

Concawe

Environmental Science for European Fuel Manufacturing

Fit for 55 transport targets: progress, compliance gaps and implications for fuel manufacturers

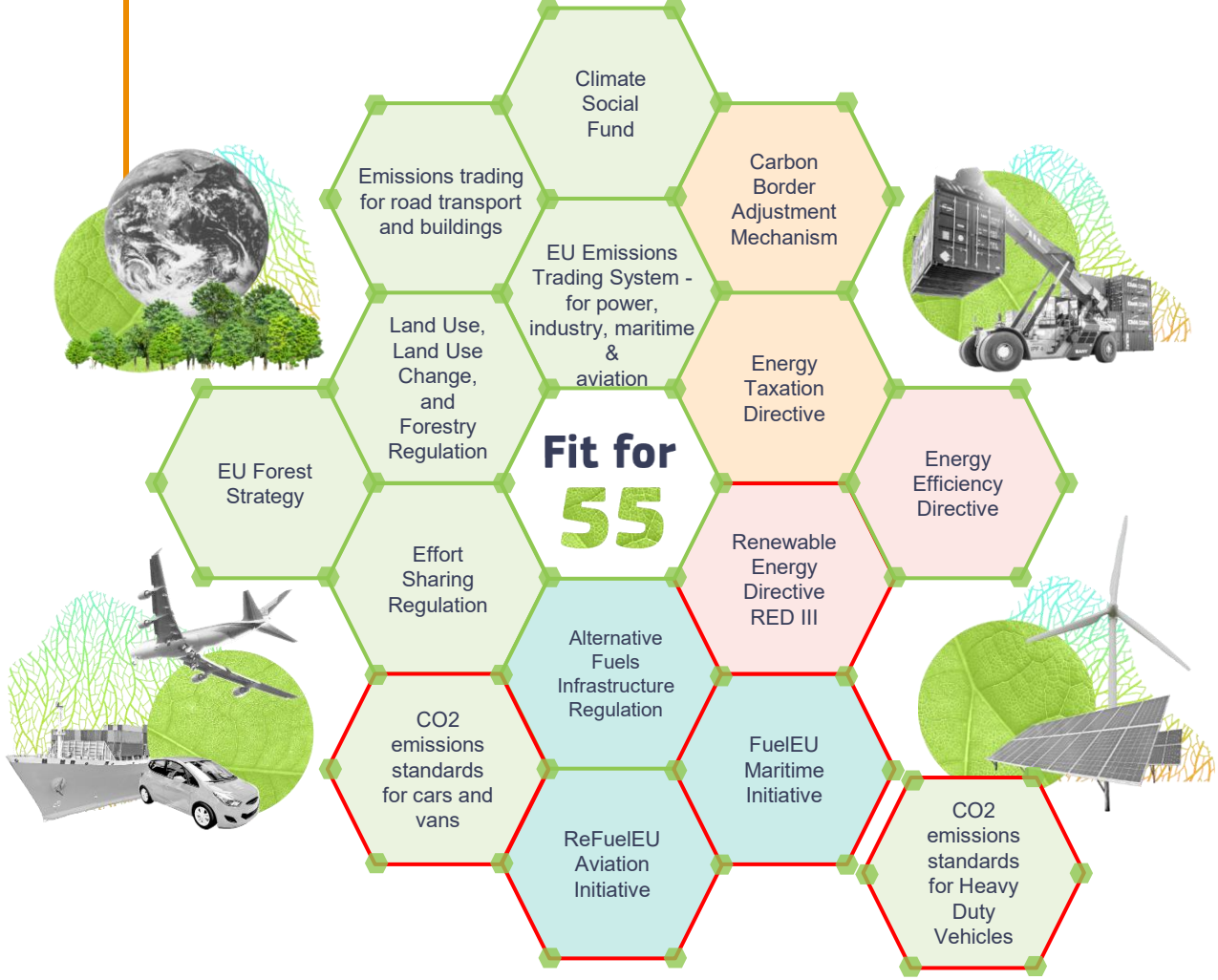
Concawe Symposium, 8 October 2026

Abinash Ramasary, Science Executive for Renewable Fuels Manufacturing

Reproduction permitted with due © Concawe acknowledgement

1 Fit-for-55 (& HDVs standards) legislative package

© Concawe



Fit for 55 package (14 July 2021) + HDV CO_2 standards

- Implementation of European Green Deal
- Bring EU policy framework in line with climate objective of -55% emissions by 2030.
- 13 initiatives, of which 11 with direct effects on transport
- Evaluation of ability to meet objectives of 5 regulations

Are EU transport decarbonisation policies on track?

Regulation	Assessment	Key findings
Passenger-car CO_2 standards	Broadly on track	Broadly on track for 2025, but acceleration in EV sales is required to meet 2030 target.
LCV CO_2 standards	More challenging	Making progress but remains behind passenger cars
HDV CO_2 standards	More challenging	More challenging due to vehicle and infrastructure constraints
ReFuelEU Aviation	2030 overall target appears achievable	2030 SAF requirement may be supplied under the assessed project pipeline, but e-SAF remains the critical investment gap.
FuelEU Maritime	2030 target appears achievable	Compliance appears achievable initially, but investment needs increase after 2030.
RED III transport	Highest compliance challenge	Compliance with renewable energy target and sub-targets is very challenging. Additional RFNBOs, advanced biofuels and/or renewable electricity

© Concawe

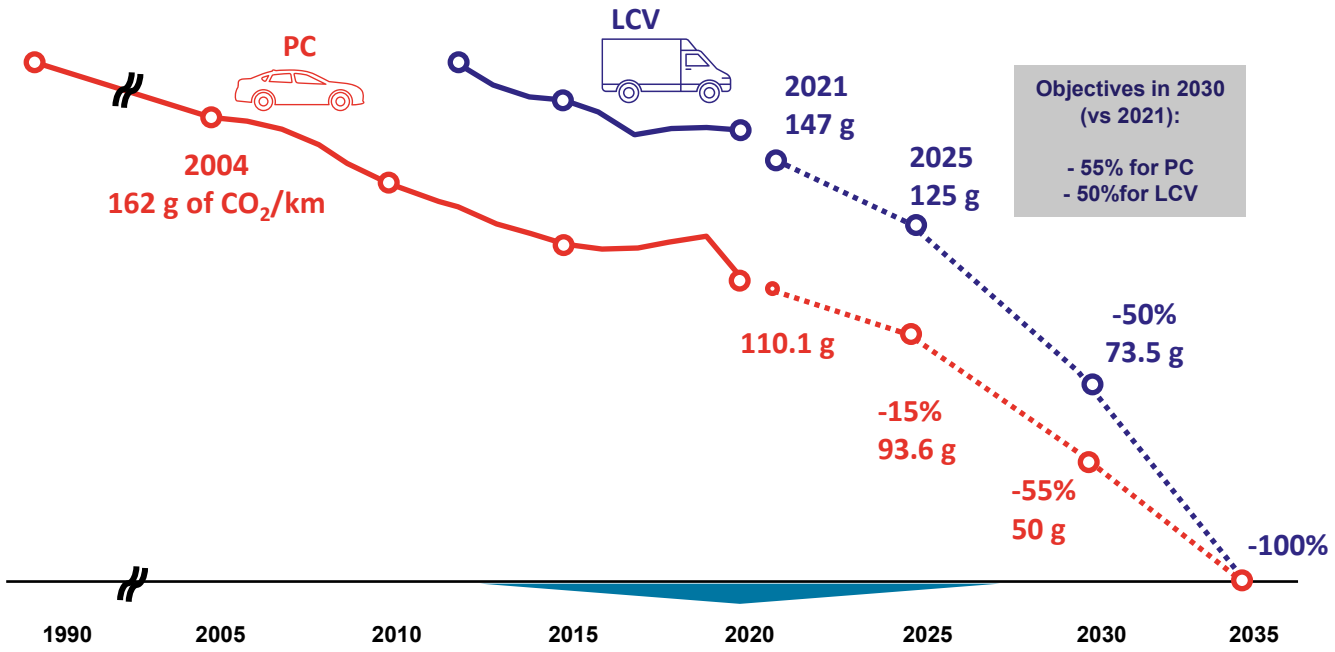
2 Passenger Cars, LCV & HDV standards

© Concawe

Passenger Cars and LCV tailpipe emission standards - original

Original Fit-for-55 targets :

- Only “Zero-emission” vehicle sales (BEV and FCEV)in 2035 and forward
- Integration of comment on “vehicles running exclusively on carbon-neutral fuels”
- Review foreseen in 2026



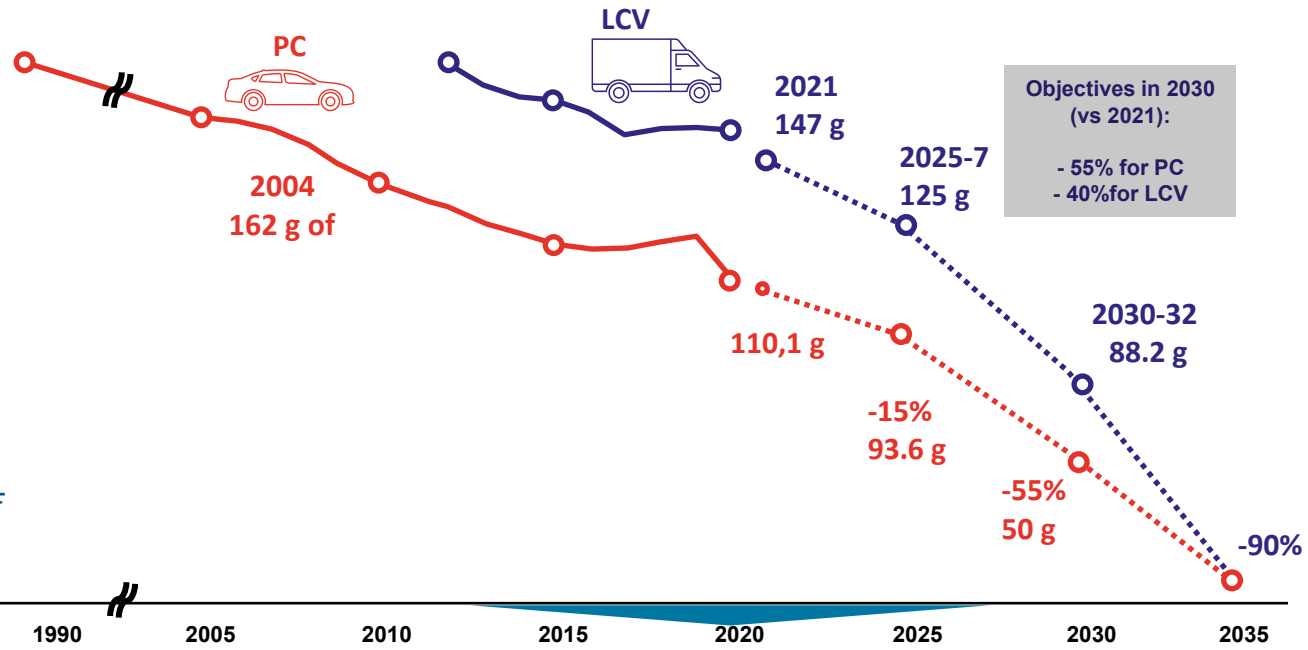
Source: EEA for historic numbers, dotted lines from European Commission FF55

© Concawe

Passenger Cars and LCV tailpipe emission standards - update

EU Commission proposal December 2025:

- 2035+ sales target relaxed to -90% of 2021 CO_2 emissions
- Compensation : 7% by “green steel” and 3% by renewable fuels
- Trial to include Clean Corporate Vehicles legislation (requiring zero emission for new vehicles from 2030; +/- 60% of sales) in “automotive package”
- Industry (and some Member States) calls for decreasing the 90% reduction target (80%?) with compensation of renewable fuels – introduction of VEEF class
- Timeline : finalisation expected Q2 2027

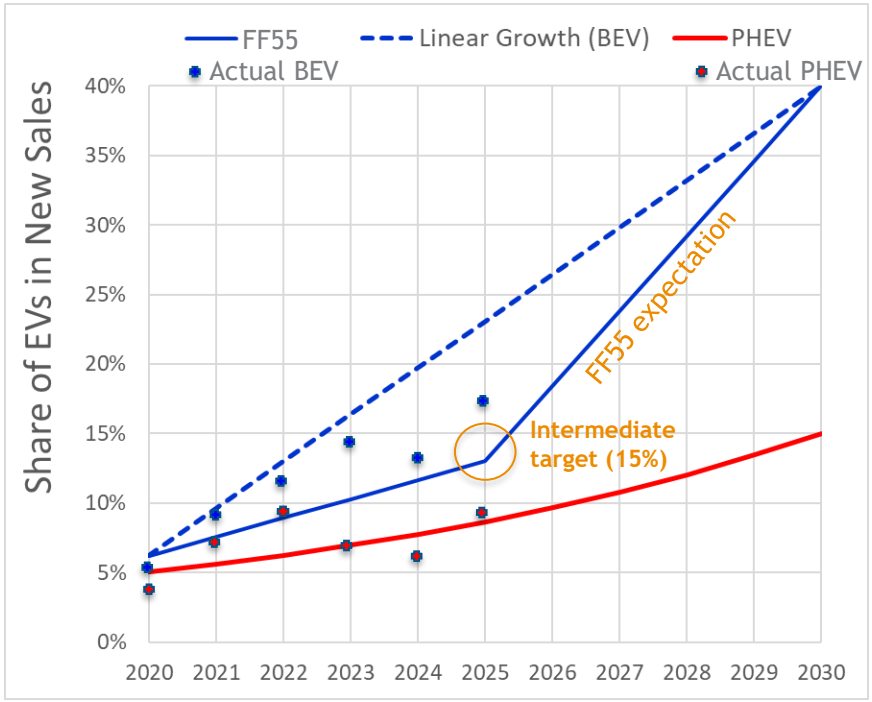


© Concawe

VEEF : Vehicles Exclusively running on Eligible Fuels

Passenger-car electrification and CO_2 compliance outlook

Share of EVs and FCEVs in new passenger-car registrations



** ACEA for 2025 values.*

Broadly on track under the current compliance framework

Continued acceleration in EV sales is required towards 2030.

1 2025 performance

- Shares of BEV and PHEV sales reached 17.4% & 9.4%, respectively.
- New vehicle sales of 10.8 million compared to 13.0 million in 2019.
- The EU passenger car fleet continues to age, with the average vehicle age increasing from 12.5 years in 2023 to 12.7 years in 2024.
- Provisional average emissions fell to 96.7 gCO_2/km, from 106.7 gCO_2/km in 2024, compared with the 2025-2029 EU-wide target level of 93.6 gCO_2/km.

2 Compliance flexibility

Manufacturer compliance for 2025-2027 is assessed over the full three-year averaging period rather than annually.

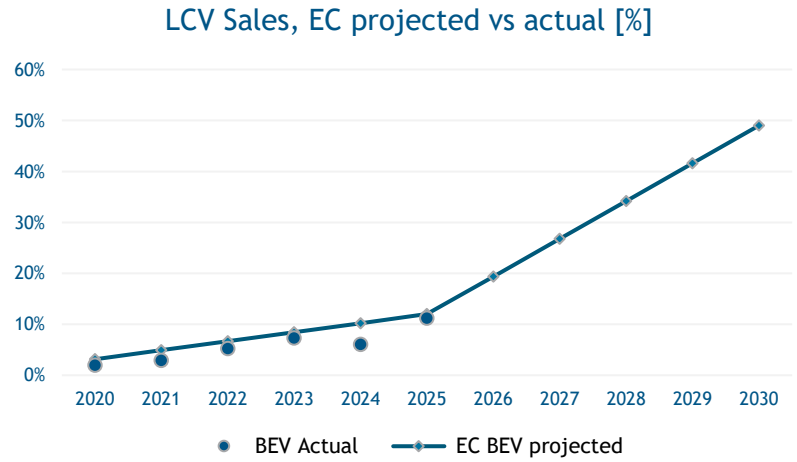
3 2030 pathway

Lower real-world electric driving shares for PHEVs increase the BEV sales share required to achieve the 2030 target to approximately 46%.

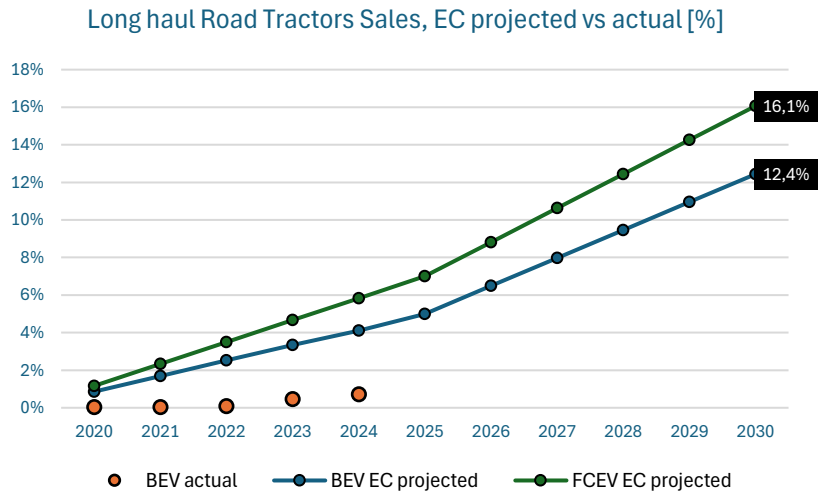
© Concawe

Concawe

Penetration rate of xEVs in LCV* and HDV**



For LCV, 2025 Average CO_2 emissions: 172.1 g CO_2/km (184.9 g CO_2/km in 2024)



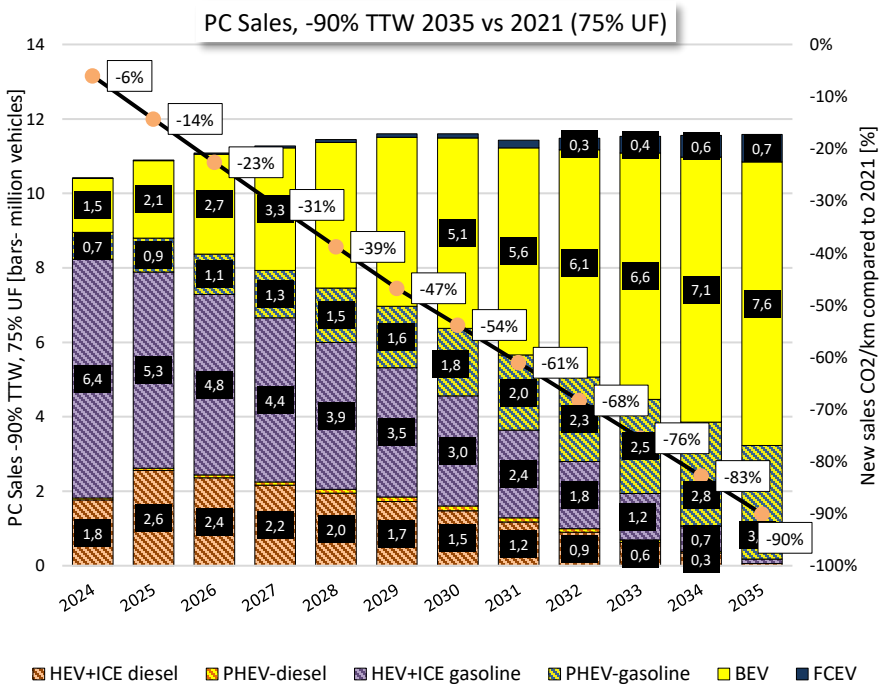
LCVs are making progress but remain behind passenger cars. HDVs face a more challenging transition due to:

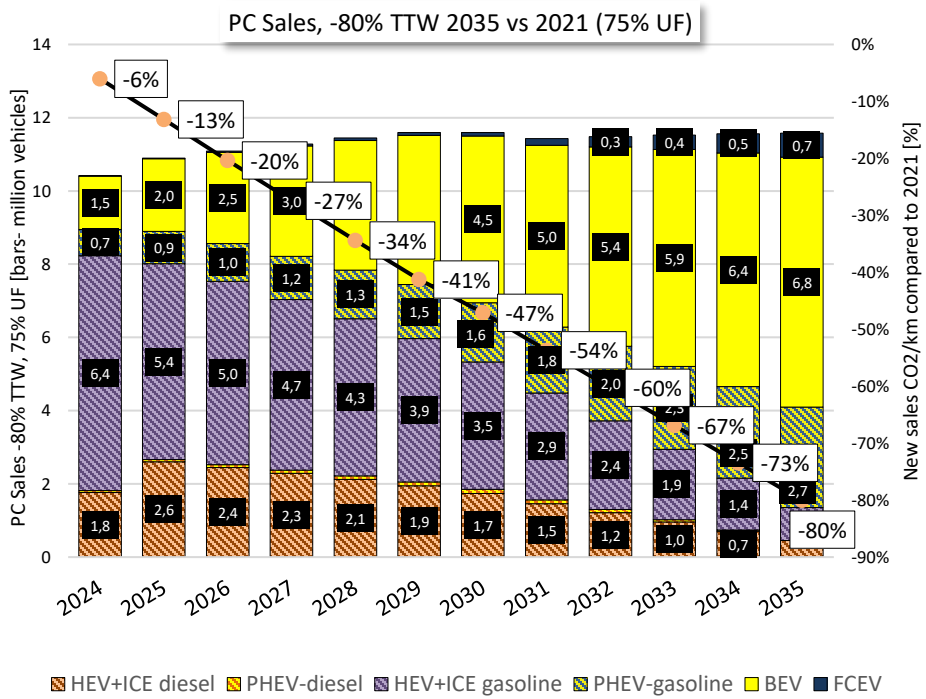
- Limited availability of zero-emission vehicles
- Limited charging point infrastructure
- Limited grid infrastructure (permitting times)

** Light Commercial Vehicles ** Heavy Duty Vehicles (figure refers to >12t category)*

© Concawe

Vehicle sales in function of 2035 car standard target





2050 liquid fuel demand For Road transportation in the EU:

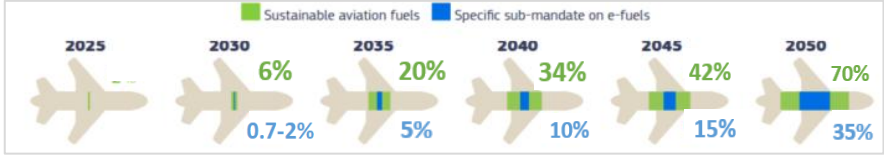
- with ICE BAN in 2035: 15 Mt/y
- with 90% CO2 reduction target for car standards in 2035 : 35 Mt/y
- with 80% CO2 reduction target for car standards in 2035 : 50 Mt/y

© Concawe

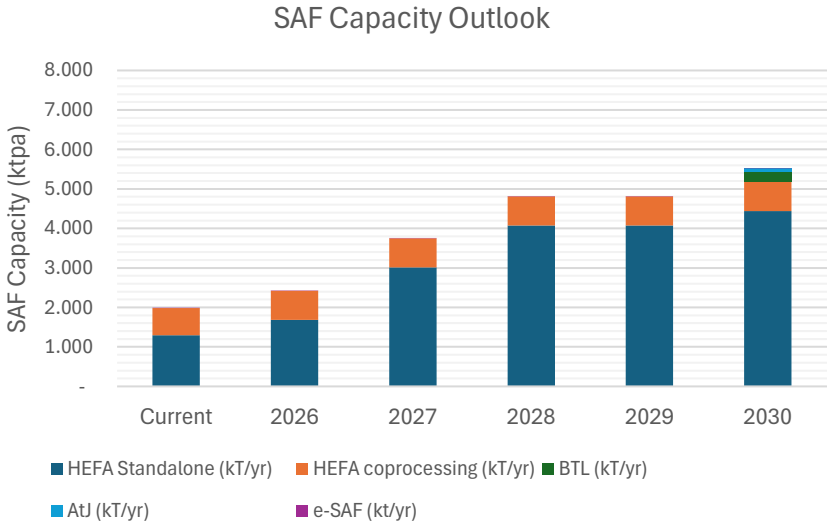
3 RefuelEU Aviation and FuelEU Maritime

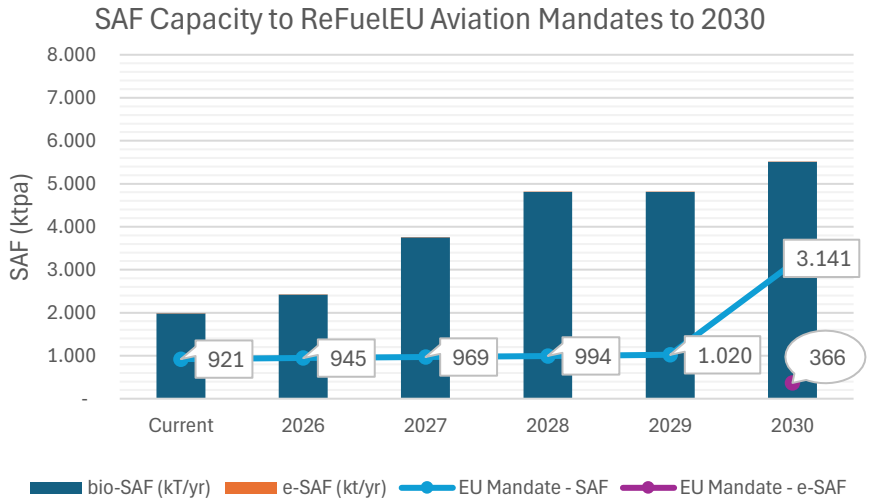
© Concawe

SAF Capacity outlook to 2030



SAF & e-SAF blending targets



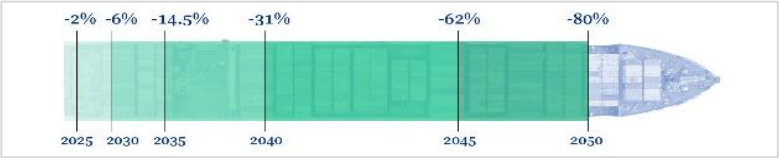


- Overall 2030 ReFuelEU Aviation SAF requirement may be supplied under the assessed project pipeline, predominantly through stand-alone biorefineries and HEFA co-processing within existing refineries.
- Synthetic aviation fuel (e-SAF) remains the critical investment gap and the principal challenge for compliance with the 2030 sub-mandate. Meeting the 2030 e-SAF sub-mandate would require rapid progression of the announced project pipeline.

Notes: E-SAF mandate: 0.7% min in 2030, with average of 1.2% over 2030 & 2031. Historic jet demand (Eurostat, 2024) with 2% growth assumed.
UK capacity and projects not included, due to UK SAF blending targets

© Concawe

FuelEU Maritime: is the 2030 target achievable?



GHG intensity target (well-to-wake)

Illustrative 2030 compliance requirement

Illustrative Total marine fuel demand **~56 Mtoe**

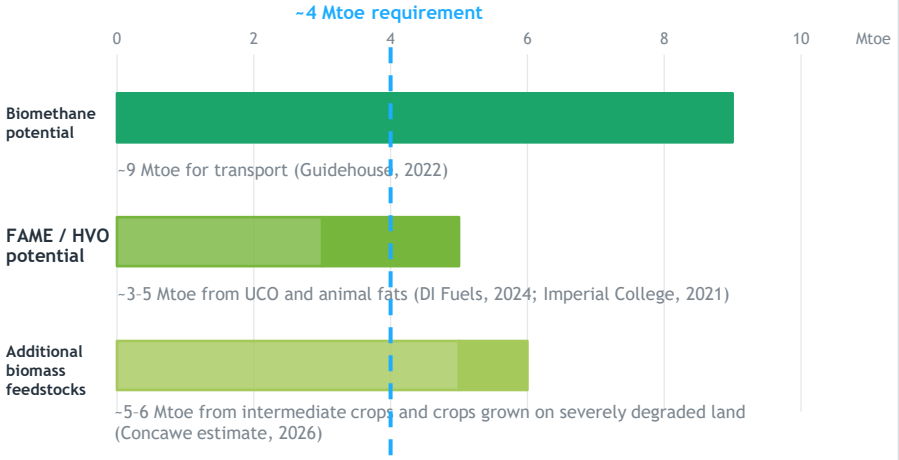


Illustrative lower-GHG fuel contribution **~4 Mtoe**

Limited share of 2030 marine energy demand needs to shift to lower-GHG fuels to meet FuelEU Maritime target.

The required contribution depends on demand, the well-to-wake GHG intensity of each pathway and the overall compliance mix.

Illustrative drop-in renewable-fuel supply potential for transport



The target appears achievable, although deployment of eligible renewable-fuel pathways remains necessary.

Potentials do not account for demand from road transport and aviation.

2030 assessment

Compliance can be supported by multiple pathways, reducing dependence on a single technology route.

RFNBO provision

If RFNBOs represent <1% of onboard energy in 2031, 2% sub-target applies from 2034, creating need for e-fuel investment.

2035 onwards: material scale-up required

Principal challenge is scaling renewable and low-carbon fuel production to meet increasingly stringent targets post 2030.

© Concawe

Concawe

4 RED III

© Concawe

Renewable Energy Directive - RED III in Transport

2030 targets

Obligated party: Member States (transposition incl. obligation)

RED III Transport: all modes in scope

Challenging overall targets:

- **either Min. 29% e.c. ('energy content' incl. multipliers)**
- **or Min. 14.5% GHG emissions savings (no multipliers)**

Advanced Biofuels (9A) /RBNBO sub-mandate: Min. 5.5% e.c. (double counting)

RFNBO sub-mandate: Min. 1%

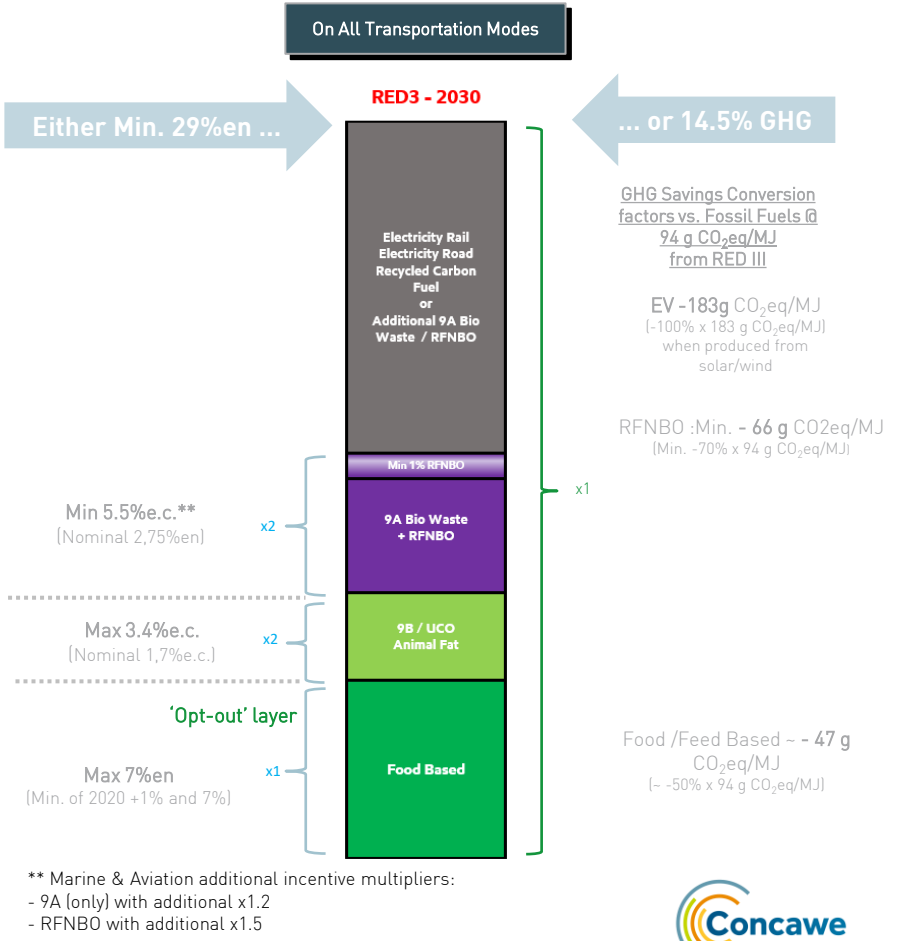
Annex 9B biofuels cap: 3.4% e.c. after double counting

Crop-based cap: 7%e.c with 'opt-out' possibility

Free zone (grey):

electrification / RCF / additional advanced biofuels and RFNBOs eligible to bridge with overall obligation

Penalties: buyout or penalty levels to be fixed by Member States (Germany : currently at 470 €/tCO2 and set to grow to 600 €/tCO2 in 2030)



** Marine & Aviation additional incentive multipliers:
- 9A (only) with additional x1.2
- RFNBO with additional x1.5

© Concawe

RED III remains the most challenging transport target for 2030

Baseline outcome after compliance with road, aviation and maritime legislation

Overall target gap

3.7 percentage points remain in the baseline

Sub-target gap

Combined Annex IX-A / RFNBO target is not achieved

Food and feed-based biofuels and Annex IX-B are already assumed at their respective caps: 4.5% and 1.7%.

Levers to close the gaps

RFNBO	Additional RFNBO and intermediate e-H_2
Electricity	Additional renewable electricity in road transport
Advanced biofuels	Additional eligible Annex IX-A biofuels

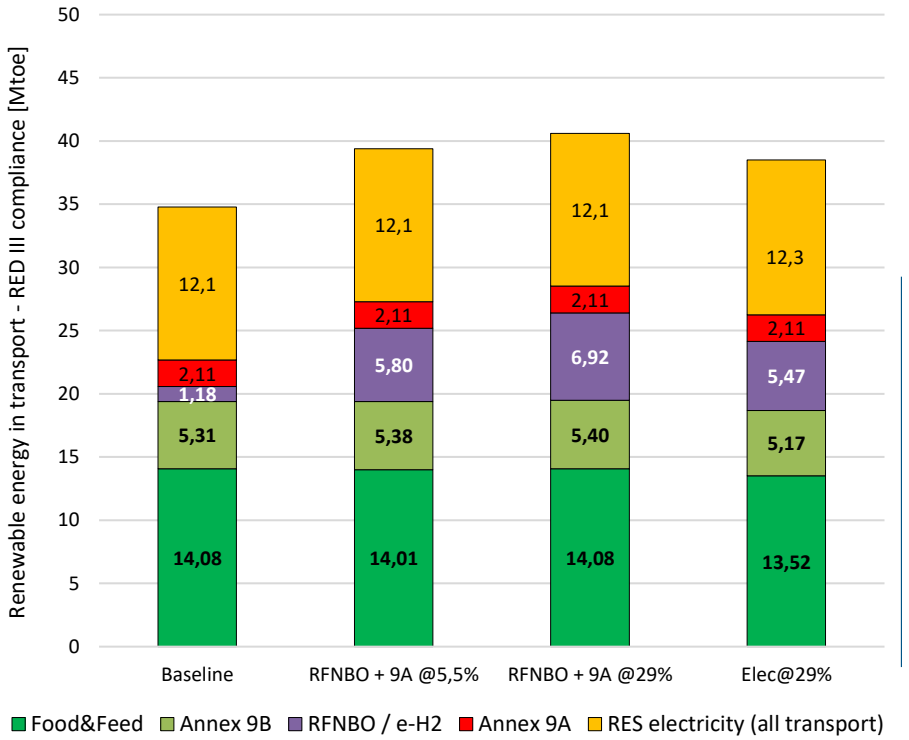
A combination of these options

Meet combined sub-target

+4.6 Mtoe RFNBO / e-H_2
≈16 GW electrolysers

To close remaining overall RED III transport target gap

- **Additional 1.1 Mtoe RFNBO (≈19 GW electrolysers);**
- **OR Additional 0.26 Mtoe renewable electricity in road transport (≈1 million BEVs).**



© Concawe

5 Key Takeaways

© Concawe

What do the 2030 transport targets mean for fuel manufacturing?

Transport Sector	What the assessment shows	Implication for fuel manufacturing
1 Passenger cars	**Electrification reduces liquid-fuel demand in new sales and in fleet over time.**	The proposed VEEF vehicle class could expand opportunities for renewable fuel deployment in new vehicles and fleet over time, supporting refinery transformation and investment in renewable fuel production.
2 LCVs and HDVs	**Slower electrification sustains demand for energy-dense fuels.**	Supports continued investment in renewable fuels such as renewable diesel and bio-LNG for hard-to-electrify transport segments.
3 Aviation	**Overall SAF supply grows, while e-SAF is the critical gap.**	HEFA production and co-processing support near-term SAF deployment, while meeting the 2030 e-SAF sub-mandate requires progression of e-SAF projects to commercial operation. Beyond 2030, additional investment in emerging pathways using lignocellulosic, waste and novel biomass feedstocks will be required.
4 Maritime	**2030 FuelEU Maritime compliance appears achievable, but requirements tighten after 2030.**	Creates demand for scalable marine-fuel pathways, including biofuels, renewable methane and RFNBO-derived fuels.
5 Transport	**The largest cross-modal compliance gap remains for RED III.**	Creates the strongest need for coordinated investment in advanced biofuels, RFNBOs, renewable hydrogen, renewable electricity and eligible feedstocks.

The analysis indicates that compliance with the 2030 transport framework will require both electrification and significant deployment of renewable and low-carbon fuels. This implies continued investment in advanced biofuels, RFNBOs, renewable hydrogen, renewable electricity and the transformation of existing refining and fuel manufacturing assets.

© Concawe