

Sustainable fuel set to power the Royal Air Force reaches landmark new stage

- Major new research into mass production of sustainable aviation fuel is set to get underway
- British technology could have the potential to eliminate use of fossil fuels in military aircraft
- New fuel could increase resilience and boost RAF's Net Zero goal

The research, carried out by the RAF in partnership with British firm Zero Petroleum, and focussed on using synthetic fuel technology, was announced today at the Farnborough International Airshow.

It will provide crucial data to evidence the scalability and efficiency of the synthetic technology, which has the potential to revolutionise the RAF's fuel while ensuring its capability remains cutting edge.

The Royal Air Force, having flown a world-record first 100% synthetic flight in November 2021, will move to the next phase producing more fuel for certification and testing. Design blueprints from this research will enable construction of squadron-scale fuel manufacturing capability as a next stage.

Synthetic fuels are believed to burn more cleanly and consistently than fossil fuels – that theory will form part of the testing in this phase. Fuel manufactured using this technology could eliminate fossil carbon emissions in flight, lessen the RAF's reliance on global supply chains, and improve operational resilience through reducing the necessity for fuel resupplying.

Defence Minister Jeremy Quin said:

The creativity and ingenuity of the RAF and UK industry, backed by our ring-fenced research and development funding, has resulted in ground-breaking new fuel technology.

It has the potential to improve operational resilience while eliminating fossil carbon emissions in flight.

In November 2021 the Ikarus C42 microlight aircraft, which was on display at Farnborough today, completed a short UK flight, powered by 15 litres of whole-blend synthetic gasoline. Whilst green technologies like electric and hydrogen power generation are viable for many RAF platforms, high-performance aircraft for example fast jets require a liquid fuel alternative to maintain operational capabilities.

Chief of the Air Staff, Air Chief Marshal Sir Mike Wigston said:

This ground-breaking collaboration with Zero Petroleum is a glimpse of the future for aviation fuel. It points to how we will crack the NetZero challenge as a national and international endeavour, and the leading role the Royal Air Force and UK science and technology can play in that.

Zero Petroleum's synthetic fuel is manufactured by extracting hydrogen from water and carbon from atmospheric carbon dioxide. Using energy generated from renewable sources like wind or solar, these are combined to create the 'drop-in' synthetic fuel.

Paddy Lowe, founder of Zero Petroleum, said:

The RAF's vision for fossil-free flight using synthetic fuels is matched by Zero Petroleum's commitment and enthusiasm to deliver the solution using unique British technology. Together we showed what was possible with our record-breaking demonstration flight in 2021.

We are incredibly excited to start now on the important development of this technology to production-readiness in advance of deployment at scale to flight operations. We could not wish for a better partner than the RAF which has been a pioneer throughout its 100+ years of existence.

The revolutionary breakthrough underscores the MOD's solution-based approach to addressing climate change issues whilst meeting operational commitments and remaining agile in a world of evolving threats. It also supports ambitions laid out in the [Defence Command Paper](#) and is backed by the £24 billion defence settlement, including a £6.6 billion R&D investment.

The sustainable aviation fuel could mark a step-change towards the RAF's goal to be Net Zero by 2040. Working towards the Government's Net Zero by 2050 goal, the RAF also plans for their first Net Zero airbase by 2025.