



Department
for Transport

From the Minister of State
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Lilian Greenwood MP
Chair of the Transport Select Committee

10th May 2018

Dear Lilian,

I am writing to provide clarification on my response to the Transport Select Committee dated 30 April on the point "*There is a hydrogen trial in the Lakes at the moment, and in a couple of weeks I am going to Lower Saxony in Germany to visit Alstom's iLint hydrogen train, which is being rolled out in that part of Germany*".

I have clarified my understanding and would like to point out that Northern are looking at a number of options for the Windermere line which I understand are more likely to be battery based rather than hydrogen based but these are still under development. It is in the North East that they are looking at hydrogen and I understand that they have been in discussion with Tees Valley Combined Authority and Network Rail.

As you will be aware from my earlier response Alstom are introducing hydrogen trains in Lower Saxony and I am due to visit soon to see for myself the progress which is being made and understand some of the challenges as well as the opportunities around this type of technology.

As I have previously said, the Department has regular meetings with rolling stock manufacturers and owners to discuss the development of alternatively powered trains. It also watches the development of alternative power sources in road transport industries with interest as advancements there are likely to create improvements that can be transferred to the rail sector.

A copy of this letter will be placed in the libraries of both Houses.
I hope this information is helpful.

JO JOHNSON

Details of Alternatively Fuelled Train Schemes and Trials

Hydrogen

Alstom has produced a Hydrogen powered train (Coradia iLint). These trains are due to enter passenger service in Germany this year. Other manufacturers (Siemens, Hitachi) are also developing similar systems. These trains store Hydrogen on the train and draw power from Hydrogen Fuel Cells on board the vehicles.

Battery

A number of train manufacturers, including Bombardier (Derby) and Vivarail (Stratford-Upon-Avon), are developing vehicles capable of storing electrical energy in batteries on board the train. These batteries can be charged whilst running on track fitted with overhead wires or a 3rd rail or from on-board diesel engines. This energy is then used to power the train when running on non-electrified sections of track.

In 2015 the Department supported the trial of an Independently Powered Electric Multiple-Unit (IPEMU) battery-powered train in passenger service between Harwich International and Manningtree stations. This prototype train was developed to demonstrate the potential of a battery / electric hybrid EMU.

Super Capacitor

Alstom manufactures the Citadis trams which can be fitted with super capacitors capable of storing electrical energy on-board the train as it runs between sections of track with overhead wires.

Trackside super capacitors, capable of storing energy recovered from the train when it is braking (regenerative brake) have been tested on the Docklands Light Railway to boost the existing 3rd rail supply. Similar devices could be used elsewhere on the rail network to enhance the existing electrical supplies.

Flywheel

The Parry People Mover is a small single vehicle lightweight train that uses energy stored in a flywheel on-board the train to produce electricity that powers the vehicle. The vehicle also has a small diesel engine that is used to accelerate the flywheel up to speed.

These vehicles have been in service on the Stourbridge branch line (near Birmingham and Kidderminster) since 2009. Other flywheel trains and trams are being developed by Alstom as a development of the Citadis trams.

Hyperloop and Maglev

Both the Hyperloop and Maglev systems use electricity drawn from their national grids. Both are high users of energy but can achieve very high speeds by removing the friction between the track and the train and, in the case of Hyperloop, removing resistance from the air by operating in an evacuated (vacuum) tunnel. The Hyperloop system is being developed in the US (California) whilst Maglev systems are currently in use in China, Japan and South Korea.