

## Fit for 55 for transport professionals

What the EU Commission's climate policy proposals mean for the transport sector and what the new German government should advocate

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27.10.20 21

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## Foreword

Dear Reader,

the excitement of the early days has died down since the European Commission presented the package of climate change proposals known as the *Fit for 55 package* in July this year. But as negotiations begin in the Council and Parliament, it's now down to business. How can the EU reduce its greenhouse gas emissions by 55 percent by 2030 compared to 1990 levels and begin the transition to climate neutrality by 2050?

While it is clear that the entire economy will change more fundamentally than ever before in response to climate change, the diverging interests among the players naturally persist. Some have recognized the signs of the times and are repositioning themselves to profit from the transformation; others are fighting rearguard battles. There is no way around tough decisions on the way forward. Germany - as the largest member state with a strong industry, especially in the automotive sector - will play a central role in this. At the same time, politicians in Germany are busy forming a new government.

Both processes - the negotiations on the *Fit for 55 package* and those on the new German government's programme - must be closely integrated. In climate protection in particular, many national decisions are only conceivable in a European context. In the transport sector, the list ranges from phasing out the internal combustion engine and developing the electric charging infrastructure to pricing CO<sub>2</sub> emissions in transport. The German government will only be able to achieve its national climate protection targets if it also lends its support to an effective *Fit for 55 package*. The effectiveness of this depends above all on whether it succeeds in putting together a coherent overall package from the many different instruments and measures - at European and national level. Those who blindly charge ahead without a view to the whole will fail. The same applies to attempts to rely solely on subsidies and incentives or on emissions trading. There is no panacea for climate protection, especially not in the transport sector, which is more dependent than others on decisions on the demand side.

This makes it all the more important to deal with the *Fit for 55 package* in Germany. The wealth of details in the Commission's 14 legal proposals does not make it easy to keep an eye on the key points. That is why we have compiled an overview of the most important aspects for the transport sector in this paper. In some places we also formulate recommendations for positions that the new German government should take in the negotiations on the package. These are summarised in a list at the beginning. The main text provides justifications for these proposals and, in addition, many further observations, in some cases combined with rough quantitative estimates, which help to better assess the Commission's proposals.

The entire paper is not a manifesto, but a working document; it does not deliver a final verdict, but comments on an intermediate state. In this way, it is intended to facilitate the work of all those who wish to become involved in or critically accompany the decision-making process. If it succeeds in doing so for one or the other reader, then this report will have fulfilled its purpose.

We wish you informative and stimulating reading.

**Günter Hörmandinger**

for the team of Agora Verkehrswende

Berlin, 27 October 2021

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# 1 Recommendations for the new federal government for the *Fit for 55* package from a transport perspective

## 1.1 Passenger car limits and electrification

1. **Raise the 2030 limit value further:** For CO<sub>2</sub> fleet limits for passenger cars, the increase in the 2030 target above the 55 percent level (reduction from 2021) should be further increased. Increases of up to 75 percent should be envisaged.
2. **Phasing out internal combustion technology in new registrations of passenger cars and light commercial vehicles:** The phase-out must be supported and the phase-out date of 2035 must not be delayed under any circumstances.
3. **Increase already before 2030:** The fleet limit values for passenger cars and light commercial vehicles (LCVs) should already be tightened before 2030. This applies both to the target value for 2025 and to the introduction of a target paths in the intervening years from 2026.
4. **No inclusion of fuels in the fleet limit values:** The Commission's approach of not including fuels in the fleet limit values should be supported.
5. **Prevent worsening of internal combustion vehicles:** With increasing electrification of the overall fleet, it would be possible for the emission levels of internal combustion vehicles to rise. This should be prevented by separate limit values that apply only to these vehicles.
6. **Energy efficiency rules for electric vehicles:** Energy efficiency rules must be prepared for electric vehicles. This must be included in a review clause.
7. **More realistic test procedures for plug-in hybrids (PHEVs).** The *Worldwide harmonized Light vehicles Test Procedure* (WLTP) for PHEVs needs to be made more realistic. During the time it takes to prepare this technically, the so-called *utility factor in the procedure* should be reduced to half.
8. **Delete the ZLEV factor:** The special regulation for weaker limit values for the introduction of *zero- and low-emission vehicles* (ZLEV) should be deleted without replacement, even before it enters into force in 2025 (as it expires in 2029 anyway).
9. **No more extras for niche manufacturers:** The exemption for niche manufacturers with a production between 10,000 and 300,000 passenger cars per year should be phased out immediately, and not only after 2028.

## 1.2 Energy infrastructure in transport

10. **Support charging infrastructure regulation in principle:** The *Alternative Fuels Infrastructure Regulation* (AFIR) creates a European minimum charging network for intra-European travel. The German government should in principle support the revision of the AFID/the new design of the AFIR.
11. **Initially, more than one kilowatt of charging capacity per battery vehicle is possible:** In the initial years, the installed charging capacity could be higher than the value of one kilowatt per battery-electric vehicle proposed by the Commission, because this is a no-regrets measure: Even if an oversized charging infrastructure should be built up initially, this will in any case be fully utilised in a few years due to increasing electrification. After a few years, a review should be carried out, which in the light of experience could then possibly bring the value back down.
12. **Specify minimum shares of fast chargers:** For the entire public charging infrastructure, not only minimum capacities per vehicle should be defined, but also minimum shares of fast chargers.
13. **Ensure data availability:** At a minimum, data on the occupancy status, functionality and available power of all charging points, as well as the price for ad hoc charging, must be publicly

available free of charge so that this information can find its way into apps and navigation systems. The AFIR proposal provides a good basis for this. However, it should also be ensured that the occupancy status is not only visible at a given moment, but over a minimum period from the time of the request, in order to enable longer route planning.

14. **Only fast chargers along the TEN-T routes:** The charging infrastructure on the TEN-T network (*Trans-European Transport Network*) should be designed entirely in the form of fast chargers. Their minimum capacity can also be higher than the proposed 150 kilowatts.
15. **Check minimum density on the TEN-T network for different traffic densities:** The proposed density of charging points in the AFIR is a minimum standard that applies everywhere, even in the most remote provinces of the EU. For a densely populated core area like Germany, a much higher density of charging points on motorways is necessary. The planned review of the adequacy of the charging infrastructure must above all address the locally very different peak traffic densities.
16. **Make advance planning mandatory:** In order to ensure that the targeted supply density in the electric charging infrastructure is in fact realised, a stronger obligation for advance planning on the part of the Member States should be provided for.
17. **Test hydrogen infrastructure first.** The supply infrastructure for hydrogen in heavy-duty vehicles should not be built up nationwide from the outset. Instead, experience should be gathered in parallel innovation corridors and a decision on the way forward should be made on the basis of this experience.
18. **Passenger car compatibility not necessary for hydrogen:** The obligation to make hydrogen filling stations also suitable for passenger cars can be dropped.
19. **Natural gas out:** At least for road transport, natural gas should be removed from the scope of the Alternative Fuel Infrastructure Regulation.

### 1.3 Renewable energy in transport

20. **Getting the greenhouse gas savings of electric vehicles right:** The proposal for the revision of the Renewable Energy Directive (RED III) de facto compares electric vehicles that run on renewable electricity with ones that run on fossil-generated electricity. However, the real saving is the difference between the emissions caused by electric vehicles (through the electricity mix) and those caused by internal combustion vehicles for the same transport performance. This should be corrected.
21. **Aim for full climate neutrality:** Instruments in the transport sector should aim for full climate neutrality in 2050, not just a 90 percent reduction in emissions.
22. **More e-fuels in aviation:** The share of synthetic fuels in aviation should be set more ambitiously. One suggestion would be to adopt the values now in force in Germany as part of the implementation of RED II.
23. **Fuel rules in shipping also for fisheries:** The fisheries sector should be included in the scope of the Regulation on maritime fuels (*FuelEU Maritime*).

### 1.4 Pricing of energy and CO<sub>2</sub> in transport and social compensation

24. **Clarify the role of ETS II and RED III for the CO<sub>2</sub> price in transport:** The proposed RED III greenhouse gas quota in transport overlaps with the new emissions trading in the buildings and transport sector (ETS II), as both affect CO<sub>2</sub> emissions from road transport. The German government should push for greater clarity of what this means for the CO<sub>2</sub> price level compared to that in the German Fuel Emissions Trading Act (BEHG).

25. **Support the abolition of the diesel privilege:** The revision of the Energy Taxation Directive stipulates that for fuels with the same minimum tax rates per unit of energy, the tax rates actually levied must also be the same and that the ranking of fuels in taxation should remain unchanged. This means the end of the diesel privilege. It should be supported.
26. **Renegotiate the US-EU Open Skies Agreement:** The aim of this should be to enable the taxation of aviation fuel in the cargo flight sector within the EU. This should then be introduced as quickly as possible.
27. **Green light for the social climate fund:** The fund should be supported as proposed.

## 2 Guide through the EU package

**Keep an overview!** On 14 July 2021, the European Commission published the long-awaited so-called *Fit for 55* package of legislative proposals on climate policy. The name refers to the target of a 55 percent reduction in greenhouse gas emissions in the EU by 2030, compared to the 1990 baseline. This 55 percent target is a core element of the EU's strategy to become climate neutral by 2050. It is now laid down in the EU Climate Change Act that came into force on 29 July 2021. The target is significantly more ambitious than the 40 percent figure previously in place. Immediately after the package was announced, there was a plethora of reactions, assessments and brief analyses. Nevertheless, it remains a challenge to maintain an overview of the overall picture as a sizeable number of individual proposals will have an impact in the transport sector. The present text aims to contribute to such an overview from a transport perspective.

**A fireworks display of legal proposals.** The package of proposals presented in July is unprecedented in scope, with 14 legal proposals and three non-legal measures. It is the largest block so far of the initiatives announced by the Commission in December 2019 as part of the so-called EU Green Deal.

The July package was only the start of a negotiation process that is now underway. Each individual proposal is subject to the co-decision procedure and must ultimately be adopted jointly by the Council, i.e. the 27 Member States, and the European Parliament.<sup>1</sup> Major changes may still occur between now and then. It remains to be seen whether the package will really make the EU fit for the already adopted target of a 55 percent reduction in greenhouse gases in 2030, and for climate neutrality by 2050. The new German government that is now to be formed will play a key role in this.

**What is at stake: Specifically,** the following proposals and initiatives are of particular interest from a transport perspective:

- Passenger car limits and electrification:
  - Revision of the **CO<sub>2</sub> emission standards** for passenger cars and light commercial vehicles,
- Energy infrastructure in transport:
  - Revision of the **Alternative Fuels Infrastructure Directive** and conversion into a regulation (AFIR),
- Renewable energy in transport:
  - Revision of the **Renewable Energy Directive** (RED III),
  - Introduction of sustainable **fuels** in **aviation** (ReFuelEU Aviation),
  - Introduction of sustainable **fuels** in **maritime shipping** (FuelEU Maritime),
- Pricing of energy and CO<sub>2</sub> in transport and social compensation:
  - Revision of the **EU Emissions Trading Scheme** (EU ETS) to include **maritime shipping** and the creation of an additional emissions trading scheme for **buildings and transport**,
  - Revision of the **Energy Taxation Directive**,
  - Revision of the **aviation emissions trading scheme**,
  - Creation of a **social climate fund**.

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<sup>1</sup> One exception is the Energy Taxation Directive, which is adopted by the Council alone.

A number of other proposals are also relevant from a transport perspective:

- A strategic rollout plan to support the rapid deployment of alternative fuels infrastructure,
- Revision of the implementation of the international compensation scheme CORSIA (*Carbon Offsetting and Reduction Scheme for International Aviation*),
- Revision of the *Effort Sharing* Regulation (ESR) on setting binding national annual targets.

In addition, there are a number of other initiatives which are no less important for climate policy as a whole, but which have only a minor impact on the transport sector (see Annex).

**That is far from all.** In the Commission's Work Programme for 2021, published in October 2020, there are only twelve proposals under the entry *Fit for 55 package* (a term that appears there for the first time), with the difference in number partly due to regroupings and mergers. In addition, there are two measures that are planned for Q4 2021 and therefore not yet included in the July package: a revision of the Buildings Directive (this is also relevant to transport because of the requirements for a charging infrastructure in buildings) and a revision of the third energy package for gas.

Many more measures have been announced in the Commission's work programme for 2021, for example in the areas of the circular economy, biodiversity and sustainable and intelligent mobility. Of particular relevance to our topic is the development of post-Euro 6 emission standards for passenger cars and light commercial vehicles as well as for trucks (Euro 7, planned for the fourth quarter) and a revision of the regulation on the Trans-European Transport Network (TEN-T) in the third quarter. In 2022, a proposal for the revision of the CO<sub>2</sub> fleet limits for heavy duty vehicles will be added that is already foreseen in the existing legislation for that year and for which the preparation is currently in full swing in the Commission.

Such a wealth of proposals cannot be analysed exhaustively in the space available. Instead, the following report addresses individual priority issues in order to understand the impact of the package in their context. An overview of the main provisions in selected proposals is provided in the annex.

## 3 Key issues from a transport perspective

### 3.1 Passenger car limits and electrification

**Raising the target for 2030 does not yet go far enough.** A target path for the EU-wide fleet average of CO<sub>2</sub> emissions from newly registered passenger cars is already in force. From 2025, this target value will be reduced by 15 percent compared to the 2021 value and from 2030 by 37.5 percent compared to 2021. The Commission proposes to increase the reduction to 55 percent from 2030. For light-duty vehicles, a 50 percent reduction is proposed (now 31 percent). While this represents a significant tightening and is consistent with the increase in the EU-level climate target from 40 percent to 55 percent in 2030, it is not sufficient to meet the climate target in Germany, which already call for a 65 percent reduction in 2030 with a separate sector target of 85 million tonnes of CO<sub>2</sub> for transport.

**Recommendation 1:** The German government should advocate even more ambitious target values in the negotiations, also in view of the foreseeable end of combustion technology shortly thereafter. In Agora Verkehrswende's position paper, it was suggested that a reduction of up to 75 percent for passenger cars should be envisaged for the year 2030.<sup>2</sup>

**No more vehicles with internal combustion engines newly registered after 2035.** In 2035, the target value will be finally raised to a reduction of 100 percent compared to 2021 for both categories of vehicles, which is equivalent to a phase-out of the internal combustion engine for new sales. In view of the 2050 climate neutrality target at EU level, this end date must in no case be later than 2035 and should be earlier if possible.<sup>3</sup> By establishing this end date, the Commission is creating clarity for all stakeholders, which is very welcome in terms of planning and investment certainty in the industry. In particular, the ambition of some Member States to impose national bans on the new registration of internal combustion vehicles will thereby be replaced by a uniform EU-wide regulation, which would counteract further fragmentation of the EU vehicle market.

**Recommendation 2:** The phase-out of combustion technology in passenger cars and light commercial vehicles must be supported and the phase-out date of 2035 at EU level must not be delayed under any circumstances.

**Improvement before 2030 is not assured.** What the proposal does not contain is an increased CO<sub>2</sub> reduction target for 2025, which, according to the proposal, remains unchanged at 15 percent compared to 2021. And there is still no target path with interim targets from 2026 to 2029 and after 2030. Thus, the Commission proposal does not bring about any improvement before 2030 compared to the status quo. This raises the prospect that the traditional behaviour of manufacturers will be repeated that was also observed in the transition from 2019 to 2020, namely a sudden reduction in emissions and a sudden increase in the supply of zero-emission vehicles only at the

<sup>2</sup> <https://www.agora-verkehrswende.de/en/publications/notes-on-the-revision-of-the-eu-co2-emission-performance-standards-for-cars-and-light-commercial-vehicles/>

<sup>3</sup> For the German goal of achieving climate neutrality as early as 2045, a phase-out of combustion technology as early as 2032 seems essential. See <https://www.agora-verkehrswende.de/veroeffentlichungen/klimaneutrales-deutschland-2045-langfassung/>.

very last possible moment, in other words in 2030 itself. This unnecessarily delays technological progress, hampers the natural renewal cycle of the vehicle fleet and unnecessarily increases cumulative emissions up to 2030 and beyond. Moreover, the huge leap needed in 2030 increases the risk of missing the target in that year.

**Recommendation 3:** The fleet limit values for passenger cars and light commercial vehicles should be tightened already before 2030. This applies both to the target value for 2025 and to the introduction of target paths between the support years from 2026 onwards. If yearly targets are considered too difficult for the car industry, two-yearly steps are also conceivable, possibly flanked by flexibility measures such as banking (i.e. overachievement of the target value in one year can be counted towards the target of the following year). This is still better than not aiming for any improvement at all before 2030.

**Hardly any help for the German sector targets.** In this way some reduction potential is being given away, which is relevant not just with a view to the - annual - German sector targets in the transport sector, and this over the entire lifetime of the relevant vehicle cohorts. Nor does it take account of the even greater urgency of reducing emissions, as the latest IPCC report has clearly shown. Therefore, the proposal is insufficient in view of timing.

**Fuels will not count towards the fleet limit values.** The idea put forward by some stakeholders to make renewable fuels count towards the achievement of the fleet limit values has not been included in the Commission's proposal for good reasons. As stated in the proposal, this would blur the lines of responsibility of the different actors, undermine the effectiveness and efficiency of the legislation and increase the administrative burden and complexity.<sup>4</sup> The instrument is not necessary for the promotion of renewable fuels: as the Commission points out, renewable fuels are already promoted through the revisions of the Renewable Energy Directive, the Emissions Trading Scheme and the Energy Taxation Directive.

**Recommendation 4:** The Commission's approach of not allowing fuels to count towards the fleet limit values should be supported.

**An increase in emissions from combustion vehicles is not prevented.** Since electric vehicles are included in the calculation as zero-emission vehicles, the increasing electrification of the fleet means that the limit values - which apply on average to all vehicles sold by a manufacturer - increasingly lose their binding effect on internal combustion vehicles.<sup>5</sup>

**Recommendation 5:** It would make sense to prevent internal combustion vehicles from backsliding by setting separate limit values that apply only to these vehicles, so that at least the status quo can be maintained.<sup>6</sup>

4 For a detailed list of reasons see also chapter 6 in [https://www.agora-verkehrswende.de/fileadmin/Projekte/2021/Flottengrenzwerte/Agora-Verkehrswende\\_Notes\\_on\\_the\\_revision\\_of\\_the\\_EU\\_CO2\\_emission.pdf](https://www.agora-verkehrswende.de/fileadmin/Projekte/2021/Flottengrenzwerte/Agora-Verkehrswende_Notes_on_the_revision_of_the_EU_CO2_emission.pdf)

5 <https://www.agora-verkehrswende.de/en/blog/making-the-car-co2-standards-fit-for-the-electric-age/>

6 Chapter 5 in [https://www.agora-verkehrswende.de/fileadmin/Projekte/2021/Flottengrenzwerte/Agora-Verkehrswende\\_Notes\\_on\\_the\\_revision\\_of\\_the\\_EU\\_CO2\\_emission.pdf](https://www.agora-verkehrswende.de/fileadmin/Projekte/2021/Flottengrenzwerte/Agora-Verkehrswende_Notes_on_the_revision_of_the_EU_CO2_emission.pdf)



**Energy efficiency rules for electric vehicles are still missing.** With the one hundred percent target for 2035, the pathway towards electrification is finally clear. However, this means that ever larger shares of the vehicle fleet are moving into an unregulated area, because electric vehicles are not subject to any efficiency requirements. For the moment this is not yet a major problem because the need for acceptable ranges provides a strong motivation to use the limited battery capacity as efficiently as possible. However, as battery technology advances in terms of cost and performance, and the density of fast-charging infrastructure increases, the usual mechanism of the passenger car market will regain influence, i.e., competition through vehicle size and performance<sup>7</sup>, and hence resource consumption and energy inefficiency. In addition, there will be new energy consumers on board, not least as a result of the automation that is already on the horizon.

**Recommendation 6:** It is high time to reflect on appropriate efficiency regulation mechanisms - taking full account of all energy consumers on board - and to set the course for the next revision of the legislation. This should be triggered already now by an appropriate review clause.

**Unrealistic emission values continue to apply to plug-in hybrids (PHEVs).** For these vehicles, significantly higher emissions are measured in practical operation than the official test suggests. There is no need to wait for the notoriously slow preparatory work for an improved method to be completed before adjusting the test procedure.

**Recommendation 7:** In the short term, the so-called utility factors in the Worldwide harmonized Light vehicles Test Procedure (WLTP) can be halved, which is much closer to reality than the status quo, until a completely new test procedure based on systematic data can be established.

**The phasing out of special rules is proceeding slowly.** Increasing electrification is enabling the phasing out of a number of provisions that have so far complicated the regulation and also represent potential loopholes. For example, the so-called ZLEV factor that is provided for in the existing legislation from 2025, is due to expire at the end of 2029. This factor allows the weakening of the limit value as an incentive for the introduction of zero- or low-emission vehicles (ZLEV).

**Recommendation 8:** As electrification increases, the ZLEV factor loses its meaning, which is why it no longer seems necessary to activate it at all - and for only five years - from 2025. It would be simpler to delete it immediately.

The rules for manufacturers of less than 10,000 passenger cars or 22,000 commercial vehicles will also expire at the end of 2029 according to the proposal. What remains unchanged is that the possible special treatment of so-called niche manufacturers between 10,000 and 300,000 passenger cars will expire after 2028. There are still seven years to go until then.

**Recommendation 9:** Bearing in mind that this latter rule came about at the exclusive request of the former Member State, the United Kingdom (and is known among insiders as the "Jaguar Land Rover clause"), it seems obvious to use the present revision to delete this rule already now.

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<sup>7</sup> One example is the introduction of electric versions of GM's Hummer and soon Ford's F-150 pickup.



## 3.2 Energy infrastructure in transport

This is about the existing Alternative Fuels Infrastructure Directive (AFID). In general, the AFID requirements are minimum requirements that fall short of the German requirements in the *Schnellladegesetz* (Fast Charging Act), both in terms of coverage and the likely resulting number of charging points. Its key additional benefit is that it creates a minimum European charging network for trans-European travel.

**Recommendation 10:** The Federal Government should in principle support the revision of the AFID/the new design of the AFIR.

**Concrete minimum requirements for charging infrastructure.** The Commission's approach in the proposed Alternative Fuel Infrastructure Regulation (AFIR) departs significantly from the very cautious approach taken previously. Where previously Member States were only required to develop national strategic frameworks leading to the establishment of an "adequate" number of charging points, the Commission is now taking the reins by imposing detailed minimum requirements, both in terms of the density of charging stations to be achieved and their technical performance, and in terms of minimum standards of customer-friendliness and services to be offered. For more direct implementation, the legal form of a directive is being changed to that of a regulation.<sup>8</sup>

**New metric: charging power per vehicle.** The proposal focuses on the minimum available installed charging capacity per vehicle and no longer on the number of charging points. This is a meaningful innovation in light of the transition to high-capacity charging. For passenger cars, the Commission proposes an installed charging capacity for public charging infrastructure of at least one kilowatt per registered battery vehicle and 0.66 kilowatts per plug-in hybrid. Whether this is sufficient depends on what are considered acceptable waiting times at charging points. A simple calculation for battery vehicles illustrates this, using the parameters shown in Table 1.

Parameter zur Abschätzung der erforderlichen installierten Ladeleistung pro Pkw, die den Wert des Kommissionsvorschlags reproduzieren

Tabelle 1

durchschnittlicher realer Energieverbrauch eines Batterie-Pkw	20 kWh/100 km
durchschnittliche Jahresfahrleistung	14.000 km
Anteil an öffentlichem Laden	50 %
aktive Zeit, das heißt Stunden pro Tag, an denen der Großteil der Ladevorgänge stattfindet	16 h
durchschnittliche Auslastung eines Ladepunkts während der aktiven Zeit	25 %

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<sup>8</sup> Directives oblige Member States to create national legal instruments in their respective national legal systems, which takes time (typically 12 to 18 months, which is still regularly exceeded by laggard states) and can lead to inconsistent approaches across the EU. A regulation, on the other hand, is directly applicable.

These settings imply an average vehicle power of 0.32 kilowatts averaged over time. With the assumed proportions of public charging, proportion of the day during which charging actually takes place and average utilisation of the charging points, this results in an installed charging capacity of 0.96 kilowatts per battery vehicle. Thus, these assumptions roughly reproduce the value proposed by the Commission. However, caution is required here, as the result depends sensitively on the assumed utilisation rate (which enters the calculation inversely). Lower utilisation rates of the individual charging points imply a higher installed capacity per battery vehicle. In the ramp-up phase of electromobility, it may make sense to provide for higher installed capacities, at least initially, because the risk of the investments losing value (stranded assets) is low as the utilisation increases with the growing fleet.

**Recommendation 11:** The installed charging capacity could initially be higher than the Commission's proposed value of one kilowatt per BEV. A review should be carried out after a few years, which could then lower the value in the light of experience.

**Proportions of fast charging points in the public charging infrastructure:** The proposal leaves it up to the Member States to decide how much of the installed capacity should be provided by normal and by fast charging points. In the field of public charging infrastructure, however, a rethink has begun in recent years, away from the old idea of large numbers of slow chargers and towards a nationwide system of fast charging hubs along the lines of today's filling stations. From the requirements for the density of charging stations (see below), it seems that the Commission has in mind a share of at least 50 percent of fast chargers with 150 kilowatts, based on the installed capacity.

**Recommendation 12:** In order to ensure that this new orientation is also pursued in all Member States, it would make sense to explicitly define such minimum shares of fast chargers, not only on the TEN-T network but everywhere. This could also be more than half. The minimum capacity could also be higher than the proposed 150 kilowatts.

**No more counting charging points.** What does the proposed target mean for Germany? Below, we consider a fleet of 14.1 million electrified vehicles for 2030, with a split of about 9.2 million BEVs against 4.9 million PHEVs.<sup>9</sup> Then the total installed charging capacity in 2030 must be about 12.4 gigawatts. Assuming that two-thirds of this capacity is provided in the form of fast charging points with a rated power of 150 kilowatts and the remainder as normal charging points at 11 kilowatts each, this amounts to about 55,000 fast charging points and 376,000 normal charging points. If, on the other hand, one hundred percent of the publicly accessible charging points are designed as fast chargers with 300 kilowatts, 41,000 charging points would be sufficient for the total required charging capacity in 2030. Only an unrealistic extreme scenario with one hundred percent public slow charging points of eleven kilowatts each would require slightly more than one million (1,130,000) charging points, which would be in line with the national target of one million publicly

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<sup>9</sup> This is the number that emerged in the modelling for a climate-neutral Germany in 2045 (see <https://www.agora-verkehrswende.de/en/publications/towards-a-climate-neutral-germany-by-2045-summary/>). It is consistent with the forecast of the agency for charging infrastructure (Leitstelle Ladeinfrastruktur), which is based on confidential discussions with the automotive industry (14.8 million, see [https://www.now-gmbh.de/wp-content/uploads/2020/11/Studie\\_Ladeinfrastruktur-nach-2025-2.pdf](https://www.now-gmbh.de/wp-content/uploads/2020/11/Studie_Ladeinfrastruktur-nach-2025-2.pdf)), and corresponds to the upper end of the range mentioned by working group 1 of the National Platform on the Future of Mobility (NPM) (14 million).

accessible charging points. Nevertheless, given the 6,750 fast charging points and just under 40,000 normal charging points installed today<sup>10</sup>, accelerated further development of the charging infrastructure is essential.

**Data availability and pre-booking of charging points:** As already explained, the necessary charging power per car depends directly on the utilisation of the charging points. Therefore, in order to reduce the overall cost of building charging infrastructure, one goal must be to improve the actual utilisation rate. To this end, and also to make the charging experience in general as customer-friendly as possible, certain data must be publicly available free of charge so that this information can find its way into apps and navigation systems. The AFIR proposal provides a good basis here (with Art. 18). However, to ensure the possibility of advance bookings, it should be ensured that the occupancy data is made available for a certain time in advance. How long this should be (for example six hours) is a matter for discussion.

**Recommendation 13:** At a minimum, data on the occupancy status over a minimum period of time from the time of the request, on the functionality and the available capacity of all charging points, as well as the price for ad hoc charging, must be publicly available free of charge.

**Minimum density for charging infrastructure.** According to the proposal, car charging stations must be installed at least every 60 kilometres on the TEN-T network. On the core network of the most important road connections<sup>11</sup>, at least 300 kilowatts of installed capacity per station are required by the end of 2025, including at least one charging point with 150 kilowatts. By the end of 2030, the installed capacity will double to 600 kilowatts, with at least two charging points of 150 kilowatts each. The same applies on the overall TEN-T network, but five years later. A similar approach is taken for trucks: charging stations must be installed at least every 60 kilometres on the core network, with at least 1,400 kilowatts and at least one charging point with at least 350 kilowatts by the end of 2025, and at least 3,500 kilowatts in total and at least two charging points with at least 350 kilowatts by the end of 2030. The same applies again on the overall network, five years later, but with minimum distances of 100 kilometres.

<sup>10</sup> Publicly accessible charging points, as of 1 August 2021. Source: [https://www.bundesnetzagentur.de/DE/Sachgebiete/ElektrizitaetundGas/Unternehmen\\_Institutionen/E-Mobilitaet/ZahlenDaten/start.html](https://www.bundesnetzagentur.de/DE/Sachgebiete/ElektrizitaetundGas/Unternehmen_Institutionen/E-Mobilitaet/ZahlenDaten/start.html)

<sup>11</sup> Maps of the TEN-T networks can be found here: <https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/site/en/maps.html>

Mindestanforderungen an die Dichte und die installierte Leistung der Lade- und Wasserstoffinfrastruktur auf dem TEN-T-Netz. core = Kernnetz, compr = Gesamtnetz, EV = Elektrofahrzeuge, H2 = Wasserstoff.

Tabelle 2

	EV								H2 <sup>(a)</sup>
	Pkw und leichte Nfz				Lkw				core & compr
	core		compr		core		compr		
Jahr	2025	2030	2030	2035	2025	2030	2030	2035	2030
max. Abstand (km)	60	60	60	60	60	60	100	100	150
min. Leistung (kW)	300	600	300	600	1400	3500	1400	3500	2.777 <sup>(b)</sup>
min. Hochleistungs-Ladepunkte (kW)	1 x 150	2 x 150	1 x 150	2 x 150	1 x 350	2 x 350	1 x 350	2 x 350	
min. H2-Angebot (t/d)									2

(a) Nicht alle Anforderungen für Wasserstoff-Tankstellen sind angeführt

(b) Aus dem Wasserstoffangebot berechnet mit dem Heizwert von 120 Megajoule pro Kilogramm für H<sub>2</sub>

Agora Verkehrswende auf Basis von Europäische Kommission (KOM(2021) 559).

It is noticeable that only about half of the required capacity is required to be in the form of fast chargers along the TEN-T network. This is difficult to understand, because hardly anyone will be prepared to charge for hours on expressways.

**Recommendation 14:** The charging points along the TEN-T network should all be fast chargers. Given the growth in the typical power of fast charging points, minimum powers of more than 150 kilowatts could also be envisaged for the charging points.

**Sparse minimum charging densities for cars on the TEN-T network.** Are the required charging densities high or low? This is investigated below for passenger car charging stations in 2030, for which a minimum power of 600 kilowatts must be achieved on the core network, at a maximum distance of 60 kilometres. With the optimistic assumption that an electric car in motorway traffic uses an average power of 20 kilowatts in real terms, this station can supply 30 passenger cars with electricity, spread over 60 kilometres. This means that, on average, there may only be one electric vehicle every two kilometers.<sup>12</sup> This may be sufficient for the more relaxed traffic situations. It becomes difficult at rush hour. Given the proportions of electric cars in the existing fleet that will be required for 2030 (a quarter to a third), this charging station would obviously be overwhelmed by heavy traffic (30 to 50 cars per kilometre, so about 15 to 30 e-vehicles every two kilometres). This is not to say that this law must immediately force a charging density that can cover the traditional peak summer travel season, because it will be many years before electric vehicles fully penetrate the market. Nonetheless, this proposal is obviously just a first step. Over the coming years, significant increases in the required installed capacity can be expected in areas with high traffic volumes.

**Recommendation 15:** It is essential (and planned by the Commission) to carry out a reality check and, if necessary, an adjustment after a few years. In particular, this should take account of traffic densities, which vary widely in different parts of the EU.

<sup>12</sup> Assuming that the charging infrastructure is fully utilised. In the case of partial utilisation, the effective average distance increases accordingly.

**Another comparison for Germany.** The motorway network in Germany has a length of 13,000 kilometres. With a distance of 60 kilometres and a single fast charging point per charging station, as required by 2025, only 217 charging stations and the same number of fast charging points would be required in Germany at that time. By 2030, there would then be twice as many charging points, i.e. 434. However, in August 2021 the agency for charging infrastructure (Leitstelle Ladeinfrastruktur) already launched a call for tenders to implement 1,000 fast-charging stations, each with 4 to 16 charging points of at least 150 kilowatts capacity. Around 200 of these stations are to be built along federal motorways. In addition to the 6,750 fast charging points already in place (not all of which are along motorways), that makes about 800 to 3,200 more fast charging points along motorways. So the proposed density of charging points in the AFIR is a minimum standard that should apply everywhere, even in the most remote provinces of the EU. Germany, on the other hand, can and should go well beyond this standard and is doing so. In the context of the discussion about the fast-charging law, the aim is to have a fast-charging station every ten minutes or so,<sup>13</sup> which at current average speeds on German motorways corresponds to a distance of around 20 kilometres between charging stations. Once again, it becomes clear that in the densely populated heartland, the expansion must be much more ambitious than in the area-wide AFIR proposal.

**Forward planning not mandatory.** The Commission's proposal sensibly relates the charging capacity required at a given point in time to the number of electric vehicles registered at that time. This requires advance planning on the part of the Member States, as the development of charging infrastructure takes time - for planning, siting, authorisation processes and the actual deployment, including grid connection. The proposal does require Member States to develop national framework plans to be reported to the Commission, which must also take into account current and future expected market developments.

**Recommendation 16:** Nevertheless, it would be desirable to explicitly require an element of forward planning in order to ensure that all Member States actually start the necessary preparatory work in good time so that they can actually achieve the necessary minimum loading capacity at the appropriate time.

**Trucks: Similar vehicle density to passenger cars.** Assuming an electrical energy consumption of articulated lorries of 120 to 160 kilowatt-hours per 100 kilometres in motorway operation, the proposed minimum charging density on the core network from 2025 onwards can on average provide sufficient energy for one articulated lorry approximately every five to six kilometres. From 2030, the average distance would then be around two to 2.5 kilometres. This would be comparable to the situation with passenger cars, see above. Since the existing fleet of trucks is significantly smaller than that of passenger cars,<sup>14</sup> a much higher proportion can be supplied with electrical energy than is the case with passenger cars.

<sup>13</sup> BMVI (2021): Press release - 087/2021, Germany network: Scheuer presents 1,000 locations for fast charging stations and pricing model.

<sup>14</sup> By about an order of magnitude. In 2018, there were just under 237 million passenger cars and light commercial vehicles registered in the EU, compared to around 35 million goods vehicles of all types. Source: EU Transport in Figures 2020.

**Trucks: Parallel development of the complete electric and hydrogen infrastructure would be risky.**

As is well known, the decision-making process for a specific drive technology for trucks is not yet as far advanced as for passenger cars, even though the scales are tipping more and more in favor of battery-electric trucks.<sup>15</sup> For reasons of efficiency and cost, these will prevail in local and regional transport. A certain proportion of battery-electric trucks in long-distance transport is therefore foreseeable. As the fuel cell trucks for long-distance transport announced by the manufacturers will only be available with a delay of several years, it is unclear how large the share of these vehicles in heavy-duty long-distance transport will be. In this situation, the proposal sets minimum requirements not only for electric charging stations but also for hydrogen refuelling stations, in both cases for the whole EU. By the end of 2030, publicly accessible hydrogen refuelling stations should be available at least every 150 kilometres on the TEN-T core network and the overall network, with a minimum capacity of two tonnes per day and at least a 700-bar connection. Liquid hydrogen must be offered every 450 kilometres. In terms of distance, the value of two tonnes of hydrogen per day every 150 kilometres is equivalent to about 19 kilowatts per kilometre, compared to 58 kilowatt hours per kilometre in 2030 for truck charging points. However, due to the lower efficiency of fuel cell propulsion, hydrogen can only power about half as many trucks as the same amount of electrical energy, so the implied truck traffic for electric trucks is about six times greater than for hydrogen trucks.

It makes sense to establish a minimum infrastructure for battery trucks along the TEN-T core network already today. At the same time, however, it seems imprudent to require a minimum infrastructure for fuel cell trucks today, as it could become obsolete again after just a few years. It increases the risk that the investments will become worthless (stranded assets). For this reason, Agora Verkehrswende has advocated the rapid realisation of a limited number of innovation corridors,<sup>16</sup> with a length of 300 to 500 kilometres, on which each technology is used under real conditions. After a few years, there would then be a decision point based on the experience gained, followed by proactive development of only one energy infrastructure, a reduced selection of charging or refuelling technologies, or regionally specific solutions, depending on the outcome. The German ministry for transport and infrastructure (BMVI) follows a comparable approach with the concept of innovation clusters.<sup>17</sup>

**Recommendation 17:** The approach should also be taken at EU level that electric charging infrastructure for trucks is being built up already now, while hydrogen and catenary trucks still need to prove themselves in practical innovation corridors before a final decision is taken for these infrastructures.

**Hydrogen for passenger cars - for which ones?** According to the proposal, the hydrogen filling stations must be able to supply not only trucks, but also passenger cars and light commercial vehicles. This seems unnecessary, because the decision of the car manufacturers is now clearly in the

15 For example, at the end of August, an electric 19-tonne truck already in everyday use covered a distance of 1,099 kilometres on a single charge, albeit under near-optimal conditions and without being loaded. See also <https://theicct.org/publications/eu-tractor-trailers-analysis-aug21>

16 [https://www.agora-verkehrswende.de/fileadmin/Projekte/2021/Regierungsprogramm\\_RPVW/65\\_RPVW.pdf](https://www.agora-verkehrswende.de/fileadmin/Projekte/2021/Regierungsprogramm_RPVW/65_RPVW.pdf);  
<https://www.agora-verkehrswende.de/en/publications/dual-benefit-stimulus-for-germany/>

17 <https://www.bmvi.de/SharedDocs/DE/Pressemitteilungen/2021/104-scheuer-innovationscluster-strassen-nutzverkehr.html>



direction of battery vehicles.<sup>18</sup> There are currently hardly any fuel cell passenger cars, and hardly any new models have been announced for the coming years. Given the huge challenge of making electrification a success, resources should not be diverted to pave the way for a theoretical solution that has very little chance of success.

**Recommendation 18:** The requirement that hydrogen refuelling stations be suitable for passenger cars should be removed from the Regulation.

**Natural gas has no place in a climate-neutral transport system**, and should no longer be supported on the way there. The Commission seems to share this view, at least as far as road transport is concerned, where support for this fuel is extremely curt and unenthusiastic: By 2025, according to the proposal, an "adequate" number of Liquefied Natural Gas (LNG) pumps should be installed, at least along the core TEN-T network. LNG trucks should be able to circulate throughout the EU, but only where there is demand for them. In addition, the costs must be proportional to the benefits, including environmental benefits. Apparently, the intention was to avoid trouble with the proponents of this technology, and so no direct deletion was made. It would, however, be appropriate to do so in the co-decision procedure.

The argument that one could drive with climate-friendly biogas does not hold water. Many biogas plants are not connected to the natural gas grid, and if they are, it is not where the gas is needed for filling stations. Biogas can therefore only find its way into the transport sector virtually by certificate and needs a fossil natural gas network to do so, which is not compatible with a climate-neutral future. In addition, biogas is also of increasing interest as a raw material for industry<sup>19</sup> and would not be optimally used in transport, not least because of the need for an additional technology and infrastructure pathway.

**Recommendation 19:** Natural gas should be removed from the scope of the Alternative Fuel Infrastructure Regulation, at least for road transport.

**Liquefied natural gas (LNG) in shipping** is not commented on further here. For an assessment of this fossil propulsion technology, readers are referred to publications by ICCT<sup>20</sup> and T&E<sup>21</sup>, which show that this form of energy offers no significant climate benefits compared with conventional heavy fuel oil and is in any case incompatible with a climate-neutral transport system.

### 3.3 Renewable energy in transport

Here, the existing Renewable Energy Directive which has already been adapted once (and which is therefore known as RED II), is being revised. The proposal is therefore referred to below as RED III,

<sup>18</sup> see, for example, the splitting of the Daimler Group into a division for passenger cars and light commercial vehicles, and a separate division for heavy commercial vehicles. Only the truck division is to continue developing electric and hydrogen technologies in parallel.

<sup>19</sup> <https://www.agora-verkehrswende.de/en/publications/towards-a-climate-neutral-germany-executive-summary/>

<sup>20</sup> The climate implications of using LNG as a marine fuel. <https://theicct.org/publications/climate-impacts-LNG-marine-fuel-2020>

<sup>21</sup> LNG as a marine fuel in the EU. <https://www.transportenvironment.org/discover/lng-marine-fuel-eu/>

even though it is not yet in force. This directive covers all sectors of the economy. The following comments concern only one of them, transport.

**The greenhouse gas intensity reduction now becomes standard.** The main objective of the RED III in the transport sector is now formulated in terms of a percentage reduction in the greenhouse gas intensity of the energy used<sup>22</sup>. The target is 13 percent by 2030, with no interim targets set for the period up to that point. By way of comparison: Germany is the only EU country already making use of the greenhouse gas intensity (GHG) metric in implementing the RED. This, in the form of an amendment to the Federal Immission Control Act passed only this year, provides for an increase in the GHG intensity target from today's 6 percent to 10 percent by 2026 and then a rapid increase to 14.5 percent in 2028 and 22 percent in 2030. This means that by 2027 at the latest, the proposed RED III target would already have been achieved in Germany.

**The actual target is 9.5 percent.** As before, the transport target needs some interpretation. The contribution of fuels from food and feed crops is limited to the 2020 value plus one percent, and a maximum of seven percent (energy share). Member States are free to set lower limits for these fuels, up to and including their complete elimination. If they do so, they can also reduce the overall target accordingly, with a GHG saving of 50 percent for these fuels. Therefore, the actual binding minimum target of the RED III proposal is to achieve a GHG reduction in the transport sector of at least 9.5 percent (= 13 percent - 7 percent x 50 percent) through advanced biofuels and biogas, e-fuels and renewable electricity.

**(Almost) No more multipliers; but still a flawed calculation for electricity.** The established RED II rewards the use of certain fuels in road transport with multipliers, which means that for the purposes of implementing the directive it is possible to pretend that more of these fuels have been placed on the market than is actually the case. These multipliers have been removed from the proposal for good reasons,<sup>23</sup> although the multiplier of 1.2 is retained for aviation and maritime transport. Renewable electricity is a special case among the multipliers. This is where the current multiplier is most justifiable (even though at a value of 4 it is rather high). This is because the existing scheme targets energy shares. The superior efficiency of electric propulsion paradoxically works to its disadvantage in this context: internal combustion engines require about 2.5 times more energy than electric engines, which is why renewable fuels have a greater impact by the same factor than renewable electricity for the same mileage. A multiplier that takes into account the difference in efficiency of the technologies offsets this effect.

In the new GHG reduction metric, things are different. Here, there would no longer be a need for a multiplier if the calculation of GHG savings for electric vehicles were performed in the way that corresponds to the factual logic: namely, the difference between (i) the emissions that the electric cars actually cause in a year with the prevailing electricity mix and (ii) the emissions of the combustion vehicles that would otherwise have done the same mileage. But this is not how the new proposal calculates. Instead, it calculates the GHG savings of e-vehicles as the amount of renewable electricity used in road transport multiplied by the fossil fuel comparator for the GHG emissions

<sup>22</sup> This is how it has been in the Fuel Quality Directive up to now. There, the provision for this is deleted.

<sup>23</sup> They lead to distorted perceptions of the real situation and weaken the primary objective of legislation with the purpose of promoting a secondary objective.



of electricity, as it is already laid down in the Directive's Annex.<sup>24</sup> In other words, e-cars that run on renewable electricity (zero emissions) are being compared to e-cars that run on fossil electricity. This has nothing to do with the actual savings that an e-car achieves as compared to a fossil fuel combustion car. It's hard to see what sense such a calculation would make. For example, inefficiency would be rewarded in this way: the more electricity an e-car uses, the higher the GHG savings calculated according to the proposal.

In addition, the fossil fuel comparator for electricity at 183 grams per megajoule (almost 659 grams per kilowatt hour) is roughly equivalent to an older gas-fired power plant. However, the electricity mix was only 350 grams per kilowatt hour even in Germany in 2019 and 255 grams per kilowatt hour for the EU-27.<sup>25</sup>

As it happens, the overestimated comparative value for electricity partially compensates for the inappropriate calculation method, sometimes more, sometimes less, depending on the assumed share of electrification.

**Recommendation 20:** A correction of the calculation methodology is recommended. The saving should be given by the difference between (i) the emissions that the electric cars actually cause in a year with the prevailing electricity mix and (ii) the emissions of the combustion vehicles that would otherwise have done the same mileage.

**Minimum energy percentages for advanced biofuels and e-fuels.** Although the proposal has moved away from minimum energy percentages in its objective for transport as a whole, it still requires them for certain fuels. This is the case for advanced biofuels (still defined in Annex IX, Part A), for which the minimum percentage of final energy increases from 0.2 percent in 2022 to 0.5 percent in 2025 and 2.2 percent in 2030. A new requirement is a minimum share of renewable fuels of non-biological origin (RFNBOs, which in practice are e-fuels). It amounts to 2.6 percent in 2030.

The percentages here refer to the entire transport sector, which is not further defined. Thus, international air and sea transport are implicitly included in the total energy.

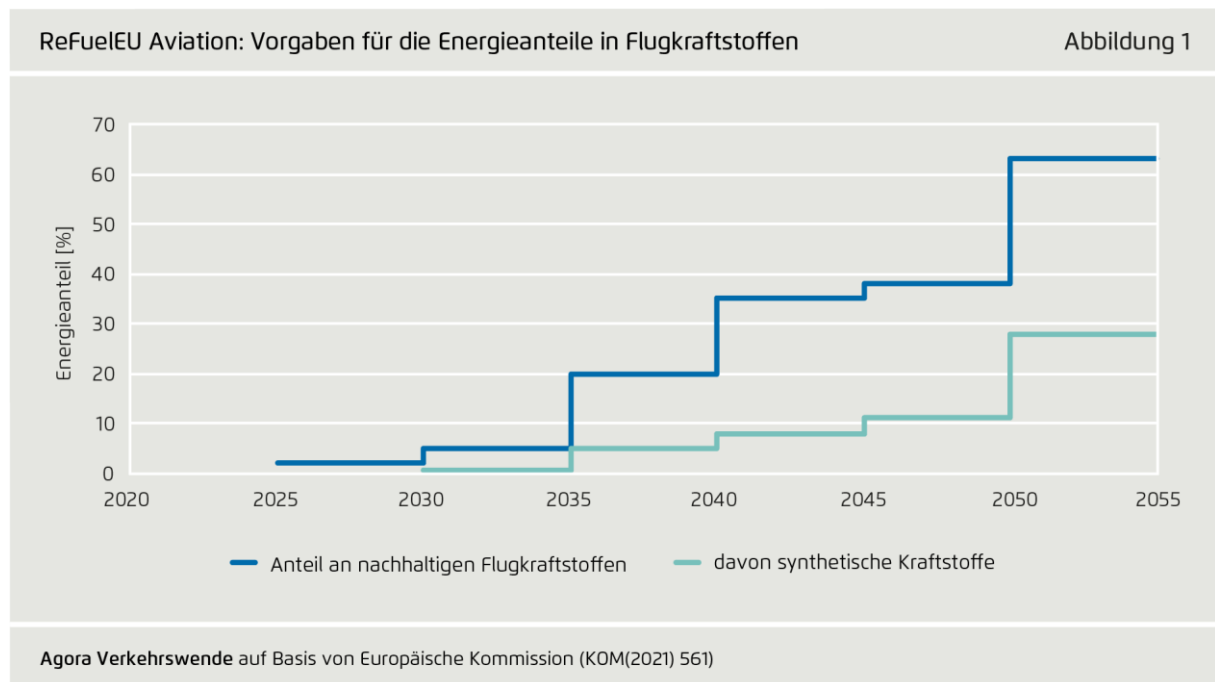
**Minimum energy shares are also required in air transport.** In parallel to the RED III proposal, there are two proposals for international air and maritime transport. In the so-called ReFuelEU Aviation proposal, minimum shares for energy content are set for air transport as follows: In 2025, at least two percent of aviation fuels sold in the EU must be sustainable aviation fuels. This includes advanced biofuels according to the definitions of RED II<sup>26</sup> as well as synthetic fuels based on renewable energies (RFNBOs). The minimum share of these fuels increases to 5 percent in 2030 and then jumps to 20 percent in 2035 and 35 percent in 2040. This initial growth phase is largely provided by biofuels. From 2040 onwards there is a pause in biofuels. Only at the very end is there a huge leap to 63 percent in 2050, most of which comes from a sudden increase in RFNBOs, but also from a further expansion of biofuels. As for synthetic fuels, they only start in 2030 with a rather

<sup>24</sup> This value,  $EC_{(e)}$ , is defined in Annex V, paragraph 19 of the Directive.

<sup>25</sup> European Environment Agency: Greenhouse gas emission intensity of electricity generation. Retrieved 3.9.2021

<sup>26</sup> for the initiated: Annex IX Part A and Part B

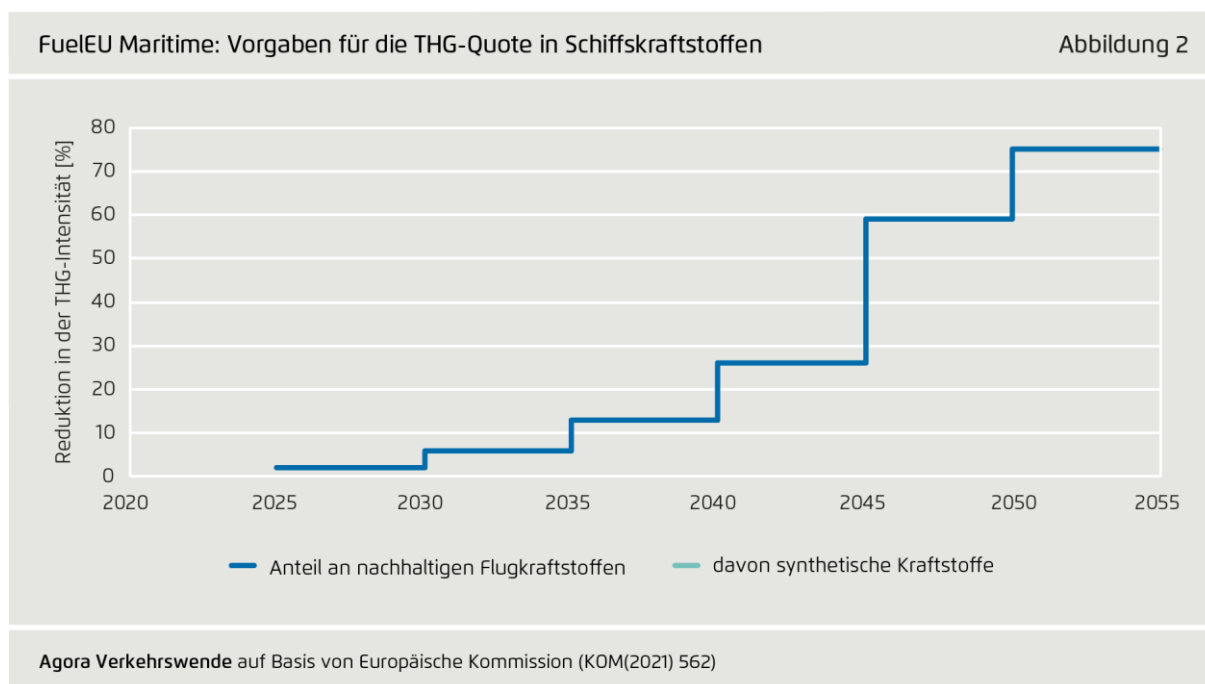
symbolic minimum share of 0.7 percent, which then reaches a moderate 5 percent from 2035. After two further intermediate stages, the figure jumps from 11 percent to 28 percent in 2050. Apparently there is sufficient trust in the technical progress that would enable a huge increase in a very short time, based on the experience of 20 years of moderate production. There are still 30 years to go until then, and likely several adjustments to the legislation – it is difficult to imagine that it will actually happen just like this.



**For ships, the GHG metric applies.** The FuelEU Maritime proposal, like the overall transport target of RED III, is formulated in terms of reductions in the GHG intensity. From 2025, these are to be at least 2 percent (measured in grams of  $\text{CO}_2$  equivalent per megajoule), then 6 percent in 2030, and then progressively increasing to 75 percent in 2050. Here, too, sustainable biofuels and synthetic fuels can be counted towards the proof of emission reduction in accordance with RED II, but not biofuels from food and feed crops.

These values must be achieved for 100 per cent of the energy consumed in port and on voyages within the EU. For journeys to or from destinations outside the EU, they apply to 50 per cent of the energy consumed. Anyone who remembers similar proposals from the early days of emissions trading in the aviation sector and the international friction they caused can only wish us all luck with this regulation (see also below on the subject of the ETS).

In addition, for container ships and passenger ships, from 2030 the entire energy consumption during a port stay must be covered by shore-side electricity.



**Aviation and maritime transport: those who crawl at a snail's pace need staying power.** It is striking that the time horizon of RED III does not extend beyond 2030, while the two instruments aimed at international bunker fuels already set targets up to 2050. In 2030, almost nothing is happening in these two fields, which unfortunately seems realistic in view of the slow progress to date, but is nevertheless completely inadequate given the urgency of the climate crisis.

**Why only 90 percent reduction for transport in 2050?** It is noticeable here that the Commission generally assumes that the transport sector will not be made completely climate neutral and that a residual amount of emissions will have to be compensated for by negative emissions. For example, the Commission's Climate Target Plan<sup>27</sup> of September 2020 only assumes a roughly 90 percent reduction in total transport emissions in 2050. The Commission's December 2020 Mobility Strategy also targets this figure.<sup>28</sup> However, the remaining emissions increase the pressure on the negative emissions then required to achieve the goal of climate neutrality.

**Recommendation 21:** The EU should think beyond the limitation to a 90 per cent target and analyse a 100 per cent target of climate neutrality also within the transport sector, and aim to achieve it as far as possible.

**How much energy is all this, roughly?** There are three parallel regulations in total, so it is instructive to compare the amounts of energy brought into circulation as a result. For simplicity, no further growth of the transport sector is assumed in the following consideration, even though that is highly likely; since only orders of magnitude are at stake here, the latest available figures for 2018 are used in a static approach. The resulting indicative values are summarised in Table 3 and in Figure 3.

<sup>27</sup> COM(2020) 562.

<sup>28</sup> Sustainable and Smart Mobility Strategy / putting European transport on track for the Future. COM(2020) 789.

Energetische Größenordnungen in Petajoule  
(es wird kein Wachstum nach 2018 einberechnet)

Tabelle 3

		EU-27	Deutschland
<b>2018</b>	gesamter Verkehrssektor 2018 <sup>(a)</sup>	15.533	2.775
	Straßenverkehr	11.208	2.215
	Luftverkehr gesamt	1.980	425
	Schifffahrt: internationale Bunkertreibstoffe <sup>(b)</sup>	1.813	71
<b>2030<sup>(c)</sup></b>	RED III: fortschrittliche Biokraftstoffe	342	61
	RED III: RFNBO	404	72
	ReFuelEU Aviation: nachhaltige Flugkraftstoffe	99	21
	ReFuelEU Aviation: synthetische Flugkraftstoffe	14	3
	FuelEU Maritime: nachhaltige Kraftstoffe <sup>(d)</sup>	155	6
<b>2050<sup>(e)</sup></b>	ReFuelEU Aviation: nachhaltige Flugkraftstoffe	1.248	268
	ReFuelEU Aviation: synthetische Flugkraftstoffe	554	119
	FuelEU Maritime: nachhaltige Kraftstoffe <sup>(e)</sup>	1813	71

(a) einschließlich internationaler Luft- und Seefahrt

(b) Anstatt 50 Prozent der ein- und auslaufenden Fahrten werden 100 Prozent der auslaufenden Fahrten beziehungsweise näherungsweise 100 Prozent der vertankten Kraftstoffe angesetzt.

(c) Die Werte für 2030 und 2050 dienen nur der Illustration, sie wurden mit den Prozentsätzen, die in den Kommissionsvorschlägen genannt sind, auf Basis der Energieverbräuche von 2018 berechnet.

(d) Unter Ausklammerung von LNG und der Annahme einer THG-Minderung von 70%, und unter Ausklammerung der Binnenschifffahrt. Es wird also angenommen, dass die THG-Minderung ausschließlich durch fortschrittliche Biokraftstoffe zustande kommt.

(e) Mit der Annahme einer 70-prozentigen THG-Minderung bei den nachhaltigen Kraftstoffen lässt sich das Ziel von 75 Prozent für die gesamte THG-Minderung gar nicht darstellen. Hier wird daher die Annahme von 100 Prozent nachhaltigen Kraftstoffen mit einer THG-Minderung von 75 Prozent getroffen (auch wenn dies im Jahr 2050 kaum mehr als nachhaltig gelten dürfte)

Agora Verkehrswende auf Basis von EU Transport in Figures 2020, Verkehr in Zahlen 2020, teilweise Schätzungen auf Basis dieser beiden Quellen.

**E-fuels in 2030: mainly hydrogen on the road.** While the 2.6 percent of RFNBO mentioned in RED III implies a consumption of 72 petajoules in Germany, the unambitious 0.7 percent from 2030 in the aviation sector - calculated only for this sector - amounts to only three petajoules, i.e. less than an entire large-scale plant.<sup>29</sup> By comparison, as part of the implementation of RED II, the German government is already mandating a minimum of 0.5 percent RFNBO in aviation from 2026, rising to 1 percent in 2028 and 2 percent from 2030.

**Recommendation 22:** The proportion of RFNBO in aviation fuels should be set higher for the EU, for example at the level now in force in Germany.

Maritime transport, assuming that sustainable fuels consist entirely of advanced biofuels, will come to about six petajoules of sustainable fuels.<sup>30</sup> The 69 petajoules on the road are mostly hydrogen - there is little sign of liquid e-fuels in the Commission's projections in 2030.<sup>31</sup> Similar ratios can be expected for the EU as a whole.

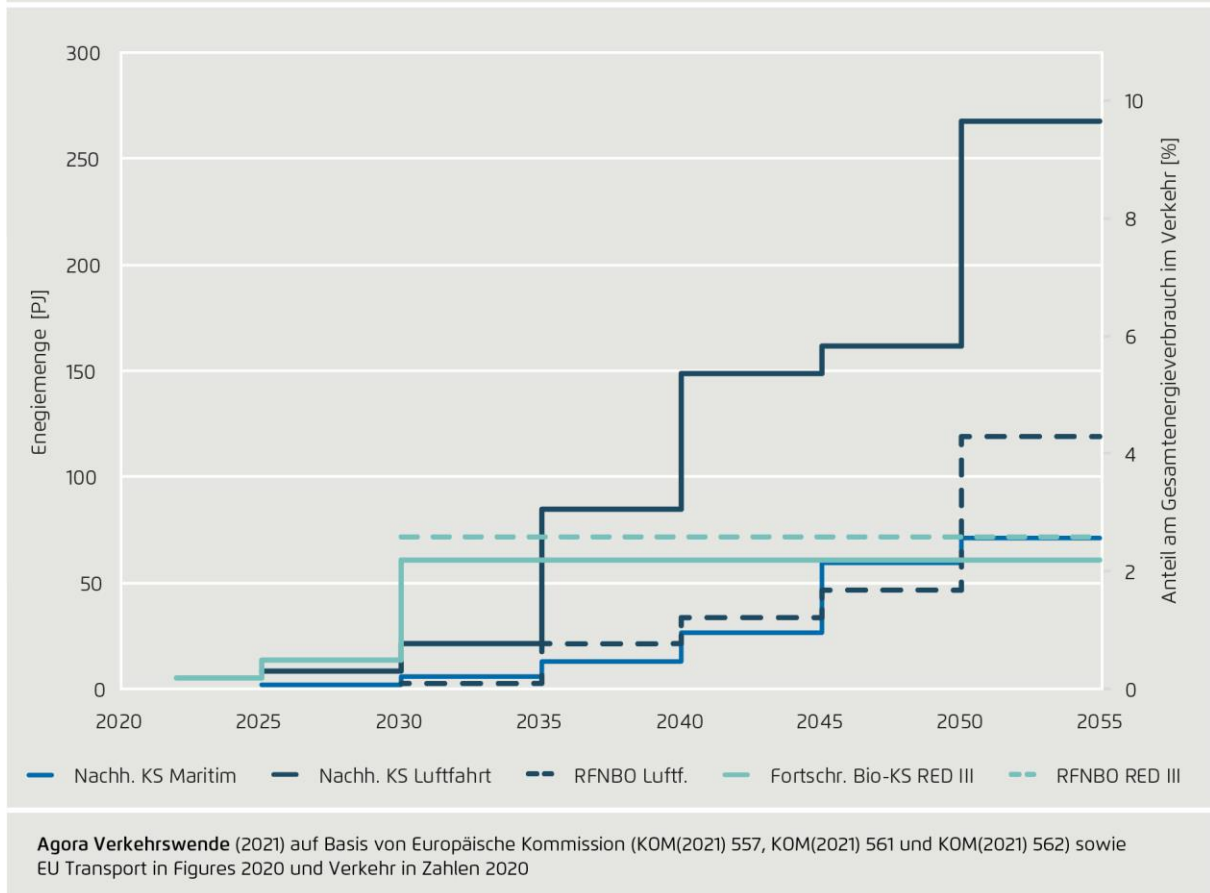
<sup>29</sup> A large-scale PtL plant is expected to produce 100,000 tonnes per year, or four petajoules of energy.

<sup>30</sup> cf. the modelled composition of the shipping fleet in the impact assessment of the Commission proposal, Tab.10

<sup>31</sup> Impact assessment for the RED III proposal, Fig.5

Energetische Größenordnungen in Deutschland als Folge der Kommissionsvorschläge.  
Es wird kein Wachstum nach 2018 einberechnet. Siehe Text für Erläuterungen.

Abbildung 3



**E-fuels in 2050: much more aviation fuel ... but far from a hundred percent.** In fact, even in 30 years, the proposal calls for just over a quarter of aviation fuels to be in the form of RFNBOs. Add to that an unknown proportion of marine fuels. Whether the rest can really be raised in the form of advanced biofuels (and electricity in shipping) seems questionable.

**Sustainable biofuels: a drop in the ocean.** The limited nature of feedstocks for sustainable biofuels is reflected in the RED III target of 61 petajoules in Germany for 2030 - less than for e-fuels. Twenty-four petajoules of that goes to bunker fuels alone.<sup>32</sup> For road transport (total consumption: 2,215 petajoules), the direction is clear: there is no way around electrification. Liquid fuels for the existing fleet would be desirable, but they are nowhere near sufficient for the order of magnitude of emission reductions that must now be achieved.

**Special treatment for fisheries:** Fishing vessels are excluded from the scope of the FuelEU Maritime scheme, which is difficult to understand. After all, this is a sector fully subject to EU legislation and dependent on significant EU subsidies.<sup>33</sup> Add to this the fact that fisheries are also fully

<sup>32</sup> Or, if the maritime industry initially goes exclusively down the LNG path, 18 petajoules for aviation.

<sup>33</sup> Over the period 2014-2020, this amounted to €6.4 billion. See [https://ec.europa.eu/oceans-and-fisheries/funding/european-maritime-and-fisheries-fund-emff\\_en](https://ec.europa.eu/oceans-and-fisheries/funding/european-maritime-and-fisheries-fund-emff_en)

covered by the Energy Taxation Directive. The impact assessment there points to the massive public opposition to exempting the sector from energy taxation.

**Recommendation 23:** The fisheries sector should be included in the scope of the Regulation on maritime fuels (FuelEU Maritime).

### 3.4 Pricing of energy and CO<sub>2</sub> in transport, and social compensation

The adjustment of the existing emissions trading system (EU ETS), which extends far beyond the transport sector, cannot be described here in all its aspects. It is worth mentioning, however, that the linear reduction factor that determines the amount of new allowances placed on the market will be raised to 4.2 percent per year. At the same time, the emissions cap will be reduced by a one-time cut in such a way that a level is reached as if the new reduction factor had already been applied since 2021. Overall, this leads to an emission reduction of the sectors included in the ETS of 61 percent in 2030 compared to 2005.

**What ETS prices can be expected as a result of this proposal?** As the Commission stresses in the impact assessment of the ETS proposal, it is not possible to make a precise projection because of the many influencing factors. It therefore does not provide very detailed information, but nevertheless gives concrete figures in several places, although not always the same ones. The key scenario assumptions<sup>34</sup> tend towards an average price for the existing ETS of €45 per tonne from 2021 to 2025 and €55 per tonne for 2026 to 2030, with an average of €50 per tonne over the whole period. The underlying assumptions are considered in detail elsewhere:<sup>35</sup> the prices for EU Allowances increase from 42 euros per tonne in 2021 to 60 euros per tonne in 2030, and prices between 45 euros per tonne and 70 euros per tonne were modelled in the analysis of the different scenarios, with the price in 2030 itself reaching values of 50 to 85 euros per tonne.<sup>36</sup> In the base case scenario, the analyses of the market stability reserve calculate a price that rises steadily from around 30 euros per tonne today to almost 70 euros per tonne in 2030.<sup>37</sup>

**Comparable prices in the new ETS II for transport and buildings.** In parallel to the revision of the existing EU ETS, a separate trading scheme will be established specifically for the transport and buildings sectors. A comparison of prices in these two systems shows that they are expected to be comparable in the central policy mix,<sup>38</sup> namely 35 euros per tonne in 2025 and 48 euros per tonne in 2030. Comparable prices are therefore assumed in the two systems. The assumption of 48 euros per tonne also underlies the figure<sup>39</sup> illustrating the impact of the ETS on fuel prices.

<sup>34</sup> Section 5.2.1, p. 32 in Part 1 of the Impact Assessment.

<sup>35</sup> Tab.45, p. 90 in Part 2

<sup>36</sup> Section 5.2.1, p. 32 in Part 1

<sup>37</sup> Fig.41, p. 34 in part 3

<sup>38</sup> Table36, Section 8.5.3, p. 64 in Part 2

<sup>39</sup> Fig.13, Section 6.3.3.2.1, p. 128 in Part 1

**So no horror prices.** That was not to be expected either. The widely published view (also from us<sup>40</sup>) that an effective ETS in transport would need prices upward of 250 euros per tonne refers to a scenario in which no instruments other than the ETS would be applied. As the Commission makes clear, it does not pursue such an extreme approach (which Agora Verkehrswende has also always opposed). In combination with other instruments that address the supply of vehicles and the necessary energy infrastructure, a CO<sub>2</sub> price must mainly capture the rebound effect, i.e. the possibility of higher traffic volumes resulting from the fact that driving becomes de facto cheaper due to lower fuel consumption. A price of 48 euros per tonne translates into a fuel price increase of eleven cents per litre for petrol or 13 cents for diesel (excluding VAT). This raises the price level overall, but it is moderate and is almost lost in the temporal and spatial fluctuations.

**ETS II, RED III and the German BEHG: How do they fit together?** Already the existing mix of instruments shows some overlaps. One of them is eliminated by the proposal: The GHG reduction obligation will be removed from the Fuel Quality Directive and instead established as the central instrument of the RED III in the transport sector, replacing the minimum share of renewable energy in final energy consumption in the transport sector that has been applicable up to now.<sup>41</sup> As a result, the RED III will change from being primarily an energy policy instrument to one that is also essentially attributable to climate policy, because it is aimed more directly than before at the greenhouse gas emissions from energy in the transport sector, and thus particularly at road transport. But this is precisely what the newly introduced Emissions Trading Scheme for Buildings and Transport (ETS II) does.<sup>42</sup>

In the ETS proposal, the Commission does address the interactions between the new ETS II and RED III, but only mentions the obvious interrelationships qualitatively<sup>43</sup> while pointing out that the model scenarios and calculations had taken both instruments into account in parallel.<sup>44</sup> In the RED III proposal, the overlapping effect of the two instruments is welcomed as a positive synergy effect,<sup>45</sup> but this is also only argued qualitatively.

From a German perspective, this overlap is of particular importance because there is already a national instrument for CO<sub>2</sub> pricing in the buildings and transport sector in the form of the Fuel Emissions Trading Act (BEHG). Before this is replaced by a Europe-wide ETS II, it must be clarified whether the ETS II in the proposed constellation would bring about a comparable CO<sub>2</sub> price.

**Recommendation 24:** The German government should work within the framework of the negotiations to ensure that these interrelationships are further investigated and more clearly disclosed.

40 As communicated e.g. by Agora Energiewende in <https://www.agora-energiewende.de/en/publications/how-to-raise-europes-climate-ambitions-for-2030/>.

41 In the implementation of the RED II, the member states were already free to use a GHG reduction obligation instead of percentage shares of renewable energy sources. Germany has been the only country to make use of this option.

42 Both instruments also overlap with the Effort Sharing Regulation (ESR), which requires emission reductions in all sectors not covered by the existing EU ETS, including transport. This is noted in numerous places in the impact assessments, indicating that EU measures are supportive of Member States' obligations under the ESR. These are increasing significantly as part of the *Fit for 55 package*, see Annex.

43 The CO<sub>2</sub> price created by the ETS II improves the economic position of renewables relative to fossil fuels; the emission reductions achieved by RED III affect scarcity and thus the market price in the ETS II.

44 Impact Assessment of the ETS Proposal, SWD (2021) 601, Part 2, Chapter 16.2, p. 132.

45 Any extreme requirements under either instrument may be mitigated by the other. See Impact Assessment of the RED III Proposal, SWD (2021) 621, Part 1, Chapter 1.2, p. 10.



**Aviation and maritime in the emissions trading system: you do what you can ...** Aviation is already part of the EU ETS, but the relevant provisions are being strengthened, especially with regard to the amount of free allocations. This will decrease systematically from 2024 until only auctioning takes place from 2027. The quantity of allowances issued will also be adjusted and the stronger linear reduction factor of the ETS Directive will be applied. Outside the countries participating in the EU ETS, the international compensation system CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation) of the ICAO will be applied. How much this will bring? The Commission itself has no illusions, pointing to the price of international offsets in CORSIA, which is currently at 33 cents per tonne - a hundred times less than the current EU ETS price of around 30 euros. In addition, there are profound doubts about the quality of these offsets.<sup>46</sup> But also overall, the impact assessment for all combinations of ETS and CORSIA examined finds that the impact of a CO<sub>2</sub> price is "negligible" compared to<sup>47</sup> other costs to aircraft operators, such as fuel costs. Arguably, then, the same is true of the system's impact on aviation activity. Conclusion for aviation: the emission reductions forced by the ETS will take place in other sectors, the aviation sector will buy allowances and carry on as before. It is therefore all the more important, as stated in the Explanatory Memorandum of the proposal, that the mix of necessary measures in addition to emissions trading also drives the ramp-up of sustainable aviation fuels as well as the further technical development of aircraft and operational improvements, for example through the Single European Sky initiative.

The situation in shipping is not much more encouraging. The proposal includes all routes within the EU in the ETS, as well as all emissions in EU ports, and half of all emissions en route between EU ports and third countries. After a phase-in period from 2023 to 2025, during which an increasing share of emissions will have to be covered by allowances, the scheme will come into full effect in 2026. Although the direct costs for operators in 2030 amount to seven percent of total costs, this would only lead to a decline in traffic volume of just under one percent compared to the reference. In shipping, too, it is therefore true that the actual emission reductions will take place elsewhere. And here, too, the Commission emphasises that inclusion in the ETS is, after all, only one part of a bundle of instruments that also includes fuel quotas and fuel taxation.

**At some point, there has to be an end to the bailing out.** The Commission's proposals reflect the plight of international bunker fuels, which have been the most difficult sectors to deal with since the start of international climate negotiations - for both technical and political reasons. Even the proposal to include half of shipping emissions on non-EU routes in the ETS is a bold move. Similar ideas in aviation had been shot down a decade or so ago by non-EU aviation nations, led by the US, India and China. But circumstances have changed, and today the goal is complete climate neutrality. This can only be achieved if aviation and maritime transport at some point start to reduce their own emissions in real terms and not just via certificate. And that in turn means new fuels and new technologies. The Commission's proposals at least make a start here.

**Hardly any change in the minimum tax rates for petrol and diesel.** In parallel with emissions trading, the energy taxation directive is also being extensively revised. The minimum tax rate is to be

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<sup>46</sup> For this reason, these international allowances can no longer be used in the EU ETS since 2020.

<sup>47</sup> Impact Assessment, Section 6.2.1. Only if the EU ETS were applied to all flights, including those outside the EU, would non-negligible impacts be expected.



determined exclusively by the energy content of an energy carrier. This is logical and consistent, because greenhouse gas emissions are regulated elsewhere. It is well known that tax laws at EU level require unanimous approval in the Council of Ministers. How little the Commission itself believes that it can achieve substantial changes here beyond formal amendments is shown by the proposed minimum tax rates for petrol and diesel. These actually fall slightly for petrol, while they rise slightly for diesel (which is not immediately visible due to the changed metric). Thus, on average, there is little change in the minimum taxation of common road fuels.

Vergleich der Mindestsätze für die Energiebesteuerung in der bestehenden und der vorgeschlagenen Richtlinie zur Energiebesteuerung

Tabelle 4

	Bestehend			Vorschlag		
	€/Einheit	Einheit	GJ pro Einheit	€/GJ	2023	2033
Benzin (unverbleit)	359	1.000 l	32	11,22	10,75	10,75
Diesel	330	1.000 l	36	9,17	10,75	10,75
Kerosin	330	1.000 l	36,8	8,97	10,75	10,75
LPG	125	1.000 kg	49	2,53	7,17	10,75
Erdgas	2,6	GJ <sup>(a)</sup>	1	2,60	7,17	10,75

(a) Bruttoheizwert

Agora Verkehrswende auf Basis von Richtlinie 2003/96/EG sowie Europäische Kommission (KOM(2021) 563)

**The end of the diesel privilege.** The actual tax rates in Germany are significantly higher than the proposal's minimums, which is why these have no direct effect here. From a German perspective, however, another newly introduced element is of interest: According to the proposal, Member States are free to levy higher taxes than the minimum rates, but the tax rates for different fuels must have the same ranking as the minimum rates in the Directive. If, in one application (for example, road transport), the minimum rates in the directive are the same for two energy products, the same must apply to the rates levied in real terms in a Member State. In other words, diesel is taxed at the same rate per unit of energy as petrol and is therefore about ten per cent higher per litre because of its higher energy content. If adopted, this would be the end of the diesel privilege.

**Recommendation 25:** The end of the diesel privilege is long overdue and should be supported by the federal government.

**Freight flights are excluded even within the EU.** The fact that the Commission does not include international flights in the taxation proposal is not surprising, given the international opposition in the aviation sector. Aviation and also shipping will be subject to the same minimum tax rates as road transport for connections within the EU, which was long overdue. However, the exemption of cargo flights within the EU is disappointing. The reason for this appears to be the US-EU Open Skies Agreement, which allows some US airlines to operate cargo flights within the EU without restrictions.<sup>48</sup> Although the proposal allows taxation for cargo flights within a Member State or by bilateral agreement between two Member States, this is just an optional provision that departs from the approach generally taken. Given the poor carbon footprint of cargo flights compared to

48 Impact Assessment, Box 4

other modes of freight transport, this way of transporting freight should not be encouraged through tax exemptions. In view of the urgency of the climate crisis, it is not enough to just point to an international agreement with a shrug. After all, the USA is now also pursuing a climate policy again.<sup>49</sup>

**Recommendation 26:** The EU should seek an amendment to the US-EU Open Skies Agreement with the aim of allowing the taxation of intra-EU cargo flights and thereafter implement it for all operators.

**Financial instruments need social compensation.** This is a key part of the EU Green Deal, which is why the Commission is proposing the creation of a social climate fund. It will provide Member States with additional resources to financially support economically vulnerable households, micro-enterprises and transport users who are particularly affected by the new ETS for buildings and transport. In the area of transport, the aim is to provide particular support to people living in rural areas who have no alternative to the private car, including through improved access to zero- and low-emission transport.

According to the proposal, each Member State will have to prepare a social climate plan to be submitted together with the next revision of the National Energy and Climate Plan (NECP) (which is due by June 2024 as scheduled). In order to steer the money in the right direction, the Commission reserves the right to evaluate these plans and to request improvements in case of insufficient plans.

The Regulation lists in detail the elements that this plan must contain. Consistency with a whole range of existing social policy and regional policy funding instruments at EU level must be ensured.

The financial envelope of the fund corresponds to 25 percent of the expected revenues from the new ETS for buildings and transport. Member States are expected to contribute at least 50 percent of the financial needs of their climate social plans, using also the revenues from the new ETS. The remainder will be fed from the Fund, with a ceiling set by a national distribution key.

The fund will be endowed with EUR 72.2 billion over the period 2025 to 2032, in two tranches: EUR 23.7 billion for 2025 to 2027 and EUR 48.5 billion for 2028 to 2032. Like everything else considered at EU level, these are big numbers, but relative to the population the amounts are limited. If, for example, 15 percent of the population were to benefit from this fund,<sup>50</sup> this would amount to EUR 118 per capita and year for recipients across the EU in the period of the first tranche, or EUR 145 in the second period. This must serve to compensate for disadvantages not only in the area of transport, but also in the area of energy poverty.

It is all the more important, therefore, to target the money. The distribution key among the member states is accordingly highly differentiated. It is not only based on the per capita income of each

<sup>49</sup> Even if the fierce opposition to including aviation in the ETS dates back to the Obama era.

<sup>50</sup> In 2018, 15.8 percent of the population in Germany lived below the poverty risk threshold. [https://www.destatis.de/DE/Presse/Pressemitteilungen/2021/03/PD21\\_113\\_p001.html](https://www.destatis.de/DE/Presse/Pressemitteilungen/2021/03/PD21_113_p001.html)

state, as is the case with other EU funds, but also depends on structural and social parameters, such as the proportion of the population in rural areas at risk of poverty, the proportion of the population with payment difficulties for its energy bills, and the respective emission levels. The resulting distribution naturally results in lower amounts for the richer Member States. For Germany, it is eight percent of the total budget, or - again assuming 15 percent of the population - 52 and 64 euros per recipient (person) per year, respectively. For needier Member States, the contribution under this assumption would rise to between €200 and €350 per person per year.

By way of comparison, the burden of a CO<sub>2</sub> price of 50 euros per tonne for transport and heating in Germany amounts to around 62 euros per person per year for the lowest ten percent of the income distribution and around 80 euros per year for the second decile<sup>51</sup>.

**Recommendation 27:** Overall, the proposal for a social climate fund is indispensable and should be fully supported by the German government.

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<sup>51</sup> Own calculation based on the values from [https://www.agora-verkehrswende.de/fileadmin/Projekte/2019/CO2-Bepreisung/Agora-Verkehrswende\\_Agora-Energiewende\\_CO2-Bepreisung\\_WEB.pdf](https://www.agora-verkehrswende.de/fileadmin/Projekte/2019/CO2-Bepreisung/Agora-Verkehrswende_Agora-Energiewende_CO2-Bepreisung_WEB.pdf)

## 4 Appendix: Details of the traffic-relevant Proposals

### 4.1 Revision of the Regulation on CO<sub>2</sub> emission standards for passenger cars and light commercial vehicles

- For passenger cars, the reduction target for 2030 is increased to 55 percent (expressed as a reduction from the 2021 average). The current value is 37.5 percent.
- For light commercial vehicles (LCVs), the target for 2030 is 50 percent (compared to 31 percent in the existing legislation).
- The reduction value for the year 2025 remains unchanged (at 15 percent).
- A new reduction value of 100 percent is to come into force in 2035, both for passenger cars and light commercial vehicles. This sets a de facto date for phasing out the internal combustion engine in new sales.
- The so-called ZLEV factor, which is provided for in the existing legislation from 2025, expires at the end of 2029. This factor allows the weakening of the limit value as an incentive for the introduction of zero- and low-emission vehicles (ZLEV).
- The exemption rules for manufacturers of less than 10,000 passenger cars or 22,000 commercial vehicles will expire at the end of 2029.
- The definition of the vehicle footprint is removed, making it clear that there is no motivation to replace the vehicle mass now used as the utility parameter with this parameter. The possibility of such an adjustment was the reason for collecting data for this parameter in the first place. However, Annex II Part A and Annex III Part A (which include this parameter as part of the Member States' data collection) will not be adapted.
- From 2025 onwards, the Commission will report every two years on progress towards zero-emission road mobility, identifying possible additional measures needed, including financial ones. This will take into account, inter alia, the emergence of zero and low emission vehicles, progress in the development of charging and refuelling infrastructure according to the AFIR, possible contributions of new technologies and alternative fuels, and social aspects.
- A further revision is foreseen in the legal text for 2028. However, the summary mentions the year 2026. Here it still needs to be verified what value the Commission actually has in mind.

What remains unchanged:

- the rules on pooling of different manufacturers,
- the amount of the fines,
- the exemptions for so-called niche manufacturers of between 10,000 and 300,000 cars a year, which will expire after 2028,
- the possibility of accounting for eco-innovations,
- the provisions relating to actual CO<sub>2</sub> emissions and actual fuel or energy consumption and the provisions relating to the verification of CO<sub>2</sub> emissions from vehicles in service,
- the biennial adjustment of the reference masses for the determination of the limit value curves for passenger cars and light commercial vehicles.

## 4.2 Revision of the Alternative Fuel Infrastructure Fuel Infrastructure Directive (AFID) and conversion into a regulation

- The Directive is transformed into a Regulation, on the grounds that this favours the rapid and coherent development of a dense and interoperable charging network. This is despite the fact that the impact assessment recommends retaining the legal instrument of a directive.

### Charging infrastructure

- The hitherto vague obligation on Member States to ensure the installation of an "adequate number of publicly accessible charging points" will be replaced by quantitative minimum requirements based on the number of registered electric vehicles.
  - The following provisions apply to passenger cars and commercial vehicles:
    - At least one kilowatt of publicly accessible charging capacity must be provided for each battery-powered vehicle (BEV).
    - A minimum of 0.66 kilowatts of publicly accessible charging capacity must be provided for each plug-in hybrid electric vehicle (PHEV).
    - On the TEN-T core network, public fast charging stations must be installed at least every 60 kilometres in each direction of travel.
      - By the end of 2025, these must offer a total of at least 300 kilowatts of charging power, of which at least one charging point must reach at least 150 kilowatts.
      - By the end of 2030, this increases to at least 600 kilowatts per station, with at least two charging points of at least 150 kilowatts.
    - The same applies on the overall TEN-T network, but five years later.
  - For heavy duty vehicles:
    - On the TEN-T core network, public fast charging stations must be installed at least every 60 kilometres in each direction of travel.
      - By the end of 2025, these must offer a total of at least 1,400 kilowatts of charging power, of which at least one charging point must reach at least 350 kilowatts.
      - By the end of 2030, this increases to at least 3,500 kilowatts per station, with at least two charging points of at least 350 kilowatts.
    - The same applies on the overall TEN-T network, but five years later and with a maximum distance of 100 kilometres.
    - By 2030, every secured truck parking lot must have at least one charging station with at least 100 kilowatts.
    - By the end of 2025, public charging points accessible to trucks must be provided in every urban node with a total of at least 600 kilowatts, with each individual charging station coming to at least 150 kilowatts.
    - By the end of 2030, this increases to at least 1,200 kilowatts per node.
  - The maximum distances mentioned also apply across national borders.
- Charging point operators must be able to choose their electricity supplier freely among all providers in the EU.

- A number of provisions are aimed at the quality and customer-friendliness of the charging points.
  - Among other things, ad hoc charging must be possible in at least one of several ways listed in the proposal. For charging points below 50 kilowatts that are built from the entry into force of the regulation, these are payment cards, contactless payment, and payment using QR codes. Above 50 kilowatts, the same applies with the exception of QR codes, starting in 2027.
  - Charging prices shall be reasonable, transparent and non-discriminatory and shall be made public before charging takes place. The same applies to e-roaming charges, with no additional charges for cross-border e-roaming.

#### Hydrogen infrastructure for road vehicles

- By the end of 2030, publicly accessible hydrogen refuelling stations with a minimum capacity of two tonnes per day and at least a 700-bar connection must be available at least every 150 kilometres on the TEN-T core network and the overall network. Liquid hydrogen must be offered every 450 kilometres. The maximum distances mentioned also apply across national borders.
- The service stations must be able to supply cars and light commercial vehicles as well as trucks.
- In freight terminals, publicly accessible filling stations must also offer liquid hydrogen.
- The provisions for payment and pricing are similar to those for charging electricity.

#### LNG infrastructure for road vehicles

- By the beginning of 2025, an adequate number of publicly accessible LNG refuelling points must be established, at least along the core TEN-T network, to allow LNG trucks to operate throughout the EU where there is demand, unless the costs are disproportionate to the benefits, including environmental benefits.

#### Shipping

- Minimum requirements are set for shore-side electricity supply in seaports and inland ports.
- For LNG in seaports, the minimum requirements are only of a qualitative nature ("an appropriate number"), in contrast to the other very detailed objectives.

#### Aviation

- All airports on the TEN-T network must provide power to stationary aircraft at the gates by the beginning of 2025, and at all external parking positions by the beginning of 2030.

#### General

- Member States are required to submit national policy frameworks by the beginning of 2024, setting out the anticipated market development of the different energy sources in the transport modes, as well as national targets and the measures needed to achieve them. The Commission is to evaluate these and make recommendations, and the final policy frameworks must be available by early 2025.
- In addition, Member States will have to submit progress reports every two years from the beginning of 2027 at the latest.
- By early 2026, the Commission shall assess and report on the national plans.
- On the basis of the national reports, the Commission shall report regularly on the progress achieved.
- In addition to this, Member States must report certain electric charging parameters to the Commission each year (total charging energy, number of publicly accessible charging points, and number of registered battery and plug-in hybrid vehicles). If the Commission finds that a Member State risks missing its national targets, it can ask it to take additional

measures, which the Member State must then report to the Commission within three months.

Technical specifications

- An annex specifies the technical characteristics of the relevant infrastructure.

## 4.3 Strategic expansion plan for the rapid development of alternative fuel infrastructure

This plan was presented in parallel with the proposal to amend the AFID. It identifies a number of ways in which Member States can accelerate the development of alternative energy infrastructures in transport:

- Better approaches in planning and licensing procedures and in public procurement,
- Making best use of national recovery and resilience plans (under the EUR 750 billion "Next Generation EU" recovery instrument to support recovery from the Corona crisis and its largest spending instrument, the EUR 672.5 billion Recovery and Resilience Facility (ARF)),
- ways to make more effective use of the various EU financial instruments,
- Standardization,
- Development of a data framework.

The Commission announces a gap analysis on the TEN-T network based on the maps of the TEN-T information system TEN-Tec.

## 4.4 Revision of the Renewable Energy Directive (RED II)

What's changing:

- The target for renewable energies in the transport sector is based on the format previously specified in the Fuel Quality Directive (FQD). The target is therefore no longer a minimum percentage share of renewable energies in final energy, but a minimum reduction in greenhouse gas intensity. At the same time, all regulations in the FQD that relate to greenhouse gas emissions and the sustainability criteria for biofuels (Articles 7a to 7e) will be deleted. This eliminates the existing overlap between the two directives.
- The FQD's previous GHG reduction target was a six percent reduction in 2020, relative to 2010 levels. The reduction target now proposed is 13 percent by 2030, relative to a fossil benchmark  $E_{F(t)}$  set in Annex V.
- The sub-target for advanced biofuels (still defined in Annex IX Part A) continues to be formulated as a percentage of final energy. It increases from 0.2 percent in 2022 to 0.5 percent in 2025 and 2.2 percent in 2030.
- A further sub-target is established for renewable fuels of non-biological origin (RFNBOs, which in practice are e-fuels). It amounts to 2.6 percent in 2030.
- The multipliers previously applied in Art.27(2) are deleted, i.e. the value of two for advanced biofuels, four for renewable electricity in road transport, and 1.5 for renewable electricity in rail transport. However, the multipliers for aviation and maritime transport of 1.2 each in relation to the energy content are retained.
- A system of certificates will be set up in each Member State so that fuel distributors can exchange renewable energy certificates for transport. Operators of charging stations for



electric vehicles will receive certificates for the renewable electricity they supply, regardless of whether they are themselves subject to the requirements for suppliers of fuels. They may sell these certificates to fuel distributors.

- The limit on the eligibility of fuels from food and feed crops remains unchanged at the 2020 level in the Member State concerned plus one per cent, with a maximum of seven per cent of final energy consumption in transport. As before, this is not a physical limit, but simply a limit on the amount that can be claimed for compliance with the directive.
- There is an adjustment in how the case will be treated when a Member State has a lower maximum value than seven percent for fuels from food and feed crops, either because the share in 2020 was less than six percent or because the Member State actively limits the share to less than seven percent. As before, the member state can then also adjust the sector target for transport downwards accordingly. Because of the newly established GHG metric, this is now done in such a way that the GHG intensity reduction target for transport (the 13 percent) is lowered accordingly. This is done by applying a GHG reduction of 50 percent for the fuels from food and feed crops. For example, suppose a member state limits the maximum share of these fuels to three percent instead of the permissible maximum of seven percent. This corresponds to a reduction of four percent. Because of the 50 percent GHG reduction, this reduces the GHG target by two percent, from 13 percent to 11 percent. This has no influence on the physical amount of advanced renewable fuels as well as electricity needed to meet the target. Therefore, the actual binding target of the Directive concerns advanced renewable fuels, e-fuels and renewable electricity which together must achieve a GHG intensity reduction in the transport sector of at least 9.5 percent (= 13 percent - 7 percent x 50 percent).
- GHG savings for biofuels and biogas are taken from the existing table in Annex V, while for RFNBO they are determined according to separate delegated acts. For renewable electricity, the GHG savings are set equal to the fossil benchmark  $EC_{F\epsilon}$  in Annex V.
- Recycled carbon fuels must achieve GHG savings of at least 70 percent.

What remains unchanged:

- The GHG reduction of RFNBO must be at least 70 percent.
- In Annex V (Calculation rules for greenhouse gas effects), the definitions of the fossil comparators  $EC_{F\epsilon}$  (183 grams CO<sub>2</sub> equivalent per megajoule, see Annex V, Part C, Sect. 19, 2nd sentence) and  $E_{F(t)}$  (94 grams CO<sub>2</sub> equivalent per megajoule, see Annex V, Part C, Section 19, 1st sentence).

## 4.5 Introduction of sustainable fuels in aviation (ReFuelEU Aviation)

- This regulation obliges fuel suppliers to blend certain minimum quantities of sustainable fuels.



Mindestanteile nachhaltiger und synthetischer Flugkraftstoffe laut Kommissionsvorschlag

Tabelle 5

Geltend ab:	Anteil an nachhaltigen Flugkraftstoffen	Davon synthetische Kraftstoffe
2025	2 %	
2030	5 %	0,7 %
2035	20 %	5 %
2040	35 %	8 %
2045	38 %	11 %
2050	63 %	28 %

Agora Verkehrswende auf Basis von Europäische Kommission (KOM(2021) 561)

- To avoid tankering, aircraft operators must take on board at EU airports at least 90 percent of the fuel they need for the routes they follow.
- Airports must provide the necessary fuel infrastructure.

## 4.6 Introduction of sustainable fuels in maritime shipping (FuelEU Maritime)

- This regulation requires ship operators to reduce the GHG intensity of the energy used on board a ship (propulsion and energy consumers on board). This reduction must reach at least the following values (compared to a reference value referring to the average of the year 2020):

Mindestwerte für die Treibhausgasreduktion bei Kraftstoffen in der Schifffahrt laut Kommissionsvorschlag

Tabelle 6

Geltend ab:	Reduktion in der THG-Intensität
2025	2 %
2030	6 %
2035	13 %
2040	26 %
2045	59 %
2050	75 %

Agora Verkehrswende auf Basis von Europäische Kommission (KOM(2021) 562)

- Sustainable biofuels and synthetic fuels in accordance with RED II can be counted towards the verification of emission reductions, but biofuels from food and feed crops cannot.
- These values must be achieved for 100 per cent of the energy consumed in port and on voyages within the EU. For voyages to or from destinations outside the EU, they apply to 50 per cent of the energy consumed.
- For container ships and passenger ships, the additional rule applies that from 2030 the entire energy consumption during a port stay must be covered by shore-side electricity.

- Fishing vessels are excluded from the scheme.

## 4.7 Revision of the EU Emissions Trading Scheme (EU ETS) with inclusion of maritime shipping and creation of an additional emissions trading system for buildings and transport

- The linear reduction factor, which determines the amount of new allowances placed on the market, will be raised to 4.2 percent. At the same time, the emissions cap will be reduced by a one-off cut so that a level is reached as if the new reduction factor had already been applied since 2021. Overall, this leads to an emission reduction of the sectors included in the ETS of 61 percent in 2030 compared to 2005.
- Ocean shipping will be included in the existing ETS, with all emissions on routes within the EU, half of the emissions on routes to or from non-EU countries, and emissions at EU ports. After a phase-in period from 2023 to 2025, during which an increasing share of emissions will have to be covered by allowances, the system will come into full effect in 2026.
- A new, separate ETS will be established for buildings and road transport (ETS II), which will be fully applicable from 2026.
- This system is not applied to individual emitters, but where fuels and combustibles are delivered to final consumers. The regulated actors are defined according to the EU excise directive.
- The quantity of allowances is determined on the basis of data from the Effort Sharing Regulation (ESR). It will be reduced by 43 percent by 2030 compared to 2005 levels, with a linear annual adjustment. (This is the same as the previous value in the existing ETS. There, the proposal now reduces the amount of allowances by 61 percent by 2030 compared to 2005).
- All allowances for this new ETS will be auctioned, there will be no free allocation.
- 150 million allowances under the new ETS will be added to the Innovation Fund.

## 4.8 Revision of the emissions trading system for aviation

- The quantity of aviation allowances for flights within the European Economic Area (EEA) plus Switzerland and the UK will be adjusted for 2024 to the quantity issued in 2023, reduced by the linear reduction factor of the ETS Directive.
- An increasing proportion of allowances will be issued through auctioning rather than free allocation, starting with 25 per cent in 2024 and ending with auctioning only from 2027.
- For flights to and from destinations outside the EEA, Switzerland and the UK, which use the ICAO's international compensation system CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation),<sup>52</sup> this system is also applied by the EU.

To this end, the EU implementation of the international compensation scheme CORSIA will also be adapted.

## 4.9 Revision of the Energy Taxation Directive

- Minimum taxation is now based on the energy content of energy products and electricity and their environmental performance. It is expressed as euros per gigajoule.
- The Directive leaves Member States free to set higher tax rates than the above minimum rates, but requires that the ranking of the different energy sources remains the same.
- Electricity should always be the least taxed form of energy, especially in the transport sector. This is about consumption taxes, not the total tax burden (which also includes VAT, for example).
- Minimum tax rates are adjusted for inflation.
- The minimum rates differentiate between different applications, namely transport, motor fuels in the primary sector, fuels for heating purposes and electricity.
- No distinction is made between commercial and non-commercial use of diesel fuel.
- In aviation, fuel and electricity are taxed for internal EU traffic, with the important exception of cargo flights. The tax rates are based on those for road fuels and electricity outside the aviation sector. For international flights, Member States are free to choose their approach.
- Sustainably produced aviation and marine fuels are exempt from the minimum tax for ten years. The supply of shore-side electricity to ships in port can also be tax-exempt.
- Shipping within the EU, including fishing, is also taxed. However, the tax rates are more than ten times lower than for road fuels (Table D instead of Table A in Annex I of the Directive). Diesel fuel and heavy fuel oil are taxed at €0.9 per gigajoule, instead of €10.75 per gigajoule for road fuels.
- To prevent tankering, Member States may also grant tax exemptions for routes to and from non-EU ports.
- The minimum tax rates in the transport sector are laid down in Annex I, Table A, with lower initial values for some energy sources at the beginning of the ten-year transition period (in 2023), which then increase in annual steps of 1/10 each to the final value from 2033. For certain sectors, different tax rates apply (for example, agriculture and construction machinery); these are set out in Table B.

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<sup>52</sup> CORSIA's goal is to keep aviation emissions stable from 2020. The project credits, so-called offsets, to be collected from operators must therefore only cover growth after 2020, not the full emissions.

- LPG and natural gas will be taxed in the same way as petrol and diesel after the 10-year transition period (at 10.75 euros per gigajoule, starting from 7.17 euros per gigajoule in 2023).
- Food and feed-based biofuels will be taxed in the same way as petrol and diesel (at 10.75 euros per gigajoule, half initially) after the 10-year transition period. Other sustainable biofuels will be taxed half as much, at 5.38 euros per gigajoule, initially. In contrast, advanced biofuels as well as e-fuels are taxed at only 0.15 euros per gigajoule, a mere 1.4 percent of what fossil road fuels pay.
- The minimum tax rates for petrol and diesel hardly change - for petrol they even fall slightly (from 11.22 to 10.75 euros per gigajoule), while for diesel they rise slightly (from 9.17 to 10.75 euros per gigajoule), so that the average between the two hardly increases. On the other hand, the minimum taxation for natural gas as road fuel increases significantly, from 2.60 euros per gigajoule to 10.75 euros per gigajoule.

## 4.10 Creation of a Social Climate Fund

- The purpose of the fund is to provide financial support to economically vulnerable households, micro-enterprises and transport users who are particularly affected by the new ETS for buildings and transport. Particular emphasis will be placed on households in fuel poverty<sup>53</sup> and people in rural areas who have no alternative to the car.
- Support is targeted at investments in building efficiency, renewal of heating and cooling systems, use of renewable energy and improved access to zero and low emission transport.
- The Fund will be endowed with 72.2 billion euros over the period 2025 to 2032, in two tranches: 23.7 billion for 2025 to 2027 (7.9 billion per year) and 48.5 billion for 2028 to 2032 (9.7 billion per year).
- The financial envelope corresponds to 25 percent of the expected revenues from the new ETS for buildings and transport. Member States are expected to match the funding provided, using also the revenues from the new ETS.
- Each member state establishes a social climate plan, which is submitted together with the next revision of the National Energy and Climate Plan (NECP) (which is scheduled to be due by June 2024). The regulation lists in detail what elements this plan must contain. Consistency with a whole range of existing social policy and regional policy funding instruments at EU level must be ensured.

## 4.11 Revision of the Effort Sharing Regulation (ESR) on setting binding national annual targets

- The previous target of a 29 percent reduction in GHG emissions in the sectors outside the EU ETS and the LULUCF Regulation (for 2030 compared to 2005; in the old EU-28 it had been 30 percent) is raised to 40 percent.
- A target path is specified that consists of two linear segments. The first segment runs until 2022, at which point the targets previously set for 2030 must be achieved (38 percent for Germany). The second segment runs linearly from 2023 to 2030, at which point the target for Germany is now 50 percent.

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<sup>53</sup> defined in the revised Energy Efficiency Directive

## 4.12 Also in the package

The July package also includes a number of other proposals which are less relevant from a transport perspective but are listed here for the sake of completeness:

- Revision of the Land Use, Land Use Change and Forestry (LULUCF) Regulation,
- Recast of the Energy Efficiency Directive,
- Introduction of a CO<sub>2</sub> border adjustment system (carbon border adjustment mechanism, CBAM),
- Revision of the ETS Market Stability Reserve,
- new EU forest strategy.