



Lufthansa using biofuels on scheduled flights

15 July 2011

DLR compares pollutant emissions

Deutsche Lufthansa AG started using biofuels on its regular scheduled flights on Friday, 15 July 2011. An Airbus A321 will be flying between Hamburg and Frankfurt to test biofuel on scheduled flights over the course of six months. On this service, one engine will be using a fuel blend containing 50 percent biosynthetic kerosene. The key objective of this project is to conduct a long-term test during which the impact of biofuels on the maintenance and efficiency of jet engines can be investigated. During this trial period, savings of around 1500 tons of carbon dioxide are expected. As part of this project, the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) will be taking exhaust gas measurements directly on the engine and comparing the emissions from kerosene and from the biofuel.

"The use of biofuels on scheduled flights is ground-breaking; this is the first time biofuels are being used in a long-term test rather than just a one-off demonstration flight. We have reached a milestone in aviation research and are taking an important step towards achieving the ambitious goals of the European strategy paper 'Flightpath 2050'," explains Rolf Henke, the DLR Executive Board member responsible for aeronautics. This long-term test will allow scientists to make informed statements about, not only the environment friendliness of the fuel, but also the possible changes to the engine. "First we measure the emission pattern of a biofuel in comparison to conventional aviation fuel on the same engine model over an extended period of time," explains Manfred Aigner, Head of the DLR Institute of Combustion Technology (Institut für Verbrennungstechnik) in Stuttgart. "We expect to see substantial improvements in terms of sustainability. If all air traffic were to use bio-kerosene, it would be possible to reduce carbon dioxide emissions from aircraft by around 30 to 50 percent." Researchers also expect a significant reduction in the production of carbon particulates.

Four-part strategy to reduce overall emissions

The bio-kerosene being used by Lufthansa is produced using only biomass. The manufacturer is Neste Oil, a Finnish petroleum refining and marketing company with many years of experience in the production of biofuels. The use of biosynthetic kerosene is one element in a four-part strategy that aims to reduce global pollutant emissions from aviation. These ambitious environmental targets can only be achieved, now and in the future, through a combination of extremely diverse measures including continuous fleet renewal, operational measures such as engine cleaning and the use of more lightweight materials, and improved infrastructure. Projects that address these topics are also under way as part of the aviation research programme. Through the use of new technologies, Lufthansa has been able to increase fuel efficiency by more than 30 percent since 1991. Today, the average per passenger fuel consumption for each 100 kilometres is 4.3 litres of kerosene.

The use of biofuels forms part of the 'burnFAIR' project being conducted by Lufthansa, and is a successful example of an integrated research approach for achieving climate protection targets. This project forms part of the umbrella project 'FAIR' (Future Aircraft Research), in which the compatibility of biofuels is just one of the topics being examined, alongside new propulsion and aircraft concepts. The German federal government is funding the FAIR project with a total of five million Euros as part of its LuFo (Luftfahrtforschung) aeronautics research programme; of this, 2.5 million Euros is allocated to 'burnFAIR'.

DLR research into alternative fuels

The DLR Institute of Combustion Technology is conducting research aimed at replacing conventional, petroleum-based kerosene and, in the longer term, phasing it out altogether in favour of a better fuel ('designer' kerosene) to achieve a sustainable and eco-friendly future for aviation. Current results show that these 'fuels of the future' may even be superior to kerosene in terms of their reliability, as well as in their environment friendliness. The further development of the natural gas-based synthetic fuel 'Gas to Liquid' (GtL) represents an important bridge to the use of biofuels. DLR scientists are currently conducting research into the properties of this new generation of synthetic fuels.

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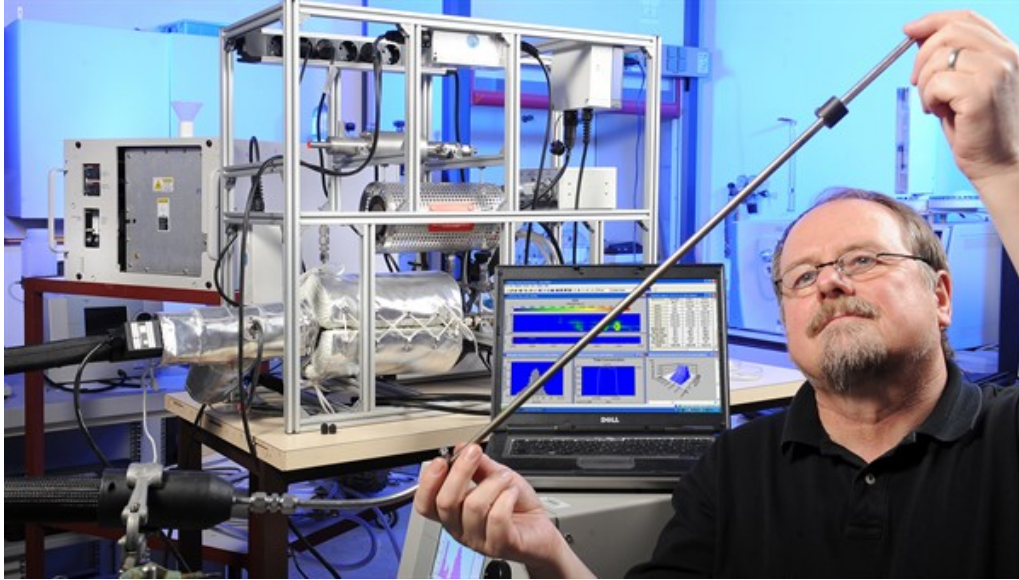
Pioneering project – from 15 July 2011, Lufthansa is using biosynthetic kerosene as a fuel



Starting on 15 July 2011, Lufthansa will use biofuel in an Airbus A321 on its regular scheduled flights between Hamburg and Frankfurt for a six-month period. On this service, one engine will be using a fuel blend containing 50 percent biosynthetic kerosene. The key objective of this project is to conduct a long-term test during which the impact of biofuels on the maintenance and efficiency of jet engines can be investigated. During this trial period, savings of around 1500 tons of carbon dioxide are expected.

Credit: Lufthansa Bildarchiv.

Analysis of the pollutant emissions of new fuels



Claus Wahl, a DLR scientist in the Chemical Analysis Department, working on a mobile measuring device to analyse exhaust emissions and measure particulates generated by 'Gas to Liquid' (GtL) fuels. In modern combustion research, chemical and instrument analyses are indispensable in analysing the emissions from combustion processes and deriving measurements to reduce pollutants.

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