

CO₂ Regulation HDV

Revision of Regulation on CO₂ Emission Standards for Heavy-Duty vehicles (HDV)

Executive Summary

In June 2019, the EU adopted its first ever CO₂ emission performance standards for heavy-duty vehicles (HDV). They require manufacturers to reduce the CO₂ emissions of their newly registered HDV fleets by 15% on average as of 2025, and by 30% as of 2030, compared to a 2019/2020 baseline. According to the EU Commission, the current CO₂ standards do not provide sufficiently clear long-term signals to channel investments into zero-emission vehicles. Hence, on 14 February 2023, the EU Commission tabled a legislative proposal to revise the CO₂ emission performance standards. The proposed revision foresees an extension to new vehicle groups, a strengthened CO₂ reduction target for 2030, and new targets for 2035 and 2040. Overall, Bosch acknowledges the need for revised CO₂ standards for HDV that contribute to the EU's long-term goal of climate neutrality in 2050. In order to comply with the increasingly ambitious CO₂ reduction targets, the future regulation must allow for technological openness. It must further ensure that the enabling conditions necessary to achieve the CO₂ reduction targets are put in place. This includes in particular the development of an adequate hydrogen refuelling and electric charging infrastructure.

Main elements of the EU Commission's legislative proposal

Extension of the scope:

The current CO₂ standards only apply to rigid and tractor trucks above 16 tonnes, with 4x2 and 6x2 axle configurations, representing approx. 60% of annual sales of HDV in the EU, and 70% of the EU's CO₂ emissions in this sector. The EU Commission's proposal also covers **trucks (above 5 tonnes), city buses and long-distance buses (above 7.5 tonnes)** as well as **trailers** (an unpowered vehicle towed by a motor vehicle). This is a significant expansion of the scope of the regulation, amounting to approx. 90% of sales, and 95% of CO₂ emissions.

New and more ambitious CO₂ reduction targets:

The EU Commission proposes new and more ambitious CO₂ emission reduction targets for new HDV from 2030 onwards. Under the proposal, CO₂ emissions would be reduced on average **by 45% from 1 January 2030, by 65% from 1 January 2025 and by 90% from 1 January 2040 onwards** (baseline 2019/2020). For trucks and coaches, the targets are slightly lower at 43% for 2030 and 64% for 2035, due to the higher-than-average target for new city buses. These will have to be zero emissions (100% share of zero-emission buses) as of 2030. Drawbar trailers will have to contribute to a 7.5% reduction in CO₂ emissions by 2030 relative to 2025, and semi-trailers will have to contribute a 15% reduction.

The **2040 90% reduction target** shall ensure that HDV which are hard to electrify (e.g., intended for driving under difficult conditions) can still be non-zero emission vehicles post 2040.

New definition of zero emission vehicles:

Renewable and low-carbon fuels do not count towards the CO₂ reduction targets. The EU Commission believes that a mechanism on renewable and low carbon fuels would create an incentive to redirect fuels needed to decarbonise sectors with fewer alternatives, like aviation and maritime, to road transport.

Exemptions from the CO₂ standards:

Some vehicle groups remain uncovered, yet they have a negligible impact on CO₂ emissions. This includes light trucks with a gross vehicle weight of 3.5-5 tonnes (4% of heavy-duty sales), 4×4 trucks (2%), and four and five axled trucks excluding 8×4 vehicles (1.5%). Further, an exemption to the CO₂ reduction targets shall apply to small volume manufacturers registering up to 100 vehicles per year as well as to a number of special-purpose and vocational vehicles. Such vehicles are not counted towards the average specific CO₂ emissions of manufacturers.

Review:

The EU Commission's proposal foresees that the EU Commission shall, in 2028, review the effectiveness and impact of the regulation and submit a report to the EU Parliament and to the Council with the result of the review. The report shall, where appropriate, be accompanied by a proposal for amending the regulation.

Other elements of the proposal:

The flexibilities for complying with the CO₂ standards have been changed slightly from the current regulation:

- The **Zero- and Low-Emission Vehicle (ZLEV) factor**, which can reduce a manufacturer's target by up to 3% if they produce enough ZLEVs, will be phased out after 2029.
- The **credit and debt system** has been extended from the current expiration date of 2030 to 2040.
- Further, a new element will allow "**economically connected**" manufacturers, such as those that share a parent company, to trade vehicles in order to comply with the targets. This can only be done this with a limited number of vehicles, up to a maximum of 5% of the receiver's sales.

Bosch Position

1. Technology diversity is a precondition for a competitive & well-functioning transport sector

- The heavy-duty vehicle sector is very cost sensitive. Hauliers and transport operators invest in vehicles based on profitability. They need to be able to choose from a wide array of technologies to pick the best fit for their specific use case. A free **competition among different technologies allows for a continuous optimization of transport operations.**

- While in the next step, **battery-electric vehicles** will make up the dominant share of alternative drivetrains, there will also be use cases for which **fuel-cell electric vehicles** and **hydrogen engine-powered vehicles** are better suited. Hence, these three technologies should, as the EU Commission rightly suggests in its proposal, be classified as **zero emission vehicles**, and be treated as equivalent options for meeting the future CO₂ fleet standards.
- In addition, highly efficient and optimized internal combustion engines will continue to play a long-term role in heavy-duty applications which are hard to electrify (e.g., vehicles intended for driving under difficult situations). It is therefore appropriate that the EU Commission has not proposed a de facto end date for internal combustion engine vehicles. In order to reach climate neutrality across all different drive powertrains, the **defossilization of road transport fuels, electricity, and hydrogen** is absolutely crucial.

2. Ambitious CO₂ targets call for equally ambitious enabling conditions

- The proposed CO₂ standards are one of the most stringent targets for HDV worldwide. Manufacturers and suppliers are already investing heavily in climate-friendly powertrain technologies to bring them to the market as fast as possible. However, the feasibility of targets depends less on industry's ability to bring zero emission vehicles to the market than on **key enabling conditions, which are, to a large extent, beyond the control of manufacturers and suppliers**.
- The current state of enabling conditions, including the **lack of high-capacity H₂ refuelling and megawatt charging stations suitable for HDV**, and the **absence of effective carbon pricing measures**, means that even the current CO₂ reduction target (30% reduction by 2030) seems difficult to achieve. The proposed tightening of the current 2030 target to minus 45%, as well as the introduction of ambitious targets for 2035 (-65%) and 2040 (-90%) will therefore require massive investments in important enabling conditions.
- **Significant parts of the investments needed must be borne and stimulated by the state**, especially with a view to building an adequate public hydrogen refuelling and electric charging infrastructure. Should the EU and its Member States fail to provide conducive framework conditions, there is a **risk that investments in zero emission vehicles as well as capacities for renewable fuels will be shifted abroad over time**. This may be true in particular for hydrogen mobility which is increasingly viewed as an important element of a competitive and decarbonized powertrain mix in countries such as China, the USA or India.

3. A regular review of key enabling conditions is needed to ensure target compliance

- The EU Commission's proposed review in 2028 would come too late to adjust the 2030 target in case important enabling conditions proved to be insufficient. Further, a minor delay of the review would risk dragging the review into the European election process in 2029, resulting in further delays. Hence, **a first review of the new CO₂ fleet standards should be completed by 2027 latest. From the year 2025 onwards, the status of key enabling conditions should be assessed on a yearly basis**.
- The yearly assessment should be based on **precise performance indicators** relating to the progress made on important enabling conditions. These include:
 - the deployment of alternative HDV, taking into account parameters affecting total cost of ownership and utility, including the cost development of components and systems for alternative drive trains,

- the roll-out of an adequate public charging and hydrogen refuelling infrastructure. The assessment should also take into account the results of the reports from the EU Commission and Member States resulting from the obligations of Article 6, 13 and 22 of the Alternative Fuels Infrastructure Regulation (AFIR);
 - the availability of green electricity, green hydrogen, renewable fuels, and critical raw materials;
 - effective carbon pricing measures, including a strong emission trading system for road transport (ETS-2) and CO₂-based road charges that also take into account the defossilization potential of renewable fuels;
 - the life-cycle emissions of HDV, based on a methodology for the assessment and the consistent data reporting of the life-cycle CO₂ emissions of HVD placed on the Union market;
 - other measures that reduce the TCO for fleet operators.
- Should the review show that key enabling conditions are not consistent with the CO₂ fleet targets, the review should trigger a) **additional actions on the enabling conditions**, b) a **temporary suspension of fines for manufacturers** or c) an **adjustment of CO₂ fleet targets**.

4. Proposed target levels for new vehicle groups should be reassessed

- The EU Commission's proposed inclusion of new vehicle groups, such as medium lorries, heavy vehicles with special axle configurations, and heavy buses will lead to additional CO₂ savings by covering around 95% of the EU's heavy-duty traffic.
- Extending the regulation's scope makes sense as long as the new targets are based on the CO₂ certification framework ((EU) 2017/2400). However, setting a CO₂ reduction target of 45% based on a 2025 baseline would give manufacturers of new vehicle groups less than five years to adapt to the new target regime. Hence, the **regulation should provide adequate lead time**.

5. The EU and Member States must ensure a coherent set of regulations to incentivize a CO₂-neutral road transport sector

- The success of the CO₂ standards for HDV depends heavily on the successful implementation of other regulations, such as the **AFIR**, the **ETS-2** and the **Renewable Energy Directive (RED III)**. Unfortunately, these regulations show rather low ambitions levels, especially in terms of the use of hydrogen and hydrogen-based fuels in road transport. For instance, the proposed targets for hydrogen refuelling stations in the AFIR have been delayed and weakened by Member States compared with the initial EU Commission's legislative proposal. EU legislators should take this into account when setting future CO₂ targets. At the same time, they should increase the targets for hydrogen in the next review of the AFIR in 2026.
- Finally, laws alone do not make a transformation. For the transformation to be successful and socially fair, the **EU and Member States must support industry with targeted funding and support programs**. Any funding and support made available should be **technology neutral** and help industry, employees, and consumers in their transition to climate neutrality.

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