

# PRESS RELEASE

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## Research by Ricardo and Arcadis forms basis for ‘zero emission’ trains

**Battery-powered ‘zero-emission’ passenger trains could be operating on the regional Dutch rail network within the next decade, according to research by Ricardo and Arcadis**

The conclusions of a new feasibility study – commissioned by the northern provinces of Fryslân and Groningen – suggest that by enabling batteries to re-charge during standstill at turning points, and adopting one of two potential range extension solutions, rail vehicles in the region could be operating entirely by battery power by the year 2025.

Both Fryslân and Groningen have previously stated an intent to implement emission free rail transport within their jurisdictions. However previous studies produced by Ricardo, had established that the costs of converting their existing diesel network to electric traction would prove prohibitive. A follow-up study, produced by Arcadis, showed that a combination of a battery and hydrogen powered train would be feasible.

As a result, Ricardo and Arcadis were commissioned to carry out a feasibility study into the deployment of battery powered trains as an alternative option, and to examine viable solutions that could account for the region’s mix of relatively short turnarounds and longer routes.

The study focused on the possibility of fitting trains with batteries that could be charged during standstill at turning points – so-called *opportunity charging* – accompanied by a *range-extender* solution that would enable vehicles to operate a full timetable each day without the need to carry a large number of batteries.

The study proposes two viable *range extender* options:

- **Partial catenaries:** This would involve partial catenaries along stretches of the longer routes so that the trains can charge during operation as well as during station stops.
- **Hydrogen:** Converting hydrogen in a fuel cell into electricity in order to charge the batteries and/or directly provide the vehicle with power.

Martijn Wolf, sustainability consultant at Ricardo, commented: “In the course of our research we examined a wide range of current and developing rolling stock, battery and charging technologies, including developments in Germany where a hydrogen train has been running since the summer. We also explored the application of batteries and charging technology in road vehicles, especially on bus networks, to look at techniques that could be successfully transferred to the rail environment.”

Niek Müller, project manager energy transition at Arcadis, added: “Analyses of the energy consumption of trains on the various routes were carried out in parallel to determine the requirements for battery powered trains in combination with ‘partial catenary’ and ‘hydrogen’ as range-extender.”

The conclusion of the study is that ‘zero-emission’ trains are entirely feasible in the Fryslân and Groningen region within seven to ten years.

Both provinces and the regional operator, Arriva, can now make an informed choice about the possible roll-out of a battery-powered fleet, with greater insight into the costs and the modifications required to both trains and infrastructure.

Ends



## NOTES TO EDITORS:

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