

Item:
14



Report to Partnership Meeting 3 February 2023
RESEARCH AND STRATEGY DELIVERY
Caith₂ness

Purpose of Report

To inform Board Members on a potential hydrogen rail project.

Caith₂ness

In order to provide experience of hydrogen train operation, HITRANS is proposing deploying the Porterbrook Hydroflex train on Wick-Thurso. This will help to deliver Phases 3 and 4 of the Zero Emissions Train project.

1. Scottish Ministers' Programme for Government Sept 2021 announced, "We will showcase our first hydrogen-powered train at Bo'ness Heritage Railway this November, coinciding with COP26, followed by a demonstration of its live running during March 2022 before working towards the first hydrogen passenger service by the end of 2025."
2. This year the first two phases of the ZET project have been completed- the 314 has been converted to run on hydrogen and has been successfully trialled at Bo'ness, using the Arcola/Ballard, St Andrews, MSIP.
3. Phase 3 covers testing within an operational environment on the Scottish mainline network of a hydrogen train. Phase 4 is for a pilot service integrated within a wider diesel passenger service north of Inverness and Phase 5 is implementation of hydrogen as the traction means for scheduled service north of Inverness. A subsequent phase or expanded Phase 5 will cover implementation on the West Highland Line.
4. Wick-Thurso is a good location for hydrogen train activity as it has capacity in the timetable, is remotely signalled 24 hours per day, has no tunnels, is surrounded by renewable energy assets, has a history of energy engineering expertise at Dounreay, has two of Scotland's independent gas undertakings, and space for stabling and maintenance at Geogemas Junction.

5. The output from Bo'ness has suggested that the business case for retrofitting and re-engineering existing units for fuel cell operation is challenging. Using Hydroflex, which has almost completed all certification for mainline work, would be a sensible way to develop understanding on fuelling, maintenance and regular main line services which would then help inform Transport Scotland's procurement of fleets to replace the 156/158 fleets.
6. The successful Bo'ness team would shift focus to Caithness, assisted by Porterbrook's engineers. The unit would be stabled at Georgemas- the land is zoned for industrial development, has no neighbours, and already sees nuclear flask shipments.
7. It fits in with the Far North Line Review Team plan for enhanced services Helmsdale-Thurso to capitalise on the Flow Country environmental experience- currently going through UNESCO World Heritage Site designation. There is also synergy with Inverness Station Masterplan which is looking at the requirements for a hydrogen train maintenance depot.
8. The socio-economic impact on the area would be significant as the area becomes a significant part of Scotland's hydrogen economy following Dounreay decommissioning. Consultants Jacobs have already worked on a hydrogen hub proposal for Georgemas.
9. We need to secure funding for Phase 3 of the Hydrogen Train Project to get this on track. It would form a good project for Levelling Up funding.
10. 2024 is the 150th anniversary of the railway opening to Wick- this could provide an opportunity for a Royal Train visit, building on HRH's enthusiasm for Hydroflex at COP26.
11. List of proposed partners: Ballard, Transport Scotland, Angel, Porterbrook, ScotRail, Network Rail, Brodies, Georgemas Energy Logistics Park, Nuclear Decommissioning Authority, Dounreay Site Restoration Ltd, Caithness and North Sutherland Regeneration Partnership, Scottish Power, SSE, Highlands and Islands Enterprise, Highland Council, HITRANS

RISK REGISTER

RTS Delivery

Impact –Mode shift, integration, resilience

Policy

Impact –Future fuels, decarbonisation, transport efficiency,

Financial

Impact – Nil currently

Equality

Impact – Nil

Recommendation

1. Members are asked to note the report.

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Date: 23 February 2023