

AEGON INSIGHTS

Rethinking Sustainable Aviation Fuel Sources

- *The sustainable aviation fuel (SAF) market is showing incredible growth driven by ambitious targets and mandates.*
- *Heavy reliance on used cooking oil (UCO) as the primary feedstock poses significant sustainability and scalability challenges.*
- *Investors should probe different opportunities, looking at other sources for sustainable aviation fuel.*

Virgin Atlantic's recent flight from London to New York powered by "sustainable" jet fuel is being heralded as an important step towards making flying more environmentally friendly. Sustainable Aviation Fuel (SAF) is a promising solution to significantly reduce carbon emissions from air travel. However, as the industry embarks on this journey, it's crucial to reevaluate the sources of SAF and address potential challenges.

Currently, the primary source of SAF is used cooking oil (UCO). While repurposing this waste product has benefits, the surge in UCO prices and the potential for fraudulent practices raise concerns. Moreover, UCO has inherent limitations, and the industry needs to explore alternative and more reliable sources.

Regulatory mandates and incentives are driving the adoption of SAF, not only in the UK but across Europe. The UK aims to implement a domestic SAF mandate starting in 2025, with a target of achieving a minimum 10% usage by 2030. Similarly, the EU has introduced an EU-wide SAF mandate from 2025, requiring fuel suppliers to provide at least 2% SAF. Final targets in the EU are still being debated, with proposals ranging from 63% to 85% SAF blending by 2050¹.

Great potential growth

These ambitious regulatory targets for SAF adoption have unlocked incredible growth potential. Leading the charge is Finnish company Neste Oyj, with an annual production capability of 1.5 million tons. This is expected to increase to 2.2 million tons when the expansion of its Rotterdam refinery is complete in 2026.

Other energy companies are also quickly entering the market recognizing the vast commercial potential. Last year, Shell set an aggressive target to produce 2 million tons of SAF by 2025, a ten-fold increase from its current production. Total Energy has started SAF production at a plant in France and BP has followed with a new facility in Germany that aims to capture an ambitious 20% of the global SAF market².



**Retno
Kusumaningtyas**
Senior Responsible
Investment
Associate

What is sustainable aviation fuel?

Sustainable aviation fuel (SAF) is a game-changer for the aviation industry's efforts to reduce its carbon footprint. Unlike traditional jet fuel, which is derived from crude oil, it is a blend of conventional fossil-based kerosene with up to 50% renewable fuel. To qualify as SAF under the EU Renewable Energy Directive II, the fuel must achieve a 65% or greater reduction in emissions against a fossil fuel baseline of 94 g CO₂e/MJ. Currently, commercial SAF is derived from various feedstocks ranging from used cooking oil (UCO), animal and fish fat waste, municipal waste, and agricultural residues. This fuel is of particular interest to the aviation industry because it can be used in certain types of jet engines without the need for adapting them first.

A finite resource fueling unsustainable demand

Currently UCO serves as the main feedstock for SAF production. However, its limited supply is raising concerns about the industry's long-term sustainability and ability to meet the rapidly growing demand for SAF.

In Europe, annual UCO collection is estimated at 0.7–1.2 million tons, with little potential for increased production. As health-conscious trends reduce household cooking oil usage, imports from Asia have become crucial, accounting for 80% of Europe's UCO supply, with China alone contributing 60% of these imports. The situation is similar in the US where the Inflation Reduction Act (IRA) has spurred domestic demand for UCO as a renewable fuel feedstock. In 2022, China's UCO exports to the US exceeded those to the EU totaling around 19.7 million tons³.

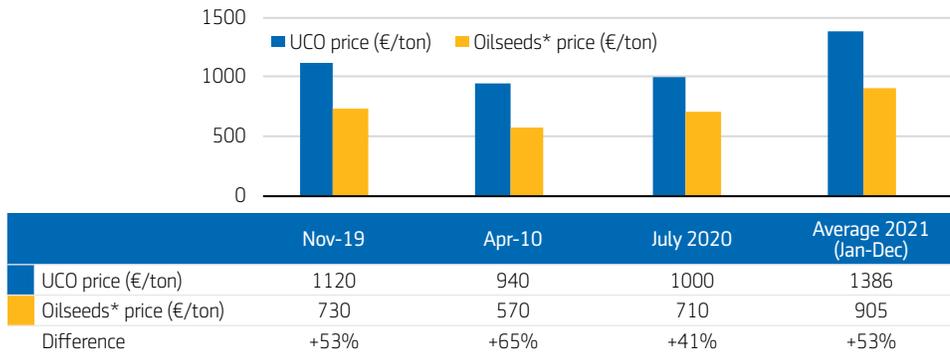
Asia - particularly China, Malaysia, and Indonesia - has emerged as a major hub for UCO collection and export. However, the tremendous surge in demand is raising concerns about whether these nations can sustain sufficient supplies to meet the ambitious production plans in Europe, the US, and their own burgeoning biofuels industries. Singapore and Indonesia for instance have witnessed a significant increase in UCO imports from China in recent years as they ramp up their own SAF production capabilities. This trend threatens to further constrain UCO availability for European and American markets, potentially hindering their efforts to decarbonize the aviation sector through SAF adoption.

A looming threat to SAF's green credentials

Sustainability issues in the production of SAF have been scrutinized by NGOs and researchers alike, with feedstocks being at the core of discussions. Recent research has revealed that an estimated one-third of UCO volume in Europe may be fraudulent: originating from unsustainable sources. High demand coupled with limited supply has driven prices to unprecedented levels, with UCO being sold at higher prices than virgin palm oil. In January 2024, UCO prices were on average 14% higher than palm oil, following a staggering 53% premium in 2021.

Limited feedstock raises concerns about the industry's long-term sustainability and ability to meet the rapidly growing demand for SAF

Figure 1. Comparison of UCO and Oilseeds market prices 2020/2021



*Oilseeds is vegetable oil from palm, rape, sunflower, and soy. Source: Argus and GREENEA in CE Delft's report (2020), Aegon AM research (2024)

The high market prices have incentivized illegal practices such as mixing UCO with cheaper virgin oils, which not only undermines the integrity of the SAF supply chain but also negates the environmental benefits that SAF seeks to achieve. In response to these risks several organizations have launched initiatives and certifications to promote sustainability and traceability in the biofuel supply chain. Notably, the ISCC (International Sustainability and Carbon Certification) system aims to mitigate these challenges through rigorous certification and chain-of-custody tracking. Within the EU, the initial requirement for UCO suppliers from outside the EU was to register with the Traces-NT system⁴. However, implementation has faced delays and, sustainability assurance within the UCO supply chain remains quite limited and primarily voluntary.

Investors should look at other ways to make flying more sustainable

While the current initiatives in Europe and the US have positioned the SAF industry as a lucrative investment opportunity, the sustainability risks associated with the UCO supply chain raise significant concerns. With the aviation industry accounting for only around 2.5% of global emissions, the potential negative impacts of unsustainable UCO sourcing practices may outweigh the intended environmental benefits of SAF adoption.

This risk will only be limited when there is a solid traceability and transparency system in place coupled with third-party assurances.

Responsible investment needs to stimulate the aviation industry's goals on carbon emissions reductions. Given the finite nature of UCO and the challenges surrounding its scalability, it is advisable to explore alternative feedstock sources and emerging technologies that offer greater potential for sustainable and large-scale SAF production. Promising avenues include green hydrogen, biomass gasification, and the conversion of biogenic waste into aviation fuel. While these fuels are not yet ready for commercial use, their development should be closely monitored.

Ultimately, responsible investing in the aviation sector should prioritize solutions that can deliver on the promise of decarbonization while upholding the highest standards of sustainability, transparency, and accountability. Only then can the aviation industry truly soar towards a greener future.

Responsible investing in the aviation sector should prioritize solutions that deliver decarbonization while upholding the highest standards of sustainability, transparency, and accountability.

¹<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0561>; <https://www.europarl.europa.eu/news/en/press-room/20220701IPR34357/fit-for-55-parliament-pushes-for-greener-aviation-fuels>

²<https://www.shell.com/business-customers/aviation/news-and-media-releases/news-and-media-2021/shell-calls-for-more-action-on-aviation-emissions.html>; <https://totalenergies.com/media/news/press-releases/total-begins-producing-sustainable-aviation-fuel-in-france#:~:text=Paris%2C%20April%208%2C%202021%20%E2%80%93airports%20starting%20in%20April%202021>; <https://www.bp.com/en/global/air-bp/news-and-views/air-bp-news/lingen-refinery-starts-saf-production-using-waste-and-residues.html>

³<https://www.fastmarkets.com/insights/chinas-uco-exports-boost-to-us-slow-to-eu/>

⁴Traces-NT is the European Union's digital certification and management platform for importation of goods entering the European Union. It ensures the safety, and quality of various products. It also provides traceability with information on consignment movements and streamlining administrative procedures.

Disclosures

For Professional Investors only and not to be distributed to or relied upon by retail clients.

This document is for informational purposes only in connection with the marketing and advertising of products and services, and is not investment research, advice or a recommendation. It shall not constitute an offer to sell or the solicitation to buy any investment nor shall any offer of products or services be made to any person in any jurisdiction where unlawful or unauthorized. Any opinions, estimates, or forecasts expressed are the current views of the author(s) at the time of publication and are subject to change without notice. The research taken into account in this document may or may not have been used for or be consistent with all Aegon Asset Management investment strategies. References to securities, asset classes and financial markets are included for illustrative purposes only and should not be relied upon to assist or inform the making of any investment decisions. It has not been prepared in accordance with any legal requirements designed to promote the independence of investment research, and may have been acted upon by Aegon AM and Aegon AM staff for their own purposes.

All investments contain risk and may lose value. Responsible investing is qualitative and subjective by nature, and there is no guarantee that the criteria utilized, or judgement exercised, by any company of Aegon Asset Management will reflect the beliefs or values of any one particular investor. Responsible investing norms differ by region. There is no assurance that the responsible investing strategy and techniques employed will be successful. Investors should consult their investment professional prior to making an investment decision.

Opinions and/or example trades/securities represent our understanding of markets both current and historical and are used to promote Aegon Asset Management's investment management capabilities: they are not investment recommendations, research or advice. Sources used are deemed reliable by Aegon Asset Management at the time of writing. Please note that this marketing is not prepared in accordance with legal requirements designed to promote the independence of investment research, and is not subject to any prohibition on dealing by Aegon Asset Management or its employees ahead of its publication.

All data is sourced to Aegon Asset Management (a trade name of Aegon Investment Management B.V.) unless otherwise

stated. The document is accurate at the time of writing but is subject to change without notice. Data attributed to a third party ("3rd Party Data") is proprietary to that third party and/or other suppliers (the "Data Owner") and is used by Aegon Investment Management B.V. under license. 3rd Party Data: (i) may not be copied or distributed; and (ii) is not warranted to be accurate, complete or timely. None of the Data Owner, Aegon Investment Management B.V. or any other person connected to, or from whom Aegon Investment Management B.V. sources, 3rd Party Data is liable for any losses or liabilities arising from use of 3rd Party Data.

Aegon Investment Management B.V. (Chamber of Commerce number: 27075825) is registered with the Netherlands Authority for the Financial Markets as a licensed fund management company. On the basis of its fund management license Aegon Investment Management B.V. is also authorized to provide individual portfolio management and advisory services.

"Please note that not all sub-funds and share classes may be available in each jurisdiction. This content is marketing and does not constitute an offer or solicitation to buy any fund(s) mentioned. No promotion or offer is intended other than where the fund(s) is/are authorized for distribution.

Please visit <https://www.aegonam.com/en/contact/> for an English summary of investor rights and more information on access to collective redress mechanisms"

Adtrax no: 6457532.1.
Expiry date: 6-6-2024