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CONTRIBUTION

From:	General Secretariat of the Council
To:	Working Party on the Environment
Subject:	Revision of CO2 standards for heavy duty vehicles: follow-up to the WPE meeting on 26 May 2023 - comments from a delegation

Following the call for comments (WK 7004/23), delegations will find attached the contributions received from the FI delegation.

Proposal by Finland for excluding the vehicles used in towing the heaviest combinations from the scope of the CO2 targets

The calculation of CO2 emissions of trucks included in the Commission Proposal does not account for the high load capacity used in several EU Member States for heavy-duty transport (with combination mass over 40 tonnes). The emissions calculations are most distorted for vehicles used in towing the heaviest combinations with maximum permissible mass over 70 tonnes.

Towing combinations over 70 tonnes is done mainly with the group 16 (8x4) vehicles and in long haulage. For vehicles in group 16, the emissions are calculated with the construction mission profile, which gives them an incorrect driving cycle in comparison to their use in extra heavy combinations (EHC) transport. In addition, their assumed payload does not correspond to the actual load transported by an EHC. Thus, the simulation gives them disproportionately large calculated emissions.

As a concrete example, the emissions (g/tkm) of a group 16 timber (8x4) truck with a combined mass of 76 tonnes are about 55% lower than the simulated emissions for this vehicle group in VECTO. In terms of long haulage on the road, the difference is even greater: the real CO2 emissions of an 8x4 truck + 5 axle full trailer in group 16 are about 35 g/tkm, while the VECTO emissions are around 110 g/tkm for these trucks.

With the current distortions in the emission calculation, extending the scope to cover all vehicles in groups 11, 12 and 16 might affect the availability of more powerful trucks and increase their prices, since vehicles used in EHC will most probably disproportionately increase the average emissions of OEMs. **This in turn would have a negative impact on the transport efficiency of the countries that use heavier combinations** by forcing a shift to more and smaller HDVs. These vehicles form only a very marginal share of new HDV registrations at the EU level. Vehicles used in combinations over 60 tonnes form only about 3% of new HDV registrations in the EU, and for over 70 tonnes the share is even smaller. They are used in transport tasks where there are significant limitations for the utilisation of zero emission technologies. These limitations relate to EHC usage in non-stop transport tasks by changing the driver or carrying out the transport task to or through a sparsely populated area, where the alternative fuels infrastructure does not enable the use of zero emission technologies. Hence, the effects on the availability of these vehicles would force a shift to a larger number of smaller vehicles or increase the use of the loopholes in the regulation, such as registering these vehicles as vocational vehicles or in the off-road sub-category (N3G) in order to keep them out of the scope.

Consequently, it is important that **the heaviest trucks in group 16, which are used for towing over 70 tonne extra heavy combinations (EHC) be exempted from the CO2 emission targets.** A small number of trucks belonging to vehicle **groups 11 and 12** are also used with large combination masses for towing extra heavy combinations. Therefore, **these trucks should also be exempt from the CO2 emission targets in cases where such trucks have a technically permissible maximum combination mass exceeding 70 tonnes.** Their inclusion in the scope could be considered in the

context of reviewing the Regulation, should the emissions calculation have been developed by that time to account for their special characteristics.

We see that the information of the technically permissible maximum mass of the vehicle combination is a reliable way to differentiate the vehicles used in towing over 70 tonne combinations. The maximum technically permissible total mass of the vehicle combination must be taken into account in the type approval, with regard to various components, systems and features. It has such a wide influence on the vehicle's requirements and the starting points of the vehicle's design that it constitutes a very significant factor influencing the cost of manufacturing for trucks. Therefore, the possibility of trying to increase the technically permissible total mass for the combination without the actual need for use must be considered very low.

In the longer term, we see that there is the need to develop the VECTO simulation tool under the scope of the certification regulation EU 2017/2400 to take into account the emissions of heavy combinations in a more realistic way. However, as long as the calculated emissions for vehicles towing over 70 tonne combinations do not reflect their actual emissions, they should be excluded from the scope.

Proposed amendments

- Vehicles in groups 11, 12 and 16, used for towing combinations with mass exceeding 70 tonnes, should be excluded from the scope of the CO₂ targets under Article 2(5) until the VECTO calculation has been developed to better account for the actual use of these combinations.
- It is also proposed that a paragraph be inserted into the Review Article (Art. 15), stating that the inclusion of these vehicles in the scope can be considered in the context of reviewing the Regulation, provided that the emissions calculation has been developed to account for their special characteristics.
- In addition to the amendments below, in order to identify the N3 trucks used in towing over 70 tonne combinations, it would also be necessary to add the technically permissible maximum mass of the combination for a category N3 truck in an EHC to the information monitored by Member States in Annex IV.

It is therefore proposed that following changes (marked in red) be made:

Article 2

5. Vehicles other than those referred to in paragraph 4 registered for use by civil protection, fire services, forces responsible for maintaining the public order, armed services or urgent medical care, or category N3 trucks in group 11, 12 or 16 which have a technically permissible

maximum mass exceeding 70 tonnes, shall not be subject to the CO₂ emission targets under Article 3a, if a Member State so indicates in the registration and reporting process, thereby confirming in the data reported in accordance with Part A of Annex IV that the purpose of the vehicle cannot be equally served by a ZEV and it is thus in the public interest to register a vehicle with a combustion engine to fulfil that purpose.

Article 15

Review

The Commission shall, in 2028, review the effectiveness and impact of this Regulation and submit a report to the European Parliament and to the Council with the result of the review.

The report shall, where appropriate, be accompanied by a proposal for amending this Regulation.

The report should assess the possibility to include in the scope the N3 category trucks in groups 11, 12 and 16, which have a technically permissible maximum mass exceeding 70 tonnes, provided that the emissions calculation of these vehicles has been developed to account for their specific characteristics when used in towing heavy combinations.

FINLAND

Proposal by Finland for taking into account the special features of EHC trucks (Extra Heavy Combination) in the calculation of the average specific CO₂ emissions of manufacturers

Extra heavy combinations (with maximum permissible mass over 60 tonnes), hereafter referred to as **EHC vehicles**, are vehicles designed to tow combinations above standard masses and often also dimensions. They are widely used in the Nordic countries, but also in several other Member States. EHC often include **EMS (European modular system)** transports, but the term EHC is used here because EMS combinations have different masses for combination in different Member States.

EHC vehicles have increased energy-efficiency gains and lowered relative fuel use. Lower fuel use results from the possibility to carry the goods with one truck instead of using e.g. two smaller trucks. Heavier and longer trucks mean less CO₂ emissions per tonne km as well as higher productivity.

For example, the typical payload of EHC is much higher – in Finland the maximum payload mass and volume for EMSs is 55% more and for larger EMS2s ¹100% more than in the EU on average within the same sub-group. However, **the CO₂ emissions calculation for heavy-duty vehicles does not take into account the better energy efficiency of EHC trucks.** Since their assumed payload is the same as for significantly smaller heavy-duty vehicles within the same sub-groups, their calculated emissions of CO₂ per tonne km will not correspond to the actual load transported by the EHC.

In Finland, the transport performance of EHC trucks with maximum combination mass of more than 60 tonnes in 2022 accounted for up to 71% of domestic transport performance carried out on trucks with a mass exceeding 18 tons and their combinations. **If the shortcoming in the emission calculation for heavy combinations is not compensated, this might affect the availability of more powerful trucks and increase their prices,** since vehicles used in EHC will most probably increase disproportionately the average emissions of OEM's. This in turn would have a negative effect on the transport efficiency of the countries that use heavier combinations, by forcing a shift to more and smaller HDVs.

As a measure to correct this shortcoming, we propose a change be made to calculation formulas of the average specific CO₂ emissions of manufacturers and reference CO₂ emissions. This aims to compensate for the higher loads carried by an EHC and this way take into account the improved energy efficiency of transports with EHC.

This would require that N3 trucks capable for use in EHC be identified and reported separately without making the compensation conditional on allowing the use of EHC in the Member State in which the truck is registered. For this reason, in addition to the proposal for altering the calculation formula it is necessary to add the maximum combination mass for these EHC to the information monitored by Member States in Appendix IV. We see that the information of the maximum technically permissible total mass of the vehicle combination in itself is a sufficient vehicle characteristic to differentiate the vehicles used in towing extra heavy combinations. The maximum

¹ In Finland, EMS combination is 25 metres and 60 tonnes, while EMS2 combination is 32 metres and 76 tonnes.

technically permissible total mass of the vehicle combination must be taken into account in the type approval, with regard to various components, systems and features. It has such a wide influence on the vehicle's requirements and the starting points of the vehicle's design that it constitutes a very significant factor influencing the cost of manufacturing for trucks. Therefore, the possibility of trying to increase the technically permissible total mass for the combination without the actual need for use must be considered very low.

In the longer term, we see that there is the need to develop the VECTO simulation tool under the scope of the certification regulation, EU 2017/2400) to take into account heavy combination's emissions in a more realistic way. However, at this point, it would be important to correct the distortions in the calculations for heavy combinations through this regulation.

The emissions calculations are most distorted for the heaviest combinations, with maximum permissible mass over 70 tonnes. Over 70 tonne combinations are towed mainly with the group 16 (8x4 trucks) vehicles. For the group 16, the emissions are calculated with the construction mission profile, which gives them incorrect driving cycle in comparison to their use in EHC transport. While the assumed payload is also significantly too low, the emission calculation gives the vehicles disproportionately high emissions.

Proposal for the calculation of the average specific CO2 emissions of manufacturers referred to in Article 4

An amendment is proposed to the formula for trucks in Annex I, point 2.7.2 starting from the 2025 reporting period. The current part of the formula that applies to the average specific CO2 emissions of the manufacturer's vehicles by sub-group would be amended with the compensation clause below. This would be applied also to the reference emission values (Annex I, point 3.1.2) to ensure that no unfair advantage is caused by the compensation factor.

We propose that in the calculation in question, when the in service maximum permissible mass of a truck and trailer(s) combination is 60-70 tonnes, a 17.0% advantage in transport efficiency be used as compensation compared to a 40-tonne combination. This proposal is based on what could be estimated on the improved transport-efficiency of EHC with different combination masses. For trucks with 8x4 axle configuration (group 16) used in EHC, the need for compensation is even higher, since their actual emissions are only about 46% of what their calculated CO2 emissions in g/tkm are. This too is reflected in the proposed formula.

It is proposed that the compensation for the average specific CO2 emissions from the manufacturer's trucks could be allocated to those N3 trucks first registered during the reporting period and that have been reported by the Member States with the higher technically permissible maximum mass of the combination applicable to EHC transports, which is at least 60 tonnes. Regardless of whether national legislation enable EHC transport, trucks reported by Member States with technically permissible maximum mass of the combination greater than 60 tonnes can receive compensation for CO2 emissions of those trucks. The condition for this is that the Member State reports information on the technically permissible maximum mass of the combination for the truck to enable the assessment of technical potential for EHC transport.

1. The proposal for a new formula in Annex I, point 2.7.2 would then be (changes marked in red):

2.7.2. For the reporting periods as from 2025:

$$\begin{aligned} CO2(NO) &= \sum_{sg} share_{sg} \times MPW_{sg} \times avgCO2_{sg} ((1 - share_{sgEHC}) + \alpha_{sg} \times share_{sgEHC}) \\ CO2(MCO2) &= \sum_{sg} share_{sg} \times MPW_{sg} \times [avgCO2_{sg} \times (1 - pv_{sg}) + avgCO2p_{sg} \times pv_{sg}] \\ CO2(MZE) &= \sum_{sg} share_{sg} \times MPW_{sg} \times (1 - zev_{sg}) \times rCO2_{sg} \\ CO2(M) &= CO2(MCO2) + CO2(MZE) \end{aligned}$$

Where,

\sum_{sg} is the sum that represents the sub-categories that are included in the calculations of the particular average specific CO₂ emissions according to point 4.2;

ZLEV is determined in point 2.3;

share_{sg} is determined in point 2.4;

zev_{sg} is determined in point 2.4;

pv_{sg} is determined in point 2.4;

MPW_{sg} is determined in point 2.6;

avgCO_{2sg} is determined in point 2.2;

avgCO_{2psg} is determined in point 2.2;

rCO_{2sg} is determined in point 3.1.2

share_{sgEHC} is the share of trucks technically suitable for towing EHC in a sub-group sg from manufacturer's new heavy-duty category N3 vehicles which are covered by the calculation of the specific emission target of a manufacturer in point 4 of Annex I;

α_{sg} is the average compensation factor to adjust the effect of the higher payload of a EHC on the trucks, depending on the subgroup, using the following standard numerical value:

$$\alpha_{sg} = 0,54; \text{ for subgroup 16, 8x4 EHC trucks}$$

$$\alpha_{sg} = 0,83; \text{ for other EHC trucks}$$

For the purposes of the calculation of CO₂ emissions, a truck covered by this Regulation shall be considered suitable for towing an extra heavy combination, hereafter EHC, if the truck is of category N3 and the truck's technically permissible maximum mass of the combination is greater than 60 tonnes and has been reported in accordance with point (r) of Part A of Annex IV.

2. The proposal for a new formula in Annex I, point 3.1.2., would then be (changes marked in red):

3.1.2. Reference CO₂ emissions $rCO2sg$ referred to in Article 3 shall be calculated as follows:

$$rCO2_{sg} = \frac{\sum v(CO2v/PLsg)}{rVsg} ((1 - share_{sgEHC\ all}) + (\alpha_{sg\ all} \times share_{sgEHC\ all})) \text{ (for vehicles of category N and O)}$$

[...]

Where,

$\sum v$ is the sum over all new heavy-duty vehicles in the sub-group sg registered in the reference period applicable to sg according to point 3.2;

CO2v are the specific CO2 emissions of the new heavy-duty vehicle v as determined in accordance with point 2.1, if applicable adjusted pursuant to Annex II;

CO2pv are the specific CO2 emissions of the primary vehicle of the new-heavy duty vehicle v as determined in accordance with point 2.1, if applicable adjusted pursuant to Annex II;

rVsg is the number of all new heavy-duty vehicles in the sub-group sg registered in the reference period applicable to sg according to point 3.2;

PLsg is the average payload of vehicles in the sub-group sg as determined in point 2.5;

PNsg is the average passenger number of vehicles in the sub-group sg as determined in point 2.5;

PLv,mp is the payload of vehicle v in the mission profile mp, as determined from the data reported according to Articles 13a and 13b ;

PNv,mp is the passenger number of vehicle v in the mission profile mp as determined from the data reported according to Articles 13a and 13b;

PMv,mp is the passenger mass of vehicle v in the mission profile mp as determined from the data reported according to Articles 13a and 13b;

maxPLv is the technically permissible maximum payload of vehicle v as determined from the data reported according to Articles 13a and 13b;

maxPNv is the technically permissible maximum passenger number of vehicle v as determined from the data reported according to Articles 13a and 13b;

CVv is the cargo volume of vehicle v as determined from the data reported according to Articles 13a and 13b;

$share_{sgEHC\ all}$ is the share of all trucks technically suitable for towing EHC in a sub-group sg from all new heavy-duty category N3 vehicles which are covered by the calculation of the specific emission target of a manufacturer in point 4 of Annex I;

α_{sg} is the average compensation factor to adjust the effect of the higher payload of a EHC on the trucks, depending on a sub-group sg, using the following standard numerical value:

$\alpha_{sg} = 0,54$; for subgroup 16 8x4 EHC trucks

$\alpha_{sg} = 0,83$; for other EHC trucks

For the purposes of the calculation of CO₂ emissions, a truck covered by this Regulation shall be considered suitable for towing an extra heavy combination, hereafter EHC, if the truck is of category N3 and the truck's technically permissible maximum mass of the combination is greater than 60 tonnes and has been reported in accordance with point (r) of Part A of Annex IV.

3. In order to monitor and report the share of new trucks to be registered, new Information to be monitored and reported by Member States as defined in Part A of Annex IV will be added (changes marked in red):

r) technically permissible maximum mass of the combination for a category N3 truck in an extra heavy combination (EHC) referred to in Annex I, points 2.7.2. and 3.1.2. as specified in entry 16.4 of the certificate of conformity or individual vehicle approval certificate