

Written evidence submitted by J Miller

Dear Meg Hillier,

I was reading a magazine on-line called Rail Business UK and it was reporting that the House of Commons Transport Select Committee are holding an enquiry into the decarbonisation of rail.

This was an excerpt from the article.

"The committee says current alternatives to overhead electrification such as hydrogen and battery do not have sufficient power to be deployed on heavy freight trains, and while bi-mode traction has the potential to reduce emissions, there is currently no overarching strategy for decarbonising this sector."

As an engineer with a proven record of disruptive innovation I very much disagree, but it needs the right decisions to be taken now.

Heavy rail freight is a difficult sector to decarbonise as it needs a locomotive of up to about 5 MW to haul a lot of these trains. A lot of countries in the world use diesel locomotives to haul these trains. So it is very much a world-wide problem.

These diesel locomotives are not built in the UK, but mainly in the United States, Spain and China. The diesel engines are produced by a variety of companies including Caterpillar of the United States and MTU of Germany. MTU are actually a Rolls-Royce subsidiary.

It is my view, that whoever solves the decarbonisation of heavy rail, will create a lot of employment and make sustainable profits.

In some ways, it seems an impossible problem, but there are two solutions; one short term and one long term, that rely on British technology.

The short term solution concerns a spin-off from Oxford University called Velocys, who are building a plant in Lincolnshire, that will convert household and industrial waste into aviation biofuel and biodiesel. It has recently received backing from British Airways, Shell and the British Government. As someone, who worked on the mathematics of chemical plants for ICI in the 1970s, I feel that this is very much a viable route to decarbonise aviation and existing heavy diesel uses in the short term.

The long term solution for heavy rail freight must be hydrogen-based. Fifty years ago, I used to work in a hydrogen factory as an instrument engineer and I don't have any fears about using hydrogen as a fuel.

Various companies are producing ideas to produce engines that could work on hydrogen for heavy rail freight uses.

The most viable in my mind is a 2.5 MW generator, which is the size of a beer keg, based on proven gas turbine technology from Rolls-Royce. The generator was originally built for electric aviation, but appears to have been sidelined. Given Rolls-Royce's troubles and their ownership of MTU, I would expect the company is looking seriously, at using the generator to power rail locomotives.

My calculations show, that the generator and a large hydrogen tank could be retrofitted into a typical freight locomotive, as you see regularly, making a lot of noise and pollution on the North London Line.

I am vaguely optimistic, that we could start to decarbonise heavy rail freight in a five year timescale, as the technology exists and there will be large rewards for the company that succeeds in providing the technology.

I would like to see Rolls-Royce hauled up in front of the Committee.

Yours sincerely,

James Miller

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