

Revision of the Regulation on CO2 Emission Standards for Heavy Duty Vehicles

European Copper Institute position

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The European Copper Institute (ECI) supports the EU's climate ambitions for 2030 and 2050. Ambitious policies are needed to increase electrification, the deployment of renewables and of energy efficiency measures to decarbonise the European economy, and in many respects the 'Fit for 55' package proposals go in the right direction to facilitate this. **Copper makes a significant contribution to the clean energy transition** as a sustainable raw material that is needed to decarbonise the economy.

The fast development of battery technologies for passenger cars is enabling an acceleration in the decarbonisation of heavy-duty vehicles (HDVs). Given the relatively low margins of HDV fleet operators (around 3% of revenues), the **key driver** to shift operators to a zero-emission (ZE) technology is the **total cost of ownership (TCO)**. Once a ZE technology has a lower TCO than vehicles fuelled by diesel, demand will pull the transition and OEMs manufacturing HDVs will follow course. For this reason, in our view the **ZE HDV uptake will be steeper than the one for cars.**

Battery technology is ready for this. In most cases, urban and regional HDVs (going back to base everyday) using smart charging have a lower TCO than vehicles using diesel. This is also likely to be the case for long-haul vehicles when they arrive on the market by 2024.

To better align the Regulation setting CO2 emission standards for HDVs with this dynamic, **ECI suggests the following changes to the current Regulation:**

1. Introduce **CO2 reduction targets for lorries and tractors** of:
 - **65% by January 2030** compared to 2019 (or 2020 depending when the monitoring started) for those lorries and tractors in categories N2 and N3 of the

- European classification for vehicle categories that are currently included under the CO2 monitoring and reporting requirements, and
- **100% by January 2035** for all new registered lorries and tractors in categories N2 and N3.
2. Include a **ZEV mandate for busses and coaches** of:
- **50%** of new registered busses and coaches in categories M2 and M3 of the European classification for vehicle categories to be zero-emission by **January 2027**, and
 - **100%** of new registered busses and coaches in categories M2 and M3 to be zero-emission by **January 2030**.
3. Mandate the European Commission to present a legislative proposal by December 2026 to set minimum **well-to-wheel energy efficiency thresholds** for HDVs.

Total Cost of Ownership is the main trigger of the transition to zero-emission HDVs

The revision of the Regulation on CO2 Emission Standards for Heavy Duty Vehicles should reflect the different in market dynamics between passenger cars and heavy-duty vehicles. For passenger cars, a key trigger to convince consumers to shift to electric is to ensure they are easy to recharge, by the deployment of the required public recharging infrastructure in coordination with the uptake of the registered battery electric vehicles.

However, the market for HDVs is different. Given the relatively low margins of HDV fleet operators (around 3% of revenues), the **key driver** to shift operators to a zero-emission technology is the **total cost of ownership** (TCO). Once a zero-emission technology has a lower TCO than vehicles fuelled by diesel, demand will pull the market to transition and OEMs manufacturing HDVs will follow course. For this reason, in our view the **ZE HDV uptake will be steeper than the one for cars**.

We expect that the required charging infrastructure will be just another element of the vehicle purchase contract. In our view, there are two main groups of HDVs: urban/regional (going back to base everyday) and long haul. Most of the charging of urban/regional HDVs will take place at their own depots, so public charging infrastructure will be less relevant. Long haul HDVs will require megawatt charging systems (and high-power chargers at truck rest areas where drivers sleep) on the TEN-T network, but fleet operators will be best placed to decide where, when and at what capacity these charging points will be required by the market at each stage of the transition.

Battery electric technology is ready for the transition

Today the TCO of battery urban/regional HDVs using smart charging is lower than vehicles operating with diesel (lorries¹ and busses²). In addition, OEMs are offering battery modularity to match capacity with daily energy demand (one battery cycle/day), in order to minimize TCO.

¹ <https://www.nrel.gov/news/program/2021/breakthrough-analysis-finds-electrified-heavy-duty-powertrains-could-provide-lower-total-cost-ownership.html>

² <https://data.bloomberglp.com/bnef/sites/14/2018/05/Electric-Buses-in-Cities-Report-BNEF-C40-Citi.pdf>

According to manufacturer announcements, battery long haul trucks will be commercially available from 2024. By that time, their TCO will also most likely be lower than the ones operating with diesel with price tags around 200,000 euros³.

Another important benefit of battery HDVs is their energy efficiency. While road transport accounts for 29% of EU final energy consumption⁴, a battery truck using renewable electricity is at least 2.6 times more energy efficient (well-to-wheel) than other zero-emission technologies (details in Annex I).

Manufacturer announcements are consistent with a requirement for all lorries and tractors to be zero emission from 2035:

The EU market share of zero-emission HDVs in 2019 was 1.4%⁵. According to the announcements of the three European HDV manufacturers with leading market share (see details in Annex II), new registered zero-emission HDVs will reach 50% of the market by 2030, which will imply close to a 50% reduction of CO₂ emissions.

In addition, improvements in the efficiency of diesel engines are expected to bring about a 30% reduction in CO₂ per kilometre driven by the late 2020s⁶. As we are assuming 50% zero-emission sales by 2030, these improvements of efficiency will bring an additional 15% CO₂ reduction for a total of 65% CO₂ reduction by 2030.

ECI ask: On this basis, in order to encourage an acceleration in the uptake of ZE HDVs, we believe it is appropriate to introduce CO₂ reduction targets of:

- **65% by January 2030** compared to 2019 (or 2020 depending when the monitoring started) for those light, medium and heavy trucks in categories N2 and N3 of the European classification for vehicle categories⁷ that are currently included under the CO₂ monitoring and reporting requirements⁸, and
- **100% by January 2035** for all new registered light, medium and heavy trucks in categories N2 and N3.

A target should be included for all busses and coaches to be zero emission by 2030 to reflect faster market uptake

³ <https://bulk-distributor.com/2020/11/batteries-could-power-big-rigs-sooner-than-you-think/#>
<https://theicct.org/sites/default/files/publications/TCO-BETs-Europe-white-paper-v4-nov21.pdf>
<https://www.nrel.gov/news/program/2021/breakthrough-analysis-finds-electrified-heavy-duty-powertrains-could-provide-lower-total-cost-ownership.html>

⁴ https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_statistics_-_an_overview#Final_energy_consumption Figure 11 and numbers in https://ec.europa.eu/eurostat/databrowser/view/NRG_BAL_C_custom_510511/bookmark/table?lang=en&bookmarkId=079816c3-4e9e-47bc-bf54-59a988e639ae

⁵ <https://theicct.org/publication/race-to-zero-ze-hdv-eu-dec21/>

⁶ <https://europeanclimate.org/resources/trucking-into-a-greener-future/>

⁷ <https://unece.org/DAM/trans/doc/2005/wp29/TRANS-WP29-1045e.pdf>

⁸ https://ec.europa.eu/clima/system/files/2018-12/201811_overview_en.pdf page20

Zero emission buses are coming onto the market at a faster rate than zero emission trucks as a result of the commitment of local and regional governments and of the fact that fixed routes are easier to electrify. In 2020 in the EU, the number of new registrations of battery busses was four times higher than battery trucks⁹, when they only account for 12% of total HDV sales.

As the CO₂ emissions of new busses are not currently monitored under Regulation 2018/956¹⁰, it is not practicable to introduce a CO₂ emissions reduction target for new busses. We believe that a zero-emission bus mandate should be included instead.

ECI ask: Include a mandate for:

- **50%** of new registered busses and coaches in categories M2 and M3 of the European classification for vehicle categories to be zero-emission by **January 2027**, and
- **100%** of new registered busses and coaches in categories M2 and M3 to be zero-emission by **January 2030**.

Energy efficiency thresholds for HDVs should be considered

The proposal to recast the Energy Efficiency Directive asks for including Energy Efficiency First as a principle also in non-energy sectors. As road transport accounts for 29% of EU final energy, the Energy Efficiency First principle (on a well-to-wheel basis) should also be considered in the revision of this regulation.

ECI ask: The Commission should be mandated to present a legislative proposal by December 2026 to set minimum well-to-wheel energy efficiency thresholds for HDVs.

⁹ <https://www.eafo.eu/vehicles-and-fleet/m2-m3>

¹⁰ https://ec.europa.eu/clima/system/files/2018-12/201811_overview_en.pdf page20
<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0956&from=EN> Annex I

Copper is a necessary raw material for decarbonisation technologies

More copper is needed for the clean energy transition. Thanks to its excellent electrical and thermal conductivity, copper delivers energy savings and CO₂ reductions across the electricity system, in transport, buildings and industry.

Copper is used in applications such as windmills, power grids, electrical installations, solar panels, electric vehicles, charging infrastructure, building automation, energy storage, solar thermal, wastewater heat recovery, heat pumps and batteries. Overall, copper-enabled decarbonising technologies can abate approximately 75% of the EU GHG emissions¹¹.

The additional copper demand generated by the energy transition is compatible with the move towards a circular economy. Copper can be recycled endlessly without loss of properties and around 50% of copper produced in the EU today is obtained through recycling. Copper also contributes to resource efficiency as a carrier metal: by-products of copper production include other metals needed for the energy transition, such as nickel.

About the European Copper Institute

The European Copper Institute (ECI) is the leading advocate for the copper industry in Europe and the European arm of the International Copper Association (ICA). Our members mine, smelt, refine and recycle copper for use across the economy, in the electricity system, buildings, transport and industry.

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¹¹ Copper estimate based on the EU 2050 "High-RES" scenario of the EU 2050 energy roadmap, plus additional assumptions about the uptake of emerging technologies. https://ec.europa.eu/energy/sites/ener/files/documents/2012_energy_roadmap_2050_en_0.pdf
GHG estimate based on DecarbEurope. <https://decarbEurope.org/>

ANNEX I

Well to wheel energy efficiency of a BEV and a FCEV using green energy¹²

		WTT (MJ_{fuel}/MJ)	
Electricity (WDEL)		1,07	
H2 (WDEL average)		1,91	
Heavy Duty		TTW (MJ/tkm)	
Group 4 (rigid)			
	BEV 2025+	1,225	
	FCEV 2025+	1,755	
Group 5 (long haul)			
	BEV 2025+	0,3279	
	FCEV 2025+	0,4795	
Heavy Duty		WTW (MJ_{fuel}/tkm)	Ratio
Group 4 (rigid)			
	BEV 2025+	1,311	
	FCEV 2025+	3,352	2,6
Group 5 (long haul)			
	BEV 2025+	0,3509	
	FCEV 2025+	0,9158	2,6

Acronyms WTT, well to tank BEV, battery electric vehicle
 TTW, tank to wheel FCEV, fuel cell electric vehicle
 WTW, well to wheel

¹² <https://ec.europa.eu/jrc/en/jec/publications/reports-version-5-2020>

ANNEX II

HDV OEM announcements¹³

	2020 HDV new registrations	2030 ZE-HDV announced market uptake target
Traton Group	27%	
MAN		40% - 60%
Scania		50%
Daimler Trucks	24%	
Mercedes		60%
Fuso		
Volvo Group	18%	
Volvo		50%
Renault		35%
CNH Industrial (Iveco)	12%	
Paccar (DAF)	9%	

¹³ <https://theicct.org/publication/race-to-zero-ze-hdv-eu-dec21/>