Is sustainable aviation fuel an oxymoron?

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Last September, EasyJet announced that their landmark carbon offsetting scheme, in which they claimed to offset all their emissions from flying, would end.[1] EasyJet acknowledged that offsets are not the right tool to help decarbonise the economy, unless being used for residual emissions, and that their updated net-zero roadmap will focus on using *"...Sustainable Aviation Fuel as required, until its fleet has been transitioned to zero carbon emission aircraft..."*.

EasyJet demonstrates a wider trend of the aviation sector looking at new low carbon technologies, with sustainable aviation fuel (SAF) at the forefront. But is 'sustainable' and 'aviation fuel' not an oxymoron? What actually is SAF, why does it matter, and what do we in the Responsible Investment team believe about its green credentials?

What is SAF?

SAF covers a range of fuels which are a substitute for fossil fuel derived jet fuel. They are generally produced from 'biological' sources – such as agriculture and forestry waste, but also household waste and waste oils and fats. They may also be produced with synthetic feedstocks such as carbon dioxide. While the current focus on SAF is relatively new, several production methods exist, some of which are close to a century old.

The resulting product is indiscernible from traditional aviation fuel and meets the high technical standards required. The ease of adoptability is also high. SAF can be blended with traditional aviation fuel, and use the exact same infrastructure, supply mechanism and aircrafts. There are big hopes for other methods of decarbonisation in the sector, but most don't have this adoptability advantage. Currently technology isn't advanced enough to offer an alternative method to reduce emissions. Only small electric aircraft on short flights (of ~200km) are likely to be possible as a zero-emissions alternative within the decade.[2] Similarly, plane manufacturers suggest commercial zero-emissions hydrogen aircraft may only be available from 2035,[3] and even then, it will take a couple of decades for airline's entire fleets to be replaced.

Emissions are key

Every tonne of aviation fuel burned produces over three tonnes of CO2, plus other emissions.[4] One flight alone may produce more CO2 than the average person in a year.[5] The total global emissions for aviation were 1.1 gigatonnes in 2019, equivalent to 3% of total global emissions.[6] Expectations are that aviation emissions will continue to grow as the global population grows and residents in developing countries gain a disposable income offering them the opportunity to travel. Assuming nothing changes, emissions are expected to be 2.1 gigatonnes by 2050 and could account for 25% of the global carbon budget.[7]

It is critical that we reduce and decarbonise aviation as soon as possible, but this is challenging as alternative technologies are not ready today. Assuming that at least some air travel is necessary and cannot be replaced by less polluting modes of transport, does SAF offer a real-world way to continue flying more sustainably?

How sustainable is SAF really?

Unfortunately, the answer to this important question is not black or white as the range of feedstocks and production methods complicate things. The emissions released from the 'tailpipe' of a plane are the same for SAF as they are for traditional aviation fuel. The emissions savings occur as rather than burning and releasing virgin carbon dioxide into the atmosphere, previously present carbon dioxide is re-released.

Compared to traditional fuels, certain types of SAF can theoretically reduce emissions by almost 100%.[8] An immediate practical limitation of this theoretical saving is that planes are currently only permitted to fly with up to 50% SAF mixed with 50% traditional aviation fuel. Accounting for this and current inefficiencies in the global supply chains, savings of around 35% have been shown.[9] Best presented as a range, once other pollutants and water vapours have also been considered, global warming savings of 30-60% are likely.[10]

But emissions are not the only sustainability consideration. Environmental and social considerations must also be paid to the feedstocks from which SAF are produced. First, SAF can be produced from edible crops, and this may reduce food supply and increase food prices. Second, the concept of Indirect Land Use Change (ILUC) refers to the unintended consequence of releasing more carbon emissions and the social implications of land use changes around the world due to increased demand for SAF. For example, farmers may resort to cutting down forests to turn into farmland for SAF feedstock production, releasing previously sequestered carbon.

Finally, as well as increased emissions, SAF production may put pressure on biodiversity, soil and water quality, food prices and supply, and also lead to displacement of Indigenous and local communities and other cultural disruption. These unintended impacts of SAF production are not very well understood. In terms of monitoring, regulators are trying to get ahead and have already specified that fuel produced from edible crops cannot be considered sustainable.[11]

So, is SAF an oxymoron?

No. SAF has a role to play, but it is not a complete answer. It offers a tangible short- and medium-term solution with which emissions can be partially reduced, until more advanced technologies provide alternative solutions. Especially once optimised, significant emissions savings may be possible, helping mitigate some of the increased demand for aviation. But we think the impact of producing feedstocks for SAF must be monitored carefully, ensuring the environmental and social implications of production are not overlooked.

To find out more about Royal London Asset Management's approach to ESG and Responsible investment please visit www.rlam.com/international/responsible-investment/

FOOTNOTE
1 easyJet publishes SBTi-aligned net-zero roadmap to 2050
2 Heart Aerospace unveils new airplane design, confirms Air Canada and Saab as new shareholders | Heart Aerospace
3 ZEROe - Zero emission - Airbus
4 ICAO Carbon Emissions Calculator
5 How your flight emits as much CO2 as many people do in a year | Carbon footprints | The Guardian
6 Clean Skies for Tomorrow: Sustainable aviation fuels as a pathway to net-zero aviation | McKinsey
7 CO2 emissions from commercial aviation, 2018 - International Council on Clean Transportation (theicct.org)
8 CORSIA: The first internationally adopted approach to calculate life-cycle GHG emissions for aviation fuels - ScienceDirect
9 Applied Sciences | Free Full-Text | Comprehensive LCA of Biobased Sustainable Aviation Fuels and JET A-1 Multiblend (mdpi.com)
10 Clean Skies for Tomorrow: Sustainable aviation fuels as a pathway to net-zero aviation | McKinsey
11 Fit for 55: Parliament pushes for greener aviation fuels | News | European Parliament (europa.eu)

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