

Why the world's first flight powered entirely by sustainable aviation fuel is a green mirage

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Credit: Wikipedia

A Boeing 787 Dreamliner is set to take off from Heathrow on November 28 and head for JFK airport in New York, powered by so-called sustainable aviation fuel (SAF). According to its operator, Virgin Atlantic, the world's "first 100% SAF flight" [will mark](#) "a historic moment in aviation's roadmap to decarbonization".

It is proof of concept, we are led to believe, of the dawn of ["guilt-free" flying](#). Unfortunately, we have been here before, and the results last time were anything but green.

Based on [our research](#) into how wealth and power shape the environment, we argue that continued growth of the [aviation](#) sector, as with the economy in general, is incompatible with preventing runaway climate change. The technology currently being developed by the aviation industry has zero chance of changing that. And the fuels being used in Virgin's latest experiment are not significantly more sustainable than those in its previous attempt.

Virgin's sustainability initiative dates back to the 2000s, when British business magnate Richard Branson was at the helm. In 2008, to some fanfare, a Virgin aircraft flew from [London to Amsterdam](#) using a fuel derived in part from [palm oil](#) and coconuts. Technically, the mission was a success, but the sustainability claims were laughable.

To have fueled that short hop with 100% coconut oil would have consumed [3 million coconuts](#). The entire global crop would supply Heathrow for only a few weeks—and it is one of 18,000 commercial airports worldwide. Following this stunt, Virgin gave up on [coconut oil](#).

Virgin's latest flight is simply a repeat of 2008. It's a smoke-and-mirrors exercise to convince governments that SAF will enable aviation to continue its relentless growth on a sustainable basis—and in this, it is succeeding.

Even waste products aren't sustainable

Virgin's defense rests on the claim that its new SAF no longer comes exclusively from crops. It is blended with waste products. One of the main suppliers for Virgin's transatlantic flight is Virent, an organization

based in Wisconsin. Virent makes SAF from conventional sugars such as corn, mixed with wood, agricultural waste and used cooking oil.

As with coconuts, any crop grown for fuel competes with foodstuffs and pushes the agricultural frontier further into forests and peatlands, with large releases of carbon.

But what of the waste products? Surely reusing cooking oils offers a sustainable solution? Unfortunately, in a notoriously unregulated market, it seems not.

Another of Virgin's suppliers, Neste, collects cooking oils from sources worldwide, including [McDonald's](#) restaurants in the Netherlands and [food processing plants](#) in California, Oregon and Washington. The US Department of Agriculture alleges that some trade in SAF feedstocks—including from Indonesia to Neste's refinery in Singapore—may be "[fraudulent](#)".

Neste has [denied](#) the claim. But, even if its used cooking oil is entirely legitimate, there is still an allegation that palm oil from plantations responsible for tropical deforestation is [being marketed as used cooking oil](#).

Virgin Atlantic maintains that the SAF it uses is made entirely from used cooking oil. However, if the aviation industry bets big on used cooking oil, it is feared it will [turbocharge tropical logging](#) and the extermination of the orangutan and countless other endangered species.

The real kicker is that even if all used cooking oils were traceable and sustainably sourced, they are [not scalable](#). The US collects around [600,000 tonnes](#) of used [cooking oil](#) each year. If every last drop were diverted to SAFs, it would meet at most 1% of America's current aviation demand.

Capturing the White House

The problems of scalability, the competition of agricultural inputs with foodstuffs, forests and wildlife, and the [carbon emissions](#) that result from [land use change](#) are just three of the shortcomings that ensure SAFs will not be the magic bullet that the aviation industry would have us believe. Despite this, SAF fever has won over the White House.

The Inflation Reduction Act set targets for SAF production at 3 billion gallons by 2030 and [35 billion by 2050](#). These targets are fantasies. But, to the extent that they are approached, they will only add to the pressure on food prices and wildlife.

That SAF is being touted so zealously attests to the shortage of [alternative technologies](#). Battery-powered planes are viable but only as short-haul ["flying taxis"](#) that compete with ground transport. The other panacea, [hydrogen](#), confronts colossal technological and infrastructural barriers, problems of scalability, competing uses, and environmental concerns.

Tinkering with aircraft technology, such as engine size or wing shape has also faced [diminishing returns](#). Efficiency improvements lag far behind the sector's growth, which is why aviation emissions are still soaring.

Where do we go from here?

Ahead of the 2008 coconut-fueled flight, Virgin's chief executive [Steve Ridgway](#) explained its logic. He said the aviation industry needs "to be seen to be doing something". Fifteen years on and the playbook remains the same.

The Virgin Atlantic SAF flight promises to rescue the airline from the

threat of climate change, allowing them and their passengers to "keep calm and carry on". In buying into this fantasy, governments give themselves an excuse to avoid taking climate breakdown seriously—an emergency that requires radical action if the planet is to remain habitable for humans.

There is the potential to create a good life for all within planetary boundaries. But getting there requires clipping the wings of the aviation industry.

This would begin, for short-haul, with ground-based alternatives. Within the US, many flights could be swiftly replaced by coach travel, and [over a quarter](#) of flights between EU destinations could be replaced by high-speed rail. For long-haul, the first step is [demand management](#), which will expedite the use of virtual conferencing, marine transportation and other alternatives.

Developing alternatives would be [practical, efficient and create jobs](#). And now is a good time to begin. Americans have been "[falling out of love with flying](#)" in recent years, in part due to large numbers of flight cancellations following [bad weather](#), which is only likely to increase with climate breakdown.

As the weather chaos worsens, the [aviation industry](#) will find it harder to shrug off its responsibility through PR stunts and greenwashed gimmickry.

In response to this article, a Virgin Atlantic spokesperson said that the organization is committed to achieving net zero by 2050, and has set interim targets, including 10% SAF by 2030. It sees SAF as a mid-term solution for decarbonizing aviation, and that Flight100 aims to demonstrate the safe use of 100% SAF within existing infrastructure. Virgin Atlantic referred to a Sustainable Aviation report, which indicates

that there is sufficient feedstock to meet the government's 2030 target without environmental impact or competition with crop production.

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