Biofuels in cars: A dead end for Europe

Why biofuels must not be allowed under the EU's car CO_2 regulation

November 2025

T&E

Summary

The EU's CO_2 regulation for cars is the backbone of Europe's automotive climate and industrial policy and the key driver for the supply of zero-emission cars. Changing the law to allow biofuels would be a disaster – here's why:

- **The shift from environmentally damaging crop-based biofuels to waste-based biofuels has maintained a high reliance on imports:** Today, 60% of biofuels are imported from non-EU countries. For used cooking oil, >80% is imported.
- **Reliance on imports comes with growing concerns over fraud risks:** Previous investigations by T&E strongly suggests that fraud is occurring. As demand from aviation and shipping grows and supply remains limited in Europe, dependency on imports will only grow, further increasing the risk and level of fraud.
- **The current EU biofuel mix is delivering limited to non-existent CO_2 savings** (only 20%-40% CO_2e savings vs. fossil fuels on average), and potential waste oil fraud would erase any emissions savings achieved at all.
- **Limited biofuels can't cover planes and ships, let alone cars:** Allowing a biofuels loophole in the EU 2035 cars law would add 30% to aviation and shipping biofuel demand **and bring total EU demand to 2-9 times what can be sustainably sourced.**
- Sustainable sources of waste feedstocks are extremely limited; e.g. **a car running on animal fats, would require the equivalent of 120 pigs a year** while a car running on used cooking oil would need 25 kg of fries per day.
- Allowing biofuels to count as CO_2 neutral fuels would risk increasing 2050 emissions by up to 23%. **Europe faces a decisive choice: to either lead the global BEV race or fall behind by diverting to false solutions.**

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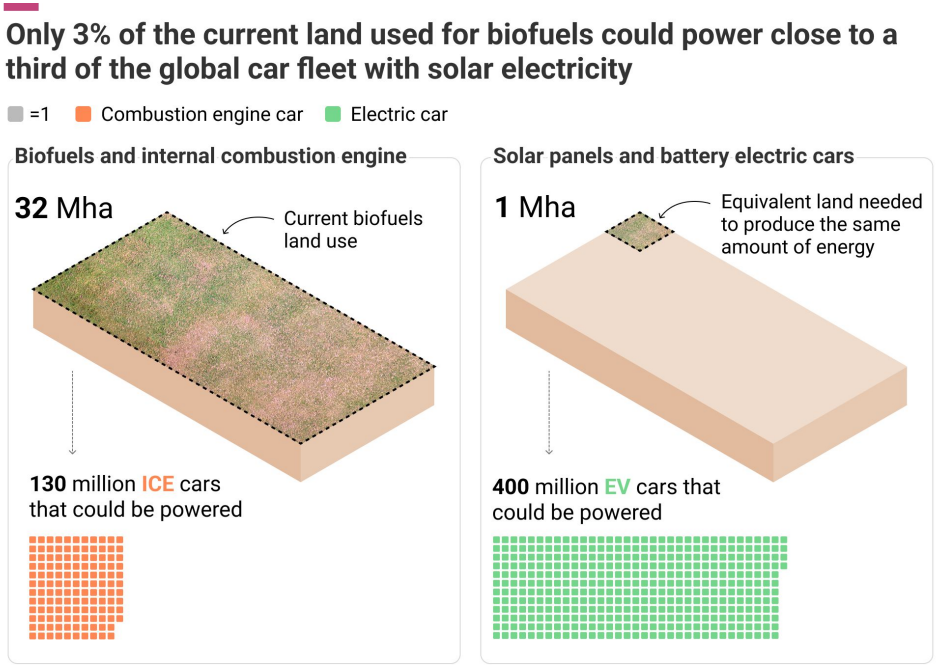
Contents

Historical trends and outlook:

An increased reliance on biofuels imports

Crop-based fuels are highly inefficient: the same land could power 90× more electric cars

- From 2009, **EU policies promoted food-based biofuels** as an alternative to fossil fuels.
- This led to a **highly inefficient use of land,** especially when compared to solar panels combined with EVs.
- Diverting farmland to grow crops for fuel drives **indirect land-use changes like deforestation**, cancelling out emissions benefits and worsening food-security pressures.

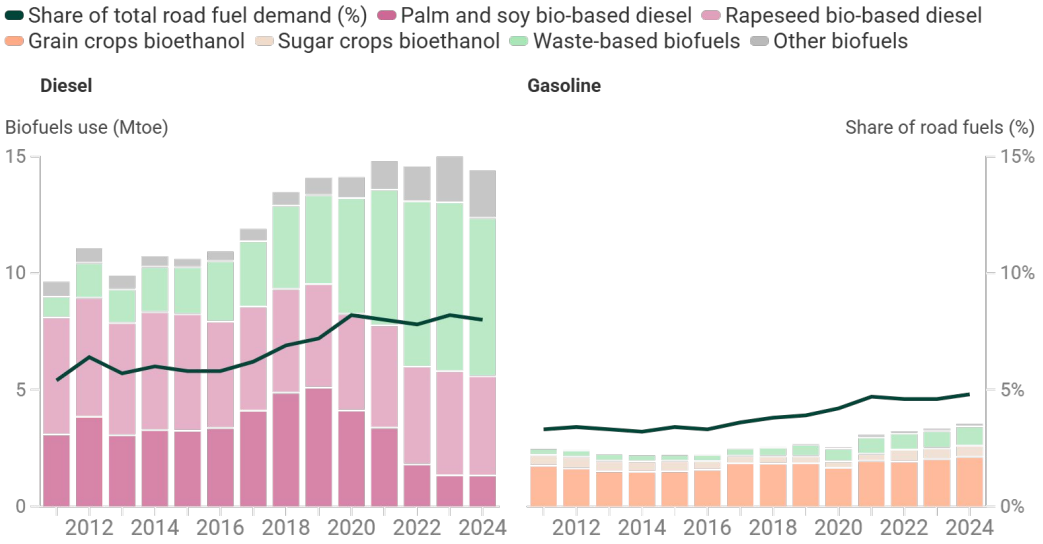


Source: T&E, based on Cerulogy (2024) and own calculations. Assuming diesel cars running on 100% biofuels, while in practice biofuels are still mostly blended in small quantities with fossil diesel or petrol

A partial shift from crops to waste oils, but uptake limited

- In 2018, the EU changed its biofuels law to limit crop-based fuels (palm, soy and rapeseed), driving **a shift to waste-based sources** such as used cooking oil (UCO) and animal fats.
- Waste feedstocks now make up around **half** of bio-based diesel.
- However, **limited overall adoption of biofuels** despite 15+ years of favourable policies: ~7% of total road fuel demand in 2024.

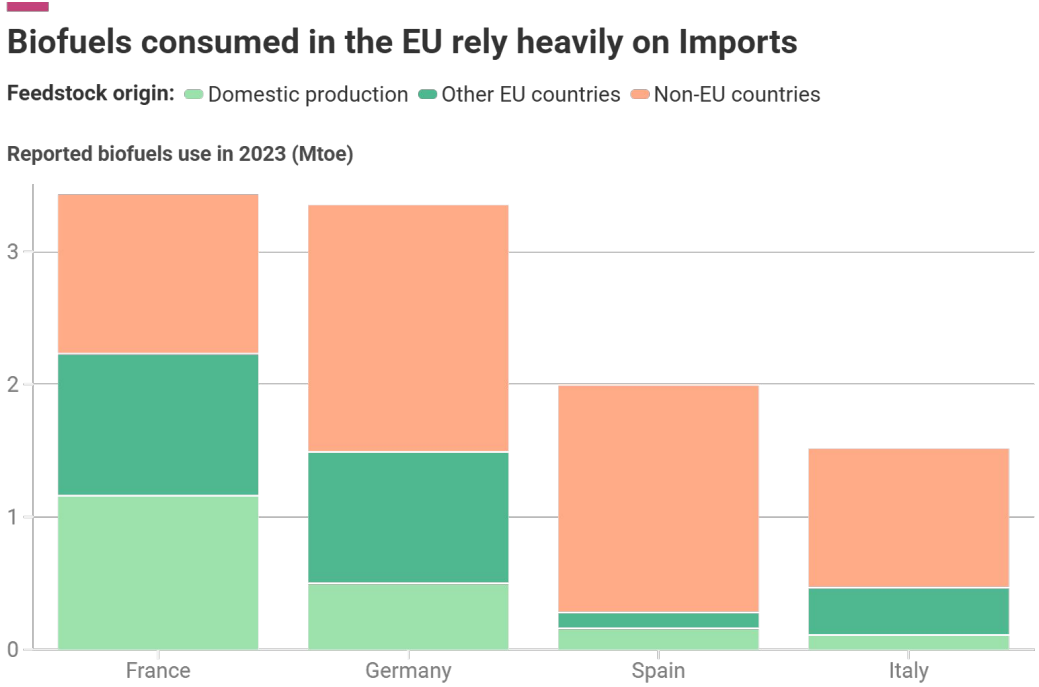
Biofuels in EU road vehicles: limited uptake and partial shift to waste-based sources



Source: T&E, based on data from Stratas Advisors and Eurostat (2025) • Bio-based diesel includes both FAME and HVO fuels. Waste-based biofuels include waste oils, such as cooking oil, animal fats or palm oil mill effluent, or industrial waste.

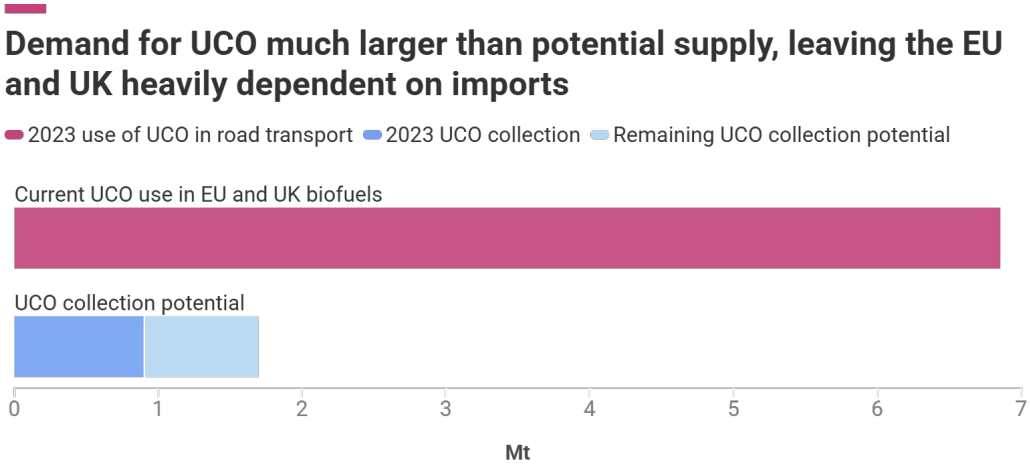
But this shift has kept reliance on imports high

- **Historical dependence on imported crops,** such as palm oil, soybean oil or rapeseed.
- Shift towards waste oils only **continued trends towards imports**, e.g. used cooking oil from Asia, as well as refined fuels (biodiesel) from China, Argentina and (bioethanol) from the US.
- As a result, **60% of biofuels** (used in FR, DE, ES, IT) **are imported from non-EU countries**.



80% of UCO used in EU biofuels is imported

- As demand for limited Used Cooking Oil (UCO) grew, imports also grew.
- The EU has seen increased reliance on **dubious imports**, in particular from Asian countries:
- **> 80% of UCO used in EU biofuels is imported**.



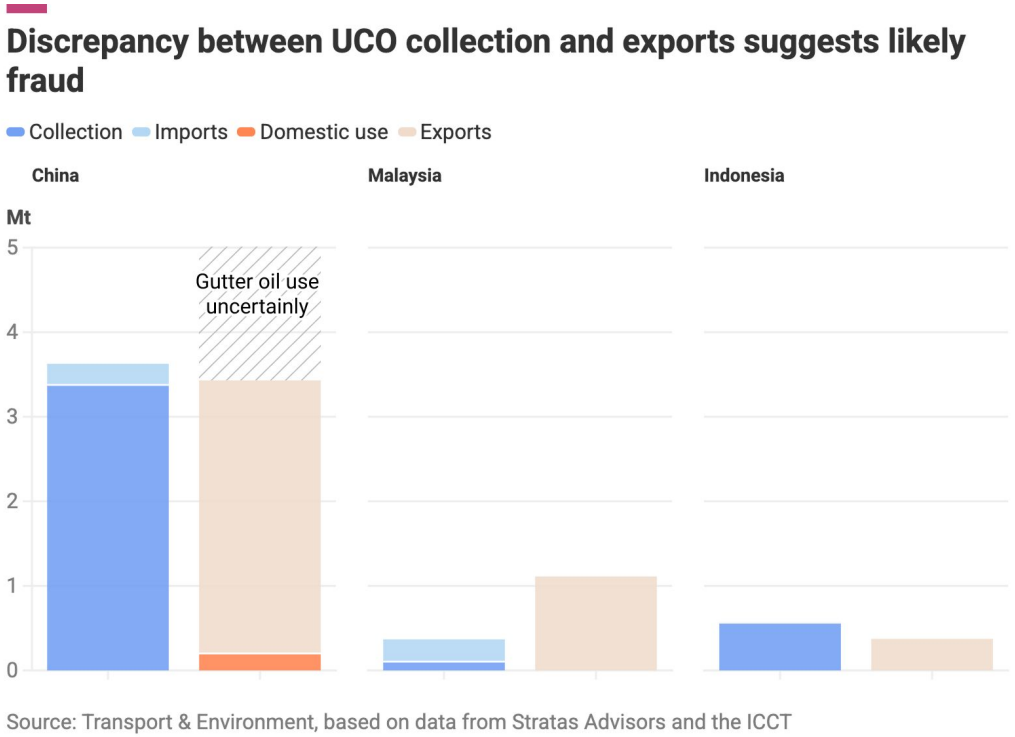
Source: T&E, based on data from Stratas Advisors, ICCT and own calculations

Fraud risks & weak certification:

As dependency on imports grows, so does the risk of fraud

As demand for waste oils grow and supplies remain limited, concerns increase over fraud risks

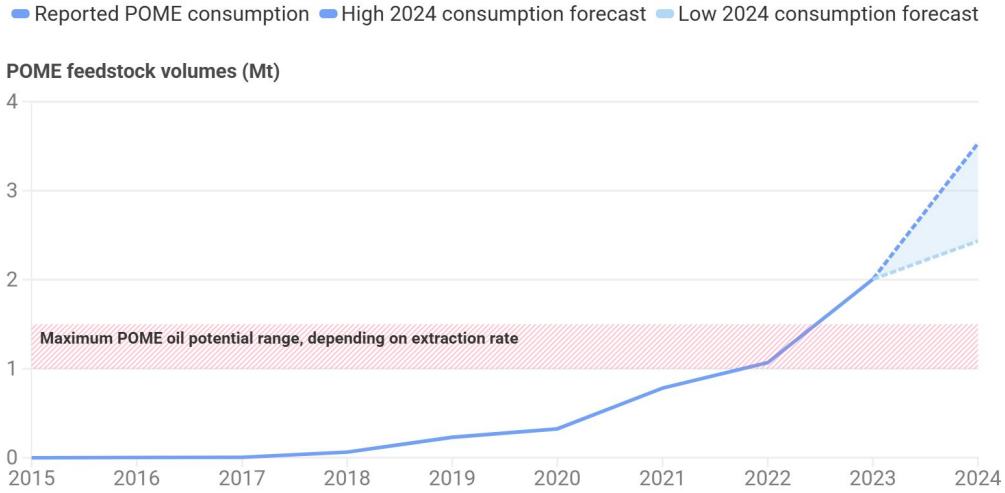
- Concerns mounted over **cases of fraudulent palm oil** being re-labelled as waste oil, potentially undermining the environmental benefits that a shift to waste biofuels was supposed to achieve.
- **Alarming mismatches in UCO imports strongly suggesting fraud is occurring**: In 2023, Malaysia exported three times more UCO that it can collect.



Palm oil mill effluent, the new fraud scandal

- **High increase of EU imports of POME**, a residue from the processing of palm oil, **reaching a quarter of EU HVO*** in 2023.
- Reported POME use in EU+UK biofuels **estimated to exceed what is collected** in palm oil producing countries.
- Several **ongoing national investigations** into suspicions of POME fraud: Indonesia, Netherlands, Ireland.

POME use in EU and UK biofuels, nearly double the maximum global potential in 2023

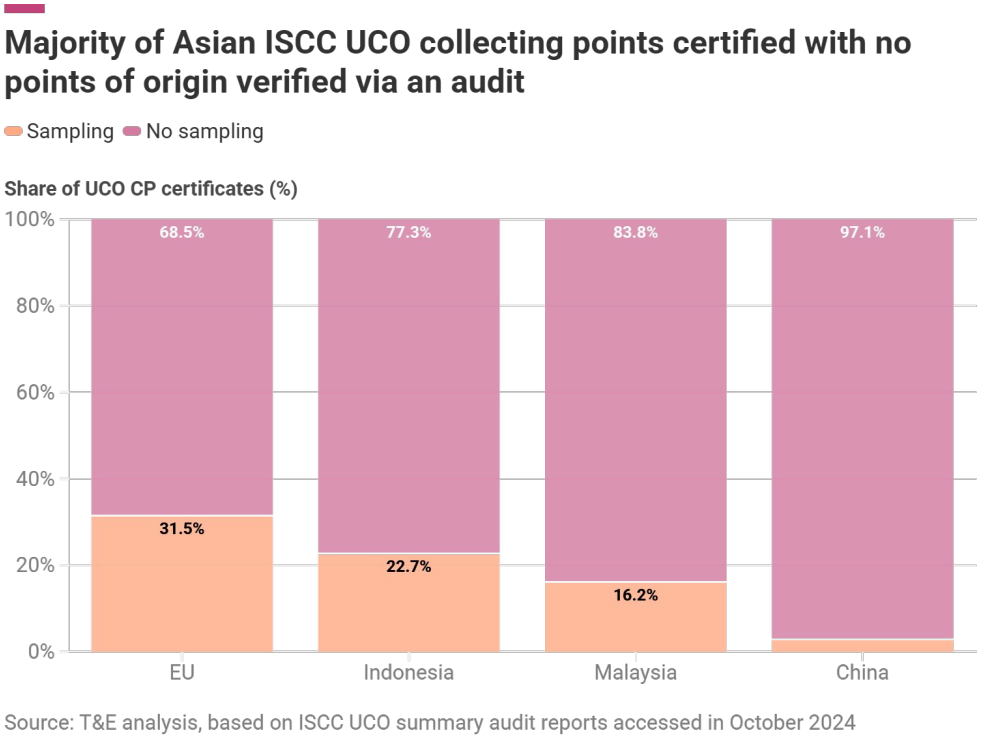


Source: T&E, based on data from EU SHARES, UK RTFO and UN Comtrade • Extrapolated 2024 consumption range based on Jan-Aug 2024 feedstock import increase. Maximum POME potential range based on crude palm oil supply, more details in Methodology. POME biofuels volumes converted to feedstock volumes based on standard yields from GREET.

*Hydrotreated Vegetable Oil, a biofuel that can be used as a drop-in replacement for diesel.

Weak biofuels certification schemes further undermine trust in imported biofuels

- Biofuel certification relies on paper-based audits, **not physical testing or verification** along the supply chain.
- E.g. in 2024 **only 9%** of International Sustainability and Carbon Certification (ISCC)-certified UCO collectors in China, Malaysia, and Indonesia were verified through an on-site audit.
- For the remaining 91%, **verification relied on minimal checks** (phone, email, or online search).



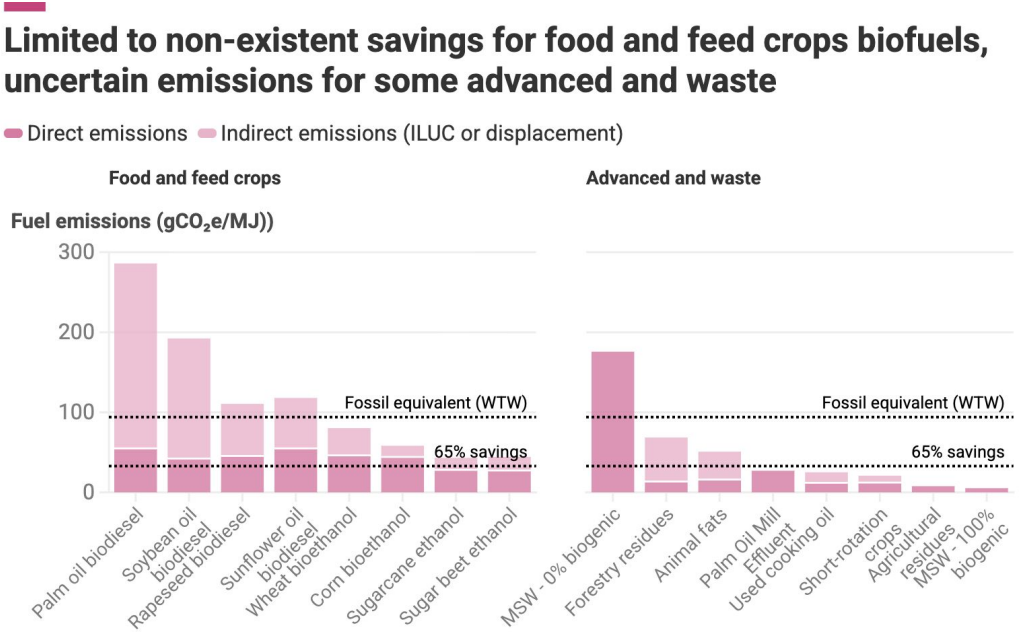
Source: T&E analysis, based on ISCC UCO summary audit reports accessed in October 2024

Environmental impacts:

Limited, non-existent or uncertain benefits

Biofuels, far from being climate neutral fuels

- Some in the industry are calling for all biofuels to be counted as CO_2 neutral.
- **Food and feed biofuels typically achieve only ~60% CO_2 savings compared to fossil fuels**, but can even exceed fossil fuel emissions when accounting for indirect emissions like deforestation (ILUC).
- **Advanced and waste biofuels can reach 80% savings** when not accounting for competition with other sectors.

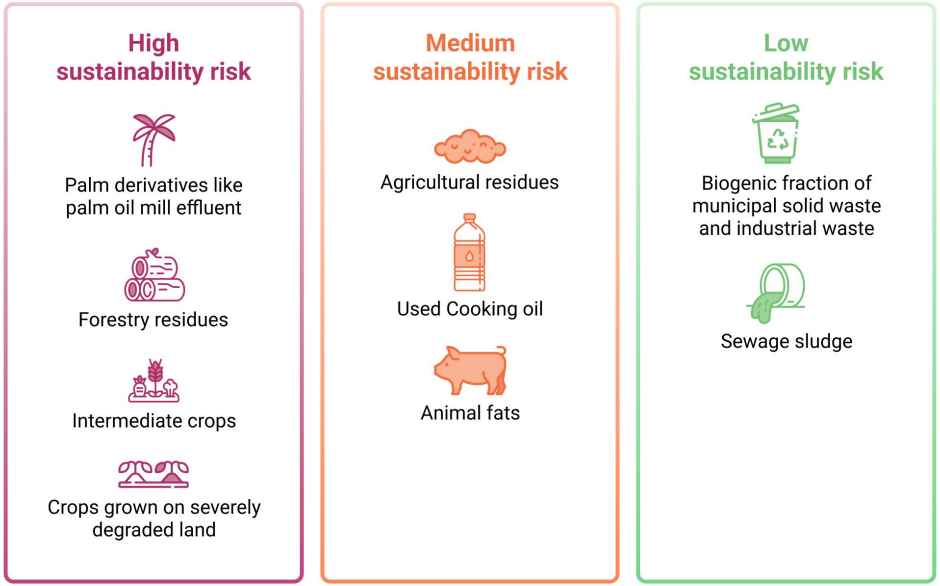


Source: T&E, based on RED typical values, Globiom ILUC emissions, CORSIA direct and ILUC emissions, ICCT displacement emissions of certain waste feedstocks. • For advanced and waste feedstocks that can be processed through different technologies, the least emitting one has been chosen.

Novel ‘advanced’ biofuels can also bring sustainability risks

- **Some new ‘advanced’ biofuels** could be made from other biomass sources, like residues or non-food crops, and are incentivised under EU biofuels law.
- However, they require more advanced technologies, many of which are **not yet fully commercialised**, and without strict sustainability safeguards, these could also cause **negative environmental impacts,** such as the loss of carbon sinks and soil degradation, or simply **emission shifting due to competition with other sectors**.

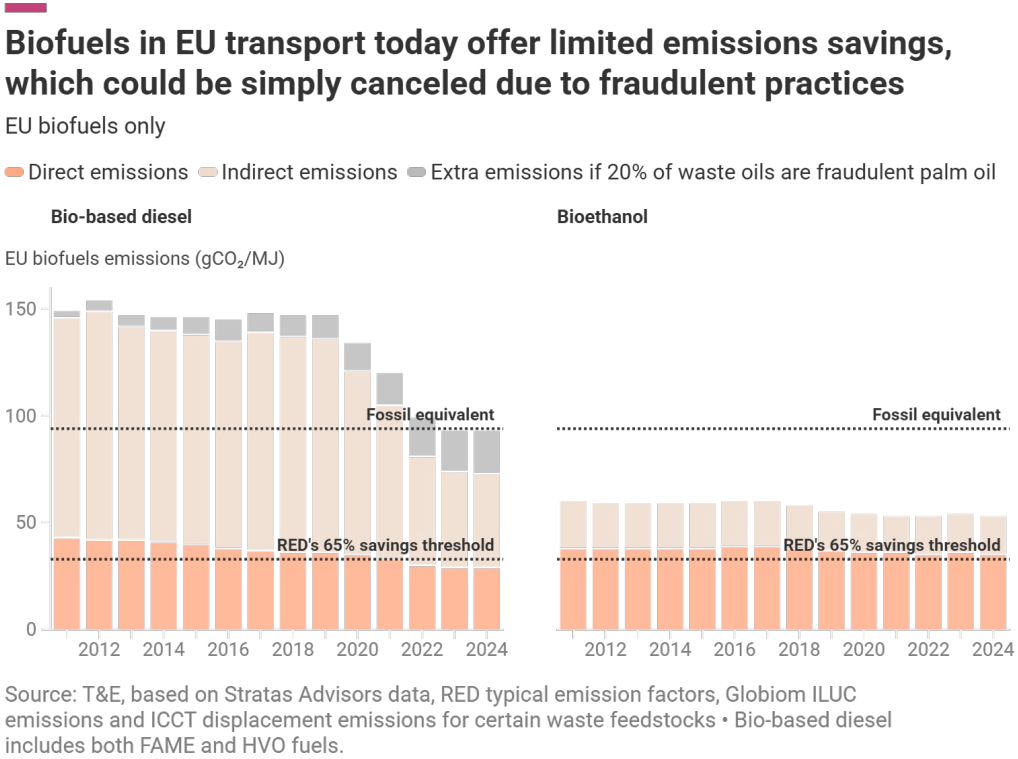
T&E's assessment of sustainability risks associated with feedstocks allowed in advanced and waste biofuels production in the EU



Source: T&E

Current biofuel mix delivers limited to non-existent CO savings

- In 2024, bio-based diesel and bioethanol only offered **20% and 40% CO_2 savings** vs. fossil fuels.
- Growing concerns over **waste oil fraud** could further erase any emissions savings from current biofuels.
- **Indirect emissions** account for land conversion happening elsewhere due to new biofuel crops, adding emissions.



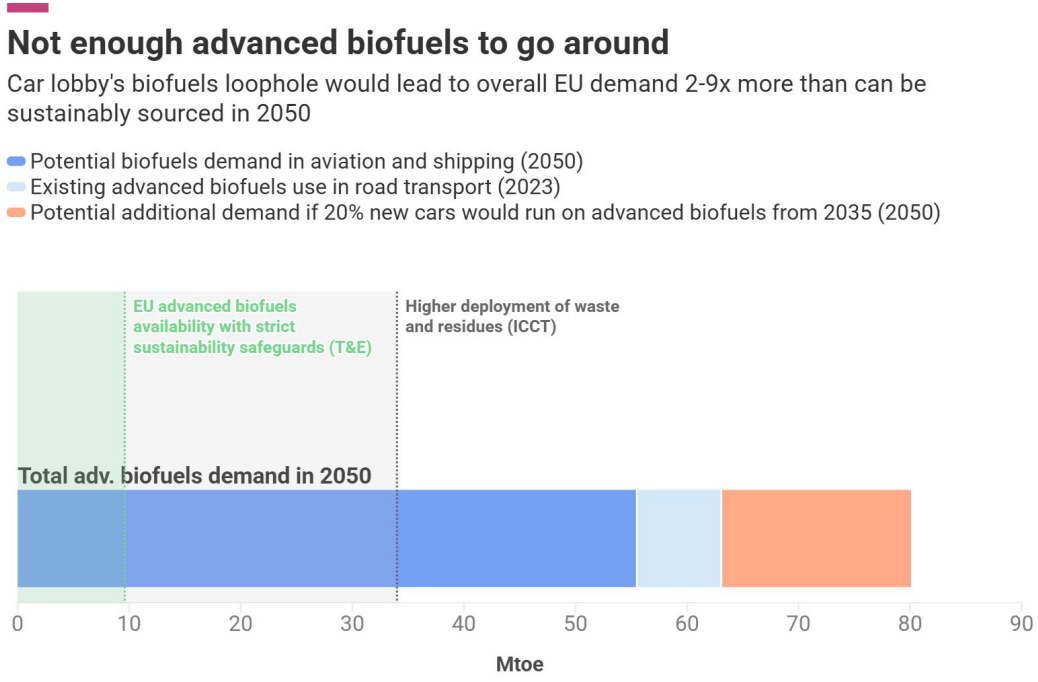
Source: T&E, based on Stratas Advisors data, RED typical emission factors, Globiom ILUC emissions and ICCT displacement emissions for certain waste feedstocks • Bio-based diesel includes both FAME and HVO fuels.

Biofuels availability

Not enough sustainable biofuels to go around

Allowing biofuels in new cars adds pressure on aviation, shipping, and existing car fleet

- 20% of new cars running on advanced biofuels after 2035 could add **30%** to the existing potential demand in 2050 from aviation and shipping.
- Combined demand from transport could require **2-9 times** the advanced biofuels that can be sustainably sourced in 2050.
- Allowing advanced biofuels in new cars would inevitably **increase the EU's reliance on unsustainable** and imports.



Source: T&E (2024), ICCT (2025), EU SHARES (2023) • New cars mix of 50% PHEVs and 50% ICEs.

Cooking oil and pig fat as examples of the limited waste supply

- Already today, European cars use 1.3 million tonnes of animal fat, **equivalent to 200 million slaughtered pigs** each year.
- For every new car running on animal fats, **120 pigs would be required a year**. With a typical lifetime of 20 years, this is equivalent to 2,400 pigs over the lifetime of the car.
- Alternatively, a car running on UCO would require cooking oil collected from up to **10 tonnes of french fries** per year (or ~25 kg a day), showing the hard limitations of such feedstocks.

Policy recommendations:

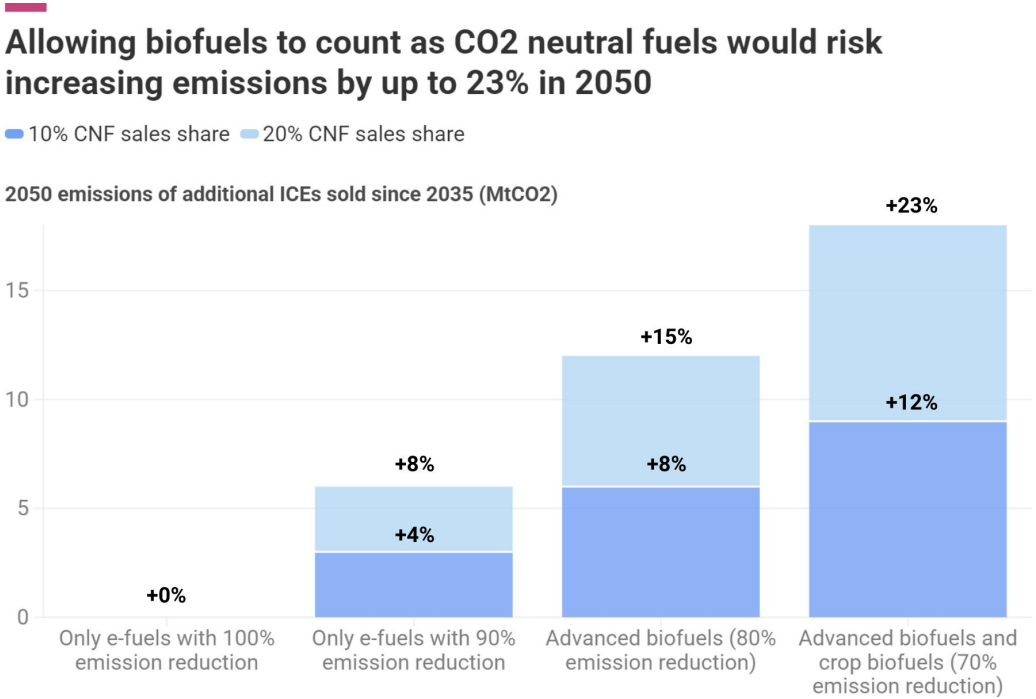
Biofuels should be kept out of vehicle CO_2 regulations

Opening a loophole for biofuels after 2035 would increase EU car emissions by up to 23% in 2050

The EU opened the door to include an exemption for **'carbon-neutral' fuelled vehicles** after 2035 (recital 11 of 2023 cars CO_2 law).

This flexibility could significantly weaken the regulation depending on the definition of carbon neutral fuels (CNFs):

- **In the worst case, the definition of CNF allows all biofuels to comply with the exemption, leading to a +23% emissions increase in 2050**.



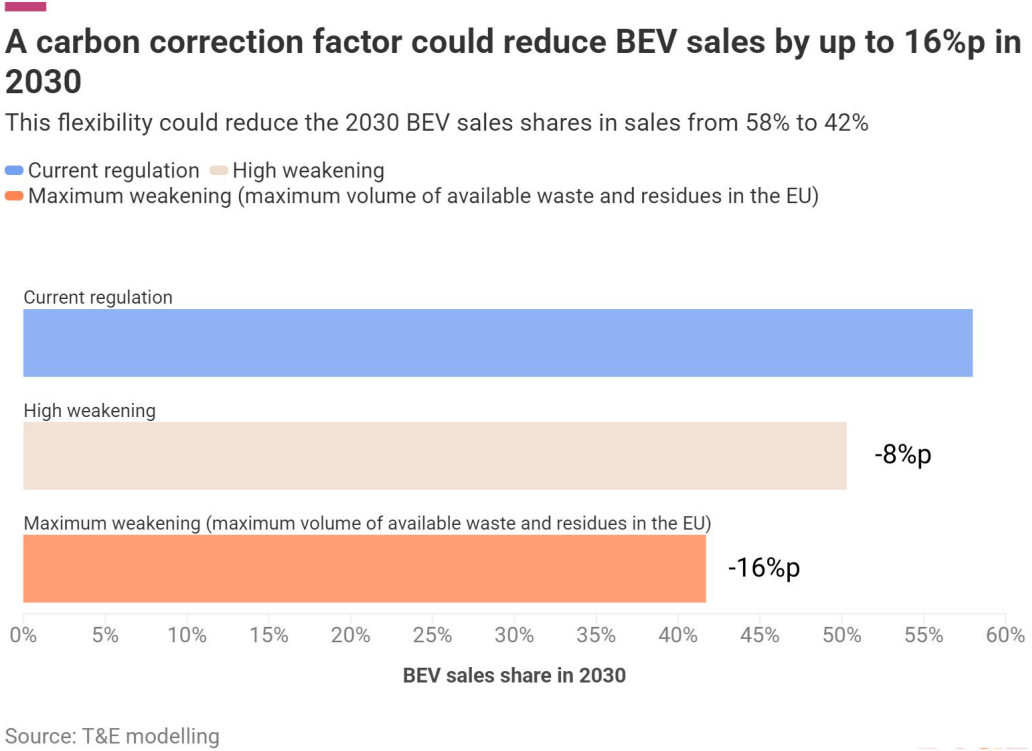
Source: T&E modelling

Allowing CO2 credits for biofuels could reduce BEV sales by up to 16% in 2030

The car industry is asking for a 'Renewable fuels coefficient' (or 'carbon correction factor') which would artificially reduce the CO2 emissions of combustion vehicles by rewarding carmakers for the biofuels placed on the market by fuel suppliers.

This system has been rejected by the Commission in the past due to double counting with EU fuel regulations.

In a high weakening scenario, **it would reduce BEV sales by 16% in 2030**, i.e. reduce 2030 BEV shares in sales from 58% to 42%.



Source: T&E modelling

Recommendations

1. Keep biofuels out of the cars CO_2 regulation: The EU must reject options that include biofuels in the car CO_2 regulation (as carbon correction factor or post-2035 exemption) to protect the integrity of the car CO_2 regulation and broader climate policy framework.
If exemptions for 'CO_2-neutral fuels' post 2035 are considered, they should be strictly limited: 5% sales cap, limited to vehicles powered exclusively by 100% climate-neutral e-fuels, with no biofuels allowed.

2. Prioritise advanced biofuels for hard to abate sectors like aviation & shipping: Projected availability of sustainable biofuels will not even be enough to decarbonise ships and planes. Any biofuels going in new cars will increase reliance on fraud-prone imports and even fossil fuels use.

3. Maintain 2030–2035 car CO_2 targets and tailpipe approach
Fake alternative like biofuels lead to regulatory ambiguity, undermine company, investor and consumer confidence, and put jobs and EV momentum at risk.

Methodology

Assumptions and sources used

- **Slide 5:** land efficiencies from crop-based biofuels production and electric cars directly taken from T&E, Nov 2025.
- **Slide 6:** historical biofuels feedstock data from Stratas Advisors and Eurostat.
- **Slide 7:** origin of feedstocks used in biofuels from national energy agencies (FR, DE, IT and ES).
- **Slides 8 and 10:** UCO use and collection potential directly from T&E, Jun 2024.
- **Slide 11:** mismatch between POME use and maximum potential from T&E, Apr 2025.
- **Slide 14:** direct emissions from the RED Annex V and VI. ILUC emissions from EU Globiom model, and potential waste displacement emissions from Cerulogy, 2017, ICCT, 2021 and T&E, 2024.
- **Slide 15:** sustainability impacts of advanced biofuels from T&E, 2024.
- **Slide 16:** emissions from current biofuels mix combining feedstock data from Slide 5 and emissions from Slide 13.
- **Slide 18:** EU advanced and waste biofuels availability from T&E, 2024 and ICCT, 2025, updated to account for all fuel fractions (jet fuel and diesel) and domestic feedstocks only. Potential aviation and shipping biofuels demand from ReFuelEU and Fuel EU Maritime analysed in T&E, 2023 and T&E, 2025, under low biofuel prices and industry growth scenarios. Existing Annex IX biofuels demand from EU Shares. Estimated demand assuming 20% of new cars sold from 2035 run on advanced biofuels, based on T&E modelling, assuming 50% PHEVs and 50% ICEs in new sales.
- **Slide 19:** animal fats comparison based on findings from T&E, 2023, and used cooking oil comparison based on T&E, 2024.

- **Slide 21:** Using a new forecasting tool, we have calculated the additional CO_2 emissions of the car fleet in 2050 for scenarios involving the sale of additional ICEs from 2035 onwards. The model is based on the average European car driving around 225,000 km over a 20-year lifetime, with decreasing annual mileage over this period.

  Additional CO_2 emissions (not displayed in the infographic) would also be produced in the aviation and shipping sectors, as their fuels would be diverted to the car sector and replaced by fossil fuels.

- **Slide 22:** In the medium weakening scenario, crop and advanced biofuels are used, with all biofuels accounting for 21% of car fleet demand. This leads to a 15% reduction in new ICE emissions.

  In the high weakening scenario, the volumes of advanced biofuels are equivalent to the maximum available volume of waste and residues in the EU (the ICCT scenario). As a result, all biofuels account for 36% of car fleet demand. This leads to a 28% reduction in new ICE emissions.

In both scenarios, the carbon correction factor (CCF) is calculated using the methodology that leads to the greatest weakening. The CCF is calculated according to the proportion of crop and advanced biofuels in car fleet demand. It is assumed that food and feed crop biodiesel would reduce emissions by 52%, crop bioethanol by 62%, and advanced biofuels by 80% as per typical emission factors from the RED Annex V and VI. This methodology assumes that indirect land use change (ILUC) in fuel production would not be accounted for.

The total fuel demand used for the CCF calculation is assumed to be the same as in the baseline scenario, as the additional ICEs sold due to the CCF have a negligible impact on total fuel consumption in 2030.

Published: November 2025

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Editeur responsable: William Todts, Executive Director

To cite this report
Transport & Environment (2025). *Biofuels in cars: A dead end for Europe*

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Acknowledgements

The findings and views put forward in this publication are the sole responsibility of the authors listed above.

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