

“Engineers at the University of Sheffield are working collaboratively with industry and other academic institutes to find solutions to the barriers that face the adoption of low-carbon synthetic fuel to enable commercial aviation to achieve the industry’s climate goals from sustainable alternative aviation fuels,” says professor Mohamed Pourkashanian, head of the university’s Energy Institute.

Cardiff University will lead the Decarbonizing Transport through Electrification network, which aims to identify challenges to developing an integrated, cross-sector transportation system including energy networks, electric vehicle charging infrastructure, electric and hybrid aircraft and electrification of the rail network. Partners include Cranfield, Bristol, Birmingham and Southampton Universities.

“The network will look to prepare the wider industry for decarbonization, commissioning projects addressing short-, medium- and long-term challenges associated with electric and autonomous vehicles, electric and hybrid aircraft and electrification of rail along with associated infrastructures,” says Professor Liana Cipcigan, director of Cardiff’s Electric Vehicle Center of Excellence.

The other research groups are: Network-H2, led by Durham University and supporting development of a hydrogen-fueled transport network; Decarbonizing the UK’s Freight Transport, led by University College London; and Decarbon8, led by the University of Leeds and looking at how different locations can be rapidly switched to low-carbon transport systems.

UAV Glides Back From 30-km Altitude in Sensor Test

The HiDRON stratospheric glider developed by Canada’s Stratodynamics Aviation and unmanned-aircraft manufacturer UAVOS has completed a 4-hr. flight after being released from a balloon at 30 km (98,430 ft.), beating its previous altitude record of 25 km.

The Aug. 2 flight demonstrated the team’s ability to perform beyond-visual-line-of-sight operations with a UAV at high altitudes. The night flight was the first of two commissioned to test an airglow monitor (AMON) from the Slovak Academy of Sciences Institute of Experimental Physics.

Airglow is light from excited atoms and molecules at 80 km or higher, caused by solar ultraviolet radiation. Monitoring the phenomenon is essential for observations by ground- and space-based telescopes.

Stratodynamics says the Slovakian team was looking for a cost-effective method of allowing the AMON detector to have a clear view of the zenith and nadir while unencumbered by a weather balloon. The sensor is planned to be an ancillary instrument for the Extreme Universe Space Observatory (EUSO) SPB2 mission that will fly on a long-duration NASA balloon in 2022.

The HiDRON’s programmable flightpath back to Earth enabled an unobstructed view upward from the stratosphere, the company says, and returned the valuable instrument back to its launch location. In addition to carrying the AMON detector, the flight tested stratospheric flight dynamics, data links, and UAVOS’ Micro Version AP10.3 autopilot.

A second AMON flight is scheduled for Aug. 31 from the Canadian Space Agency’s (CSA) Stratos balloon base in Timmins, Ontario. This time the



UK startup Faradair is designing the 18-seat biofuel hybrid-electric BEHA M1H for regional and cargo flights. Credit: Faradair



The HiDRON unmanned research glider is lifted aloft by balloon for release in the stratosphere. Credit: UAVOS

glider will be released from the CSA's scientific gondola at a higher altitude of 35 km. The data collected will be compared with results from the EUSO-Balloon mission in the same region in 2014.

UK Waste-to-Biofuel Plans Move Closer

British Airways (BA) has taken a step toward powering its fleet with sustainable alternative jet fuel after its partner Velocys submitted an application to develop Europe's first plant for turning household and commercial solid waste into liquid fuel.

Altalto Immingham, a subsidiary of renewable-fuels company Velocys that works with BA and Shell, has submitted a planning application to develop a plant at Immingham in northeast Lincolnshire, England, that would convert over 0.5 million metric tons per year of nonrecyclable municipal solid waste destined for landfill or incineration into cleaner-burning sustainable jet fuel.

BA, which announced its cooperation with Velocys in September 2017, has agreed to buy jet fuel produced at the plant. Velocys was to have supplied the Fischer-Tropsch reactors for the Green Sky London waste-to-fuel plant that was planned by BA and Solena Fuels, but which was scrapped in 2016. Lack of government support for the project was blamed.

UK company Velocys announced in July it had secured £7 million in funding for its Bayou Fuels biorefinery in Mississippi, plus £2.8 million in cofunding from BA and Shell to complete the remaining "pre-FEED" (front-end engineering design) work for the similar Altalto Immingham project.

"This development is an important step in the reduction of our carbon emissions and meeting the industry targets of carbon-neutral growth from 2020, and a 50% in CO2 reduction by 2050 from 2005 levels," says British Airways CEO Alex Cruz.

Jonathon Counsell, head of sustainability at BA's parent, International Airlines Group (IAG), has called on the UK government to support the setting up of a dedicated office to help encourage the development and commercial deployment of sustainable aviation fuels. IAG says it plans to invest \$400 million in sustainable alternative fuel development over the next 20 years.



UK's Altalto plant will use the Fischer-Tropsch process to produce sustainable jet fuel from solid waste. Credit: Velocys

—With Helen Massey-Beresford in Paris

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