

FAQ on Commission Proposal for a Regulation of the European Parliament and of the Council setting CO<sub>2</sub> emission performance standards for new heavy-duty vehicles (17 May 2018)

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## ***I. Overview***

### **1. Why is the Commission proposing CO<sub>2</sub> emission standards for heavy-duty vehicles? What is the objective of such standards?**

Despite the increasing levels of CO<sub>2</sub> emissions from heavy-duty vehicles, i.e. lorries, buses and coaches, these emissions are currently not regulated at EU level. At present, they account for a quarter of road transport CO<sub>2</sub> emissions in the EU and are projected to grow by 9% in the period 2010-2030.

This lack of regulation leads to three main problems:

- If no further action is taken, CO<sub>2</sub> emissions from heavy-duty vehicles will continue to grow.
- Transport operators and consumers miss out on fuel savings.
- European heavy-duty vehicle manufacturers and component suppliers risk losing their technological leadership.

Setting CO<sub>2</sub> standards for heavy-duty vehicles at EU level is therefore important to deliver on the EU's commitments under the Paris Agreement on climate change, to reduce fuel costs for transport operators, most of which are SMEs, and to contribute to maintaining the EU's leadership in innovation.

### **2. Why are existing policy measures not sufficient to address the identified problems?**

The existing measures within the EU policy framework have not triggered a sufficient uptake of fuel-efficient technologies. A large number of readily available cost-effective technologies to improve fuel efficiency are not widely deployed in the market even though their costs are low and they could bring high net savings. This is mainly due to imperfect and asymmetric information in the new vehicle market, as it is complex for transport operators, which are mainly SMEs, to access and make full use of the technical information on such technologies.

As evidenced in countries which have already set CO<sub>2</sub> emission standards for heavy-duty vehicles, such as the US, Canada, Japan and China, such standards enable the uptake of more energy-efficient technologies.

### **3. Is the proposal part of a wider strategy?**

Yes. It is part of the Commission's third "mobility package". It delivers on the commitment taken in the 2016 European Strategy for low-emission mobility, whose goals include, amongst others, reducing greenhouse gas emissions in road transport by at least 60 % in 2050 compared to 1990 levels and setting CO<sub>2</sub> emission standards for high duty vehicles.

The proposal also builds upon the two previous mobility packages of May and November 2017. It complements other existing EU mobility policy measures such as the Certification Regulation, the Monitoring and Reporting Regulation, the EU type-approval system, the Eurovignette Directive, the

Fuel Quality Directive, the Clean Vehicles Directive, the Directive on maximum authorised weights and dimensions and the Directive on the deployment of alternative fuels infrastructure.

#### **4. What are the main elements of the CO<sub>2</sub> emission standards?**

As regards the scope, the proposal will cover the biggest lorries, responsible for around 65% to 70% of the total CO<sub>2</sub> emissions of the heavy-duty sector. It is tailored to the specific characteristics of heavy-duty vehicles, which in certain respects differ substantially from cars and vans.

The four main elements of the proposal are the following:

- 1) The proposal foresees an overall EU CO<sub>2</sub> emission reduction target for the new heavy-duty vehicles fleet of 15% by 2025 compared to the 2019 emission levels. This overall target is, in turn, translated into manufacturer specific CO<sub>2</sub> emission targets in grams of CO<sub>2</sub>/km, which are defined on the basis of their fleet composition and characteristics. The at least 30% target for 2030 is aspirational and will be determined as part of the review to take place in 2022.
- 2) The proposal provides for cost-effective implementation. It allows banking and borrowing of CO<sub>2</sub> credits. This will reduce compliance costs for manufacturers by allowing to factor-in long development cycles in the industry, while safeguarding the environmental integrity of the targets.
- 3) The proposal includes incentives for zero- and low-emission vehicles in the form of a "super-credits system". These vehicles will be counted as more than one vehicle for calculating the specific emissions of a manufacturer. A cap is set to avoid too much weakening of the CO<sub>2</sub> target. These incentives should help the sector and public authorities in developing an EU market for these vehicles fostering the innovation and the required investments in these technologies.
- 4) Adequate governance of the performance standards will be ensured by the application of financial penalties in case the target is not met, by the collection, publication and monitoring of real-world emission data and by the introduction of in-service conformity tests coupled with a mechanism to adjust the reported emissions in case of significant deviations from type-approval values.

#### **5. When will the targets come into force? What is the purpose of the 2022 review?**

The first legally binding CO<sub>2</sub> emission targets will come into force on 1 January 2025. New binding targets for the year 2030 and beyond will be determined as part of the review foreseen in 2022.

The review aims to (1) determine the target for 2030, (2) extend the scope to other groups of heavy-duty vehicles, i.e. buses, coaches, smaller lorries and trailers, (3) review the effectiveness of the modalities for implementation, for instance the incentive system for zero and low emission vehicles.

## **6. What are the main costs and benefits of having CO<sub>2</sub> emission standards for heavy-duty vehicles?**

First and foremost, CO<sub>2</sub> emission standards will result in a positive impact on the environment. In addition to reductions in CO<sub>2</sub> emissions, the legislative proposal will contribute to lowering emissions of air pollutants such as nitrogen oxides (NO<sub>x</sub>) and particulate matter (PM<sub>2.5</sub>). Therefore, the CO<sub>2</sub> emission standards will not only mitigate climate change but will also bring better air quality for citizens.

Secondly, the standards will lead to lower costs for transport operators and their clients. While the CO<sub>2</sub> emission standards will entail higher initial costs – just like other energy efficiency solutions – the resulting fuel savings will greatly offset the additional costs of a new lorry equipped with CO<sub>2</sub> reduction technologies. The net savings during the first 5 years of use are around €25.000 for the average new lorries bought in 2025 and about €55.000 in 2030. The user of a second hand lorry will equally benefit.

Thirdly, the proposed standards will foster investments in research and development of new technologies, helping the EU automotive industry to retain its global technological leadership.

## **7. How does the proposal contribute to the EU and Member States achieving the 2030 emission reduction targets set under the Effort Sharing Regulation (ESR)?**

The Effort Sharing Regulation (ESR) sets out binding annual greenhouse gas emission targets for Member States for the period 2021–2030. These targets cover sectors of the economy that fall outside the scope of the EU Emissions Trading System, such as road transport. No sectoral targets are set under the Effort Sharing Regulation.

The analytical work underpinning the ESR proposal showed a cost-effective EU-wide emission reduction of 25% for road transport by 2030 relative to 2005. Under the baseline, emission reductions are around 17%, i.e. a difference of some 8 percentage points.

With the 2017 proposal for post-2020 emission standards for cars and vans, this difference gets significantly smaller, to 4 percentage points. The gap could be progressively closed by about one percentage point with the implementation of the proposed CO<sub>2</sub> standards for lorries.

The remaining gap will be addressed through other additional policies with impacts on road transport GHG emissions. This concerns the minimum share of renewable fuels in transport as proposed by the Commission in the revision of the Renewable Energy Directive, as well as the proposed Eurovignette, Clean Vehicles and Combined Transport Directives.

## **8. Why is the proposed 2030 target aspirational and not binding as the 2025 target?**

While the 2025 target can be met by deploying readily available cost-effective technologies, achieving a more ambitious 2030 target will require the implementation of new technologies that are not yet on the market.

There is currently a lack of robust information on how the performance and costs of these more innovative and prospective technologies might evolve in the medium term. This creates a risk that a binding 2030 target could not be set at the most cost-effective level right now.

It will therefore be necessary to review the 2030 CO<sub>2</sub> emission targets in 2022 once sufficient certified CO<sub>2</sub> emission data have been collected and more information is available on the costs and savings of the prospective technologies, reducing the level of uncertainty on these technologies.

The 2022 review will also address the following:

- the extension of the scope to other groups of heavy-duty vehicles, i.e. buses, coaches, smaller lorries and trailers;
- review the effectiveness of the modalities for implementation, for instance the incentive system for zero and low emission vehicles and the banking and borrowing scheme.

## **9. What are the impacts of the proposal on jobs and growth?**

The proposed CO<sub>2</sub> emission standards for heavy-duty vehicles will have a positive impact on job creation and economic growth. The proposal could lead to up to 25 000 more jobs in 2025 and more than 120 000 additional jobs in 2030. A sector that will particularly benefit from the proposal in this respect is transport, where both freight and passenger transport will experience increased turnover and new jobs.

## **10. Which heavy-duty vehicles are considered as "zero- and low-emission" vehicles? What are the proposed incentives for such vehicles?**

The proposal defines a "zero-emission heavy-duty vehicle" as a vehicle either without an internal combustion engine or with an internal combustion engine that emits less than 1 g CO<sub>2</sub>/kWh or that is emitting less than 1 g CO<sub>2</sub>/km<sup>1</sup>.

A "low-emission heavy-duty vehicle" is a vehicle with specific CO<sub>2</sub> emissions of less than 350 g CO<sub>2</sub>/km. This covers vehicles emitting less than about half the average fleet emissions.

Manufacturers will benefit from "super-credits". Each zero-emission vehicle is counted as 2. Each low-emission vehicle is counted up to 2 according to its CO<sub>2</sub> emissions.

In order to limit the risk of weakening the CO<sub>2</sub> targets, a safeguard is foreseen so that the average emissions of a manufacturer are not lowered by more than 3% due to the super credits gained.

Zero emission buses, coaches and small lorries can also benefit from super-credits. However, a lower cap of 1.5% is set to avoid distortions in the market.

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<sup>1</sup> This threshold is set to take account of inaccuracies of the type approval measurement procedure or minor methane impurities of commercial carbon free hydrogen fuels

## **11. Why are zero-emission buses included in the incentive mechanism for zero- and low-emission high duty vehicles?**

CO<sub>2</sub> emission standards cannot be set yet for buses as their emissions are not yet certified under the Certification legislation. However, as set out in the review clause, they will be included in future standards.

In addition, short-term action is needed. Many European cities are very interested in changing to zero-emission buses in particular to improve air quality. However, they face difficulties to finance new fleets of clean buses and also to find EU manufacturers.

At the same time, the market is booming in China where there are already 200,000 electric buses in operation, with strong Chinese manufacturers.

If EU manufacturers want to keep a competitive edge on buses, a market for clean buses is needed in Europe within the coming five years.

The Clean Vehicle Directive and the Platform that has been recently created to help cities on joint public procurement are an important first step to create a larger market. The EU budget will also continue to support the financing of new fleets of clean buses.

This proposal also offers an opportunity to complement these other instruments. It will further speed up the market uptake of these technologies, which could in turn promote and accelerate the dissemination in other segments of heavy duty vehicles.

In order to mitigate the risks of competitive distortion among manufacturers, a sub-cap of 1.5% is proposed to restrict the contribution of zero-emission buses to the incentive mechanism. This sub-cap will also ensure that zero- and low-emission large lorries remain sufficiently incentivised.

## **12. What are the key differences with cars and vans?**

Although parallels could be drawn between both vehicle groups, lorries differ from cars and vans on several points.

First, compared to cars and vans, the sector of lorries is much more diversified, with a significant number of different vehicle types and models as well as with a higher degree of customisation.

Second, while the EU car market is composed of numerous manufacturers, the EU heavy-duty vehicles market only has a small number of major manufacturers, from just a few countries. The scale of the EU market is also significantly different, with around 420,000 heavy-duty vehicles and 16.5 million cars manufactured in 2016.

Third, the fuel consumption and CO<sub>2</sub> performance of new passenger cars and vans is determined through emissions type approval on a chassis dynamometer since 1980. For heavy-duty vehicles, CO<sub>2</sub> data is currently only available for the engines and not for the whole vehicle. The lack of reliable data in the CO<sub>2</sub> performance of lorries has hindered the uptake of fuel-efficient technologies in the heavy-duty vehicles sector.

To improve the availability of CO<sub>2</sub> emission data for lorries, the Commission has engaged since 2009 with main stakeholders in the development of a simulation tool, the Vehicle Energy Consumption Calculation Tool ([VECTO](#)). VECTO simulates CO<sub>2</sub> emissions and fuel consumption at whole-vehicle level. The tool will enable the reporting and monitoring of CO<sub>2</sub> emission data for heavy-duty vehicles - requirements that are to be observed under the Certification Regulation and the Monitoring and Reporting Regulation as of 2019.

**13. Isn't CO<sub>2</sub> being over-emphasised compared with air pollutants?**

Air pollutants emitted by vehicles are also regulated through EU legislation and have been progressively reduced over the last years. As regards heavy-duty vehicles, the latest emission standards for these pollutants, known as Euro VI, came into force in 2014 (for all registrations).

**14. Has the Commission consulted stakeholders on its proposal?**

Yes. The Commission sought feedback from stakeholders through a public on-line consultation, which took place between 20 November 2017 and 29 January 2018 and a stakeholder workshop on 16 January 2018. The results of the public consultation are available [here](#).



## ***II. CO<sub>2</sub> emission standards in detail***

### **15. What types of heavy-duty vehicles will be subject to the CO<sub>2</sub> reduction requirements?**

Under the current proposal, CO<sub>2</sub> emission standards will apply to four main groups of lorries which account for about 65% to 70% of total emissions from heavy-duty vehicles. These are groups 4, 5, 9 and 10 as defined in [Annex 1 to the Certification Regulation](#).

### **16. Does the proposal provide for any exemptions?**

Under the proposal, vocational vehicles, such as construction lorries, garbage lorries, and concrete mixers will be exempted from the CO<sub>2</sub> targets. These vehicles have very specific technical characteristics and a relatively small annual mileage, which limits the possibilities of reducing CO<sub>2</sub> emissions in a cost-efficient way.

### **17. What are the links with VECTO and the Certification Regulation?**

The Certification Regulation (Regulation (EU) 2017/2400) and the Vehicle Energy Consumption Calculation Tool (VECTO) enable the implementation of the CO<sub>2</sub> emission standards for heavy-duty vehicles by ensuring the availability of the necessary CO<sub>2</sub> emission data for the relevant vehicle groups.

The Certification Regulation requires manufacturers, as of 1 January 2019, to determine the CO<sub>2</sub> emissions and fuel consumption of new vehicles they place on the EU market. The CO<sub>2</sub> emissions are calculated by using the Vehicle Energy Consumption Calculation Tool (VECTO), a simulation tool developed for that purpose by the Commission. Information on the CO<sub>2</sub> emissions and fuel consumption of new heavy-duty vehicles will be declared for the registration of vehicles under the EU type-approval legislative framework. The recently agreed Monitoring and Reporting Regulation requires that these data are monitored and reported to the Commission, and will be made publicly available.

### **18. Why are the targets set against the 2019 emissions?**

Certified CO<sub>2</sub> emission data from heavy-duty vehicles are currently not available.

The Certification Regulation will apply from 1 January 2019 onwards. The year 2019 will be the first year for which certified emissions will be available. These data will be reported to the Commission in 2020 based on the application of the recently agreed Monitoring and Reporting Regulation.

To ensure manufacturers' CO<sub>2</sub> emission targets are set on the basis of robust data, the targets will therefore be calculated using the 2019 emissions as the reference.

**19. What measures are proposed to ensure that banking and borrowing would weaken the CO<sub>2</sub> targets?**

Banking and borrowing have been introduced in order to take account of long production cycles in the manufacturing of lorries. This offers manufacturers greater flexibility and increases the overall cost-effectiveness of the policy.

However, in order to maintain the environmental integrity of the CO<sub>2</sub> target, the following design elements have been introduced:

- Credits can be banked only if the emissions are below a linear emission reduction trajectory
- Total debts cannot exceed 5% of the target
- Surplus of credits cannot be carried over into the next period

**20. Why are well-to-tank emissions not taken into account for the purposes of setting the CO<sub>2</sub> emission targets?**

The proposed “tank-to-wheel” or tailpipe approach ensures a clear responsibility for meeting the target by the manufacturers.

The CO<sub>2</sub> footprint of fuel production and electricity generation is already addressed by other EU legislation, such as the Emission Trading Scheme, the Fuel Quality Directive and the Renewable Energy Directive.

**21. How is it ensured that the emission reduction effort is distributed across manufacturers in a fair way?**

Each manufacturer will have a specific CO<sub>2</sub> emission reduction target, which takes into account the composition of its fleet, including its technical and business characteristics. This will ensure that the reduction effort is distributed fairly across manufacturers.

**22. Why does the proposal not include complementary engine standards as in the US?**

The impact assessment of the proposal considered the option of two separate standards for whole-vehicle and engine-only CO<sub>2</sub> emissions.

While acknowledging that this option could have positive environmental impacts if the engine-only standards would go beyond the requirements of the whole vehicle standards, the analysis raised some concerns.

Indeed, this option could prevent manufacturers to achieve the required level of emissions in the most cost-efficient way by combining all available CO<sub>2</sub> reduction technologies.

It would most likely result in higher compliance costs. It would also deviate from a technology neutral approach, limit technological flexibility. It could undermine innovation in non-engine related CO<sub>2</sub> reduction technologies.

The impact assessment therefore concludes that, for the largest lorries covered by the first phase of the standards, the whole-vehicle standards should not be complemented by engine-only standards.

**23. How will the Commission ensure effective implementation of the CO<sub>2</sub> emission standards for heavy-duty vehicles and how to address the risk of an increasing gap between type-approval and real-world emissions of CO<sub>2</sub>?**

The effectiveness of the CO<sub>2</sub> targets in reducing real-world emissions depends on the one hand on the representativeness of the results of the VECTO simulation tool with respect to average real-world driving, and on the other hand on the extent to which the HDVs placed on the market conform to the reference vehicles tested at type approval.

The following requirements are therefore proposed to ensure the effectiveness of the targets:

- (a) To mandate the collection, publication and monitoring of real-world fuel consumption data reported by manufacturers, based on mandatory standardised fuel consumption meters.
- (b) To introduce in-service conformity tests and mandate the reporting of deviations and the introduction of a correction mechanism.
- (c) To apply financial penalties in case of non-compliance with the CO<sub>2</sub> targets.

**24. What happens in case a manufacturer does not meet its CO<sub>2</sub> target?**

If a manufacturer exceeds its specific emission target, taking into account the banked and borrowed credits, a financial penalty will be imposed. The level of this excess emission premium is set at 6 800 € per g/tkm of excess emissions, equivalent to 570 € per g/km based on an average payload of 12 tons as set out in VECTO. This premium exceeds the average marginal costs of the technologies needed to meet the targets. It also ensures an equivalent stringency with the penalty established for light duty vehicles.

**25. How are Modular Concepts, also called European Modular Systems or "giga-liners", addressed in the proposal?**

Due to a lack of data, it has not been possible to distinguish such Modular Concepts in the proposal. However, such vehicles will be considered in the review in 2022. This assessment will be done strictly for the purpose of the Regulation on CO<sub>2</sub> standards and how such vehicles could be further considered.