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From:	General Secretariat of the Council
To:	Delegations
No. Cion doc.:	8922/18
Subject:	Proposal for a Regulation of the European Parliament and of the Council setting CO_2 emission performance standards for new heavy-duty vehicles - Presidency text

Delegations will find attached a Presidency text on the above proposal with a view to discussion at the meeting of the Working Party on the Environment on 20 September 2018.

New or changed text compared to the initial Commission proposal is marked as **bold and underlined**. Deleted text is marked **[…]**

ANNEX

Proposal for a

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

setting CO_2 emission performance standards for new heavy-duty vehicles and amending Regulation (EC) No 595/2009

(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 192(1) thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national parliaments,

Having regard to the opinion of the European Economic and Social Committee[1],

Having regard to the opinion of the Committee of the Regions[2],

Acting in accordance with the ordinary legislative procedure,

Whereas:

(1) The **Commission's Communication: "A** European Strategy for Low-Emission Mobility**"** sets a clear ambition: by mid-century, greenhouse gas emissions from transport will need to be at least 60% lower than in 1990 and be firmly on the path towards zero. Emissions of air pollutants from transport that harm our health need also to be drastically reduced without delay.

[1] OJ C , , p. .
[2] OJ C , , p. .

(2) Following **that Communication**, the Commission adopted two mobility packages in May[3] and November 2017[4]. These packages set out a positive agenda **also aimed at** ensuring a smooth transition towards clean, competitive and connected mobility for all.

(3) This Regulation is part of the third **mobility package of the Commission entitled** "Europe on the Move", which **is a follow up to the Commission's Communication: "Investing in a smart, innovative and sustainable Industry: A renewed EU Industrial Policy Strategy"**[5], and is designed to complete the process of enabling the Union to reap the full benefits of the modernisation and decarbonisation of mobility. The aim of th**is third mobility p**ackage is to make European mobility safer and more accessible, European industry more competitive, European jobs more secure, and the mobility system to be cleaner and better adapted to the imperative of tackling climate change. This will require the full commitment of the Union, Member States and stakeholders, not least in strengthening efforts to reduce CO_2 emissions and air pollution.

(4) This Regulation provides, together with the CO_2 emission standards for passenger cars and light commercial vehicles[6], a clear pathway for CO_2 emissions reductions from the road transport sector and contributes to the binding target of at least a 40% domestic reduction in economy-wide greenhouse gas emissions by 2030 compared to 1990, as was endorsed in the Conclusions of the European Council of 23-24 October 2014, and approved **by the Council on 6 March 2015** as the Union Intended Nationally Determined Contribution under the Paris Agreement **[…]**.

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3 Europe on the Move: An agenda for a socially fair transition towards clean, competitive and connected mobility for all, COM(2017) 283 final.

4 Delivering on low-emission mobility A European Union that protects the planet, empowers its consumers and defends its industry and workers, COM(2017) 675 final.

5 Investing in a smart, innovative and sustainable Industry A renewed EU Industrial Policy Strategy, COM(2017) 0479 final.

6 Regulation (EU) No …/… of the European Parliament and of the Council setting emission performance standards for new passenger cars and for light commercial vehicles as part of the Union's integrated approach to reduce CO2 emission from light duty vehicles and amending Regulation (EC) No 715/2007, (OJ L, …,…, p.).

(5) The European Council Conclusions of October 2014 endorsed a greenhouse gas emissions reduction of 30% by 2030 compared to 2005 for the sectors that are not part of the Union's emissions trading system. Road transport provides a major contribution to the emissions of those sectors and its emissions remain significantly above 1990 levels. If road transport emissions would increase further, it will off-set reductions made by other sectors to combat climate change.

(6) The European Council Conclusions of October 2014 highlighted the importance of reducing greenhouse gas emissions and risks related to fossil fuel dependency in the transport sector through a comprehensive and technology neutral approach for the promotion of emissions reduction and energy efficiency in transport, for electric transportation and for renewable energy sources in transport also after 2020.

(7) Energy efficiency contributing to moderation of demand is one of the five mutually-reinforcing and closely interrelated dimensions **set out in** the **Commission's Communication on "The** Energy Union Strategy"[7] **which aims** to give consumers in the Union secure, sustainable, competitive and affordable energy. The **Communication** states that, while all economic sectors must take steps to increase the efficiency of their energy consumption, transport has a huge energy efficiency potential energy efficiency.

(8) CO_2 emissions from heavy-duty vehicles, including lorries, buses and coaches, represent around 6% of total CO_2 emissions in the Union and about 25% of total road transport CO_2 emissions. Without further action taken, the share of emissions from heavy-duty vehicles is expected to grow by around 9% between 2010 and 2030. Currently, Union law does not set any CO_2 reduction requirements for heavy-duty vehicles.

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[7] **Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank: A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy (COM(2015) 80 final).**

(9) In order to fully realise the energy efficiency potential and ensure that the road transport sector as a whole contributes to the greenhouse gas emission reductions agreed, it is appropriate to complement the already existing CO_2 emission standards for new passenger cars and light commercial vehicles by setting CO_2 emission performance standards for new heavy-duty vehicles. These standards will be a driver for innovation in fuel-efficient technologies, contributing to the strengthening of the technological leadership of the Union's manufacturers and suppliers.

(10) Taking into account that climate change is a trans-boundary problem and the need to safeguard a well-functioning single market both for road transport services as well as for heavy-duty vehicles, it is appropriate to set CO_2 emission standards for heavy-duty vehicles at Union-level. Those standards should be **[…]** without prejudice to competition law.

(11) In defining the reduction levels that should be achieved by the Union's fleet of heavy-duty vehicles, account should be taken of the effectiveness of those reduction levels in delivering a cost-effective contribution to reducing emissions of the sectors covered by the Regulation [Effort Sharing (EU) No …/2018] by 2030, of the resulting costs and savings for society, manufacturers, transport operators, consumers, as well as of their direct and indirect implications for employment, innovation and co-benefits generated in terms of reduced air pollution and improved energy security.

(12) A new procedure for determining the CO_2 emissions and fuel consumption of individual heavy-duty vehicles has been introduced as part of the implementation of Regulation (EC) No 595/2009[8]. Commission Regulation (EU) 2017/2400[9] provides a methodology, based on the VECTO tool, through which the CO_2 emissions and fuel consumption of whole heavy-duty vehicles can be simulated. The methodology allows taking into account the diversity of the heavy-duty vehicle sector and the high degree of customisation of individual vehicles. In a first step, from 1 January 2019, the CO_2 emissions are determined for four groups of heavy-duty vehicles that account for around 65% to 70% of all CO_2 emissions from the Union's fleet of heavy-duty vehicles.

(13) In the light of innovation and to take account of the implementation of new technologies improving the fuel efficiency of heavy-duty vehicles, the VECTO simulation tool as well as Regulation (EU) 2017/2400 will be continuously and timely updated.

(14) The CO_2 emissions data determined pursuant to Regulation (EU) 2017/2400 are to be monitored under Regulation (EU) **2018/596** of the European Parliament and of the Council[10]. Those data should form the basis for determining the reduction targets to be achieved by the four groups of the most emitting heavy-duty vehicles in the Union, as well as for determining a manufacturer's average specific emissions in a given calendar year.

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8 Regulation (EC) No 595/2009 of the European Parliament and of the Council of 18 June 2009 on type-approval of motor vehicles and engines with respect to emissions from heavy-duty vehicles (Euro VI) and on access to vehicle repair and maintenance information and amending Regulation (EC) No 715/2007 and Directive 2007/46/EC and repealing Directives 80/1269/EEC, 2005/55/EC and 2005/78/EC

9 Commission Regulation (EU) 2017/2400 of 12 December 2017 implementing Regulation (EC) No 595/2009 of the European Parliament and of the Council as regards the determination of the CO2 emissions and fuel consumption of heavy-duty vehicles and amending Directive 2007/46/EC of the European Parliament and of the Council and Commission Regulation (EU) No 582/2011, OJ L 349, 29.12.2017, p. 1.

10 Regulation (EU) **2018/596** of the European Parliament and of the Council on the monitoring and reporting of CO_2 emissions from and fuel consumption of new heavy-duty vehicles, OJ L **173, 9.7.2018, p.1**.

(15) A reduction target should be set for 2025 as a relative reduction based on the average CO_2 emissions of those heavy-duty vehicles in 2019, reflecting the deployment of readily available cost-effective technologies for conventional vehicles. The **30% reduction target for** 2030 **[…]** should be considered aspirational and the final target **for 2030 onwards** should be **confirmed** pursuant to a review to be carried out in 2022 as there are more uncertainties on the uptake of more advanced technologies which are not yet readily available. **Where an increased target for 2030 onwards is not confirmed, the reduction target set for 2025 onwards should continue to apply.**

(16) Liquefied natural gas (LNG) is an available alternative fuel to diesel for heavy duty vehicles. The deployment of current and upcoming more innovative LNG-based technologies will contribute to meeting the CO2 emission targets in the short and medium term as the use of LNG technologies leads to lower CO2 emissions as compared to diesel vehicles. The CO2 emission reduction potential of LNG vehicles is already fully reflected in VECTO. In addition, current LNG technologies ensure a low level of air pollutant emissions such as NOx and particulate matters. A sufficient minimum refuelling infrastructure is also in place and being further deployed as part of national policy frameworks for alternative fuel infrastructure.

(17) In calculating the 2019 reference emissions serving as basis for determining the 2025 and 2030 reduction targets, the expected reduction potential of the heavy-duty fleet **[…]** should be taken into account. It is therefore appropriate to exclude from that calculation, vocational vehicles such as vehicles used for garbage collection or construction works. Those vehicles have a comparatively low mileage, and due to their specific driving pattern, technical measures for reducing CO_2 emissions and fuel consumption do not appear to be cost effective in the same way as for heavy-duty vehicles used for the delivery of goods.

(18) The CO_2 reduction requirements should be expressed in grams of CO_2 per tonne kilometre to reflect the utility of the heavy-duty vehicles.

(19) A fair distribution of the overall reduction requirements among the manufacturers needs to be ensured, taking into account the diversity of heavy-duty vehicles in terms of their design and driving pattern, annual mileage, payload and trailer configuration. It is therefore appropriate to distinguish the heavy-duty vehicles according to different and separate vehicle sub-groups that reflect the vehicles' typical usage pattern and specific technical characteristics. By setting annual manufacturer specific targets as a weighted average of the targets defined for each such sub-group, manufacturers are also given the means to effectively balance a possible underperformance of vehicles in certain sub-groups with an overachievement in other vehicle sub-groups, taking into account the average lifetime CO_2 emissions of vehicles in the different sub-groups.

(20) A manufacturer's compliance with its annual specific targets should be assessed on the basis of its average CO_2 emissions. In determining the average specific emissions, the specificities that are reflected in the different vehicle sub-group targets should also be considered. As a consequence, the average specific CO_2 emissions of a manufacturer should be based on the average emissions determined for each sub-group including a weighting based on their assumed average annual mileage and average payload, which reflects the total lifetime CO_2 emissions. Due to the limited reduction potential of vocational vehicles, those vehicles should not be taken into account for the calculation of the average specific emissions.

(21) Contrary to cars and vans, zero- and low-emission heavy-duty vehicles are not yet available on the market, except for buses. A dedicated mechanism, in the form of super credits, should therefore be introduced to facilitate a smooth transition towards zero-emission mobility. This will provide incentives for the development and deployment on the Union market of zero- and low-emission heavy-duty vehicles that would complement demand-side instruments, such as the Clean Vehicle Directive 2009/33/EC of the European Parliament and of the Council[11].

[11] Directive 2009/33/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of clean and energy-efficient road transport vehicles as amended by Directive …/…/EU [COM(2017) 653 final] (OJ L 120, 15.5.2009, p. 5).

(22) For the purpose of calculating the average specific emissions of a manufacturer, all zero- and low-emission heavy-duty vehicles should therefore be counted multiple times**, which will result in a reduction in the average specific emissions of that manufacturer**. The level of incentives should vary according to the actual CO_2 emissions of the vehicle. In order to avoid a weakening of the environmental objectives, the resulting **reduction** should be subject to a cap.

(23) Low-emission heavy-duty vehicles should only be incentivised if their CO_2 emissions are less than about half of the CO_2 emissions of the Union fleet-wide average in 2025. This is consistent with the approach taken for light-duty vehicles and would incentivise innovation in this field

(24) In designing the incentive mechanism for the deployment of zero-emission heavy-duty vehicles, also smaller lorries, buses and coaches that are not subject to the CO_2 emission targets under this Regulation should be included. These vehicles also have significant benefits in terms of helping to address air pollution problems in cities. However, it should be noted that zero-emission buses are already on the market and are incentivised through demand-side measures such as public procurement. In order to ensure that the incentives are well balanced between the different types of vehicles, the **reduction in the average specific emissions of a manufacturer** resulting from the zero-emission smaller lorries, buses and coaches should therefore also be subject to a cap.

(25) In order to promote a cost-effective implementation of the CO_2 reduction requirements, while taking into account fluctuations in the fleet composition and emissions over the years, manufacturers should have the possibility to balance their overachievement in complying with their specific emission target in one year with an underperformance in another year.

(26) In order to incentivise early reduction achievements, a manufacturer, whose average specific emissions are below the emission reduction trajectory defined by the reference emissions in 2019 and the 2025 target, should be able to bank those emission credits for the purpose of target compliance in 2025. Similarly, a manufacturer, whose average specific emissions are below the emission reduction trajectory between the 2025 **target** and the **target applicable from** 2030 **onwards**, should be able to bank those emission credits for the purpose of target compliance in the period 2025 to 2029.

(27) In case of non-compliance with its specific emission target in any of the years 2025 to 2029, a manufacturer should also have the possibility to acquire a limited emission debt. However, by 2029 manufacturers should clear any remaining emission debt.

(28) Emission credits and debts should be considered only for the purpose of determining a manufacturer's compliance with its specific emission target and not as assets that are transferrable or subject to fiscal measures.

(29) The Commission should impose a financial penalty, in the form of an excess emissions premium, where a manufacturer is found to have excess emissions, taking into account the emission credits and debts. In order to provide manufacturers with a sufficient incentive to take measures to reduce the specific CO_2 emissions from heavy-duty vehicles, the premium should exceed the average marginal costs of the technologies needed to meet the targets. The premium should be considered as revenue for the general budget of the Union. The methodology for collecting the premiums should be determined by means of an implementing act, taking into account the methodology adopted pursuant to Regulation (EC) No 443/2009.

(30) A robust compliance mechanism is necessary in order to ensure that the targets under this Regulation are met. The obligations placed on manufacturers to deliver accurate data pursuant to Regulation (EU) **2018/956** and the administrative fines that may be imposed in the case of non-compliance with that obligation, contributes to ensuring the robustness of the data used for target compliance purposes under this Regulation.

(31) It is essential for achieving the CO_2 reductions pursuant to this Regulation that the CO_2 emissions of heavy-duty vehicles in use are in conformity with the values determined pursuant to Regulation (EC) No 595/2009 and its implementing measures. It should therefore be possible for the Commission to take into account, in the calculation of the average specific emissions of a manufacturer, any systematic non-conformity found by type approval authorities with regard to the CO_2 emissions of heavy-duty vehicles in use.

(32) In order to be in a position to take such measures the Commission should have the powers to prepare and implement a procedure for verifying the in-service conformity of the CO_2 emissions of heavy-duty vehicles on the market. For that purpose Regulation (EC) No 595/2009 should be amended.

(33) The effectiveness of the targets set out in this Regulation in reducing CO_2 emissions is strongly dependent on the representativeness of the methodology used for determining the CO_2 emissions. In line with the Opinion of the Scientific Advice Mechanism (SAM)[12] as regards light duty vehicles, it is appropriate also in the case of heavy-duty vehicles to put in place a mechanism to assess the real-world representativeness of the CO_2 emissions and energy consumption values determined pursuant to Regulation (EU) 2017/2400. The Commission should have the powers to ensure the public availability of such data and, where necessary, develop the procedures needed for identifying and collecting the data required for such assessments.

(34) In 2022, the Commission should assess the effectiveness of the CO_2 emission standards laid down in this Regulation and in particular the level of the reductions to be achieved by 2030, the modalities that should be available for achieving that target and beyond, as well as the setting of CO_2 reduction targets to other types of heavy-duty vehicles such as smaller lorries, buses, coaches and trailers. That assessment should also include, strictly for the purpose of this Regulation, considerations of heavy-duty vehicles and vehicle combinations **[…]**.

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12 High Level Group of Scientific Advisors, Scientific Opinion 1/2016 "Closing the gap between light-duty vehicle real-world CO2 emissions and laboratory testing"

(35) In order to ensure that the specific CO_2 emissions of heavy-duty vehicles remain representative and fully up-to-date, amendments to Regulation (EC) No 595/2009 and its implementing legislation that affect those values need be reflected in this Regulation. For that purpose, the Commission should have the powers to determine a methodology for defining a representative heavy-duty vehicle for each vehicle sub-group, on the basis of which changes of the specific CO_2 emissions should be assessed.

(36) **In order to ensure uniform conditions for the implementation of this Regulation, t**he implementing powers **laid down in** Articles 8(3), 9(3), 11(3) and 12 (2) should be **conferred on the Commission**. **Those powers should be exercised** in accordance with Regulation (EU) No 182/2011 of the European Parliament and of the Council[13].

(37) In order to amend or supplement non-essential elements of the provisions of this Regulation, the power to adopt acts in accordance with Article 290 of the Treaty of the Functioning of the European Union should be delegated to the Commission in respect of adjusting the reference CO_2 emissions **[…]** and in respect of amending **the** Annexes **[…] to this Regulation** as regards certain technical parameters, including the weightings of the mission profiles, the payloads, and the annual mileages as well as the payload adjustment factors. It is of particular importance that the Commission carry out appropriate consultations during its preparatory work, including at expert level and that those consultations be conducted in accordance with the principles laid down in the Interinstitutional Agreement of 13 April 2016 on Better Law-Making[14]. In particular, to ensure equal participation in the preparation of delegated acts, the European Parliament and the Council should receive all documents at the same time as Member States' experts, and their experts should systematically have access to meetings of Commission expert groups dealing with the preparation of delegated acts.

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13 Regulation (EU) No 182/2011 of the European Parliament and of the Council of 16 February 2011 laying down the rules and general principles concerning mechanisms for control by Member States of the Commission's exercise of implementing powers (OJ L, 55, 28.2.2011, p. 13).

14 OJ L 123, 12.5.2016, p. 1.

(38) Since the objectives of this Regulation, namely the establishment of CO_2 emissions performance standards for new heavy-duty vehicles, cannot be **sufficiently** achieved by the Member States **but** can **rather**, by reason of its scale and effects, be better achieved at Union level, the Union may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty on European Union. In accordance with the principle of proportionality, as set out in that Article, this Regulation does not go beyond what is necessary in order to achieve that objective,

HAVE ADOPTED THIS REGULATION:

Article 1
Subject matter and objective

In order to contribute to fulfilling the Union's target of reducing its greenhouse gas emissions by 30% below 2005 levels in 2030 in the sectors covered by Article 2 of Regulation (EU) No 2018/…[Effort Sharing Regulation], and to achieving the objectives of the Paris Agreement and to ensure the proper functioning of the internal market, this Regulation sets CO_2 emission performance standards for new heavy-duty vehicles whereby the specific CO_2 emissions of the Union's fleet of new heavy-duty vehicles shall be reduced compared to the reference CO_2 emissions as follows:

(a) From 1 January 2025 **onwards** by 15%;

(b) From 1 January 2030 onwards by at least 30%, **if confirmed pursuant** to the review **foreseen in** Article 13.

The reference CO_2 emissions shall be based on the 2019 monitoring data reported pursuant to Regulation (EU) **2018/956**, excluding vocational vehicles, and shall be calculated in accordance with Point 3 of Annex I.

Article 2
Scope

1. This Regulation shall apply to new vehicles of the categories N2 and N3 that meet the following characteristics:

(a) rigid lorries with an axle configuration of 4x2 and a technically permissible maximum laden mass exceeding 16 tons;

(b) rigid lorries with an axle configuration of 6x2;

(c) tractors with an axle configuration of 4x2 and a technically permissible maximum laden mass exceeding 16 tons;

(d) tractors with an axle configuration of 6x2.

It shall also apply, for the purposes of Article 5 and point 2.3 of Annex I, to vehicles of the categories M2 and M3, and to vehicles of the category N that do not fall within the scope of Regulation (EU) No 510/2011 and do not meet the characteristics set out in points (a) to (d).

The vehicle categories mentioned above refer to the vehicle categories as defined in Annex II of Directive 2007/46/EC of the European Parliament and of the Council[15].

2. The vehicles referred to paragraph 1 shall, for the purposes of this Regulation, be considered as new heavy-duty vehicles in a given calendar year, if they are registered in the Union for the first time in that year and have not been previously registered outside the Union.

A previous registration outside the Union made less than three months before registration in the Union shall not be taken into account.

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15 **Directive 2007/46/EC of the European Parliament and of the Council of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles (Framework Directive) (OJ L 263, 9.10.2007, p. 1).**

Article 3
Definitions

For the purposes of this Regulation, the following definitions shall apply:

(a) 'reference CO_2 emissions' means the average of the specific emissions in 2019 of all new heavy-duty vehicles in each of the vehicle sub-groups, excluding vocational vehicles, determined in accordance with point 3 of Annex I;

(b) 'specific emissions' means the CO_2 emissions of an individual heavy-duty vehicle determined in accordance with point 2.1 of Annex I;

(c) 'average specific emissions' means the average of the specific emissions of a manufacturer's new heavy-duty vehicles in a given calendar year determined in accordance with point 2.7 of Annex I;

(d) 'specific emission target' means the target of an individual manufacturer, expressed in g/tkm and determined annually for the preceding calendar year in accordance with point 4 of Annex I;

(e) 'rigid lorry' means a lorry that is not designed or constructed for the towing of a semi-trailer';

(f) 'tractor' means a tractor unit that is designed and constructed exclusively or principally to tow semi-trailers;

(g) 'vehicle sub-group' means a grouping of vehicles as defined in Point 1 of Annex I, that are characterised by a common and distinctive set of technical criteria relevant for determining the CO_2 emissions and fuel consumption of those vehicles;

(h) 'vocational vehicle' means a heavy-duty vehicle not intended for the delivery of goods and for which the CO_2 emissions and fuel consumption have been determined, in accordance with Regulation (EC) No 595/2009 and its implementing measures, only for other mission profiles than those defined in point 2.1 of Annex I to this Regulation;

(i) 'manufacturer' means the person or body responsible for submitting the data relating to new heavy-duty vehicles pursuant to Article 5 of Regulation (EU) **2018/956** or, in the case of zero-emission heavy-duty vehicles, the person or body responsible to the approval authority for all aspects of the EC whole vehicle type-approval procedure or of the individual approval in accordance with Directive 2007/46/EC and for ensuring conformity of production;

(j) 'zero emission heavy-duty vehicle' means a heavy-duty vehicle without an internal combustion engine, or with an internal combustion engine that emits less than 1 g CO_2/kWh as determined pursuant to Regulation (EC) No 595/2009 and its implementing measures, or which emits less than 1 g CO_2/km as determined pursuant to Regulation (EC) No 715/2007 and its implementing measures;

(k) 'low-emission heavy-duty vehicle' means a heavy-duty vehicle, which is not a zero emission heavy-duty vehicle, with specific CO_2 emissions of less than 350 g CO_2/km as determined pursuant to point 2.1 of Annex I;

(l) 'mission profile' means a combination of a target speed cycle, a payload value, a body or trailer configuration and other parameters, if applicable, reflecting the specific use of a vehicle, on the basis of which official CO_2 emissions and fuel consumption of a heavy-duty vehicle are determined;

(m) 'target speed cycle" means the description of the vehicle velocity, which the driver wants to reach or to which he is limited by traffic conditions, as a function of the distance covered in a trip;

(n) 'payload' means the weight of the goods or of persons that a vehicle is carrying under different conditions.

Article 4
Average specific emissions of a manufacturer

Starting from 2020 and in each subsequent calendar year, the Commission shall, by means of implementing acts referred to in Article 10(1), determine for each manufacturer the average specific CO_2 emissions in g/tkm for the preceding calendar year, by taking into account the following:

(a) the data reported pursuant to Regulation (EU) **2018/956** for the manufacturer's new heavy-duty vehicles registered in the **preceding** year, excluding vocational vehicles;

(b) the zero- and low-emission factor determined in accordance with Article 5.

The average specific emissions shall be calculated in accordance with Point 2.7 of Annex I.

Article 5
Zero- and low-emission heavy-duty vehicles

1. Starting from 2020 and for each subsequent calendar year, the Commission shall, by means of implementing acts referred to in Article 10(1), determine for each manufacturer the zero- and low-emission factor referred to in Article 4(b) for the preceding calendar year.

   The zero- and low-emission factor shall take into account the number and the CO_2 emissions of zero- and low-emission heavy-duty vehicles in the manufacturer's fleet in a calendar year, including zero- emission vehicles of the categories referred to in the second sub-paragraph of Article 2(1), as well as zero- and low-emission vocational vehicles.

   The zero- and low-emission factor shall be calculated in accordance with point 2.3 of Annex I.

2. For the purpose of paragraph 1, the zero- and low-emission heavy-duty vehicles shall be counted as follows:

   (a) a zero-emission heavy-duty vehicle shall be counted as 2 vehicles;

   (b) a low-emission heavy-duty vehicle shall be counted as up to 2 vehicles according to a function of its specific CO_2 emissions and the threshold emission level of 350 g CO_2/km.

3. The zero- and low-emission factor shall reduce the average specific emissions of a manufacturer by a maximum of 3%. The contribution of zero-emission heavy-duty vehicles of the categories referred to in the second sub-paragraph of Article 2(1) to that factor shall reduce the average specific emissions of a manufacturer by a maximum of 1.5%.

Article 6
[…] *Specific emission target* ***of a manufacturer***

Starting from 2026 and for each subsequent calendar year, the Commission shall, by means of implementing acts referred to in Article 10(1), determine for each manufacturer a specific emission target for the preceding calendar year. The specific emission target shall be the sum over all vehicle-subgroups of the products of the following values:

(a) the CO_2 reduction target referred to in Article 1 (a) or (b), as applicable;

(b) the CO_2 reference emissions;

(c) the manufacturer's share of vehicles in each vehicle sub-group;

(d) the annual mileage and payload weighting factors applied to each sub-group.

The specific emission target shall be calculated in accordance with Point 4 of Annex I.

Article 7
Emission credits and debts

1. For the purpose of determining a manufacturer's compliance with its specific emission targets in the period 2025 to 2029, account shall be taken of its emission credits or emission debts, which correspond to the number of new heavy-duty vehicles, excluding vocational vehicles, of the manufacturer in a calendar year, multiplied by the difference between:

   (a) the CO_2 reduction trajectory referred to in paragraph 2 and the average specific emissions of a manufacturer, if the difference is positive ('emission credits');

   (b) the average specific emissions and the specific emission target of a manufacturer, if that difference is positive ('emission debts').

Emission credits shall be acquired over the period 2019 to 2029. However, the credits acquired over the period 2019 to 2024 shall be taken into account for the purpose of determining the manufacturer's compliance with the 2025 specific emission target only.

Emission debts shall be acquired over the period 2025 to 2029, but the total debt shall not exceed 5% of the manufacturer's specific emission target in 2025 multiplied by the number of heavy-duty vehicles of the manufacturer in that year ('emission debt limit').

Emission credits and debts acquired in 2025 and any of the subsequent calendar years until 2028 shall, where available, be carried-over from one calendar year to another until 2029 when any remaining emission debts shall be cleared.

2. The CO_2 reduction trajectory **[…]** shall be set for each manufacturer in accordance with point 5.1 of Annex I, based on a linear trajectory between the reference CO_2 emissions referred to in the second sub-paragraph of Article 1 and the 2025 target specified in point (a) of **the first sub-paragraph of** that Article, and between the 2025 target and the **target applicable as from 2030 onwards**.

Article 8
Compliance with the specific emission targets

1. Where a manufacturer is found to have excess emissions pursuant to paragraph 2 in a given calendar year from 2025 onwards, the Commission shall impose an excess emission premium calculated in accordance with the following formula:

– (Excess emission premium) = (Excess emissions x 6 800 €/gCO_2/tkm)

2. A manufacturer shall be deemed to have excess emissions in any of the following cases:

(a) Where, in any of the calendar years from 2025 to 2028, the sum of the emission debts reduced by the sum of the emission credits exceeds the emission debt limit referred to in Article 7(1);

(b) In the calendar year 2029, where the sum of the emission debts reduced by the sum of the emission credits exceeds zero;

(c) In the calendar years from 2030 onwards, where the manufacturer's average specific emissions exceed its specific emission target.

The excess emissions in a given calendar year shall be calculated in accordance with Point 6 of Annex I.

3. The Commission shall, **by means of implementing acts,** determine the means for collecting excess emissions premiums under paragraph 1 **[…]**. Those **implementing acts** shall be adopted in accordance with the examination procedure referred to in Article 14(2).

4. The amounts of the excess emissions premium shall be considered as revenue for the general budget of the Union.

Article 9
Verification of the monitoring data

1. Type approval authorities shall, without delay, report to the Commission deviations found in the CO2 emissions of heavy-duty vehicles in service as compared to those values that are indicated in certificates of conformity or in the customer file as a result of verifications performed in accordance with the procedure referred to in [Article 5(4)(l)] of Regulation (EC) No 595/2009.

2. The Commission shall take those deviations into account for the purpose of calculating the average specific emissions of a manufacturer.

3. The Commission shall, **by means of implementing acts,** adopt detailed rules on the procedures for reporting such deviations and for taking them into account in the calculation of the average specific emissions. Those **[…]** implementing acts **shall be adopted** in accordance with the examination procedure referred to in Article 14(2).

Article 10
Publication of data and manufacturer performance

1. The Commission shall, by means of implementing acts to be adopted by 31 October each year, publish a list indicating:

   (a) from 2020, for each manufacturer its average specific emission of CO_2 in the preceding calendar year, referred to in Article 4;

   (b) from 2020, the zero- and low-emission factor, referred to in Article 5;

   (c) from 2026, for each manufacturer its specific emission target for the preceding calendar year, referred to in Article 6;

   (d) from 2020 until 2030, for each manufacturer its CO_2 reduction trajectory, its emission credits and, from 2026, its emission debts in the preceding year, referred to in Article 7;

   (e) from 2026, for each manufacturer its excess emissions in the preceding calendar year, referred to in Article 8;

   (f) from 2020, the average of the specific emissions of CO_2 of all new heavy-duty vehicles registered in the Union in the preceding calendar year.

   The list shall, for the publication by 31 October 2020, include the reference CO_2 emissions referred to in Article 1.

2. The Commission shall adopt delegated acts in accordance with Article 15 to adjust the reference CO2 emissions referred to in paragraph 1 of this Article in accordance with the following:

   (a) where the payload values have been adjusted pursuant to Article 12(1)(c), in accordance with the procedure set out in Point 1 of Annex II;

   (b) where an adjustment factor has been determined pursuant to Article 12(2), by applying that adjustment factor to the reference CO_2 emissions.

The Commission shall publish the adjusted reference CO_2 emission values and shall apply those values for the calculation of the manufacturer specific emission targets applicable in the calendar years following the entry into force of the delegated acts adjusting the values.

Article 11

Real-world CO_2 emissions and energy consumption

1. The Commission shall monitor and assess the real-world representativeness of the CO_2 emissions and fuel consumption values determined **within the framework of** Regulation **(EC) No 595/2009**. It shall ensure that the public it informed of how that representativeness evolves over time.

2. For that purpose, the Commission shall ensure **that at least the following parameters relating to** real world CO2 emissions and energy consumption of heavy-duty vehicles **are made available at regular intervals to the Commission, starting from 1 January 2021, from manufacturers, national authorities or through direct data transfer from vehicles, as the case may be:**

(a) vehicle identification number;

(b) fuel and/or electric energy consumed;

(c) total distance travelled;

(d) payload;

(e) for externally chargeable hybrid electric vehicles, the fuel and electric energy consumed and the distance travelled distributed over the different driving modes.

The Commission shall process the data received to create an anonymised and aggregated dataset for the purposes of paragraph 1. The vehicle identification numbers shall be used only for the purpose of the data processing and shall not be retained longer than needed for that purpose.

3. The Commission **shall**, by means of implementing acts, **adopt** the **detailed rules on the procedure for collecting and processing the data** referred to in paragraph **[…]** 2 of this Article. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 14(2).

Article 12
Adjustments to Annexes I and II

1. In order to ensure that the technical parameters used for the calculation of the average specific emissions of a manufacturer pursuant to Article 4 and the calculation of the specific emission targets pursuant to Article 6 take into account technical progress and the evolution of freight transport logistics, the Commission shall be empowered to adopt delegated acts in accordance with Article 15 to amend the following provisions set out in Annexes I and II

   (a) The entries for cab type and engine power set out in Table 1 of Annex I and the definitions of 'sleeper cab' and 'day cab' referred to in that Table;

   (b) The mission profile weights set out in Table 2 of Annex I;

   (c) The payload values set out in Table 3 of Annex I, and the payload adjustment factors set out in Table 1 of Annex II;

   (d) The annual mileage values set out in Table 4 of Annex I.

2. Where the type-approval procedures laid down in Regulation (EC) No 595/2009 and its implementing measures are modified so that the level of the CO_2 emissions of the representative vehicles defined pursuant to this paragraph increase or decrease by more than 5 g CO_2/km, the Commission shall, in accordance with Article 10(2)(b), apply an adjustment to the reference CO_2 emissions referred to in Article 10(1) that shall be calculated in accordance with the formula set out in Point 2 of Annex II.

3. The Commission shall, by **means of** implementing acts **[…]**, establish a methodology for defining one or more representative vehicles of a vehicle sub-group, including their statistical weightings, on the basis of which **the** adjustment **referred to in paragraph 2 of this Article** shall be determined, taking into account the monitoring data reported pursuant to Regulation (EU) **2018/956** and the technical characteristics of the vehicles listed in Article 12(1) of Regulation (EU) 2017/2400. **Those implementing acts shall be adopted in accordance with the examination procedure set out in Article 14(2).**

Article 13
Review and report

By 31 December 2022, the Commission shall submit a report to the European Parliament and the Council on the effectiveness of this Regulation, the CO_2 reduction target **applicable from** 2030 **[…]** and the setting of CO_2 reduction targets to other types of heavy-duty vehicles including trailers. That report shall also include an assessment of the effectiveness of the modalities addressing, in particular, zero- and low-emission vehicles, notably buses taking into account the targets set out in Directive 2009/33/EC[16], and the CO_2 credit system and the appropriateness of prolonging the application of those modalities in 2030 and beyond and, where appropriate, be accompanied by a proposal for amending this Regulation.

Article 14
Committee procedure

1. The Commission shall be assisted by the **Climate Change** Committee established by Regulation (EU) No …/2018 [Governance]. That Committee shall be a committee within the meaning of Regulation (EU) No 182/2011.

2. Where reference is made to this paragraph, Article 5 of Regulation (EU) No 182/2011 shall apply.

3. Where the Committee delivers no opinion, the Commission shall not adopt the draft implementing act and the third subparagraph of Article 5(4) of Regulation (EU) No 182/2011 shall apply.

[16] Clean Vehicle Directive 2009/33/EC as amended by Directive …/…/EU

Article 15
Exercise of the delegation

1. The power to adopt delegated acts is conferred on the Commission subject to the conditions laid down in this Article.

2. The power to adopt delegated acts referred to Articles 10(2) and 12(1) shall be conferred on the Commission for an indeterminate period of time from [the date of entry into force of this Regulation].

3. The delegation of power referred to in Articles 10(2) and 12(1) may be revoked at any time by the European Parliament or by the Council. A decision to revoke shall put an end to the delegation of the power specified in that decision. It shall take effect the day following the publication of the decision in the Official Journal of the European Union or at a later date specified therein. It shall not affect the validity of any delegated act already in force.

4. Before adopting a delegated act, the Commission shall consult experts designated by each Member State in accordance with the principles laid down in the Interinstitutional Agreement **of 13 April 2016** on Better Law-Making **[…]**.

5. As soon as it adopts a delegated act, the Commission shall notify it simultaneously to the European Parliament and the Council.

6. A delegated act adopted pursuant to Articles 10(2) and 12(1) shall enter into force only if no objection has been expressed either by the European Parliament or by the Council within a period of two months of notification of that act to the European Parliament and the Council or if, before the expiry of that period, the European Parliament and the Council have both informed the Commission that they will not object. That period shall be extended to two months at the initiative of the European Parliament or of the Council.

Article 16
Amendment to Regulation (EC) No 595/2009

In Article 5(4) of Regulation (EC) No 595/2009 the following paragraph (l) is added:

‘(l) a procedure to verify, on the basis of appropriate and representative samples, whether vehicles that have been registered and entered into service are in conformity with the CO_2 emissions and fuel consumption values determined pursuant to this Regulation and its implementing measures;’

Article 17
Entry into force

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels,

For the European Parliament	*For the Council*
The President	*The President*

ANNEX I
Calculation of the average specific emissions, the average specific emission target and excess emissions

1. VEHICLE SUB-GROUPS

Each new heavy-duty vehicle shall be attributed to one of the sub-groups defined in Table 1 in accordance with the conditions set out therein.

Table 1 – Vehicle sub-groups (sg)

Heavy-duty vehicles	**Cab type**	**Engine power**	**Vehicle sub-group (sg)**
Rigid lorries with axle configuration 4x2 and technically permissible maximum laden mass > 16 tons	All	<170 kW	**4-UD**
	Day cab	≥170 kW	**4-RD**
	Sleeper cab	≥170 kW and <265 kW	
	Sleeper cab	≥265 kW	**4-LH**
Rigid lorries with axle configuration 6x2	Day cab	All	**9-RD**
	Sleeper cab		**9-LH**
Tractors with axle configuration 4x2 and technically permissible maximum laden mass >16 tons	Day cab	All	**5-RD**
	Sleeper cab	< 265 kW	
	Sleeper cab	≥ 265 kW	**5-LH**
Tractors with axle configuration 6x2	Day cab	All	**10-RD**
	Sleeper cab		**10-LH**

"Sleeper cab" means a type of cab that has a compartment behind the driver's seat intended to be used for sleeping as reported in accordance with Regulation (EU) No …/2018 [HDV M&R].

"Day cab" means a type of cab that is not a sleeper cab.

If a new heavy-duty vehicle cannot be attributed to a vehicle sub-group because information on the cab type or engine power is not available, it shall be attributed to the long-haul (LH) sub-group corresponding to its chassis type (rigid lorry or tractor) and axle configuration (4x2 or 6x2).

Where a new heavy-duty vehicle is attributed to sub-group 4-UD, but data on the CO_2 emissions in g/km are not available for the UDL or UDR mission profiles as defined in Table 2 of point 2.1, the new heavy-duty vehicle shall be attributed to the sub-group 4-RD.

2. CALCULATION OF THE AVERAGE SPECIFIC EMISSIONS OF A MANUFACTURER

2.1. Calculation of the specific CO_2 emissions of a new heavy-duty vehicle

The specific emissions in g/km ($CO2_v$) of a new heavy-duty vehicle *v*, attributed to a sub-group *sg* shall be calculated in accordance with the following formula:

$$CO2_v = \sum_{mp} W_{sg,mp} \times CO2_{v,mp}$$

Where,

$\sum mp$ is the sum is over all mission profiles *mp* listed in Table 2;

sg is the sub-group to which the new heavy-duty vehicle *v* has been attributed according to Section 1 of this Annex;

$W_{sg,mp,}$ is the mission profile weight specified in Table 2;

$CO2_{v,mp}$ is the CO_2 emissions in g/km of a new heavy-duty vehicle *v* determined for a mission profile *mp* and reported in accordance with Regulation (EU) No …/2018 [HDV M&R]

The specific CO_2 emissions of a zero-emission heavy-duty vehicle shall be set to 0 g CO_2/km.

The specific CO_2 emissions of a vocational vehicle shall be the average of the CO_2 emissions in g/km reported in accordance with Regulation (EU) No …/2018 [HDV M&R].

Table 2 - Mission profile weights ($W_{sg,mp}$)

Vehicle sub-group *(sg)*	**Mission profile[1] (*mp*)**						
	RDL	**RDR**	**LHL**	**LHR**	**UDL**	**UDR**	**REL, RER, LEL, LER**
4-UD	0	0	0	0	0,5	0,5	0
4-RD	0,45	0,45	0,05	0,05	0	0	0
4-LH	0,05	0,05	0,45	0,45	0	0	0
9-RD	0,27	0,63	0,03	0,07	0	0	0
9-LH	0,03	0,07	0,27	0,63	0	0	0
5-RD	0,27	0,63	0,03	0,07	0	0	0
5-LH	0,03	0,07	0,27	0,63	0	0	0
10-RD	0,27	0,63	0,03	0,07	0	0	0
10-LH	0,03	0,07	0,27	0,63	0	0	0

[1]Mission profile definitions

RDL	Regional delivery payload low
RDR	Regional delivery payload representative
LHL	Long haul payload low
LHR	Long haul payload representative
UDL	Urban delivery payload low
UDR	Urban delivery payload representative
REL	Regional delivery (EMS) payload low
RER	Regional delivery (EMS) payload representative
LEL	Long haul (EMS) payload low
LER	Long haul (EMS) payload representative

2.2. Average specific CO_2 emissions of all new heavy-duty vehicles in a sub-group for a manufacturer

For each manufacturer and each calendar year, the average specific CO_2 emissions in g/tkm ($avgCO2_{sg}$) of all new heavy-duty vehicles in a sub-group *sg* shall be calculated as follows:

$$avgCO2_{sg} = \frac{\sum_v CO2_v}{V_{sg} \times PL_{sg}}$$

Where,

$\sum v$ is the sum over all new heavy-duty vehicles of the manufacturer in the sub-group *sg* excluding all vocational vehicles in accordance with Article 4(a).

$CO2_v$ is the specific CO_2 emissions of a new heavy-duty vehicle *v* determined in accordance with point 2.1;

V_{sg} is the number of new heavy-duty vehicles of the manufacturer in subgroup *sg* excluding all vocational vehicles in accordance with Article 4(a);

PL_{sg} is the average payload of vehicles in the sub-group *sg* as determined in point 2.5.

2.3. Calculation of the zero- and low-emission factor as referred to in Article 5

For each manufacturer and calendar year, the zero- and low-emission factor (ZLEV) referred to in Article 5 shall be calculated as follows:

ZLEV = V / (Vconv + Vzlev) with a minimum of 0,97

Where:

V is the number of new heavy-duty vehicles of the manufacturer excluding all vocational vehicles in accordance with Article 4(a).

Vconv is the number of new heavy-duty vehicles of the manufacturer excluding all vocational vehicles in accordance with Article 4(a) and excluding zero- and low-emission heavy-duty vehicles;

Vzlev is the sum of *Vin* and *Vout,*

Where,

Vin = $\sum_v$ □ *(1+ (1 – $CO2_v$ /350))*

with $\sum_v$ □ being the sum over all new zero- and low-emission heavy-duty vehicles with the characteristics set out in Article 2(1)(a) to (d);

$CO2_v$ is the specific CO_2 emissions in g/km of a zero- and low-emission heavy-duty vehicle *v* determined in accordance with point 2.1.

Vout is the total number of zero-emission heavy-duty vehicles of the categories referred to in in the second sub-paragraph of Article 2(1), multiplied by 2 , and with a maximum of 1,5% of *Vconv.*

2.4. Calculation of the manufacturer's share of vehicles in a sub-group

For each manufacturer and each calendar year, the share of new heavy-duty vehicles in a sub-group $share_{sg}$ shall be calculated as follows:

$$share_{sg} = \frac{V_{sg}}{V}$$

Where,

V_{sg} is the number of new heavy-duty vehicles of the manufacturer in a subgroup *sg* excluding all vocational vehicles in accordance with Article 4(a);

V is the number of new heavy-duty vehicles of the manufacturer excluding all vocational vehicles in accordance with Article 4(a).

2.5. Calculation of the average payload values of all vehicles in a sub-group

The average payload value PL_{sg} of a vehicle in a sub-group *sg* shall be calculated as follows:

$$PL_{sg} = \sum_{mp} W_{sg,mp} \times PL_{sg,mp}$$

Where,

Σ_{mp} is the sum over all mission profiles *mp*

$W_{sg,mp,}$ is the mission profile weight specified in Table 2 under point 2.1

$PL_{sg,mp}$ is the payload value attributed to the vehicles in the sub-group *sg* for the mission profile *mp, as* specified in Table 3.

Table 3 - Payload values $PL_{sg, mp}$ (in tons)

Vehicle sub-group *sg*	**Mission profile[1] *mp***									
	RDL	RDR	LHL	LHR	UDL	UDR	REL	RER	LEL	LER
4-UD	0,9	4,4	1,9	14	0,9	4,4	3,5	17,5	3,5	26,5
4-RD										
4-LH										
5-RD	2,6	12,9	2,6	19,3	2,6	12,9	3,5	17,5	3,5	26,5
5-LH										
9-RD	1,4	7,1	2,6	19,3	1,4	7,1	3,5	17,5	3,5	26,5
9-LH										
10-RD	2,6	12,9	2,6	19,3	2,6	12,9	3,5	17,5	3,5	26,5
10-LH										

[1] See mission profile definitions under Table 2 of point 2.1

2.6. Calculation of the mileage and payload weighting factor

The mileage and payload weighting factor (MPW_{sg}) of a sub-group *sg* is defined as the product of the annual mileage specified in Table 4 and the payload value per sub-group specified in Table 3 of point 2.5, normalised to the respective value for sub-group 5-LH, and shall be calculated as follows:

$$MPW_{sg} = \frac{(AM_{sg} \times PL_{sg})}{(AM_{5-LH} \times PL_{5-LH})}$$

Where,

AM_{sg} is the annual mileage specified in Table 4 for the vehicles in the respective sub-group

$AM_{5\text{-}LH}$ is the annual mileage specified for the sub-group 5-LH in Table 4

PL_{sg} is as determined in point 2.5

$PL_{5\text{-}LH}$ is the average payload value for the sub-group 5-LH as determined in point 2.5.

Table 4 - Annual mileages

Vehicle sub-group *sg*	**Annual mileage AM_{sg} (in km)**
4-UD	60 000
4-RD	78 000
4-LH	98 000
5-RD	78 000
5-LH	116 000
9-RD	73 000
9-LH	108 000
10-RD	68 000
10-LH	107 000

2.7. Calculation of the average specific CO_2 emissions in g/tkm of a manufacturer referred to in Article 4

For each manufacturer and each calendar year, the average specific CO_2 emissions in g/tkm (*CO2*) shall be calculated as follows:

$$CO2 = ZLEV \times \sum_{sg} share_{,sg} \times MPW_{sg} \times avgCO2_{sg}$$

Where,

$\sum_{sg}$ is the sum is over all sub-groups;

ZLEV is as determined in point 2.3

$share_{,sg}$ is as determined in point 2.4

MPW_{sg} is as determined in point 2.6

$avgCO2_{sg}$ is as determined in point 2.2

3. CALCULATION OF THE REFERENCE CO_2 EMISSIONS REFERRED TO IN ARTICLE 1

The reference CO_2 emissions ($rCO2_{sg}$) shall be calculated for each sub-group *sg* on the basis of all new heavy-duty vehicles of all manufacturers of the year 2019 as follows:

$$rCO2_{sg} = \frac{\sum_v CO2_v}{rV_{sg} \; x \; PL_{sg}}$$

Where,

$\sum_v$ is the sum over all new heavy-duty vehicles registered in the year 2019 in the sub-group *sg* excluding all vocational vehicles in accordance with the second sub-paragraph of Article 1;

$CO2_v$ are the specific CO_2 emissions of the vehicle *v* as determined in accordance with point 2.1, if applicable adjusted pursuant to Annex II;

rV_{sg} is the number of all new heavy-duty vehicles registered in the year 2019 in the sub-group *sg* excluding all vocational vehicles in accordance with the second sub-paragraph of Article 1;

PL_{sg} is the average payload of vehicles in the sub-group *sg* as determined in point 2.5.

4. CALCULATION OF THE SPECIFIC EMISSION TARGET OF A MANUFACTURER REFERRED TO IN ARTICLE 6

For each manufacturer and each calendar year, from 2025 on, the specific emission target *T* shall be calculated as follows:

$$T = \sum_{sg} share_{sg} \times MPW_{sg} \times (1 - rf) \times rCO2_{sg}$$

Where,

$\sum_{sg}$ is the sum over all sub-groups;
$share_{sg}$ is as determined in point 4 of Section 2;
MPW_{sg} is as determined point 6 of Section 2;
rf is the CO_2 reduction target (in %) **applicable in** the specific calendar year;
$rCO2_{sg}$ is as determined in Section 3.

5. EMISSION CREDITS AND DEBTS REFERRED TO IN ARTICLE 7

5.1. Calculation of the CO_2 reduction trajectory for emission credits

For each manufacturer and each calendar year Y in the period 2019 to 2029, a CO_2 emission trajectory (ET_Y) is defined as follows:

$$ET_{,Y} = \sum_{sg} share_{sg} \times MPW_{sg} \times R\text{-}ET_Y \times rCO2_{sg}$$

Where,

$\sum_{sg}(\ldots)$ is the sum over all sub-groups;
$share_{,sg}$ is as determined in point 4 of Section 2;
MPW_{sg} is as determined point 6 of Section 2;
$rCO2_{sg}$ is as determined in Section 3;

Where,

for the calendar years Y from 2019 to 2025:

$$R\text{-}ET_{Y,} = (1\text{-}rf_{2025}) + rf_{2025} \times (2025 - Y)/6$$

and, for the calendar years Y from 2026 to 2030:

$$R\text{-}ET_{Y} = (1\text{-}rf_{2030}) + (rf_{2030} - rf_{2025}) \times (2030 - Y)/5$$

rf_{2025} and rf_{2030} are the CO_2 reduction targets (in %) **applicable in** 2025 and 2030 **[…]** respectively.

5.2. Calculation of the emission credits and debts in each calendar year

For each manufacturer and each calendar year Y in the period 2019 to 2029, the emission credits ($cCO2_Y$) and emission debts ($dCO2_Y$) shall be calculated as follows:

If $CO2_Y < ET_Y$*:*

$$cCO2_Y = (ET_Y - CO2_Y) \times V_y \quad \text{and}$$

$$dCO2_Y = 0$$

If $CO2_Y > T_Y$ *for the years 2025 to 2029:*

$$dCO2_Y = (CO2_Y - T_Y) \times V_Y \quad \text{and}$$

$$cCO2_Y = 0$$

In all other cases $dCO2_Y$ *and* $cCO2_Y$ *are set to 0.*

Where,

ET_Y	is the manufacturer's emission trajectory in the calendar year Y determined in accordance with point 5.1;
$CO2_Y$	is the average specific emissions in the calendar year Y determined in accordance with point 2.7;
T_Y	is the manufacturer specific emission target in the calendar year Y determined in accordance with Section 4;
V_Y	is the number of new heavy-duty vehicles of the manufacturer in the calendar year Y excluding all vocational vehicles in accordance with Article 4(a).

5.3. Emission debt limit

For each manufacturer the emission debt limit (*limCO2*) is defined as follows:

$$limCO2 = T_{2025} \times 0{,}05 \times V_{2025}$$

Where

T_{2025} is the manufacturer specific emission target for 2025 determined in accordance with Section 4;

V_{2025} is the number of new heavy-duty vehicles of the manufacturer in 2025 excluding all vocational vehicles in accordance with Article 4(a).

5.4. Emission credits acquired before the year 2025

Emission debts acquired in the year 2025 shall be reduced by an amount *(redCO2)* corresponding to the emission credits acquired prior to 2025, which is determined for each manufacturer as follows:

$$redCO2 = min(dCO2_{2025}\,;\ \sum_{Y=2019}^{2024} cCO2_Y)$$

Where,

min is the minimum of the two values mentioned between the brackets;

$\sum_{Y=2019}^{2024}$ is the sum over the calendar years 2019 to 2024;

$dCO2_{2025}$ is the emission debts for 2025 as determined in accordance with point 5.2;

$cCO2_Y$ is the emission credits for the calendar year Y as determined in accordance with point 5.2.

6. DETERMINATION OF A MANUFACTURER'S EXCESS EMISSIONS REFERRED TO IN ARTICLE 8(2)

For each manufacturer and each calendar year from 2025 onwards the value of the excess emissions ($exeCO2_Y$) shall be determined as follows, if the value is positive:

For the year 2025

$$exeCO2_{2025} = dCO2_{2025} - \sum_{Y=2019}^{2025} cCO2_Y - limCO2$$

For the years Y from 2026 to 2028

$$exeCO2_Y = \sum_{I=2025}^{Y} (dCO2_I - cCO2_I) - \sum_{J=2025}^{Y-1} exeCO2_J - redCO2 - limCO2$$

For the year 2029

$$exeCO2_Y = \sum_{I=2025}^{2029} (dCO2_I - cCO2_I) - \sum_{J=2025}^{2028} exeCO2_J - redCO2$$

For the years Y from 2030 onwards

$$exeCO2_y = (CO2_Y - T_Y)\ x\ V_Y$$

Where,

$\sum_{Y=2019}^{2025}$ is the sum over the calendar years 2019 to 2025;

$\sum_{I=2025}^{Y}$ is the sum over the calendar years 2025 to Y;

$\sum_{J=2025}^{Y-1}$ is the sum over the calendar years 2025 to (Y-1);

$\sum_{J=2025}^{2028}$ is the sum over the calendar years 2025 to 2028;

$\sum_{I=2025}^{2029}$ is the sum over the calendar years 2025 to 2029;

dCO2Y is the emission debts for the calendar year Y as determined in accordance with point 5.2;

cCO2Y is the emission credits for the calendar year Y as determined in accordance with point 5.2;

limCO2 is the emission debt limit as determined in accordance with point 5.3;

redCO2 is the reduction of emission debts of the year 2025 as determined in accordance with 5.4.

In all other cases the value of the excess emissions *exeCO2Y* shall be set to 0.

ANNEX II

Adjustment procedures

1. PAYLOAD ADJUSTMENT FACTORS REFERRED TO IN ARTICLE 12(1)(C)

Subject to the provisions laid down in Article 10(2)(a), for the purposes of calculating the reference CO_2 emissions referred to in Article 1, the CO_2 emissions in g/km of a heavy-duty vehicle *v* determined for a mission profile *mp* referred to in Table 2 in point 2.1 of Annex I shall be adjusted as follows:

$$CO2_{v,mp} = CO2(2019)_{v,mp} \times (1 + PLa_{sg,mp} \times (PL_{sg,mp} - PL(2019)_{sg,mp}))$$

Where

sg is the sub-group to which the vehicle *v* belongs;

$CO2(2019)_{v,mp}$ is the specific CO_2 emissions of vehicle *v* in g/km, as determined on mission profile *mp* and based on the 2019 monitoring data reported in accordance with Regulation (EU) No …/2018 [HDV M&R] ;

$PL(2019)_{sg,mp}$ is the payload value, which was attributed to vehicles in the sub-group *sg* on the mission profile *mp* in the calendar year 2019, in accordance with Table 3 of point 2.5 of Annex I, for the purposes of establishing the 2019 monitoring data reported in accordance with Regulation (EU) No …/2018 [HDV M&R];

$PL_{sg,mp}$ is the payload value attributed to vehicles in the sub-group *sg* on the mission profile *mp* in the calendar year when the changes referred to in Article 12(1)(c) take effect for all new heavy-duty vehicles, in accordance with Table 3 of point 2.5 of Annex I;

$PLa_{sg,mp}$ is the payload adjustment factor defined in Table 5.

Table 5 - Payload adjustment factors *PLa $_{sg, mp}$*

PLa$_{sg,mp}$ (in 1/tons)		**Mission profiles *mp*[1]**				
		RDL, RDR	REL, RER	LHL, LHR	LEL, LER	UDL, UDR
Vehicle sub-groups *sg*	**4-UD**	0,026	N.A.	0,015	N.A.	0,026
	4-RD					
	4-LH					
	5-RD	0,022	0,022	0,017	0,017	0,022
	5-LH					
	9-RD	0,026	0,025	0,015	0,015	0,026
	9-LH					
	10-RD	0,022	0,021	0,016	0,016	0,022
	10-LH					

[1] see mission profile definitions in point 1 of Section 2 of Annex I.

2. ADJUSTMENT FACTORS REFERRED TO IN ARTICLE 10(2)(B)

Subject to the provisions laid down in Article 10(2)(b), for the purposes of calculating the reference CO_2 emissions referred to in Article 1 the CO_2 emissions in g/km of a heavy-duty vehicle *v* determined for a mission profile *mp* referred to in point 2.1 of Annex I shall be adjusted as follows:

$$CO2_{v,mp} = CO2(2019)_{v,mp} \times (\sum_r s_{r,sg} \times CO2(2019)_{r,mp}) / (\sum_r s_{r,sg} \times CO2_{r,mp})$$

Where

$\sum_r$ is the sum over all representative vehicles *r* for the sub-group *sg*;

sg is the sub-group to which the vehicle *v* belongs;

$s_{r,sg}$ is the statistical weight of the representative vehicle *r* in the sub-group *sg;*

$CO2(2019)_{v,mp}$ is the specific CO_2 emissions of vehicle *v* in g/km, as determined on mission profile *mp* and based on the 2019 monitoring data reported in accordance with Regulation (EU) No …/2018 [HDV M&R] ;

$CO2(2019)_{r,mp}$ is the specific CO_2 emissions of the representative vehicle *r* in g/km, as determined on mission profile *mp* in accordance with this Regulation in its version applicable in 2019;

$CO2_{r,mp}$	is the specific CO_2 emissions of the representative vehicle *r,* as determined in accordance with this Regulation in the calendar year when the changes referred to in Article 12(2) take effect for all new heavy-duty vehicles.

The representative vehicle shall be defined in accordance with the methodology referred to in Article 12(**3**).