



Tech Talk

Hydrogen Train and Electric Plane ©

by John McCarthy

Hi and a very warm welcome once again to Tech Talk. This week, some great news for environmentalists and vehicle enthusiasts, and indeed a thoroughly well-deserved Cocorico to the French industrial group Alstom for having developed the first passenger train that has zero emissions, fuelled entirely by a hydrogen fuel cell which generates electricity. The world's first hydrogen-powered train recently completed its first test run in Germany and its performance was very promising. The locomotive, named the Coradia iLint reached speeds of up to 80 kph on a test track specifically designed for it. This test run marks the beginning of a four-week testing period with the objective of determining the efficiency of the train's energy supply and braking system. For Alstom this test is a significant milestone in environmental protection and state-of-the-art technical innovation, hoping ultimately to run the train at its theoretical maximum speed of 140 kph.

To power it, Alstom decided to build its own hydrogen refilling station along the tracks, where hydrogen gas is pumped into the pressurised fuel tank within the train. According to Citylab.com, the fuel source of the train is effectively carbon neutral as it consumes hydrogen that comes from waste by-products, mainly from the chemical industry. The hydrogen gets burnt, so using it as a fuel to power the train won't place any extra burden on the environment. In fact, plans for the future are very ambitious as Alstom intends one day to produce hydrogen from wind energy.

In layman's terms, hydrogen fuel cells are able to generate electricity by combining hydrogen with oxygen atoms to move a motor and produce electrical current. This technology is much more efficient than the traditional internal combustion engine and the only exhaust it produces is condensed water. I've seen a journalist drinking a glass of water made by a fuel cell car on camera, and further research revealed that he's still very much alive and kicking.

The first passenger service is scheduled to begin at the end of the year, and the Lower Saxony transportation authority has ordered 14 trains of this type, hoping eventually to replace the 4,000 diesel burning-tractors in Germany. Alstom believes that in countries forced to make tough choices in order to slash their carbon emissions, purchasing this new system may prove to be the ideal solution.

Well, Brexit may have been triggered; whether the UK's divorce from the EU is for better or for worse is anyone's guess and way beyond my own understanding of economics. However, barring belligerent acrimony a new start-up Wright Electric hopes that commercial flights between London and Paris will become a reality within the next ten years. Its plane would be designed to carry 150 people on trips of less than 300 miles. Short-haul flights constitute approximately 30% of all commercial airline flights and account for a mouth-watering 25-billion-euro market.

It's easy to see all the positive points. Relatively clean energy will replace the need for jet fuel, thereby cutting down on harmful emissions injected directly into the stratosphere and perhaps leading to a considerable drop in the price of flying. As the plane would presumably be silent, it could circumvent noise abatement procedures and allow night-flights in and out of Roissy and Orly airports. Batteries could be charged separately, so planes wouldn't have to sit idly on the tarmac while being recharged, so the modular power packs would enable airlines to keep their planes in the air as long as possible and maximise their profits.

Easyjet has expressed interest in this technology, but there are significant impediments to overcome before the project can become a reality. Wright Electric has admitted it's relying heavily on innovation in battery technology continuing to evolve at its present rate. Should this prove not to be the case, the firm simply won't be able to build in enough power to give the plane the range it requires and would be forced to switch to a hybrid system of both electricity and jet fuel. Either way, the technology employed will undoubtedly be a step in the right direction.