

Algal biofuel powers jet airliner

Flight test in US confirms that use of biofuel in jet engines could cut carbon emissions

CONTINENTAL Airlines has demonstrated the use of a sustainable algae-based biofuel to power one of its aircraft.

This is the first time a commercial carrier has powered the flight of a two-engine aircraft using such a fuel.

The demonstration took place last week on a Boeing 737-800 equipped with CFM International turbofan engines. The biofuel blend included components derived from algae and jatropha plants, both of which are second-generation sources that do not have an impact on food crops or contribute to deforestation, said Continental.

The biofuel blend consisted of 50% biologically-derived fuel and 50% traditional jet fuel, in the No 2 engine. The No 1 engine used 100% traditional jet fuel, allowing engineers to compare performance between the biofuel blend and traditional fuel.

During the two-hour flight, from Houston's Bush Intercontinental Airport in Texas, test pilots engaged the aircraft



Biofuel boost: Continental's flight followed months of testing in engines on the ground (inset)

in a number of flight manoeuvres, such as mid-flight engine shutdown and restart, and power accelerations and decelerations. A Continental engineer recorded the flight data on board.

Continental said that the biofuel was a "drop-in" fuel, and that no modifications to the engine were necessary. It said that the biofuel exceeded specifications for jet fuel, including a flash point and a freezing point appropriate for

use in aircraft. Continental said that it had worked with Boeing and GE Aviation for more than nine months to evaluate and test the biofuel in engines on the ground.

Eric Bachelet, president of engine maker CFM International, said: "The second-generation fuel being tested comes closer to simulating the characteristics of traditional jet fuel in terms of engine performance and operability, such as fuel consumption,

engine start and other parameters. We have also found that engines running this mix emit less smoke than those fuelled by traditional jet fuel."

Continental said that the biofuel blend would result in a significant net decrease in carbon emissions relative to traditional jet fuel, as both jatropha and algae consume carbon during their lives. The algae oil was provided by Sapphire Energy, and the jatropha oil by Terasol Energy.

G-Wiz electric car gets faster all round

A NEW version of the G-Wiz electric car powered by lithium-ion batteries has been developed by its Indian maker.

The lithium-ion batteries replace older lead-acid systems that take eight hours to charge completely. India's Reva said the lithium-ion batteries boosted the G-Wiz's range to 75 miles and increased its top speed to 50mph. It added that it expected the reduced weight of the new power supply to increase the car's acceleration.

Reva is introducing a fast-charge station relying on three-phase power capable of charging the car to 90% in one hour. Otherwise the batteries can be fully charged in six hours using an ordinary mains connection, compared with eight hours for lead-acid.

Steve Hartridge, managing director of GoinGreen, which sells the G-Wiz in the UK, said: "Retailing a vehicle which has a range significantly greater than 97% of all car journeys brings electric vehicles into the mainstream."

Project clears nuclear waste speedily and under budget

UNDERGROUND vaults containing miscellaneous radioactive materials have been successfully emptied at Trawsfynydd in the first waste retrieval project of its kind to be completed at a UK nuclear power station.

High levels of radioactive contamination from the miscellaneous activated components meant that the vaults could not be directly accessed by the site's decommissioning



Handle with care: Robots used different tools to collect and encapsulate radioactive waste

teams. Engineers therefore used remotely operated vehicles with an array of tools to pack the waste into 3m³ stainless steel boxes, ready for intermediate storage within a shielded concrete overpack in a specially built on-site facility.

Thirty boxes have been filled with more than 35 tonnes of waste during the project which was delivered two months early and with a saving of £473,222.

The waste consists mainly of steel and graphite components from within the nuclear reactors which became highly radioactive during the generating life of the power station. This intermediate-level waste (ILW) was stored in two vaults beneath the reactor buildings which were constructed when the station was built, almost 50 years ago.

The Trawsfynydd site in Snowdonia is operated by

Magnox North on behalf of the owner the Nuclear Decommissioning Authority. Glenn Vaughan, the authority's site programme manager, said: "Completion of the recovery of the waste from the vaults is a significant event for the site, representing completion of the first bulk ILW waste stream. The safety record during the project has been exemplary.

"This opens the way for recovery and encapsulation of

residual dust and safe store preparation and the ongoing progress towards care and maintenance."

Trawsfynydd site director Dr Phil Sprague said: "This is a significant milestone in the journey towards the safe decommissioning of Trawsfynydd site. By pioneering the innovative use of various technologies we have delivered the project safely, ahead of time and under budget."