



BRIEFING - June 2024

Unknown Cooking Oil

High hopes on limited and suspicious materials

Summary

Europe's increased consumption of used cooking oil biofuels has resulted in a severe reliance on imports from Asian countries. Based on Stratas Advisors' analysis and other sources, in this briefing T&E assesses recent trade flows, economic dynamics and explores current and future limitations of UCO biofuels.

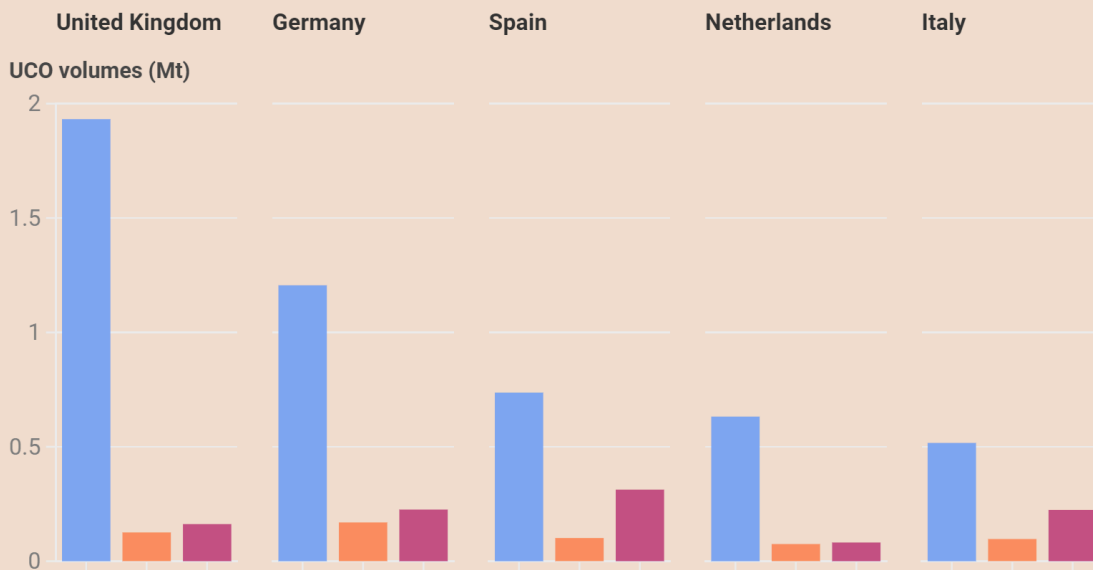
European supply of UCO already struggles to meet the increased demand

In 2023, European countries consumed close to seven million tonnes of UCO for biofuels according to Stratas' analysis, with the vast majority being blended for biodiesel to use in cars and trucks. This is close to eight times higher than the collected volumes estimates in 2023 and four times the continent's maximum potential, with demand growing much faster than domestic supply.

European UCO appears to come almost exclusively from restaurants, with less than 10% collected from households, and more than half of the continent's maximum potential already tapped. While a significant potential remains within European houses, improvements in collection infrastructure, logistics, and social awareness might be challenging in many countries.

European countries consumed 8 times more UCO than they collected and 4 times more than their maximum potential in 2023

■ UCO used in biofuels ■ Current collection ■ National potential



Source: Transport & Environment, based on data from Stratas Advisors

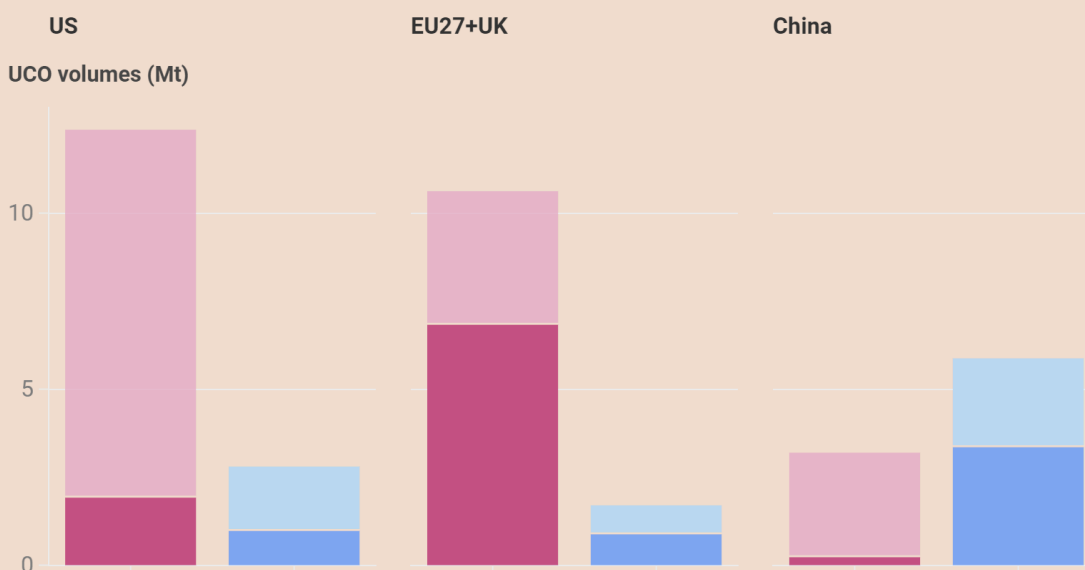


Cars, planes and ships all betting on the same horse

UCO accounted for one third of conventional biodiesel feedstocks and a quarter of hydrotreated vegetable oil (HVO) biofuels volumes in 2023. Most notably, UCO made up 80% of the increasing but still very limited sustainable aviation fuel (SAF) demand, which grew five-fold between 2021 and 2023. While the EU and UK's green fuel mandates for planes and ships are forecasted to put even more pressure on cheap biofuels feedstocks, the United States committed to a three times bigger SAF target for 2030 and China is expected to announce a 2-5% blending target soon.

Demand for UCO much larger than potential supply

■ 2023 use of UCO in road transport
 ■ 2030 SAF mandates
 ■ 2023 UCO collection
 ■ Remaining UCO collection potential



Source: Transport & Environment, based on data from Stratas Advisors, ICCT and own calculations



As a result of limited collection potential, even in China, today's biggest producer, combined current UCO biofuels consumption and projected SAF demand will fall short of supply if they were to bet only on this feedstock. For instance, Ryanair, Europe's most polluting airline, will alone require all of the European UCO collection potential to meet its own voluntary 12.5% SAF target by 2030.

Likely discrepancy between collection and export figures, another sign of fraud

2023 saw a pivot in UCO trade flows with half of Chinese UCO previously exported to Europe redirected to the United States, as a result of Biden's Inflation Reduction Act (IRA). At the same time, presumably waste-based biodiesel imports from China to Europe jumped by 40% and raised serious suspicions about the authenticity of such large quantities.

China, Indonesia, and Malaysia have increased their collection of waste cooking oil to around 4 million tonnes in 2023, with over three-quarters supplied by China alone. However, irregularities in collection and export rates also raise serious concerns over fraud. Malaysia already exports three times more UCO than it collects according to Stratas' analysis, meaning fraud is very likely happening at scale, benefiting from high incentives for advanced and waste biofuels in Europe.

On the other hand, while Chinese collection of UCO roughly matches up official exports and domestic uses, the picture is obscured by a robust gutter oil market. In reality, the country is likely consuming significant volumes of UCO domestically, raising strong suspicions over virgin vegetable oil being mislabelled as waste oils.

Cheap Asian UCO biofuels, despite high transport costs

Stratas' assessment shows that collecting UCO in Asia is around a third cheaper than in Europe but that import costs and excise duties can lead to a higher final UCO cost for European buyers, depending on quality and variable freight costs. As a result of the combined competitive advantage of Asian UCO biofuels, oversupply of Chinese biodiesel and limited increase in demand, European biofuels market prices have been driven down in 2023.

Following the outcry of European biodiesel producers, that claimed to be flooded with cheap and fraudulent products, the European Commission launched an anti-dumping investigation in December 2023 to assess whether unfair and illegal practices have been held. While the official results of such a probe are still to be disclosed, the second half of 2023 saw a decline in imports of Chinese biodiesel.

T&E recommendations

There is no silver bullet that can rectify the economic, political and environmental problems that arise from UCO import dependence and fraud. Instead, there are multiple fronts on which the EU and national governments must work in order to adjust their policies and practices.

- At the national level, governments should ensure that UCO **imports from outside the EU no longer count towards renewable targets**, thus eliminating a key incentive for their demand.
- Furthermore, national governments should impose **more stringent caps** on incentivizing UCO biofuels.
- At the EU level, a dedicated **fraud investigation unit** should be established to investigate fraud cases. A fraud investigation could be triggered by a variety of reasons, such as an alert through industry whistleblowers, suspicious transactions or suspected market distortions likely caused by fraud.
- A **complete review of the certification system** needs to be carried out, moving away from independent, industry-led voluntary schemes in favour of more stringent EU and national regulation. A supervision procedure for national governments to better oversee the work of voluntary schemes should be established, including cooperation frameworks with third countries to supervise in their territories.
- Finally, these recommendations should be complemented with support for cleaner alternatives. **Direct electrification** must be the preferred option for road transport. For sectors that are harder to electrify, such as aviation and shipping, **hydrogen-based fuels** should play the key role.

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Introduction

Largely promoted across Europe as an alternative to conventional crop-based biofuels, biofuels made from “waste” materials such as Used Cooking Oil (UCO) and animal fats have been significantly growing in recent years, reaching one third of EU biodiesel in 2022¹. However, this rapid uptake of UCO has come at the cost of an increased reliance on imports, which reached 80% of the EU’s UCO biofuels and mostly came from China and Malaysia, raising concerns about the authenticity of such alleged waste volumes.

Following the particular surge in biodiesel imports from China and complaints from the EU biofuels industry about the inflow of cheap and potentially fraudulent UCO products in the first half of 2023, the EU Commission announced it would investigate both Indonesian biodiesel suspected of transiting through China and the United Kingdom to circumvent customs duties² and unfairly traded biodiesel from China³. The former investigation has since been closed, while provisional measures are soon expected from the latter. However, it remains unclear whether the EU will be able to stop its addiction to suspicious imports.

In order to better understand the recent UCO and UCO biofuels⁴ market trends, T&E commissioned Stratas Advisors to assess trade flows between Asia and Europe as well as economic dynamics and factors that may promote the export of non-waste products instead of genuine used cooking oil. Also based on other sources analysed by T&E, this briefing will explore the limitations of UCO biofuels, which are commonly touted as a steadfast solution for fuelling planes, ships, cars and trucks all over the world.

1. UCO trade and economic dynamics

While the increase of UCO and UCO biofuels imports to Europe has been well documented until 2022, more recent data unveil several new trends. This section highlights new trade and economic dynamics and explores potential discrepancies between reported UCO collection and exports.

1.1 The West’s increased reliance on Asian UCO

Stratas’ analysis of trade records shows that overall exports from China more than doubled between 2021 and 2023, while destinations and product types also evolved (Figure 1). Driven by increased incentives from the US Inflation Reduction Act, around half of Chinese UCO previously exported to Europe has been redirected to the US in 2023, flooding the country with up to 0.8 million tonnes (Mt), equivalent to an eighteen-fold surge in Chinese UCO compared to 2022.

At the same time, the European market saw a significant 40% increase in Chinese biodiesel imports in 2023, reaching around 2 Mt with half of it being estimated to be UCO biodiesel by Stratas. However, from

¹ Transport & Environment. (Dec 2023). *Biofuels from unsustainable crops to dubious waste?* ([Link](#)).

² European Commission. (Aug 2023). *Commission Implementing Regulation (EU) 2023/1637*. ([Link](#)).

³ European Commission. (Dec 2023). *Notice of initiation of an anti-dumping proceeding concerning imports of biodiesel originating in the People’s Republic of China*. ([Link](#)).

⁴ In this briefing, UCO will refer to used cooking oil as a feedstock while UCO biofuels will refer to UCO biodiesel (UCO Methyl Ester or UCOME), UCO Hydrotreated Vegetable Oil (UCO-HVO) and UCO-Hydro-processed Esters and Fatty Acids (UCO-HEFA), when not specifically differentiated. While UCOME can be blended up to a certain point with diesel, HVO can be used as a drop-in fuel in road transport and HEFA can be blended with aviation fuels.

mid-2023, Asian biodiesel inflow to Europe declined following the announcement of the EU probe into Chinese biodiesel exports, with Chinese imports declining by 26% compared to the first half of the year.

In 2023, the Netherlands and the United Kingdom were the largest entry points of UCO biodiesel and UCO in Europe, each receiving around 40% of all European UCO imports. More specifically, acting as a major hub for the EU, the Netherlands was notably Malaysia’s largest export destination, being supplied with close to 40% of the country’s alleged UCO exports. Exports from the UK to the EU also followed similar but less pronounced trends to that of Asian imports, with increased UCO and biodiesel shipments to the continent in the first half of 2023.

Europe and the US, main buyers of Asian UCO and UCOME

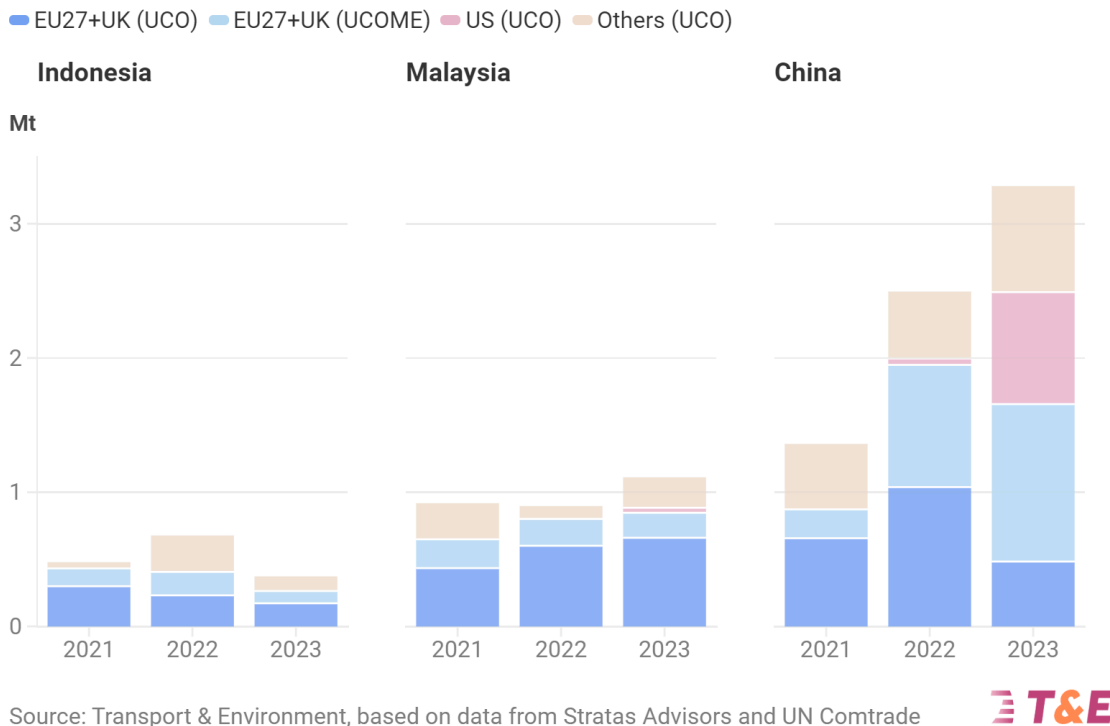


Figure 1: 2021-2023 exports of UCO and UCO biofuels from Indonesia, Malaysia and China⁵

Finally, while Europe and the US totalled more than three quarters of UCO and UCOME exports from China, Malaysia and Indonesia, it is worth noting that exports to Singapore have also been doubling between 2021 and 2023, reaching a fifth of Chinese UCO exports. The country is indeed becoming a major biofuels hub, with companies such as Neste ramping up their local production⁶.

1.2 Impact of cheap Asian flows on the biofuels market

Following the surge in UCO and UCO biofuels imports to Europe, the biofuels industry has been complaining about distorting market prices and unfair competition⁷. Stratas’ analysis shows that UCO and UCO biofuels cost components vary widely between Europe and Asia.

⁵ Wherever UCO biofuels and UCO are compared altogether, biofuel yield factors of 0.91 kg_{fuel}/kg_{UCO} for UCOME and 0.85 kg_{fuel}/kg_{UCO} for UCO HVO and HEFA are applied based on the GREET model. ICCT. (Dec 2021). *Indirect emissions from waste and residue feedstocks: 10 case studies from the United States*. ([Link](#)).

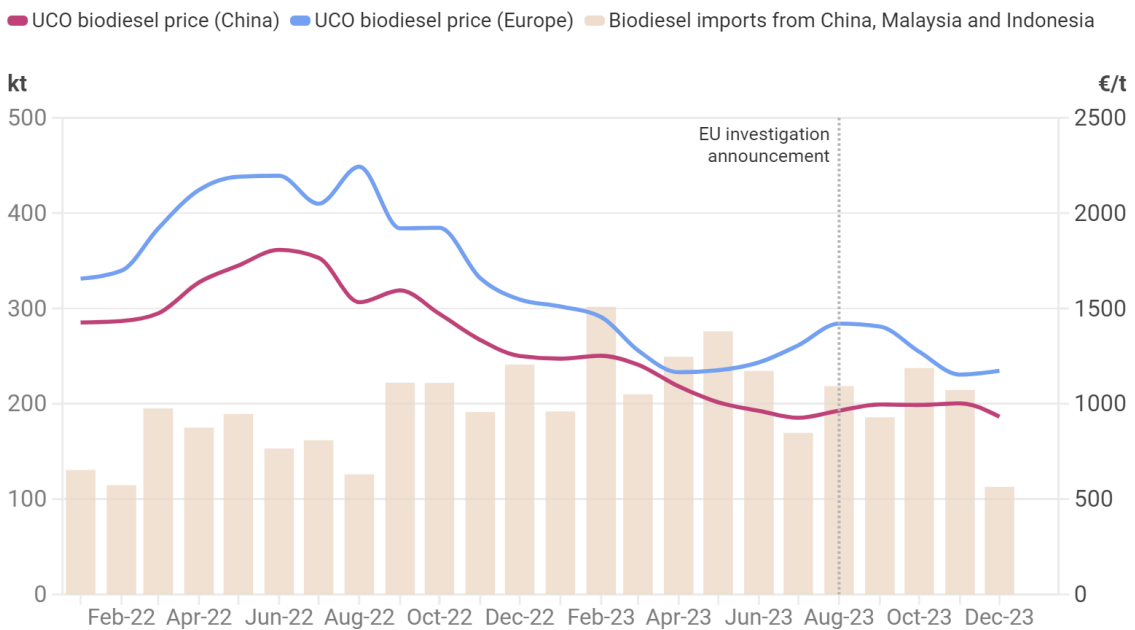
⁶ Argus Media. (Oct 2023). *Neste to ramp up Singapore biofuels output in 1H Nov*. ([Link](#)).

⁷ Bloomberg. (Apr 2023). *Europe Battles Flood of Green Fuel Suspected to Be Fraudulent*. ([Link](#)).

While combined UCO collection and pre-treatment costs are estimated to be 30% cheaper in Asia, mainly because no collection fees are commonly paid, adding transport costs gives a different picture. Despite Asian suppliers' efforts to optimise their export logistics, sea freight cost accounts for up to 60% of Asian UCO cost with significant variations over the past two years. On top of that, custom duties generally amount to around 8% of the imported cost, with exceptions on Indonesian biodiesel⁸ and products supplied from Singapore⁹. As a result, UCO costs highly depend on fluctuating freight costs and European supply chain costs can be lower. However, when looking at UCO biofuels, Asian products present a competitive advantage thanks to lower labour and energy costs. This seems to be particularly the case for biofuels requiring more refining energy inputs, such as hydrotreated vegetable oil (HVO) or hydrotreated esters and fatty acids (HEFA).

Finally, the analysis of the UCOME market shows a sharp decline in both Asian and European prices starting from the second half of 2022 (Figure 2), when imports of biodiesel from China, Malaysia and Indonesia started growing. Such a trend became even more noticeable in the beginning of 2023, when imports peaked above 0.3 Mt in February. Market analysts explained this decrease in prices by an oversupply of Asian products, but also by a reduced fuel demand in Europe¹⁰.

Collapse of UCO biofuels prices following increased biodiesel imports from Asia



Source: Transport & Environment, based on data from Stratas Advisors



Figure 2: 2022-2023 UCOME prices vs Asian biodiesel imports to Europe

⁸ Indonesian biodiesel has been subject to a 18% anti-dumping duty since 2019. European Commission. (Nov 2019). *Commission Implementing Regulation (EU) 2019/2092*. ([Link](#)).

⁹ Most products traded between the EU and Singapore have had duty exemptions under the free trade agreement in force since 2019. European Commission. (Nov 2019). *Free trade agreement between the European Union and the Republic of Singapore*. ([Link](#)).

¹⁰ S&P Global. (Mar 2023). *European biodiesel prices plummet since start of 2023 amid weakening market factors*. ([Link](#)).



1.3 Discrepancy between collection and exports in Asia?

The sudden growth in imports of biodiesel from China during the first half of 2023 raised suspicions that virgin oils, such as palm oil, were mislabelled as UCO to benefit from high incentives for advanced and waste biofuels in Europe. The analysis of collection rates and traded volumes already gives a first overview of potential discrepancies.

Stratas estimates that altogether China, Indonesia and Malaysia improved their collection of waste cooking oil to reach around 4 Mt in 2023, with more than three quarter being supplied by China alone. With most of the volumes coming from the commercial sector, these three countries hit close to half of their maximum potential¹¹.

Figure 3 shows how current collection rates compare with exports of UCO and UCO biofuels. In China, combined exports and domestic uses of UCO biofuels only appear 5% lower than collected and imported volumes. Such a thin gap raises suspicions of some of the exported UCO or UCOME being something else than waste given the uncertainty around other domestic uses of UCO. While it is hard to access accurate data, waste cooking is indeed very commonly re-used as “gutter oil” in Chinese kitchens. Estimates of the gutter oil market vary significantly and range somewhere between 2 Mt and 10 Mt according to the ICCT, again suggesting that combined UCO uses and exports may exceed actual collection.

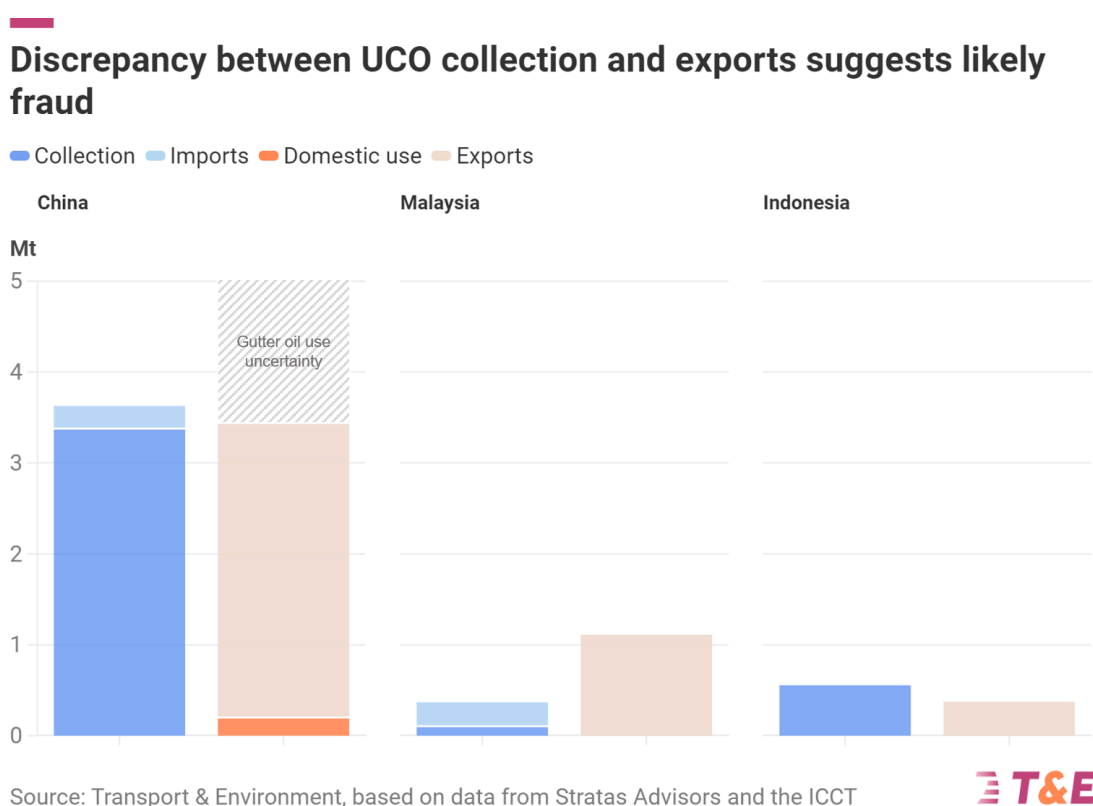


Figure 3: 2023 collection, imports, exports and domestic uses of UCO and UCO biofuels

¹¹ Stratas’ modelling integrates various factors, including dietary habits, vegetable oil consumption, population density and growth, industrial activity, policy support and available infrastructure (e.g. biofuel production capacity, major UCO collection hubs etc) to estimate UCO collection and potential.

On the other hand, Stratas' assessment reveals a strong imbalance between Malaysian collection and exports in 2023, as already suggested in the past by the ICCT¹². Combined national collection and imports of UCO and UCO biofuels indeed appear more than three times smaller than exported volumes, indicating strong suspicions of fraud, with risks of palm oil compensating for the shortfall.

Certified fraud: the inherent shortcomings of the UCO verification process

To count towards EU RED targets, biofuels must be certified as sustainable by an EU-approved voluntary or national certification scheme¹³. For Asian UCO, the most popular schemes are International Sustainability and Carbon Certification (ISCC), Roundtable on Sustainable Biomaterials (RSB) and REDcert, all of which are voluntary schemes.

Certification has already been shown to have several inherent limitations when it comes to verifying products¹⁴. Firstly, the current system functions as a market-driven mechanism, where the main motivation for economic operators is not to achieve genuinely sustainable production, but rather enhanced market access and increased sales.

Secondly, voluntary schemes typically engage third-party certification bodies (CBs) to conduct desk-based or on-site audits to verify an economic operator's compliance with sustainability requirements before issuing a certificate. Schemes can have a plethora of CBs conducting these audits. For example, ISCC and REDcert have 67 and 33 CBs, respectively, issuing sustainability certificates on their behalf. Competition between CBs means that those implementing more stringent audits are less likely to be hired by nefarious actors committing fraud. There are also disparities among certification schemes regarding their governance, the rigour and quality of their standards and their enforcement. For example, ISCC still allows Control Union to conduct audits on their behalf, despite RSB no longer allowing them to do so¹⁵.

Furthermore, there is an overreliance on self-declared proofs of sustainability. Once an economic operator is individually certified by a scheme, it is then expected to self-declare proof of sustainability for each consignment it trades. In the case of waste and residues, such as UCO, individual certification is only mandatory from the first collection point onwards. Points of Origin (PoO), such as restaurants or food processing plants, do not need to be individually certified to provide a self-declared proof of sustainability to a collector.

Instead, collectors must be able to provide CBs with a list of all the PoO they collect from, as well as information on each PoO's monthly or annual expected volume capacity, for verification. Typically, the number of PoO a CB will verify on a collector's list is only equal to the square root of the total amount of PoO listed. CBs are also obliged to take samples for laboratory analysis for self declaring PoO that deliver more than five tonnes of waste material per month.

¹² ICCT. (Feb 2022). *An estimate of current collection and potential collection of used cooking oil from major Asian exporting countries.* ([Link](#)).

¹³ Full list of approved schemes available on European Commission website ([Link](#)).

¹⁴ Greenpeace. (2021). *Destruction: Certified.* ([Link](#)).

¹⁵ See RSB list of certified bodies ([Link](#)) vs. ISCC list of certified bodies ([Link](#)).

However, in practice, true verification of submitted information is limited. Auditors verify the documentation of operators periodically, often without frequent spot checks on the physical material and infrastructure. What's more, even when samples are taken for laboratory tests, detecting adulteration of UCO and UCOME with other products such as palm oil can be challenging due to their similar chemical composition.

Therefore, it can be relatively easy for UCO collectors and biofuel producers to provide falsified mass-balance records to auditors without detection. For instance, self-declared restaurants on a collector's list may not actually exist or their volumes may be falsely reported to obscure the high volumes of fraudulent UCO, which is or has been blended with virgin palm oil. Biofuels producers can mislabel palm oil products as UCOME by omitting palm oil deliveries from their incoming mass-balance records. They then certify the resulting "UCOME" volumes with different CBs. This process is known as "double / multiple claiming" and generally works due to limited data validation between CBs.

Non-compliant operators who have had their certificates removed have also been known to apply for new certificates with other schemes or CBs, known as "scheme hopping" or "certificate body hopping".

According to the research conducted by Stratas Advisors, mislabelling is more likely to take place at the point of UCOME production, rather than during UCO collection. While audits on collectors are obliged to conduct sample inspections on PoO supplying more than five tonnes of UCO per month, audits of UCOME producers focus more on the verification of their mass balance records and delivery documents, rarely conducting a sample inspection on the incoming UCO feedstocks. That being said, both UCO collectors and producers technically still have similar chances of mislabeling their products.

In an attempt to bolster the verification of the supply chain, the European Commission announced the publication of the web-based Union Database (UDB) in early 2024. The database was created to track all transactions of operators along the biofuel supply chain and therefore eliminate concerns of double claiming. However, the reliance of the UDB on inputs from voluntary schemes leaves room for potential flaws, such as inadequate data verification, which could allow fraud to persist.

2. Europe's bet on very limited UCO volumes

Despite being highly incentivised in the European fuel legislation, the current rush to UCO biofuels cannot be sustained. This section puts into perspective the increased global demand for waste biofuels with the limited supply potential in main producing countries.

2.1 Current UCO consumption already far above potential

In 2023, the EU and the UK consumed around 6.3 Mt of UCO biofuels according to Stratas, equivalent to around 7 Mt of raw UCO. Conventional UCO biodiesel (UCOME) represented 80% of the volumes, the rest being renewable diesel (UCO-HVO, 15%) and sustainable aviation fuel (UCO-HEFA, 4%). While UCO

represented around one third of biodiesel and a quarter of HVO consumed in 2023, the feedstock reached more than 80% of the limited but fast-growing HEFA pool. It is also worth noting that HEFA consumption has been multiplied by over 5 times between 2021 and 2023, when biodiesel (FAME¹⁶) and HVO only slightly increased by 4% and 2% respectively.

While UCO biofuels consumption has been increasing by almost 40% between 2021 and 2023, Stratas' estimates show that collection rates only grew by 3%, once again stressing the increased reliance on imports. European UCO collection today comes primarily from restaurants and food manufacturers, with only 7% coming from households, despite such sources representing half of the continent's potential.

Current collection of waste cooking oil is assessed to have reached 55% of its maximum potential, with around three quarters of the professional sector's potential already reached. Conversely, only 12% of households' potential is currently tapped, but further improvement will require significant efforts given the limited collection infrastructure in most urban areas, elevated transport costs in less densely populated areas, and poor social awareness in most countries.

More than half of European supply can be found in the countries shown in Figure 4. European countries' consumption appears to be eight times greater than the current collection rates and already four times above the maximum potential in 2023. While the UK's and Germany's collection of waste cooking oil already reached close to 80% of their maximum potential, some countries such as Spain and Italy are estimated to still have some margin for increased collection, with only 32% and 43% of their respective potential already used.

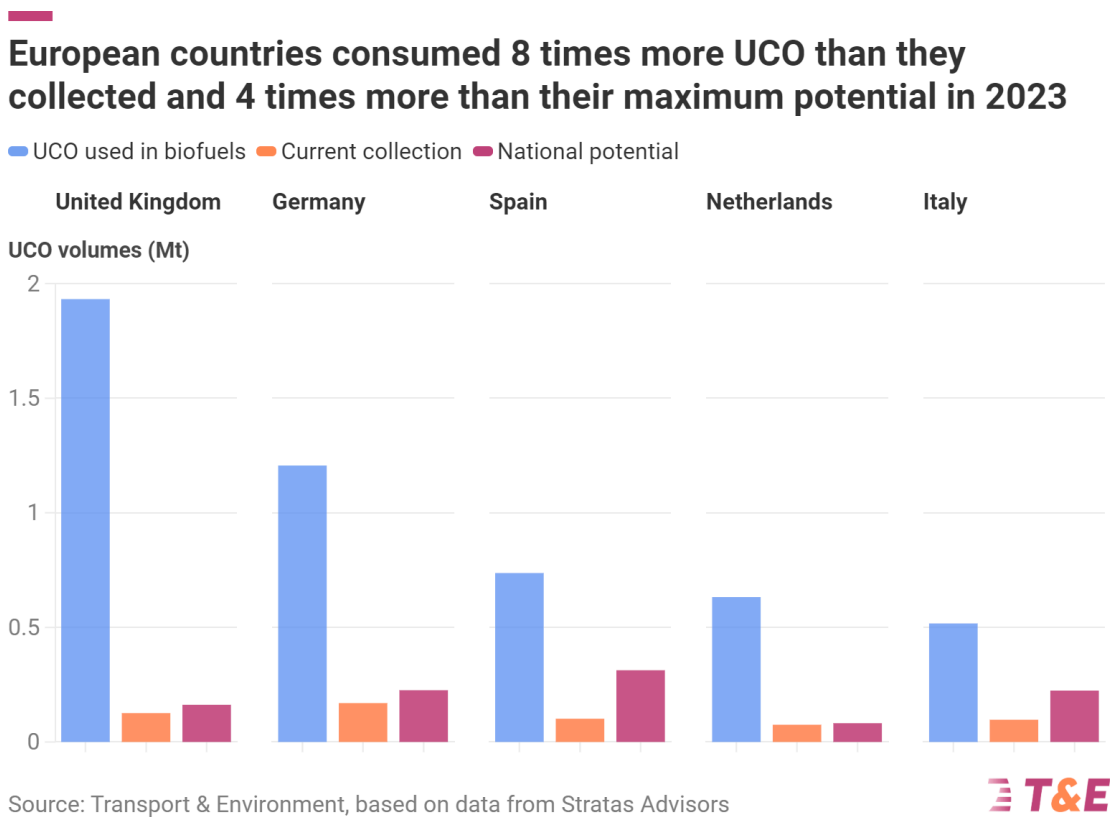


Figure 4: 2023 use of UCO in biofuels, UCO collection and potential in main European consumers

¹⁶ Fatty Acid Methyl Esters

2.2 SAF mandates' high hopes

Finally adopted in late 2023, EU's ReFuelEU aviation mandate sets a 6% target of sustainable aviation fuels (SAF) that need to be incorporated by fuel suppliers, including a minimum sub-target of 1.2% of green synthetic kerosene¹⁷. Combined with FuelEU Maritime regulation that sets emissions reduction targets for the shipping sector¹⁸, demand for biofuels is expected to soar in the years to come. As a result, the pressure on cheap feedstocks that rely on conventional biofuels technologies, such as used cooking oil and animal fats, is forecasted to increase.

Furthermore, Europe is not alone in the global feedstock race, with important players such as the United States and China also having ambitious targets. The US unveiled its SAF Grand Challenge in 2021, with the aim of producing 3 billion gallons of SAF by 2030, equivalent to 9 Mt and close to three times the EU's mandate ambition. Despite not having officially disclosed any targets, China is also heavily betting on SAF and fuel producers are expecting a blending mandate in the range of 2-5% by 2030¹⁹.

To illustrate such a SAF rush, Figure 5 compares UCO demand based on current UCOME and HVO biofuels consumption as well as projected SAF demand with the respective UCO collection potential in each region²⁰. China appears to be the only country with enough potential to supply its forecasted short-term demand, if road use does not increase. On the contrary, the US and European countries will fall short of UCO supply if they were to bet on this only feedstock.

In Europe several measures have been implemented to acknowledge the limited availability of waste feedstocks. In the EU's Renewable Energy Directive, a 1.7% cap on Annex IX Part B feedstocks is in place but it has proved to be very weak to prevent imports, in part because of the possibility for Member States to increase this limit²¹. More recently, the UK's SAF mandate added a specific cap on HEFA volumes, starting at 71% of the total mandated SAF volumes in 2030 and 33% in 2040²². T&E calculations show that this cap will in practice amount to 0.9 Mt of fuel in 2030²³, close to ten times the country's UCO-SAF maximum potential.

¹⁷ European Council. (Oct 2023). *RefuelEU aviation initiative: Council adopts new law to decarbonise the aviation sector.* ([Link](#)).

¹⁸ ICCT. (Nov 2023). *Meeting the SAF Grand Challenge: current and future measures to increase the US sustainable aviation fuel production capacity.* ([Link](#)).

¹⁹ Reuters. (May 2024). *Focus: Chinese firms invest in 'green' jet fuel, anticipating blending rule.* ([Link](#)).

²⁰ EU27+UK mandate corresponds to the combination of ReFuelEU's mandate excluding the minimum e-kerosene share and UK's maximum amount of HEFA in its aviation fuel plan as estimated by T&E. A 5% SAF mandate, equivalent to 2.5 Mt of SAF has been used as an illustrative example for China. US collection potential is based on the ICCT's SAF Grand Challenge report sourced above and current collection estimated based on UCO biofuels consumption and imports.

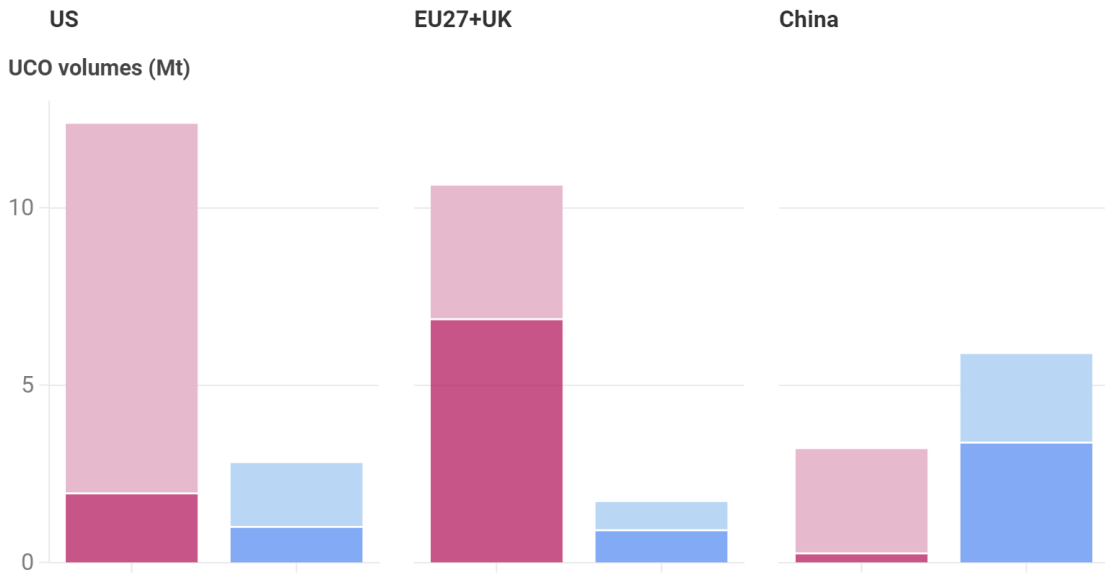
²¹ The Netherlands has for instance increased their cap on Part B to 10% of their transport energy.

²² UK department for Transport. (Apr 2024). *Written statement to Parliament - Aviation fuel plan.* ([Link](#)).

²³ Assuming that HEFA volumes only meet the UK GHG emissions threshold.

Demand for UCO much larger than potential supply

■ 2023 use of UCO in road transport ■ 2030 SAF mandates ■ 2023 UCO collection
■ Remaining UCO collection potential



Source: Transport & Environment, based on data from Stratas Advisors, ICCT and own calculations



Figure 5: Current and projected demand for UCO biofuels vs collection potential

UCO scarcity in practice: Ryanair's green fuel objective alone would require all European collection potential

With increased climate ambition from the aviation and shipping sectors, more and more agreements keep being announced between fuel suppliers and airlines or shipping companies. All kinds of so-called “renewable fuels” are promoted, with used cooking oil biofuels getting most of the attention. While Nike signed a biofuels agreement with CMA CGM to purchase biofuels for a part of their maritime transport, mainly relying on UCO²⁴, Virgin Atlantic achieved the first ever transatlantic flight based on UCO SAF²⁵.

Europe's most polluting airline²⁶, Ryanair is also piling up biofuels offtake deals with Shell²⁷, Eni²⁸ and Neste²⁹ among others, which plan to heavily rely on waste oil to produce SAF. The airline also committed to power 12.5% of their flights with SAF by 2030, equivalent to nearly 1 Mt of sustainable fuel according to their sustainability report³⁰. If all of Ryanair's target would be met thanks to UCO biofuels, more than 1.7 Mt of UCO would be required, equivalent to Europe's entire maximum collection potential.

²⁴ Biofuels News. (Mar 2024). *Nike using biofuel for maritime transport*. ([Link](#)).

²⁵ The Standard. (Nov 2023). *Virgin Atlantic: First ever transatlantic flight fuelled by cooking oil takes off from Heathrow*. ([Link](#)).

²⁶ Transport & Environment. (Apr 2024). *Above the clouds: European aviation emissions in 2023*. ([Link](#)).

²⁷ Quantum Commodity Intelligence. (Apr 2024). *Ryanair buys SAF from Shell for London airport delivery*. ([Link](#)).

²⁸ Biofuels International. (Jan 2024). *Ryanair and Enilive sign SAF agreement*. ([Link](#)).

²⁹ Ryanair. (Apr 2023). *Ryanair Powers 100% Of Amsterdam Flights With SAF Blend*. ([Link](#)).

³⁰ Ryanair. (Jul 2023). *Aviation with purpose: 2023 sustainability report*. ([Link](#)).

2.3 What about Asian countries' own needs?

Previous sections showed how used cooking oil collected in China, Malaysia and Indonesia are almost exclusively exported towards Europe and the United States today. However, these countries will also need such sustainable materials for their own decarbonisation.

Following the announcements of European investigations against allegations of fraudulent and unfair practices, China is about to shift towards more local use of biofuels, with the recent release of schemes to boost domestic consumption by the country's National Energy Administration³¹, including local subsidies. As mentioned before, China is also about to release a SAF blending mandate, with biofuels producers already planning to quickly launch new biorefineries and reach up to 1 Mt of SAF by the end of 2025³².

On the other hand, Indonesia and Malaysia also have some potential to produce biodiesel from their own used cooking oil. A previous study from the ICCT concluded that Indonesia might supply close to 0.7 Mt of biodiesel domestically and even at a lower cost than conventional palm oil biodiesel³³, while the country has the ambition to increase its biodiesel blending mandate to 40% and beyond³⁴. Despite the relatively limited UCO potential compared to Indonesia's current 9 Mt palm biodiesel use, such feedstock would still relieve palm's pressure on forests.

3. T&E recommendations

As outlined in this brief, there are several challenges that arise from Europe's rapidly growing demand for UCO and UCO biofuels. Competition from third countries undercutting European industry and increased energy dependence on imports both undermine the EU's agenda and need to be addressed immediately.

Most concerning from an environmental perspective is the risk of fraudulent UCO imports effectively acting as a backdoor for palm oil to enter the European fuels market, especially considering the EU's hardfought efforts to ensure palm oil biofuels will no longer be considered as renewable by 2030. On a broader scale, the limited availability of UCO combined with Europe's huge demand is likely to encroach upon exporter countries' own sustainability ambitions and demand for UCO, resulting in an increased usage of first generation crop biofuels, such as palm oil, to achieve their own green targets in the transport sector.

There is no silver bullet that can rectify the economic, political and environmental problems that arise from UCO import dependence and fraud. Instead, there are multiple fronts on which the EU and national governments must work in order to adjust their policies and practices. These actions would not only be beneficial in the case of UCO but also to tackle the import dependence and fraud issues happening with other biofuels feedstocks as well. Below, we explore some suggested recommendations.

³¹ S&P Global. (Apr 2024). *China releases list for a biofuel pilot scheme to boost domestic consumption.* ([Link](#)).

³² Reuters. (May 2024). *Focus: Chinese firms invest in 'green' jet fuel, anticipating blending rule.* ([Link](#)).

³³ ICCT. (Aug 2023). *Producing high quality biodiesel from used cooking oil in Indonesia.* ([Link](#)).

³⁴ Quantum Commodity Intelligence. (May 2024). *Indonesia to replace \$20bn diesel imports with biodiesel: Subianto.* ([Link](#)).

3.1 Restrict imports

Because of the EU's and national governments' lack of mandate to control and effectively verify UCO imports from third countries, one solution is to impose restrictive measures on imports. In May this year, the energy ministries of Germany, France and the Netherlands, with the support of other EU Member States, emphasised the need to strengthen controls on producers of UCO in third countries³⁵. In doing so, they proposed to reject the certification of any biofuels producers who refuse access to the premises for the inspecting entities of the competent authorities of the Member States.

While this proposition is a step in the right direction, the effectiveness of such inspections is still unclear. Therefore, a more effective solution is for national governments to no longer allow UCO and UCO biofuels from third countries to count towards their sustainability targets. This would effectively eliminate one of the key factors driving the need for unverifiable imports, reducing the unsustainable and unmanageable demand for UCO and UCO biodiesel imports from outside of the EU.

Means for restricting imports are also possible at the EU level. The Commission's ongoing investigation into imported Chinese biodiesel could yield effective anti-dumping measures on Chinese UCO and UCO biodiesel imports. The introduction of such measures could help the European biofuels industry regain ground lost on the market to the vast quantities of cheap Chinese biodiesel imports that has recently flooded the market. In turn, this could disincentivize UCO imports in favour of EU-collected UCO and EU-produced UCO biodiesel. However, it must be noted that these anti-dumping measures would only be effective for imports coming from China.

Restricting imports of UCO would not only ensure that Europe focuses on what it can collect at home, but would also encourage governments of producing countries such as Indonesia, Malaysia and China to use these fuels locally to decarbonise their own economy.

3.2 Reinforce policy measures

At the EU level, it is crucial that the cap on Annex IX Part B biofuels that can be incentivised with double counting stays at least at 1.7%. A recent addition of new feedstocks to Annex IX³⁶ means that there is now a concerning possibility for this cap to be increased, in accordance with the latest version of the Renewable Energy Directive.

The European Commission can, based on the assessment of availability of feedstocks, adjust the limit on Part B. In addition to this, Member States have the right to ask the Commission to increase their cap on Part B biofuels, which would further promote too high a demand for these feedstocks³⁷.

The Commission should no longer be giving this possibility to Member States. Instead, Member States should be strengthening their safeguards on UCO by implementing a more stringent limit on UCO biofuels than the 1.7% laid out in the RED. For example, France has further restricted the limit on UCO and fats to 1.1%³⁸. This can then be complemented with a requirement for more data from economic operators than is required at the EU level.

³⁵ Council of the European Union. (May 2024). *NON-PAPER from the delegations of France, Germany and the Netherlands*. ([Link](#)).

³⁶ The official publication of the revised [Delegated Act on Annex IX](#) by the European Commission took place on May 17th 2024, following a 'period of scrutiny' by the European Parliament and Council ([Link](#)).

³⁷ European Commission. (Oct 2023). *Renewable Energy Directive : article 27, paragraph 2 and 3*. ([Link](#)).

³⁸ République Française. (Dec 2023). *Code des douanes*. ([Link](#)).

In addition to this, national governments can also put a limit on the amount of SAF made from UCO that can count towards aviation fuels targets.

The above measures can be complemented by strengthening the market conditions for EU/UK-produced UCO and UCO biofuels by improving Europe's own UCO collection capacity. As shown in this brief, much of the bloc's untapped potential from UCO comes from household waste. Therefore, to avail of this potential, the EU and national governments could provide investment incentives for necessary infrastructure, such as municipal collection points, as well as awareness campaigns to influence the habits of the general public.

3.3 Ensure European and national authorities are well equipped to fight fraud

As highlighted in the EU's own assessment on Annex IX feedstocks, a key solution for tackling biofuels fraud is to have a dedicated fraud investigation unit specifically for the RED, equipped with necessary resources and specially trained staff that could work with national governments, industry and customs authorities to investigate suspected fraud cases³⁹.

In the current system, there is no presumption of fraud when audits on behalf of certifying bodies take place. Furthermore, assurance providers are generally not specifically investigating to find fraudulent activities. Unlike compliance audits, investigations into fraudulent activities require specific skills and resources that most assurance providers do not have.

A fraud investigation could be triggered by a variety of reasons, such as an alert through industry whistleblowers, suspicious transactions or suspected market distortions likely caused by fraud. Importantly, an investigation unit could avoid additional investigation costs for certifying bodies, certification schemes or economic operators that would deter such investigations from happening.

3.4 Completely review the certification system

As shown in this brief, there are multiple factors in the current certification system that increase the risk of fraud, such as a reliance on self-declaration and a lack of communication between certifying bodies which results in double / multiple claiming. On this basis, we recommend a complete review of the certification system for biofuels, moving away from independent, industry-led voluntary schemes in favour of more stringent EU and national regulation. The following suggestions should be taken on board in achieving this⁴⁰.

An EU-wide supervision procedure for Member States to oversee the work of voluntary schemes should be established to bolster the verification process, including the establishment of cooperation frameworks with third countries to supervise the certification bodies auditing in their territories. Should a third country authority forbid access for EU Member States to supervise certification bodies, stringent restrictions, as referred to in part 3.1 should be implemented.

The Commission should centralise and improve access to guidelines on typical yields expected from different feedstocks. This should include publishing typical ranges of UCO production for restaurants by

³⁹ European Commission. (Oct 2021). *Assessment of the potential for new feedstocks for the production of advanced biofuels*: Chapter 9.5 Subtask 3.6 ([Link](#)).

⁴⁰ *Ibid.* ([Link](#)).

size or geography in order to identify if an economic operator is reporting more UCO than feasible. If these ranges do not exist, it is recommended for the Commission to develop a list of accepted technical descriptions and/or standards and support further research to establish them.

Encourage rapid indicative tests that could be useful for auditors, like visual indicators (e.g. colour strip), pH level and other visual or chemical tests. The European Commission could also provide approved laboratories for testing, while random testing could fall under the remit of the fraud investigation unit mentioned in part 3.2.

3.5 Support cleaner alternatives

To ensure a full decarbonisation of the transport sector, cleaner and more scalable alternatives will be needed, in parallel to decreasing overall energy demand. Direct electrification must be the preferred option wherever it is possible. For sectors that are harder to electrify, like aviation and long-distance shipping, hydrogen-based fuels - renewable fuels of non-biological origin (RFNBOs) - will play a key role. Both renewable electricity and RFNBOs are currently supported through the Renewable Energy Directive (RED).

T&E supports a dedicated credit mechanism for rewarding the use of renewable electricity in transport⁴¹. Regarding RFNBOs, T&E recommends slightly higher ambition compared to the current RED targets but also a clearer targeting at aviation & shipping⁴².

For these fuels too, the traceability and proof of sustainability will be a major challenge and something that needs to be closely scrutinised.

Further information

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⁴¹ More in: Transport & Environment. (Aug 2023). *RED III and renewable electricity*. ([Link](#)).

⁴² More in: Transport & Environment. (Aug 2023). *2023 Renewable Energy Directive fact sheet - hydrogen*. ([Link](#)).