

# Rolls-Royce and Porterbrook team up to develop technological innovations

February 14, 2022



Rolls-Royce is teaming up with UK rail rolling stock owner and asset manager Porterbrook, to identify and develop technological innovations to reduce carbon emissions and improve air quality across the rail network.

The two companies, who have signed a memorandum of understanding, will investigate the potential for the use of synthetic and net zero fuels, including hydrogen, both in fuel cells and internal combustion engines. Building on their recent success of jointly introducing hybrid battery-diesel railcars into passenger service, the two companies will also explore the potential for advanced hybridisation.

The relationship also includes considering the role of the wider rail ecosystem in decarbonisation, including fuel chain supply, infrastructure and operational models that can aid innovation and the transition to net zero.

The UK's railway accounts for approximately 1% of all domestic greenhouse gas (GHG) emissions\* and the Government's ambition is to remove all diesel-only trains – both passenger and freight – from the network by 2040 and achieve a net zero rail network by 2050. The UK Government has identified a number of

different routes to this target including alternative forms of power such as hydrogen, fuel cells, batteries, hybrid-electric and sustainable fuels.

Warren East, CEO, Rolls-Royce, said: “We have extensive experience of rail technology and are able to draw upon expertise from across our business in new net zero and zero emissions technologies for safety critical applications.

“We are committed to helping our customers make the transition to net zero by enabling them to use our current and future products in a way that is compatible with emissions reduction, and this relationship with Porterbrook will help us further understand the options for decarbonising rail transport.

“For us, playing a leading role in enabling the energy transition is both a societal imperative and a very significant commercial opportunity.”

Mary Grant, CEO, Porterbrook, said: “We have been at the forefront of developing alternative traction systems for rolling stock over recent years, through our innovations and long-term asset management approach.

“Our partnership with Rolls-Royce will mean that we continue to lead the UK’s rail sector in sustainable solutions, by leveraging expertise across industries on the pathway to net zero.”

Rolls-Royce, through its Power Systems business, has decades of experience in providing drive solutions for rail with its mtu-branded engines in service across five continents. The company has been developing new sustainable solutions including the hybrid-electric mtu Hybrid PowerPack for rail use.

This technology recently entered commercial service in the UK with Chiltern Railways on HybridFLEX trains, supplied by Porterbrook, which reduce CO<sub>2</sub> emissions by up to 25%. Power Systems is already developing a range of engines for power generation which can run on hydrogen; and is working on fuel cells – that produce electricity – to be used as reliable power supply in ships and heavy-duty off-highway vehicles.

Last year, Power Systems committed to release new generations of its most popular diesel engines for use with sustainable fuels by 2023, this includes mtu Series 4000 engines which are today used in locomotives operating in conditions as varied as Siberia and the Australian outback.

From next year it plans to have conversion kits available which enable mtu Series 4000 engines to run on 100% hydrogen.

Porterbrook owns almost a quarter of the national passenger rail fleet and currently has around 4,000 vehicles on lease or on order. The business has an established reputation for delivering new technologies, such as battery, hybrid and hydrogen powered trains.

Alongside the HybridFLEX and other hybrid trains in commercial service, the company has developed HydroFLEX, the first hydrogen-powered train to run on the UK’s mainline network.

It can operate under electric, battery and hydrogen power, making it the world's first 'tri-mode' train. Porterbrook was recently named Transport Sector Leader in the annual Global Real Estate Sustainability Benchmark (GRESB) assessment, where real estate and infrastructure organisations across the world are compared based on their environmental, social and governance (ESG) performance.

\*2019 figures. UK Department for Transport: *Decarbonising Transport*, 2021