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# Pioneering flights on sustainable fuel do not move the green transition forward



Virgin Atlantic's **flight** across the Atlantic Ocean using only sustainable aviation fuel (SAF) has entered the history of pioneering efforts towards achieving the carbon-free goal in air transport.

A flight from London to New York this week pushed the limits regarding the SAF application. But how much has this really increased the prospects for the industry more decisively to embrace this technology and push it above its current almost negligible level?

Not much, it seems. Apart from the significant promotion of the SAF use and the technological achievement, flying on processed vegetable oil and other renewable sources remains a rarely accepted practice even after the Virgin Atlantic flight.

The obstacles to the more massive use of SAF still far outweigh the benefits and environmental justification.

The Virgin Atlantic flight is the latest in a series of "firsts" to use 100% SAF over the past 2 years.

Two years ago, United made the first commercial flight with full use of SAF, followed by the first such business aviation flight, then Emirates' first SAF flight in the Middle East and Africa region, and then the first helicopter flight.

However, there is not much data on whether and how often a second, third, or hundredth flight using 100% SAF followed the first one.

## Industry is not interested in SAF

The series of pioneering flights came a decade after the first-ever partial use of SAF on a commercial **flight by Dutch KLM in 2011**. There has been no significant shift towards using environmentally friendly fuel in civil aviation in that lengthy period.

Frequent demonstrations of the reliability and justification of using SAF, such as Virgin

Atlantic's non-commercial flight to New York, are unlikely to change this unenviable trend.

There are still numerous restrictions preventing companies from increasing the share of non-fossil fuel in their operations.

## The price of SAF is still on the top of the list of those obstacles and the most difficult to overcome

The **price of SAF** is still on the top of the list of those obstacles and the most difficult to overcome. In 2022, SAF was more than twice as expensive as jet fuel, costing about \$2,400 a ton, and traditional fuel about \$1,100.

The trend of their price ratio is more negative, since the price of SAF has been increasing faster than the price of fossil aviation fuel. From 2020 to 2022, the price of a ton of SAF increased by as much as \$1,000. It has faster growth rate than the price of jet fuel, which increased by about \$700 during that period.

This trend and the growing price gap show no indication that SAF could be financially more attractive for companies in the near future.

The production of SAF has been increasing. It has quintupled from 2020 to today, from 0.05 million tons to 0.24 Mt. However, the share of its use in aviation operations remained symbolic, with only 0.1% of the total fuel consumption.

In the past 2 years, air traffic has been recovering from the decline during the COVID-19 pandemic. The number of flights has been constantly increasing, so the simultaneous increase in the production of SAF does not cause an increase in its use.

## Not all SAF are eco-friendly

An obstacle to the broader use of SAF in the aviation industry is that some still leave a carbon footprint, so with the high price, they are not particularly attractive as an alternative

to fossil fuels.

According to a [study](#) by The Royal Society on the advantages and limitations of using SAF in the aviation industry, of the 4 alternative energy sources examined, 2 still leave CO<sub>2</sub> behind aircraft engines - biofuels and synthetic efuels (man-made fuels). Only using ammonia and hydrogen will guarantee carbon-free flying.

Discouraging data also comes from the quantity of resources required to produce a significant volume of SAF, supported by green regulations.

If the annual needs in the UK for jet fuel were to be replaced with an alternative, about 42 million tons of biomass would be necessary, and to produce it (rapeseed, for example), it would have to occupy almost 70% of the arable land in the UK.



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Calculations about replacing fossil fuels with used cooking oil are equally unattainable. If all processed cooking oil in the UK (about 250 million litres annually) were used for this purpose, the production would be at 50 to 100 million litres of SAF, which is only 0.3 to 0.6% of the annual demand in the UK.

Despite these obstacles and many other constraints, such as adapting aircraft and airport services, the goals set by governments and industry remain high and optimistic.

According to last year's International Air

Transport Association (IATA) resolution, the global aviation industry will achieve carbon-neutral status by 2050.

Since SAF has a significant role in achieving this target, alternative fuels should participate with as much as 65% in the overall emission reduction.

Governments are no less ambitious. The US plans to use 3 billion gallons of domestic SAF by 2030 and 35 billion gallons of this fuel by 2050, which would represent a complete reorientation from fossil fuels.

The UK expects to substitute traditional fuel with SAF with 10% by 2030 and even 75% by 2050, similar to the EU, where an even more ambitious plan for the use of SAF was adopted last September, up to 6% by 2030 and even 70% by 2050.

However, the negative trends and a lack of interest of companies in the transition regarding fuel use indicate that these ambitious goals will probably suffer the fate of all others regarding eliminating carbon emissions.