

Insight Paper | April 2024

Spotlight on the European SAF market: countdown to 2025

An Argus overview on SAF regulations, market
fundamentals and prices



What is the European SAF legislative landscape and how does it shape the market?

Mandates



Aviation Fuel Suppliers

Must supply minimum shares of SAF according to mandatory quota.



EU Airports

At the end of the flexibility period, Union airports must make the refueling of airplanes with SAF possible* when passenger traffic is above 800,000 or freight traffic exceeds 100,000 tons/yr.

The sustainable aviation fuel flexibility mechanism runs for the next 10 years, from 1 January 2025 to 31 December 2034. During this period, aviation fuel suppliers will have the flexibility to supply the minimum shares of SAF as a weighted average over all the aviation fuel supplied across Union airports for that reporting period.

*Exceptions for small remote airports apply.



Aircraft operators

Aircraft operators are obligated to refuel at least 90% of their yearly required aviation fuel from within the EU. This obligation was set up to prevent tankering, the act of loading more fuel than needed outside of Europe.

European Union—minimum quotas

Year	2025	2030	2032	2035	2040	2045	2050
Share of SAF	2%	6%	6%	20%	34%	42%	70%
Minimum share of synthetic aviation fuels	0%	1.2%*	2%*	5%	10%	15%	35%

*Average share of 1.2% for the period 2030-2031 and average share of 2% for the period 2032-2034

Penalties under the ReFuelEU initiative

Member states shall set and enforce fines on fuel suppliers, Union airport managing bodies, and aircraft operators in case of non-compliance with the mandate. The penalties must fall within the prescribed minimum threshold for the different obligated parties defined by ReFuelEU.

Minimum Fines

Aviation Fuel Suppliers

$2 \times$ [yearly average of the difference between the SAF or synthetic aviation fuel price and the conventional kerosene price per tonne] \times quantity of aviation fuel not complying with the minimum quota

Conventional kerosene price	SAF/synthetic aviation fuel price	Minimum fine
1,000 \$/t	3,000 \$/t	4,000 \$/t

EU airports

fines defined and structured by Member States

Aircraft Operators

$2 \times$ yearly average price of aviation fuel per tonne \times yearly non-tanked quantity

Yearly average price of aviation fuel	Minimum fine
1,000 \$/t	2,000 \$/t

EU Emissions Trading System (ETS)

Between 1 January 2024, and 31 December 2030, a reserve of 20 million carbon allowances from the EU Emissions Trading System (ETS) will be dedicated to incentivise the use of SAF.

These allowances will cover the price differential – in total or partially – between SAF and conventional jet fuel.

The distribution of SAF allowances will vary depending on the type of SAF used and the geographic location of use.

- Small islands, small airports and outermost regions will be able to cover 100% of the price differential

For all other airports, the coverage of the price differential will depend on the type of fuel used:

- 95% for renewable fuels of non-biological origin (RFNBOs)
- 70% for advanced biofuels
- 50% for other eligible fuels

How is global UCO availability affecting the SAF market?



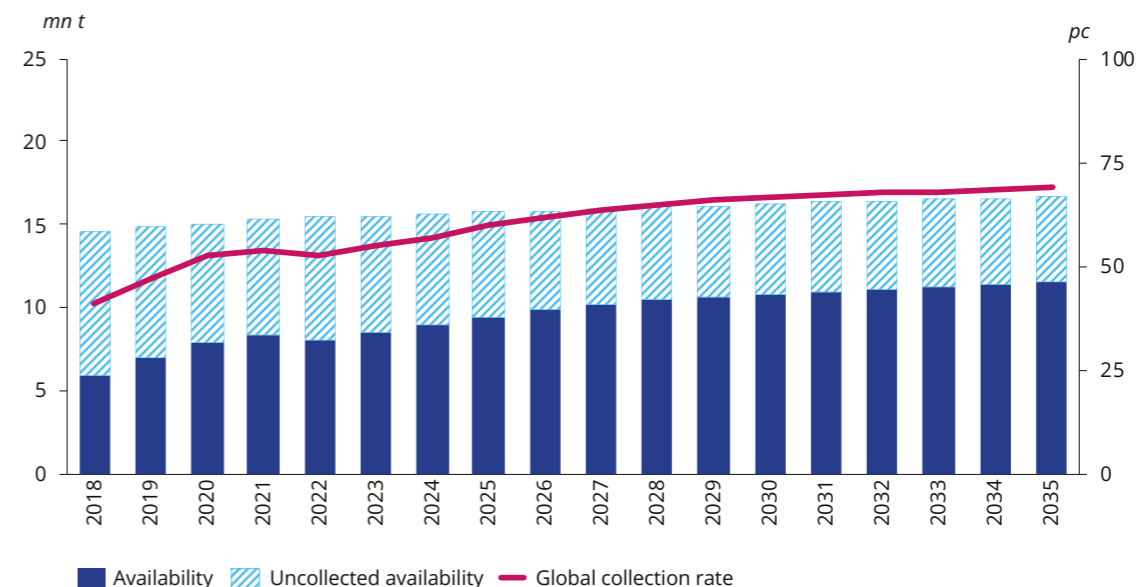
Availability of UCO to tighten as demand for the feedstock grows

UCO availability

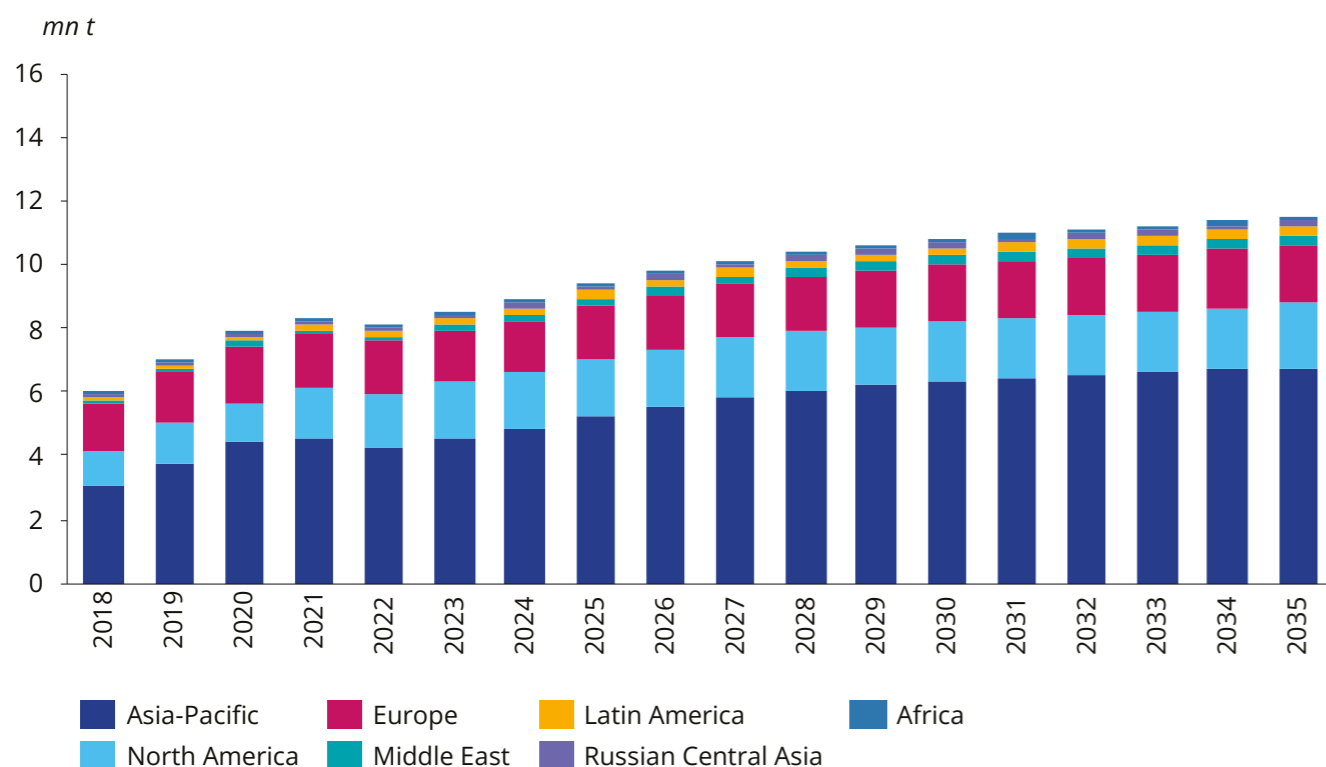
We estimate global used cooking oil availability to be around 8.9mn t in 2024. Global collection sits at 57%, with a large portion of theoretical availability around the world not currently collected. UCO availability is expected to increase to 10.8mn t by 2030 as populations and the share of urban areas increase throughout the world.

UCO availability is concentrated in Asia-Pacific due to the region's high vegetable oil consumption, vast population, and urban density. In 2024, Asia-Pacific will represent close to 60% of all UCO that is collected. Collection rates in Latin America, the Middle East, and Russian Central Asia represent a tiny fraction of our estimated global UCO availability in part due to very low rates of collection.

Additional potential UCO collection



UCO supply by region



What is left for SAF?

SAF is expected to take up a significant portion of UCO availability. Europe's ReFuelEU Aviation legislation and LCFS programs in the US will significantly increase demand for UCO as a feedstock for SAF production.

Higher margins associated with SAF production are likely to support the security of UCO for SAF production, diverting some feedstocks away from the more traditional biodiesel industry. Total theoretical availability is expected to sit around 16mn t in 2025.

In the last couple of years there has been a noticeable decrease in vegetable oil consumption around the world and the OECD-FAO Agricultural Outlook has since revised their vegetable oil consumption projections substantially downwards. As a result, we anticipate collection rates to hit their practical maximum sooner and estimate global UCO collection will set at 69% by 2035.

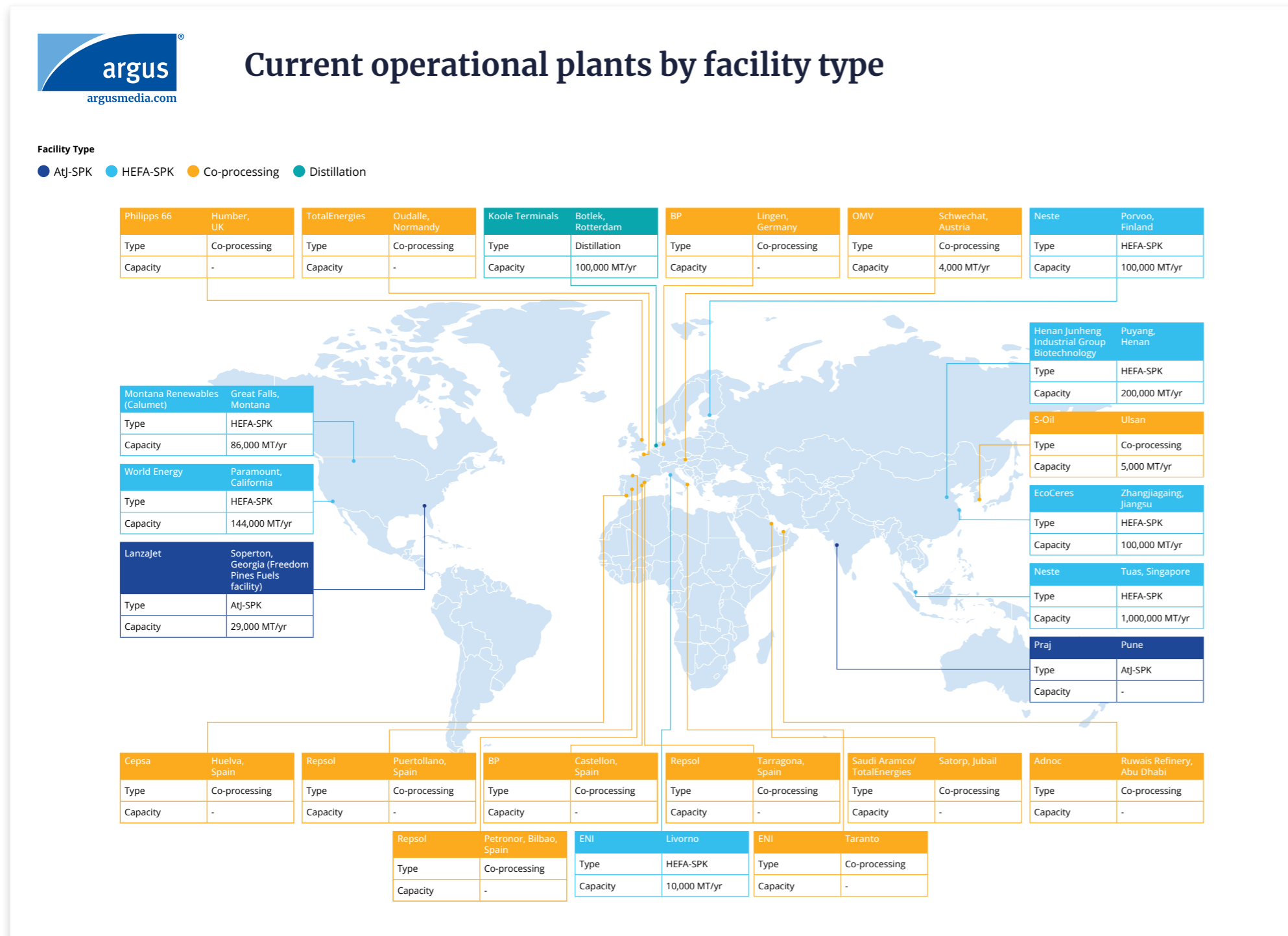
Collection rates are very unlikely to reach 100% of UCO in any market. Collection rates in western Europe are understood to be around 85%, and this rate of collection is likely the "maximum" rate that can be achieved without widescale residential UCO collection.

Will SAF supply keep up with demand?

A view of global SAF capacity

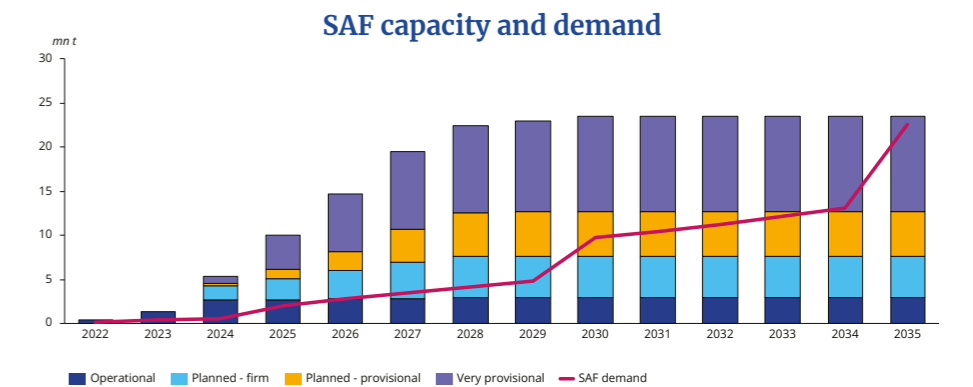
Get a view of global SAF capacity around the world. The data behind the map is also available in Data and Downloads on Argus Direct for subscribers.

Scan the QR code on page 8 for more information.



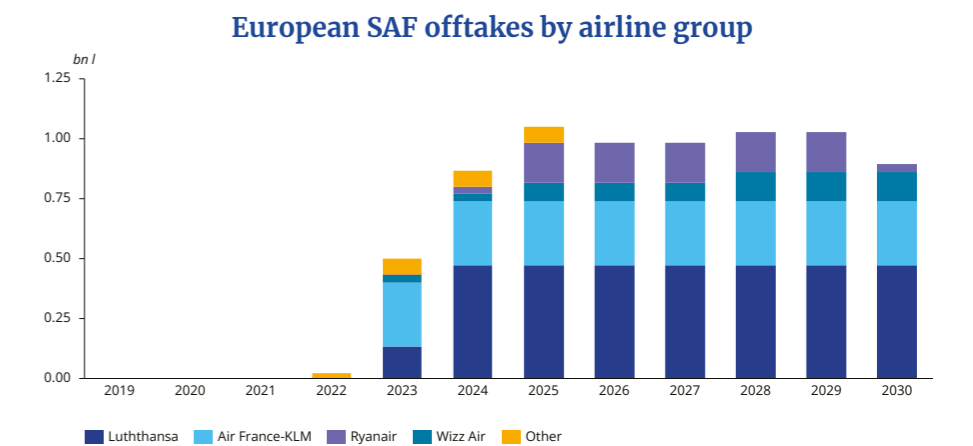
Forecasted SAF capacity and demand provided by Argus Biofuels Analytics

Based on announced projects, SAF capacity has the potential to surpass 20mn t by the end of the decade and could increase almost threefold to 11.8mn t by 2035. Most of this upcoming capacity is expected to be hydrotreatment facilities, although we do anticipate an increase in other processing technologies at limited capacity by 2035.



Offtake agreements for SAF

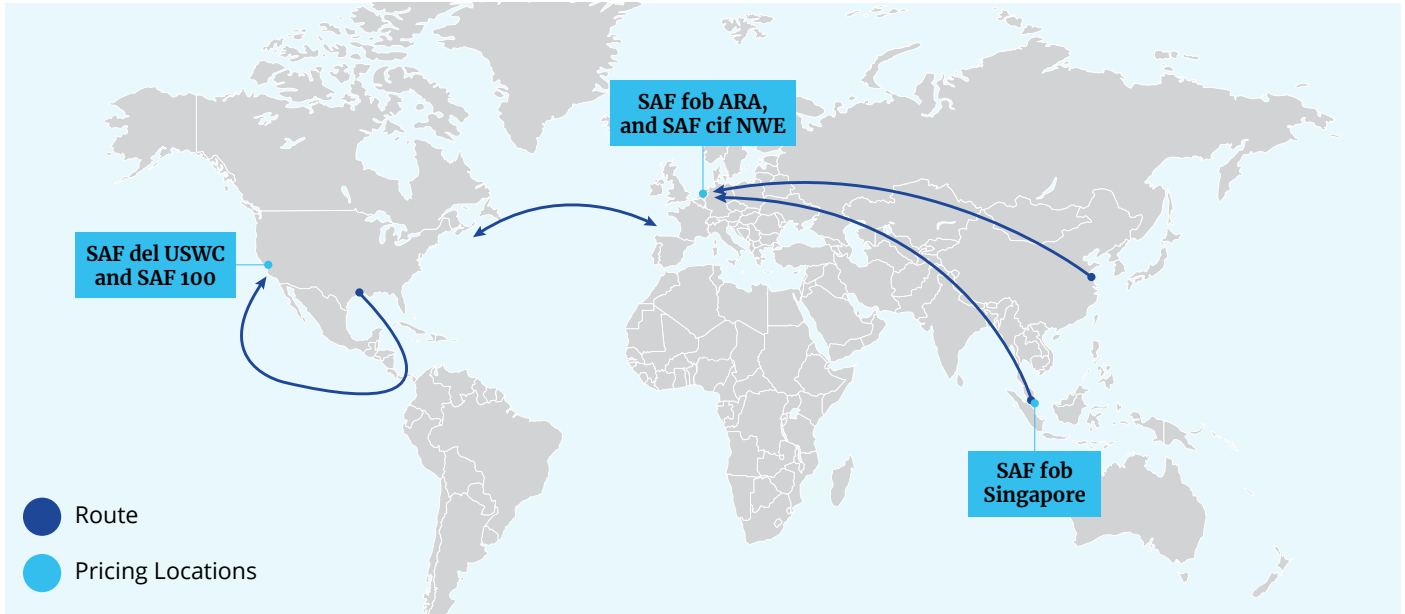
Argus provides a comprehensive database on current and future offtake agreements for SAF. Looking at the provider, supplier, location, technology, feedstock used, volumes and more.



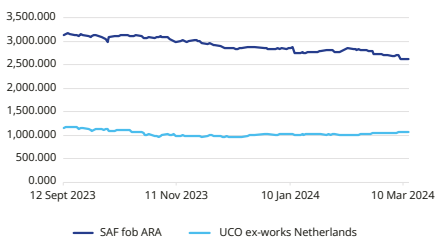
What SAF benchmarks are most representative of the market?

Argus publishes a full suite of prices for SAF based on real market transactions, bids, offers, and indications that provide an accurate reflection of the specific supply/demand dynamics of this low carbon renewable fuel.

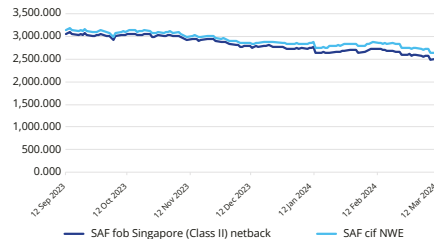
Global SAF trade flows



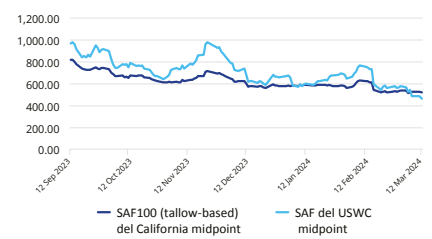
Argus SAF fob ARA and Argus UCO ex-works Netherlands



Argus SAF cif NWE and Argus SAF fob Singapore



Argus SAF del USWC and Argus SAF100



Argus SAF Hub: Providing transparency to how SAF is priced, produced and delivered.

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