

Cleaner, greener, self-charging trains of tomorrow to revolutionise rail travel

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Self-charging trains could make their way onto Britain's railways, transforming the future of transport after receiving government funding.

Top innovators and inventors have won prize money to bring their innovations to life, as part of the First of a Kind 2022 competition. This year's competition, in partnership with Innovate UK, focused on new concepts that will transform rail travel for passengers and decarbonising the network.

FOAK 2022 saw 24 innovators receive a share of more than £5 million with grants of up to £400,000 each. From technology making our railways greener than ever before by removing harmful emissions from train exhausts to research into powering our railways with renewable energy, this year's successful bidders will revolutionise the future of train travel for generations to come.

Transport secretary, Mark Harper said: "The UK has a long history of leading the way in railway innovation and the First of a Kind competition is getting the great brains of today to create the trains of tomorrow.

"Through millions of pounds worth of government funding, we are breathing life into ideas that will

revolutionise our railways and make them greener than ever before.

“This is just the beginning and, as transport secretary, I am determined to support British innovation and create a cutting edge, green rail industry that delivers even more benefits for passengers and freight.”

Mike Biddle, executive director for Net Zero at Innovate UK, said: “The innovations funded through this competition will help to deliver a greener, lower-emissions railway carrying increasingly higher proportions of the U.K.’s freight.

“Delivered by Innovate UK, on behalf of the Department for Transport through the Small Business Research Initiative, it seeks the best and brightest ideas.

“Companies from all over the UK have demonstrated the quality of their innovations in previous rounds of this scheme. Now we will support even more innovations to help deliver a greener railway that benefits passengers, employees and customers for rail freight.”

This year’s winners include Varamis who, working closely with DHL and Fedex, are revolutionising parcel delivery in the UK by repurposing former passenger carriages and putting rail right at the heart of the online shopping boom to create high-speed, non-letter delivery services. Echion Technologies, another successful bidder, is developing batteries that will charge from overhead wires and use that charge to ‘leapfrog’ across unelectrified section of track and, effectively, create self-charging trains – truly, ‘the first of a kind’. Thales Ground Transportation Systems have developed new sensors which will detect people approaching tracks, pin down their location, and give an early warning to staff – lifesaving technology that will reduce disruption and could act as suicide intervention or even stop protestors getting on the tracks.

Other winning projects include:

- Automatic systems that detect and stop track flooding
- Cutting edge electric drivetrains that replace polluting diesel engines
- New tech to instantly relay track information to improve and modernise rail safety

Winners with a track record of success will have the opportunity to progress for further funding next year as projects move from concepts to realisation.

The First of a Kind competition has already helped launch over 100 projects that are having a transformative effect across the entire industry. Previous winners have included Riding Sunbeams, which power railways with sunlight, and 4Silence’s sound bending walls which cancel out noise pollution from the railway.

Network Rail says it is pleased to support 15 of the 24 winning First of a Kind 2022 competition projects, announced by the Department for Transport. It’s particularly encouraging to see environmental projects being funded, such as the Rail Flood Defender, designed to reduce risk of rail services being disrupted during rainstorms, and a converter making renewable energy compatible with powering UK railways.

Gareth Evans, head of rail technology, said “Railways will play a key part in achieving net zero targets and

the response to climate change. I'm delighted that, via the Innovate UK First of a Kind initiative, Network Rail is supporting UK businesses in rising to this challenge. A thriving research, development and innovation supply chain is critical to our collective success in future years."