates 8,000 vans—has been an early adopter of zero emissions vehicles. A third of its fleet was battery electric. The organisation aims to be 100% zero-emission by 2030. Centrica has also trialled its first hydrogen van, which was supplied by Vauxhall.

Dr Jeevun Sandher MP proceeded to open the panel up to questions.

Henry Tufnell MP (Labour, Mid and South Pembrokeshire) asked a question on cost, and asked whether the panel could elaborate on said competition element.

Dr Roberts outlined how China, Japan, and Germany were market leaders in hydrogen fuelling stations. The EU has a strategy to install such stations. There is, therefore, a massive disparity between what the UK has done, and what market competitors have achieved. The sheer disparity in scale will mean that, for the vehicle market, hydrogen cars will struggle to adopt mass domestic adoption if these fuelling stations, alongside the hydrogen supply itself, are not constructed in far greater numbers to what currently exists.

Mr Hunt added that tariffs and trade—especially with the new US administration—was a vice for the UK because it does not currently have the competitive edge to produce products to export at scale.

Mr Saddler emphasised that a big barrier to competitiveness was the price of the power itself. To become more price competitive, the UK will need to achieve scale, and adopt resilient transportation systems, to access bigger markets.

Wera Hobhouse MP (Liberal Democrat, Bath) wanted to get a broad sense about what manufacturers are presently thinking, specifically regarding domestic hydrogen vehicle production and consumer demand.

Mr Hunt outlined manufacturers, such as Toyota, have a strong understanding of what consumers expect. The uptake of large-scale hydrogen in the energy system will have the effect of driving demand for hydrogen vehicles, much in the same way that electric vehicles have benefited from changes to electrical infrastructure. Hydrogen should not just be seen functionally as a fuel cell, but hydrogen as an energy actor. However, some infrastructure bottlenecks would need to be addressed for there to be mass hydrogen vehicle uptake.



Professor Spencer added there were other logistical challenges. In aerospace, for example, the size of some planes—and the distances they travel—posed serious economic and infrastructure challenges to hydrogen-powered aircraft.

Lord Ashcombe (Conservative) asked about the lack of hydrogen in the UK, and about where it [hydrogen] goes.

Mr Sadler said that the issue the UK had was not that it didn't have any hydrogen, but that it does not have enough low-carbon hydrogen. The UK could only create low-carbon hydrogen if it had the system in place to use it, and that there were four constituent parts at play with hydrogen: (a) production; (b) usage; (c) transportation, and (d) installation. The costs involved with hydrogen production meant that companies looking to develop such production networks first and foremost needed a return on investment. The UK Government—in not setting up adequate clarity—was threatening to make “perfection the enemy of progress”.

Dr Roberts suggested that around half of the hydrogen available for it is either from green sources or by-products. Most grey hydrogen produced in the UK is not available for use in transport. This presents a challenge, as the current “pool” for transport-ready hydrogen was severely limited in the UK.

Andrew Cooper MP (Labour, Mid-Cheshire) mentioned the Ellesmere Port HPP1 an HPP2 Plant, which aims to achieve to 4 gigawatts by 2030 – would this be enough for what industry needed.

Mr Hooper mentioned aviation testing, and that the UK does not currently have the requisite infrastructure to undertake these engine tests – and Rolls-Royce has instead conducted them in the US and Germany. Due to the sheer volume of aviation fuel Rolls-Royce burned in testing, adding that it would need a “considerable” amount for testing alone.

Lord Cameron raised the issue of GB Energy and the investment that it would make in the value chain.

Mr Sadler said it was welcome that GB Energy would be designed to invest and de-risk the energy value chain. Investing in hydrogen infrastructure was the core issue. Hydrogen is relatively easy to store, but the lack of a means through which to transport it was holding the UK back.

Baroness Hooper raised the issue of shipping and wanted to know the extent to which the UK's ports were ready for hydrogen.

Professor Spencer said there was sense in building infrastructure directly at ports, given that it would help to simplify the entire transportation process. Equinor were considering investing in ports, given the size of the company's shipping fleet.