eFuel Alliance Position on the Revision of the CO_2 Emission Standards for Cars and Vans: More options instead of less ambition

The European Union's Automotive industry is struggling. The lagging uptake of electric vehicles, due to many reasons such as grid, roll-out of charging infrastructure or trade disputes, lead to countless car manufacturers and suppliers announcing job cuts and revenue losses. The review of the CO_2 emission standards for new cars and vans provides the chance to correct the course and change towards a technology-neutral approach that will complement the electric uptake by CO_2 neutral fuel (CNF). This will lead to de-risking the transition, faster defossilisation as well as protecting European competitiveness in one of its leading industries. As already shown in the last review, over 500,000 jobs in the powertrain production value chain could be affected if Europe focuses on electric propulsion only, as shown in a study by CLEPA. The good news is that we can still shift the course. This will require fast action and a fundamental change in the way the Regulation defines what is a zero-emission vehicle (ZEV).

Therefore, we urge the European Commission to publish a legislative proposal with the utmost urgency and before end of 2025. In view of the acute massive competitive pressure on European industry and the need to accelerate ambitious climate protection measures, there is no time to lose at this point. This legislative proposal needs to recognise the real carbon reduction provided by CNFs for vehicle manufacturers. In the following, we will explain which mechanism can be used to complement the roll out of electric vehicles. The guiding principle should be **more options instead of less ambition.**

The eFuel Alliance fully supports the Paris Climate Agreement and the goals implemented to become climate neutral as a continent in 2050. In times when climate policy in general is under increasing pressure, we believe it is even more important to underline the necessity of reducing CO_2 emissions caused by fossil energy carriers. But it is and was always clear: These ambitious climate goals can only be reached when all renewable energy sources and all technologies are enabled to provide the necessary results. In particular renewable molecules such as hydrogen and eFuels are treated by the EU-regulator in a way that they are not enabled to contribute to the degree that climate goals can be achieved.

Why CO_2 neutral fuels?

CNFs can significantly reduce the risk of the current approach, protect jobs in the automotive and related industries, create new business opportunities and contribute to achieving the major challenges of climate protection and energy security through carbon neutrality in the transport sector. Road transport will become an additional driver for global investments into the industrialised production of eFuels, leading in addition to eFuels becoming available faster and more affordable for hard-to-abate sectors such as aviation, shipping and the non-road sector.

In our definition, CNFs are all fuels compliant with sustainability criteria of Renewable Energy Directive (EU) 2018/2001. For instance, these fuels are conventional biofuels, which are capped[1], advanced biofuels of annex IXa, biofuels of annex IXb, hydrogen and eFuels (so-called RFNBOs) and recycled carbon fuels. These fuels are CO_2 neutral in the use phase like electric vehicles because the CO_2 emissions in the use of the vehicles have been previously bound in the production of fuels. Due to the principle of 'better regulation', we recommend referring to these existing definitions and not inventing new rules in a vehicle regulation. In the Working Group on Monitoring Methodologies (WGMM) over 50 companies and associations have defined CNFs accordingly, which can be seen as industry consensus.

[1] Article 26.1 in RED Directive sets the cap for Member States as *"the share of biofuels and bioliquids, as well as of biomass fuels consumed in transport, where produced from food and feed crops, shall be no more than one percentage point higher than the share of such fuels in the final consumption of energy in the transport sector in 2020 in that Member State, with a maximum of 7 % of final consumption of energy in the transport sector in that Member State"*

The CNF industry can complement the needed electrification of the road sector as well as defossilise the existing fleet and provide fuels for hard-to-abate sectors like aviation and maritime. The European automotive industry would be enabled to maintain its high investment volumes into alternative propulsion such as electrification or fuel cell technology. Choosing a technology-neutral approach could drive innovation and competitiveness for multiple solutions, ensuring a better adaptation to evolving market demands and increasing resilience.

Multiple options are available to include CO_2 neutral fuels in the CO_2 Emission Standards for cars and vans, which can also be implemented jointly. A more detailed insight into these options can be found in the technical annex of this position paper.

1. A new **vehicle-class for cars, vans and trucks fueled exclusively with CNFs** to guarantee that newly registered vehicles with an internal combustion engine do not cause additional CO_2 emissions. In the latest revision of the CO_2 emission standards for new vehicles, the European Commission committed putting forward a proposal to allow the registration of vehicles running exclusively on CO_2 neutral fuels after 2035. In response to the European Commission's request for industry-led solutions to track and verify CO_2-neutral fuels in road transport, the WGMM presented 11 solutions within their report. These **monitoring methodologies span from exclusive physical supply via digital fuel tracking systems to a mass balance approach**, some of which are already being implemented in practice, such as the Swiss Crediting System for eFuels based on mass balancing. We recommend implementing a vehicle class based on mass balancing to take advantage of an already existing infrastructure as well as the possible blending into fossil fuels. This will keep mobility affordable while greening the fuel mix.

2. A **carbon correction factor (CCF)** would take into consideration the share of CNFs in the fuel mix for different fuel types in a reference year. Such an option would reduce the CO_2 emission targets for cars and vans manufacturers by the share of CNFs already included in the current fuel mix. This would take into account that, in addition to technological and efficiency improvements by manufacturers, the fuel mix is decisive for how much CO_2 a car or van emits. The contribution of CNFs to reducing emissions from cars and vans is not appropriately reflected and acknowledged. Instead, vehicle manufacturers are facing fines which limit their abilities to invest in clean technologies - both electrification and propulsion technology using CNFs. Beginning of 2025, the association of the automotive industry (ACEA) announced potential fines of up to €16 billion. Considering the current share of CNFs €7.2 billion of fines could be avoided. The CCF creates a link between Renewable Energy Directive (EU) 2018/2001, which obligates increasing admixture of renewable fuels, and the CO_2 emission standards for cars and vans. This option goes hand in hand with an ambitious target in the Renewable Energy Directive.

3. As a third step, in the long-term, a **lifecycle approach** (LCA) should be developed to evaluate and compare the different mobility concepts. A holistic lifecycle approach would not just recognise the contribution of CNFs but also allow compensation along the value chain e.g. the use of green steel or climate friendly logistics. Since speed is of core importance, we think that a vehicle class as well as the CCF will be the first steps to a more holistic approach that needs to be implemented as soon as possible. We should not wait for a fully functional LCA methodology. The Commission is already developing a LCA methodology that once operational needs to be assessed carefully and could be used for future revisions of the CO_2 emission standards.

Mobility of the future is versatile

The eFuel Alliance's membership represents the whole value chain of eFuels and its off-takers. We are agnostic to technology choices and working towards a level-playing field for all possible options. Many of our fuel station member companies provide not only increasing admixtures of renewable fuels, but also actively roll out charging and hydrogen infrastructure. Many of our members in the automotive and automotive supplier industry are highly invested in electric powertrains. All off-takers from hard-to-abate

sectors in our membership would profit from the inclusion of renewable fuels in the CO_2 emission standards thanks to the economies of scale a huge market such as road transport can offer.

While we strongly believe that electric vehicles will play a major role on the pathway to a climate-neutral transport system, these industry insights highlight: The future of mobility is versatile.

The current tailpipe-based regulation for new vehicles does not reflect this development and leads to the opposite – a ban of combustion technologies and the connected jobs and added value. At the same time, this makes investment into hard-to-abate sectors more risky and hence expensive. In addition, CNFs can be combined with other technologies, for example by using range extenders or plug-in hybrids. Substituting fossil fuels by CNFs can be a role model to demonstrate technological complementarity.

In addition, to achieve the ambitious climate targets, we need solutions that work everywhere, regardless of a country's economic power, geography or technical requirements. If emission-reduction solutions are only applicable in a few Member States that can afford a complete exchange of the current fleet stock and infrastructure, the EU misses out on a great opportunity to reduce CO_2 emissions in the transport sector. A mix of battery electric mobility, sustainable and advanced biofuels, eFuels, fuel cells and potentially other emission-reduction technologies will not only reduce greenhouse gas emissions effectively, but it will also help to safeguard the single market for vehicles.

Renewable fuel industry is ready to deliver

All of our fuel producing members are committed to step up and supply CNFs to the road sector. On a global scale, more than 300 projects are on the way with an estimated maximum production capacity of 20 billion Liter of Diesel equivalent in 2030. Estimated production costs could reduce to 2 Euro per Liter in 2030 due to scale effects achieved through mass production in regions with low electricity costs, further declining long term. But only 6% of these projects have a final investment decision due to an insufficient political framework. Find more information about the current market challenges here.

To ensure more of these projects reach final investment decision and contribute to climate neutrality, including CNFs in the CO_2 Emission Standards for Cars and Vans is crucial. Without this, road as the largest transport mode with over 70% of the fuel consumption is in the long term excluded from the usage of eFuels. Currently, there is little incentive to produce or sell eFuels for road which also leads to less investments in production from which the hard-to-abate sectors could benefit. Thus, in addition to including renewable fuels in the CO_2 emission standards for new vehicles, the policy ecosystem needs to be adapted to kick-start CNF production: Both more pragmatic production criteria for green hydrogen and eFuels as well as a high quota in the Renewable Energy Directive are crucial to support the transport sector's path to net zero. Lastly, the Energy Taxation Directive needs to be adjusted in order to incentivise the usage of renewable energy carriers. All steps are explained in detail in the above linked position paper.

Our call is supported by a broad list of supports from science, industry and society. Feel free to discover more information and background studies on our landing page: https://www.renewable-fuels-for-cars.eu/

ABOUT THE eFUEL ALLIANCE

The eFuel Alliance is interest group working for the political and social acceptance of eFuels and for their approval. We represent more than 170 companies, associations and consumer organizations along the eFuel production value chain. We stand for fair competition and a level playing field for all relevant emission reduction solutions. We are clearly committed to greater climate protection and want to see the significant contribution of eFuels to sustainability and climate protection more widely recognised. Our goal is to enable the industrial production and widespread use of CO_2-neutral fuels from renewable energy sources.

Technical annex to the eFuel Alliance Position on the Revision of the CO2 Emission Standards for Cars and Vans

1. CO_2 neutral fuel Vehicle Class

Background
The formulation of 'vehicles exclusively supplied with CNFs' has its origin in the German coalition treaty back in 2021. In 2023, during the legislative process on the CO_2 Emission Standards for Cars and Vans, German Minister for Transport Dr. Volker Wissing formed a blocking minority at the last Council meeting to include this formulation in the final text. Following this pressure from Member States, the European Commission promised in a protocol note and recital that it will work out a methodology within a year after publication. In September 2023, the Commission proposed a draft in the 'Technical Committee of Motor Vehicles', which included unrealistic conditions like -100% CO_2 reduction along the whole value chain (the Renewable Energy Directive sets a threshold of 70%) and no flexibility mechanism. Thereupon, 55 industry players along the value chain (among them truck and car manufacturers, fuel suppliers and infrastructure providers) formed a working group to define more pragmatic and workable solutions.

In December 2024, WGMM published its report detailing 11 solutions on how to practically implement a registration of vehicles exclusively supplied with CNFs. The report includes, next to technical implementability, an assessment of each solution from both customer and retailer perspectives.

Functioning and Implementation
The 11 solutions provided in the report can be split up into two clusters: Direct exclusive supply versus Mass Balancing and Digital supply. The solutions are explained in order of rising flexibility.

1.1. Monitoring Methodologies for direct exclusive CNF supply to vehicle

This cluster includes technical and infrastructural methods that ensure a vehicle can only be fueled with CNFs. The approaches are mainly physical, mechanical, or sensor-based and mostly require technical adaptations in the vehicle, logistics and fueling stations. In the following section, we summarise and structure the different monitoring methodologies:

- **Via regional exclusivity**: A mechanical adaptation of the filler neck and the nozzle would physically prevent that the wrong fuel is filled. However, this requires hardware changes and ongoing standardisations at both filling stations and the vehicle (see solutions 1 of the WGMM report). The outcome can also be reached by ensuring only CNFs are available in the EU fuel market in the long term, thereby removing the risk of fossil fuel contamination altogether (see solution 8).
- **Via fuel property measurement**: On board fuel detection by processing the existing Engine Control Unit (ECU) signals uses data already available in the vehicle; however, it is limited to CNFs with properties different from fossil fuels such as Hydrotreated Vegetable Oils (HVO) (see solution 5). Similarly, a molecular structure sensor is another option which directly tracks the fuel type in the vehicle (see solution 6).
- **Via fuel additivities**: A fuel marker and sensor in the vehicle can physically track the CNF. While fuel markers are already used for heating oil, this requires developments in automotive sensors (see solution 2). Improving this approach could be done by combining it with a digital fuel tracking system, bypassing the lack of automotive ready sensors by performing a digital handshake with the filling station and thus leading to lower integration efforts at the automotive manufacturer side (see solution 4).
- **Via hybrid and digital means**: Building on solution 4, implementing a 100% digital fuel tracking system from upstream to downstream would enable the reliable pairing of vehicle and nozzle with a digital handshake (see solution 3). Similarly, bidirectional communication between the vehicle and the filling station could be used as a 1-to-1 pairing solution between nozzle and

vehicle and would include a filling monitoring and a blockage device in the filler neck (see solution 7).

Case Study: Tour d'Europe

The Tour d'Europe project showcased the potential of renewable fuels to defossilise road transport. Over three months in 2025, 11 cars and 5 trucks travelled 77,500 km across 16 countries, running 84% of the distance on 100% renewable fuels. This resulted in a 67% reduction in greenhouse gas emissions. The results were certified using a digital fuel twin tool and analysed by the Technical University of Darmstadt and the Karlsruhe Institute of Technology. The final report confirmed up to 77% CO_2 savings on a well-to-wheel basis.

A specially developed monitoring system was used for tracking the fuel and vehicles during the Tour d'Europe. Using data from the respective vehicle such as tank level, GPS position, time, mileage as well as information from the filling station about the fuel (based on the proof of sustainability), the refueling can be monitored and verified and the CO_2 emission factor of the tank filling can be determined. The Tour d'Europe is therefore a first example of a digital fuel tracking system being tested all over Europe.

1.2. Monitoring Methodologies for mass balanced CNF supply

This cluster focuses on digital certification, registry systems, and balancing methods within the existing infrastructure. Instead of physically separating CNFs, it ensures equivalence through accounting systems and thus reduces the necessity of technical adaptations to vehicles, logistics and fueling stations.

- **Via digital supply chain tracking with mass balancing**: A fuel usage balancing solution uses a mass-balancing approach based on tracking of fuel energy in the vehicle tank, with the driver of the vehicle purchasing equivalent fuel certificates to cover its vehicles demand. However, this might be feasible mostly for fleet customers in commercial vehicle segment while risking overdue burden for end-costumers in passenger car segment (see solution 10). A combination of mass balancing and digital fuel tracking system reduced this burden by ensuring that the fuel station automatically deletes certificates according to the amount of delivered fuel, which has been brought into the market on a mass balance approach (see solution 11).
- **Via mass balancing**: Mass-balancing is an indirect solution using book and claim of certificates and is well established in trading markets such as electricity and gaseous fuels in pipelines. In a mass balance approach, while the CNF may not be physically consumed in the claiming CNF vehicle, the CNF amount is introduced elsewhere into the market. This guarantees a fast ramp-up of fuel production and fuel supply chain without extensive technical adaptations (see solution 9 of the WGMM report).

Case Study: The Swiss Crediting Model for eFuels

The Swiss crediting system as the first practical implementation to incorporate eFuels into a tailpipe-based vehicle regulation came into effect from January 1, 2025. It is an example of a mass balancing solution.

To qualify, the eFuel must be placed on the Swiss market by a supplier who also provides proof of origin. Car manufacturers or importers can purchase these proofs of origin to lower their average fleet emissions. Crediting is possible up to 18 months after production or import, and any eFuel qualifies: eDiesel, for example, can be used to reduce the emissions of a petrol engine. To set a passenger car climate neutral, a mileage of 175,000 km is assumed.

Car manufacturers' participation in such a system would be voluntary, providing an additional solution to electrification. For the fuel industry, Switzerland represents an attractive early market, well before 2030. The willingness to pay, calculated on the basis of the penalties of the fleet targets and

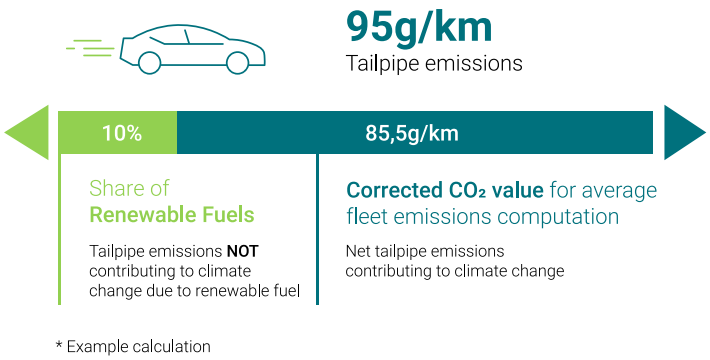
exemption of energy taxation, is more than € 2.5 per liter. More information is available in an eFuel Alliance webinar.

This system was originally developed by Frontier Economics on behalf of the German Economics Ministry in 2020, with the necessary amendments for an inclusion in the EU legislative framework already included. Such a system can be designed with frontloading – meaning that the lifetime carbon footprint is compensated at the beginning, which leads to even more climate protection.

2. Carbon Correction Factor (CCF)

Background

The Renewable Energy Directive as well as the Fuel Quality Directive have been setting incentives for the admixture of CNFs in the European transport sector, leading to a rising share of especial biofuels and a lower CO_2 intensity of the transport fuel mix in the EU. According to SHARES database, a European mix of 6.7 % renewable fuels was already achieved. Nonetheless, a vehicle with an internal combustion engine, when registered, counts towards the car manufacturers' fleet targets as if it is exclusively running on fossil fuels. The CCF would take into account the share of CNFs that is already in the market. For example, if 10% CNF is in the market in 2030, the CO_2 value of a new vehicle would be reduced by 10%. For a vehicle with 95 g/km it means a reduction of 9.5 g/km.



Functioning and Implementation

One of the main advantages of a CCF is that it can be easily integrated into the existing regulation: the data needed to determine the CCF can be collected using the EU Environment Agency's SHARES tool, which records the amounts of CNFs in all Member States – including all types of renewable fuels that the suppliers are required to put on the market to meet their RED obligations.

- While the Member States report their fuel shares with a delay, the increasing targets of renewable fuels foreseen by the Renewable Energy Directive guarantee that this delay will not lead to distortion.
- With only small adjustments, e.g. breaking down certain datasets into their subcomponents, SHARES already provides an accurate and usable database. These recommendations for adjustment have been brought forward by stakeholders to Eurostat and can be implemented quite quickly.
- The CCF determined on this basis can then be factored into the formula for calculating the specific CO_2 emissions of a new vehicle. The necessary amendments for the legal text have been developed and were already tabled in the last revision of the CO_2 emission standards, defining both CNFs and CCF as well as the necessary changes to the calculation formula.
- Analog to electricity and the definition of a CNF vehicle class, RED-compliant fuels are considered as zero emission in the use-phase. The same amount of CO_2 has been bound in the production that is emitted later in the combustion. For that reason, the share of CNFs is equal to the CO_2 reduction of relevant fuels. We understand in a holistic lifecycle perspective CO_2 neutrality is not achieved without negative emissions – also true for electric vehicles. In the CO_2 emission standards, the carbon footprint for new passenger cars and vans is measured in drive cycles. For that reason, it is appropriate to focus only on the vehicles use phase and

exclude emissions occur in the production of the vehicle or for facilities producing renewable fuels.

- Some stakeholders argue that double counting takes place because these fuels are already considered in the Renewable Energy Directive. We would like to point out that a consideration in different regulations is not automatically a double counting. For example, electric vehicles are considered as 0 g/km vehicles in the CO_2 emission standards, Eurovignette (truck toll), Clean Vehicle Directive as well as many national funding schemes and car tax systems. For national climate balance sheet, the energy consumption is important – not the CO_2 tailpipe value of new vehicles. Acknowledging clean technologies in different regulations displays an additional incentive.
- In the future, the use of CNFs will be more accurately tracked in the 'Union database for Renewable Fuels'.