New aviation fuels are needed to clean up an industry that is responsible for 12 per cent of transport related CO2 emissions | Photo source Amamath Tade on Unsplash

INTEGRATED PROCESS TURNS GREEN HYDROGEN AND CO2 INTO AVIATION FUEL

The new technology will provide a scalable solution for cost-effective sustainable aviation fuel production

Spotted: UK sustainable tech leader Johnson Matthey has designed a conversion process that will help to turn captured carbon dioxide and green hydrogen into sustainable aviation fuel (SAF).

The process—called HyCOgen—first converts the hydrogen and CO2 into carbon monoxide. This is then combined with additional hydrogen to form ‘syngas’ — a building block for a range of fuels and chemicals. By combining this process with another existing process—known as FT CANS—Johnson Matthey can produce high-quality synthetic crude oil. This can be further upgraded into fuel products such as sustainable aviation fuel and renewable diesel.

Ninety-five per cent of the captured CO2 is converted into synthetic crude oil. Scalability is another key benefit of the combined processes. The integrated HyCOgen/FT CANS solution can be cost-effectively deployed across a wide range of project sizes.

“Given the challenges associated with new propulsion technologies and airport infrastructure, plus the long asset life of aircraft, there are significant hurdles in moving from hydrocarbon-based aviation fuel to alternatives such as battery electric or hydrogen,” explains Jane Toogood, Sector Chief Executive, Johnson Matthey. “This is where Johnson Matthey’s longstanding expertise and market-leading position in syngas generation technology can play a crucial role, by providing solutions that enable the production of sustainable drop-in fuels that are deployable today.”

Johnson Matthey are not the only company developing new forms of aviation fuel. German non-profit atmosfair has set up an e-kerosene plant which will produce up to eight barrels per day in
2022. United Airlines also recently grabbed headlines when it announced the world’s first commercial flight completely powered by sustainable fuel.

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Takeaway:

The development and use of low carbon intensity SAF is fundamental to reducing emissions. The global aviation industry is responsible for 12 per cent of transport related CO2 emissions, producing around 21 per cent of all human emitted carbon dioxide emission worldwide. Both the EU and US are setting ambitious targets to scale up SAF. The European Commission has proposed SAF blending volumes in aviation fuel to reach 2 per cent in 2025, 5 per cent in 2030 and 63 per cent in 2050. As for the United States, the Sustainable Aviation Fuel Grand Challenge aims to scale up SAF production to 11 billion litres annually by 2030 and by 2050 meet the entirety of its aviation fuel demand.