

eFUEL ALLIANCE - POSITION PAPER

'AMENDMENT OF THE REGULATION SETTING CO₂ EMISSION STANDARDS FOR HEAVY DUTY VEHICLES'

The eFuel Alliance fully supports the European Commission's assessment that all sectors will have to strengthen their efforts in reducing greenhouse gas (GHG) emissions significantly in order to achieve climate neutrality by 2050. Especially road transport needs to play a key role as it accounts for a fifth of today's GHG emissions in the EU. Given the huge potential of promising climate-protection technologies that have not yet been exploited, such as renewable hydrogen and its derivate products as well as advanced biofuels, we believe that road transport can make a significant contribution to the defossilisation efforts in Europe.

One instrument to reduce GHG emissions in the transport sector is the revision of the CO_2 emission standards for heavy duty vehicles (HDVs). However, the focus of the current EU regulation on tailpipe emissions falls short of assessing the carbon footprint of a vehicle's entire life-cycle and thereby determining the real GHG savings of HDVs. This is because emissions that occur in earlier or later phases of a vehicle's life cycle, such as during the production of the vehicle or the generation and provision of its operating power, are being ignored. With such tailpipe approach, even considering that the EU's electricity mix is still heavily dependent on fossil fuels, a battery powered truck that is charged with predominantly fossil fuel-generated electricity qualifies as a zero-emission vehicle under the current regulation.

A first step to a more holistic, comprehensive and effective transport climate policy is the consideration of renewable fuels in the CO_2 emission standards and, therefore, harmonizing the regulations of the fuel and automotive industry. This will speed up the achievement of the EU climate goals by unlocking the enormous GHG savings potential of carbon-neutral synthetic fuels such as eFuels or even carbonnegative renewable fuels such as biomethane. At the same time, the inclusion of renewable fuels in the regulation will offer manufacturers, alongside battery electric and fuel cell powertrains, complementary technological options to meet the CO_2 emission standards.

A viable policy measure to integrate renewable fuels into the regulation on CO₂ emission standards for heavy duty vehicles is to introduce a voluntary crediting system for renewable fuels. This concept was developed in 2020 on behalf of the German Federal Ministry for Economic Affairs and Energy (BMWi).

RECOMMENDATIONS

- Introducing a voluntary crediting system for renewable fuels, which
 - ... offers more climate neutral choices for logisticians and freight forwarders,
 - ...leads to more CO2 reduction in the foreseeable future compared to electric vehicles only,
 - ...is a first step towards a holistic life cycle assessment of vehicles,
 - ...can't undermine effectiveness and efficiency because it is voluntary,
 - ...considers only amounts of renewable fuels that are placed in addition to those resulting from the RED provisions,
 - ...retains responsibilities, limitations of biofuels, and sustainability criteria of the fuel industry,
 - ...builds on established procedures and official certification bodies to verify the fuel quantities places on the market,
 - ...offers more GHG saving solutions as well a safety net for the automotive industry and ultimately also for the climate.

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RENEWABLE FUELS CAN ADDRESS THE SPECIFICITIES OF HEAVY-DUTY TRANSPORT

Heavy-duty transportation is the backbone of trade and commerce on the European continent. Most goods and daily necessities are shipped by trucks, with 73% of all freight transported by land being carried by trucks in the EU. Public services such as refuse collection, fire brigade or construction services also fall into this category. At the same time, heavy-duty transportation is responsible for 27% of the EU's road transport CO₂ emissions and 5% of total CO₂ emissions in the EU – more than aviation and maritime transport combined. Since 1990, these emissions have increased by 25%. Large trucks account for 65 to 70% of all CO₂ emissions from heavy-duty vehicles. According to ACEA, annual registration of new trucks increased from 217,000 in 2010 to 333,000 in 2019 before Covid-19 hits Europe. More than 6.2 million trucks were operating on European roads in 2020. Due to increasing passenger and freight traffic, heavy-duty is a sector with further growing CO₂ emissions.

In order to responsibly tackle the GHG issue for heavy-duty vehicles, taking into account the economic, social and climate policy implications, solutions must address the various demands of the different use cases: A delivery van in a metropolitan region requires different technical solutions than a long-haul 40-tonne truck that drives thousands of kilometres every day. A municipal refuse truck has different operation modes than an off-road construction machine. For that reason, a "one-size-fits-all solution" involving a pure electrification strategy, as envisaged in the regulation on CO₂ emission standards for passenger car and light-duty regulation is even less suitable for heavy-duty vehicles.

According to Eurostat, even in 2020, which was marked by lockdowns and border movement restrictions to counter the Covid-19 pandemic, around 60 % of freight volumes were carried out over distances of more than 300 km, with the distance class of 500 to 999 km accounting for the most tonne-kilometres. To electrify a truck suitable for such distances (usually a 40-tonne truck), an adequate battery to achieve ranges up to 800 km would weigh between 5,000 and 6,000 kg, equivalent to a payload loss of 5-10% (depending on the truck) compared to diesel – on the way there and back. Such a large battery increases the carbon footprint of vehicle production enormously. In addition, charging times would take several hours, even with current fast-charging technology. This is associated with a requirement on utilities to provide a minimum of the same capacity in additional renewable power production

Moreover, there are logistical and infrastructural challenges: For the widespread roll-out of fuel cell trucks, a new hydrogen filling station network needs to be built across Europe. Also, there is still a lack of logistical infrastructure such as vessels, pipelines or trucks for the transport of green hydrogen from the production site to the filling stations. The strategic uncertainties arising from these challenges are reflected in the fact that different truck manufacturers opt for different technologies.

Although sustainable renewable fuels address many of these specific requirements of heavy-duty transport (high energy density essential for long distances and weight restrictions, existing infrastructure and logistics, available global production potential) the current regulatory logic of the CO₂ emission standards for new heavy-duty vehicles as adopted in 2019 does not take into account their positive contribution. This is due to the already mentioned focus on tailpipe emissions: While an electric truck will always measure 0 g CO₂ per tonne-kilometre – regardless of whether it is charged 100% with fossil electricity – a truck with an internal combustion engine always features the fossil tailpipe value – even if it is powered 100% by renewable fuels and thereby set climate-neutral. In order to meet the regulation's emission reduction targets and avoid high penalties of up to 6,800 € per gram per ton-kilometre and vehicle, manufacturers are forced into battery-electric or fuel cell technologies – whether or not these are viable solutions for most use cases in heavy-duty transport.

The 'tailpipe logic' has also implications on truck tolls charges (Eurovignette) and vehicle taxes, which additionally drives up total costs of ownership.

We believe that this imbalanced regulatory approach not only undermines the principle of technology-neutrality, but also limits customer choice and jeopardises effective climate protection. That is why we encourage European decision-makers to include renewable fuels in the CO₂ emission standards for new heavy-duty vehicles.

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¹ Eurostat: Road freight transport statistics

NEED FOR ACTION: IMPLEMENTATION OF A CREDITING SYSTEM FOR RENEWABLE FUELS

The <u>public consultation</u> of the CO₂ emission standards for new heavy-duty vehicles clearly signals a need for implementing a mechanism to introduce renewable fuels in the heavy-duty regulation. Two third of the stakeholders – most from the industry – are in favour of a consideration of renewable fuels like the European Express Association or European Association for Forwarding, Transport, Logistics and Customs Services (CLECAT). Just 23% of 137 stakeholders oppose such a mechanism. Public authorities are split. Italy, Estonia and Latvia welcome the consideration of renewable fuels while the transport ministry of Finland is against. Just like Norway, which is not a member of the EU, and the German Federal Environmental Agency, which is not an official ministry. However, the result of the public consultation shows that the Commission has to act and should propose a mechanism to consider renewable fuels in the regulation for new trucks.

A mechanism should be introduced in the HDV Regulation so that compliance assessment takes into account contribution of renewable and low-carbon fuels



Figure 1: Public consultation welcomes the consideration of renewable fuels in the CO2 emission standards for heavy-duty vehicles (on a scale from 1 to 5 where 5 is highest agreement and 1 is no agreement, not all statements needed to be rated)

In principle, two different ways of integrating renewable fuels in the regulation on CO_2 emission standards for heavy-duty vehicles are possible. On the one hand, the so-called 'carbon correction factor' (CCF) considers the share of renewable fuels in the transport fuels market and reduces the tailpipe value accordingly. On the other hand, a voluntary crediting system counting CO_2 emission savings from renewable fuels towards the EU fleet targets for new vehicles would be a more flexible solution, detached from the RED targets, which would allow truck manufacturers to fully offset the carbon footprint generated over the lifetime of the vehicle.

Both – a CCF and a crediting system for renewable fuels – can be implemented together. The CCF acknowledges the volumes of renewable fuel, that have been brought to the market as a result of the RED requirements, and the fuel crediting system leads to additional amounts of renewable fuels and thus more climate protection. Including both mechanisms in the CO₂ emission standards would create a level-playing field for all technologies and deliver a win-win for the climate, industry and citizens. However, since a crediting system leads to more climate protection, it should be prioritised. This would also meet the call of more than 200 scientists who advocate the introduction of a credit system for fuels.

Introducing a crediting system for renewable fuels will help to reduce road transport sector emissions effectively and efficiently, while providing manufacturers with an additional and voluntary climate-effective option to comply with the CO₂ emission standards. The climate would benefit from more carbon-neutral synthetic fuels that, in contrast to fossil fuels, do not release additional CO₂. And consumers would benefit from a greater portfolio of clean technologies that meet their needs. This would strengthen the demand-side of eFuels and ensure that additional volumes of synthetic fuels are being sold in the market.

There are already proposals regarding the practical implementation of such a crediting system, e.g. the report 'Crediting System for Renewable Fuels in EU Emission Standards for Road Transport'² by the consultancy Frontier Economics and the law firm Flick Gocke Schaumburg from May 2020, drafted for the BMWi. In the

² For more information, also see: https://www.bmwi.de/Redaktion/DE/Downloads/C-D/crediting-system-for-renewable-fuels.html

above-mentioned public consultations, the Commission asked about both mechanism. A majority of 75 of 137 stakeholders prefer the crediting system while only 52 are in favour of the CCF.

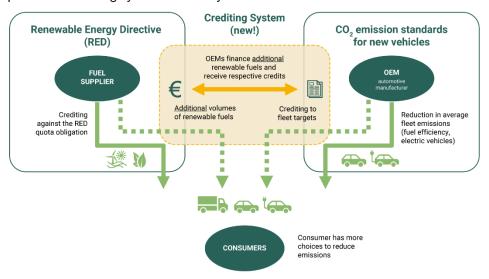


Figure 2: Proposal to link the fuel regulation (Renewable Energy Directive) and vehicle regulation (CO2 emission standards for cars, vans and trucks) via a new Crediting System for Renewable Fuels

The eFuel Alliance strongly supports such a mechanism and encourages the European Commission to incorporate the crediting system for renewable fuels in the amended regulation setting CO₂ emission standards for heavy-duty vehicles. An appropriate amendment is presented below.

THE COMMISSION HAS A CLEAR TASK TO INCLUDE RENEWABLE FUELS

During the ongoing debate on the Fit-for-55 package, the eFuel Alliance has been arguing for the introduction of a voluntary crediting system in the regulation on CO_2 emissions standards regulation for passenger cars. This call was shared by a large majority in the transport committee of the European Parliament and is supported by different political groups and various Member States like Italy, Portugal, Finland, Romania and many more. At the final meeting of the Environment Council before agreeing on a General Approach, the German government insisted on a solution for vehicles which are fully powered with CO_2 -neutral fuels. As a result, the European Commission is now requested to prepare a proposal to this effect.

Also, in the current CO_2 emission standards for new heavy-duty vehicles ((EU) 2019/1242) the Commission has a clear order to develop a more comprehensive assessment in Article 15 paragraph 5 of:

'The Commission shall, not later than 2023, evaluate the possibility of developing a common Union methodology for the assessment, and the consistent data reporting, of the full life-cycle CO₂ emissions of new heavy-duty vehicles that are placed on the Union market. The Commission shall transmit that evaluation, including where appropriate proposals for follow-up measures, such as legislative proposals, to the European Parliament and to the Council.'

Further, in the same article in paragraph 3 (g) the Commission is clearly addressed to develop:

'An assessment of the possibility of developing a specific methodology to include the potential contribution to CO₂ emissions reductions of the use of synthetic and advanced alternative liquid and gaseous renewable fuels, including e-fuels, produced with renewable energy and meeting the sustainability and greenhouse gas emissions saving criteria referred to in Directive (EU) 2018/2001 of the European Parliament and of the Council'.

MAIN ADVANTAGES AND PRINCIPLES OF A CREDITING SYSTEM

Truck manufacturers' participation in such a system would be voluntary. Participants would be able to purchase certain amounts of alternative fuels, which have to be additional to existing amounts and meet the sustainability criteria of the Renewable Energy Directive (RED). Fuel suppliers are eventually

responsible for supplying these fuels to the end customers. It is guaranteed that the amount of renewable fuels, which corresponds to the credits generated when purchasing the renewable fuels, is brought to the market and therefore makes an actual contribution to the reduction of GHG emissions in the transport sector.

The proposed crediting system is aligned with existing regulations for the automotive and fuel sectors and has climate protection as a basic premise. It is therefore important to stress that the **proposed crediting system does not allow for double counting, i.e. credits can only be counted either against the renewable share under RED or against the fleet targets under the EU CO₂ emission standards regulation. This means that suppliers of renewable fuels and truck manufacturers will have to decide which targets the fuels will count towards. The crediting system thereby ensures effective climate action, unlocks additional volumes of renewable fuels and therefore additional CO₂ reductions in the transport sector.**

Further climate benefits can be achieved by introducing a 'front-loading'. In that case, the OEM has to guarantee that the whole volume of renewable fuels is brought into the market at the time of the registration of the new vehicle. Hereby, the CO₂ reduction of the whole lifetime is brought forward by the average lifetime. That helps Member States to reach near-term climate targets and enables immediate investments.

Guaranteeing affordable individual mobility is also a very important point when revising any EU transport legislation. More options to meet the requirements under the CO₂ emission standards will also have a positive effect on costs for end customers in all EU Member States, being respectful of a just transition to carbon-neutral mobility. Mobility concepts such as LNG trucks will still be possible after 2035 if the fuel consumption is fully compensated by applying the crediting system. Renewable fuels can contribute to a significant reduction of GHG effectively and affordably – right up to climate neutrality. With increased quantities of eFuels being added gradually to conventional fuels (thanks to their dropin capability) and production costs falling thanks to economies of scale, eFuels would be affordable for consumers in every phase. The upscaling and by-products generated in the process of producing eFuels will additionally reduce costs for hard-to-abate sectors like aviation and maritime.

Potential concerns that a crediting system could lead to reduced incentives for manufacturers to further invest in efficiency improvements are unjustified. Electric mobility is a promising solution meeting a variety of mobility needs. Introducing a crediting system will make more climate-neutral choices available without prompting an 'either or' in European climate-protection policy. Providing investment security and a prospect for the use of renewable fuels will also encourage further developments regarding the efficiency of the used powertrain. Efficiency is not only important to reduce the overall CO₂ footprint over lifetime but also in terms of consumer acceptance and to reduce the total cost of ownership.

INCREASING INVESTMENT INCENTIVES - MAINTAINING TECHNOLOGICAL LEADERSHIP

The EU also intends to amend the current regulatory framework in order to provide the market with long-term investment security and to maintain the technological leadership and competitiveness of the EU's automotive value chain. The eFuel Alliance strongly agrees with the assessment of the Commission that additional security for investors is needed to strengthen the European automotive value chain. A long-time planning perspective is crucial to attract and to channel investments. This is especially true for hydrogen and its derivatives, which is why the provision of added security should not be limited to only one climate-protection technology. Just the export of machinery and equipment to produce electricity-based synthetic energy sources could create 1.2 million new jobs.³

If Europe focuses too narrowly on the promotion of electric vehicles only, it is likely to lose its technological leadership in areas where Europe has been at the forefront of innovation over the last century. A voluntary crediting system would provide the automotive industry with an additional, climate-effective option to reduce CO_2 emissions from their fleets. A fair competition between emission-reduction technologies is vital. Especially where the market ramp up of the electric mobility faces challenges and difficulties other climate-neutral options must be available.

³ See https://www.efuel-alliance.eu/fileadmin/Downloads/2021-02-25_Synthetische_Kraftstoffe_EN_Final_update__IW_.pdf

eFUELS - A SOLUTION THAT CAN BE DEPLOYED THROUGHOUT THE EU

To achieve the EU 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 will never achieve their climate goals. A mix of e-mobility, sustainable and advanced biofuels, eFuels, hydrogen in combustion engines, fuel cells and potentially other emission-reduction technologies will not only reduce GHG emissions effectively, it will also help to safeguard the single market for vehicles.

We need to keep in mind that the energy transition needs to be affordable and leave no one behind, especially people with lower incomes or those living in rural or economically weaker regions. If climate-protection measures do not receive broad support from the European citizens, the EU runs the risk of missing the ambitious climate targets.

The second-hand vehicle market for heavy-duty vehicles is also very important in that context. Second-hand trucks have to work in all parts of the world. Since eFuels help to defossilize the stock, without the need to replace the current truck or infrastructure, the energy transition can be made affordable for all people. Therefore, an uptake of climate-neutral fuels in the near future is needed. The revision of the CO₂ emission standards for heavy-duty vehicles has the potential to be one of the main drivers for such a market uptake.

CONSIDERING EFFICIENCY IN THE INTERNATIONAL DIMENSION

One issue often debated in the context of eFuels is their efficiency. It is suggested that by using electric energy directly, battery electric vehicles will always have a higher degree of efficiency. However, this perspective does not take into account the international dimension of the production of hydrogen and eFuels and is therefore misleading. The efficiency of the electricity's end usage is not the only criteria to assess the actual efficiency. It is also important how efficiently electricity can be produced from renewable energies, and then made usable.⁴ For example, a windmill in Patagonia is generating four times more electricity than renewables in Germany. The better capacity factor in proper regions is compensating most of the efficiency losses of the eFuel production. In order to achieve a global energy transition and to leverage the potential from regions where large amounts of climateneutral electricity are available, international cooperation and an import strategy on a global scale are needed.

CONCLUSION AND AMENDMENT

As a CO_2 -neutral alternative to conventional fossil energy carriers, eFuels can make a crucial contribution to the global energy transition. With the CO_2 emission standards regulation being one of the decisive regulations to promote or prevent the use of renewable fuels, the EU should take the opportunity to introduce a crediting system for renewable fuels in the fleet target regulation. Therefore, the following amendment is needed, which is in line with the developed amendments by the consultancy Frontier Economics and the law firm Flick Gocke Schaumburg on behalf of the German Ministry of Economics:

New point (c) in article 4:

Average specific CO₂ emissions of a manufacturer

Starting from 1 July 2020, and in each subsequent reporting period, the Commission shall determine for each manufacturer the average specific CO₂ emissions in g/tkm for the preceding reporting period, by taking the following into account:

a) the data reported pursuant to Regulation (EU) 2018/956 for the manufacturer's new heavy-duty

⁴ For more information, also see: 'Comprehensive efficiency of technologies in the transport sector', study by Frontier Economics, October 2020: https://www.frontier-economics.com/media/4297/rpt-frontier-unitimwveffizienz-antriebssysteme-26-10-2020-stc.pdf
The study comes to the conclusion that, if eFuels come from regions that are rich in sun and wind, the usage efficiency of battery-powered electric vehicles is almost on par with vehicles powered by eFuels.

vehicles registered in the preceding reporting period, excluding vocational vehicles; and

- b) the zero- and low-emission factor determined in accordance with Article 5; and
- c) the CO2 reductions achieved through the use of alternative fuels that are credited pursuant to Article 4a. The crediting of CO2 reductions pursuant to Article 4a of Regulation (EU) 2019/631 shall be in accordance with Regulation (EC) 715/2007 and Regulation (EC) No 595/2009.

The average specific CO2 emissions shall be determined in accordance with point 2.8 of Annex I.

New article 4a:

Use of synthetic and sustainable renewable fuels

- (1) Upon application by a manufacturer, CO2 savings achieved through the use of synthetic and advanced alternative fuels (hereinafter "alternative fuels") shall be considered in accordance with paragraphs 2 and 3 of this Article.
- (2) Instead of being included in a manufacturer's average specific CO2 emissions as referred to in paragraph 1 of this Article, CO2 savings achieved through the use of alternative fuels may be allocated to individual vehicles which are technically capable of using the credited alternative fuel in accordance with Regulation (EC) 715/2007.
- (3) Each Member State shall record for each calendar year the quantities of alternative fuels placed on the market by a manufacturer, or the quantities of alternative fuels allocated to a manufacturer, and shall provide appropriate certification of these quantities and the resulting CO2 savings by correspondingly applying the certification and documentation procedure laid down in Directive (EU) 2018/2001.

All fuels listed in Articles 2(27), (28) and (33) to (37) of Directive (EU) 2018/2001 shall be allocated and shall be used to issue credits. The Member States shall ensure that credits are issued only for quantities that meet the requirements of Directive (EU) 2018/2001 and where it is ensured that no simultaneous allocation takes place against the reduction targets set out in Article 25(1) of Directive (EU) 2018/2001.

The credits must indicate the issuing Member State, their period of validity, and the quantity and type of alternative fuel for which they were issued. The credits must be tradable. With a view to minimising the risk of single quantities being claimed more than once in the Union, Member States and the Commission shall strengthen cooperation among national systems, including, where appropriate, the exchange of data. Where the competent authority of one Member State suspects or detects a fraud, it shall, where appropriate, inform the other Member States.

(4) The reductions pursuant to paragraphs 1 and 2 shall be determined in accordance with point 2.7 of Annex I.

New point 2.7 in Annex I:

2.7 Total CO₂ emissions savings achieved through the use of alternative fuels pursuant to Article 4a

The total (origin) of all CO_2 savings credits (credit_{total}) in g in year t pursuant to Art. 4a shall be calculated using the formula:

$$credit_{total,t} = \sum_{k} (fuel_{k,t} \times CO2_{ref} \times CO2saving_{k}) + banking_{t-1}$$

The total (usage) of all CO₂ savings credits is also calculated using the formula:

$$\textit{credit}_{\textit{total},t} = \textit{credit}_{\textit{fleet},t} + \sum_{j} \textit{credit}_{\textit{vehicle},j,t} + \textit{banking}_t$$

The CO2 reduction amount in g credited in year t to the specific average emissions in accordance with Article 4 c) sentence 1 (reduction amount_{fleet}) in g shall be calculated using the formula:

$$reduction \ amount_{fleet,t} = \frac{creditfleet,t}{\sum lifetime_{sg} \times tkm_{sg} \times vehicles \ _{sg,t} \times \frac{1}{MPW_{sg}}}$$

The amount of CO2 reduction allocated to an individual vehicle in year t in accordance with Article 4 c) sentence 2 (reduction amount_{vehicle,j,t}) shall be calculated using the formula:

$$reduction \ amount_{vehicle,j,t} = \frac{credit_{vehicle,j,t}}{lifetimes_{g} \times tkm_{sg}}$$

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$\sum_k(.)$	Total of all alternative fuels placed on the market across all fuel types
$\sum_{j}(.)$	Total of all CO ₂ reductions credited to individual vehicles pursuant to Article 4 c) sentence 2
$\sum_{sg}(.)$	Total of all new vehicle subgroups in accordance with Table 1
fuel _{k,t}	Contributed or allocated quantity in MJ of an alternative fuel k placed on the market in year t
CO2 _{ref}	CO ₂ emission comparator for fossil fuels in g/MJ pursuant to Annex V of Directive (EU) 2018/2001
CO2saving _k	Greenhouse gas emissions saving of each alternative fuel pursuant to Annex V of Directive (EU) 2018/2001 in comparison to fossil fuels
banking _t	Certificates not credited and transferred by a manufacturer in year t
credit _{fleet,t}	Total emission reduction credits in g CO ₂ credited in year t pursuant to Article 4 c) sentence 1
credit _{vehicle,j,t}	Emission reductions in g CO ₂ credited to vehicle j in year t pursuant to Article 4a
lifetime _{sg}	Average expected lifetime of newly registered vehicles is 13 years according to ACEA
tkm _{sg}	Annual mileage in tkm/a per vehicle subgroup in accordance with Table 4
vehicle _{sg,t}	Annual new vehicle registrations by a manufacturer per vehicle subgroup in year t
MPW _{sg}	Weighting factor for mileage payload determined in accordance with no. 2.6.

ABOUT THE eFUEL ALLIANCE

The eFuel Alliance is a stakeholder initiative committed to promoting the political and social acceptance of eFuels and to securing their regulatory approval. We represent more than 180 companies and associations along the value chain of eFuel production. We stand for fair competition and a level-playing field for all relevant emission reduction solutions. We are clearly committed to more climate protection and aim to win broader recognition of the significant contribution eFuels can make in the drive for sustainability and climate protection. Our goal is to facilitate the industrial production and widespread use of carbon neutral fuels made from renewable energy sources.