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REGULATORY SCRUTINY BOARD OPINION

Revision of the CO2 emission standards for Heavy Duty Vehicles

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EUROPEAN COMMISSION
Regulatory Scrutiny Board

Brussels,
RSB/

Opinion

Title: Impact assessment / Revision of the CO2 emission standards for Heavy Duty Vehicles

Overall 2nd opinion: POSITIVE WITH RESERVATIONS

(A) Policy context

The European Climate Law sets out the EU's commitment to cut greenhouse gas emission by at least 55% by 2030 and to achieve climate neutrality by 2050. The Sustainable and Smart Mobility Strategy calls for a shift to zero-emission mobility. In this context, in 2021 the Commission proposed a package of policy proposals as part of the 'Fit for 55' package'.

Much of the heavy-duty vehicles (HDV) sector is already subject to CO2 standards. Regulation (EU) 2019/1242 sets out the current CO2 emission standards for certain HDVs, requiring manufacturers to decrease the average CO2 emissions by 15% from 2025 and by 30% from 2030. This initiative aims to revise the CO2 emission standards for HDVs.

(B) Summary of findings

The Board notes the improvements to the report.

However, the report still contains significant shortcomings. The Board gives a positive opinion with reservations because it expects the DG to rectify the following aspects:

(1) The report does not sufficiently discuss the constraints and risks arising from the potential underdeployment of key technologies and infrastructures.

(2) The analysis of proportionality of the most relevant combinations of options is not sufficiently developed.

(C) What to improve

(1) The report should further elaborate on the issue of constraints arising from the potential under deployment of key technologies and supporting infrastructure for zero emissions HDVs, and the risk of insufficient availability of green electricity. All uncertainties, in particular the ones influencing the incremental results, should be better reflected in the modelling with their potential impact on the model results clearly highlighted.

This opinion concerns a draft impact assessment which may differ from the final version.

(2) The report should further improve the analysis of proportionality. Proportionality considerations should include all costs and benefits. Although the report presents the net impacts for the most relevant combinations of options, it should also calculate the Benefit Cost Ratios so that the available choices in terms of differences in efficiency are clear. The report should also more clearly present the effectiveness of the most relevant options (in terms of CO2 emission reduction capacity).

(3) The cumulative costs and benefits of the politically most relevant combinations of options should be clearly presented in the relevant section of the report, including in the chapter on the preferred option. Given that the prefered option on the ambition of the targets is to be established at the political level, this chapter as well as Annex 3 should clearly recall the key impacts of each of the three identified target level options in terms of costs and benefits, so that the available trade-offs, related uncertainties and implementation risks are clearly identified and presented.

(4) The report should elaborate on and assess in more detail the impact of the most relevant combinations of options on the international competitiveness of the EU HDV sector.

(5) In view of the uncertainties and dynamics of technological and infrastructure deployment, the report should clarify when an evaluation will be conducted.

The Board notes the estimated costs and benefits of the most relevant combinations of options in this initiative, as summarised in the attached quantification tables.

Some more technical comments have been sent directly to the author DG.

(D) Conclusion

The lead DG must take these recommendations into account before launching the interservice consultation.

If there are any changes in the choice or design of the preferred option in the final version of the report, the lead DG may need to further adjust the attached quantification tables to reflect this.

Full title	Revision of the CO2 emission standards for Heavy Duty Vehicles
Reference number	PLAN/2021/11035
Submitted to RSB on	8 November 2022
Date of RSB meeting	Written procedure

ANNEX: Quantification tables extracted from the draft impact assessment report

The following tables contain information on the costs and benefits of the initiative on which the Board has given its opinion, as presented above.

If the draft report has been revised in line with the Board's recommendations, the content of these tables may be different from those in the final version of the impact assessment report, as published by the Commission.

I. Overview of Benefits (total for all provisions) –		
Description	***Amount***	***Comments***
	Direct benefits	
Reducing CO_2 emissions from HDV cost-effectively, in line with the EU climate goals while contributing to improve EU energy security.	**CO_2 emissions** CO_2 (tailpipe) emissions from heavy-duty motor vehicles, **lorries, buses and coaches,** are projected to decrease by around 730-996 Mton between 2031 and 2050, representing 35%-48% reduction compared to the baseline scenario. On **trailers and semi-trailers**, the energy efficiency standards are expected to reduce cumulative tailpipe CO_2 emissions by nearly 45 Mton between 2031 and 2050 compared to medium scenario. This represents 1.9% of CO_2 emissions reduction of the vehicle groups 4, 5, 9 and 10 or about 1.4% over HDV total. Setting a zero-emission mandate by 2030 for **urban buses** would save additional 9 Mton of CO_2 between 2031 and 2050, as compared to the medium ambition scenario, which is equal to almost half of the emissions of the regulated buses sector. **Contribution to EU energy security** Demand of fossil fuels (mostly oil products as diesel) from **lorries, buses and coaches** is expected to decrease by 215-281 Mtoe over the period 2031 to 2050 as compared to baseline and additionally about 23 Mtoe over the period 2031 to 2050 from setting energy efficiency standards for trailers, as compared to the medium ambition scenario. This is equivalent to, respectively, around €150-200 bn from motor vehicles and additional €16 bn from setting energy efficiency standards for trailers, at current oil prices (95 EUR / Brent barrel). **Reduction of energy demand** Final energy demand from **lorries, buses and coaches** is expected to decrease by nearly 131-220 Mtoe over the period 2031-2050. The cumulative expected reduction by 2050 represents savings of 11-19% with respect to baseline scenario. Additionally, nearly 42 Mtoe will be saved by more energy efficient trailers during 2031-2050 compared to the medium ambition scenario, equivalent to about 3.7% of CO_2 emissions reduction of the vehicle groups 4, 5, 9 and 10 or about 2.7% over HDV total.	By reducing CO_2 emissions, the revised HDV Regulation will directly contribute to meeting the EU climate target goals both for 2030 and 2050. Main beneficiaries are society overall Energy security of the EU will improve, as the import of fossil fuels will decrease with lower fuel consumption.

Benefits for European transport operators and users from a wider deployment of more energy-efficient vehicles: improvements in fuel savings from reduction in energy consumption and in air quality	**Net economic savings** Net economic savings for motor vehicles from different perspectives are calculated as the difference, between the policy options and the baseline, of the total costs, averaged over the new EU vehicle fleet of lorries, buses and coaches registered in 2030, 2035 or 2040. The total costs include the capital costs, the fuel or energy carrier costs and the operation and maintenance (O&M) costs of the vehicles. For the societal perspective, they also include the external cost of CO_2 emissions[1]. The end-user perspective is presented for the first user (first 5 years after first registeration), the second user (years 6-10) and the third user (years 11-15). TCO (total cost of ownership) for **first users** of new HDV show the following economic savings ranges: 6 000 - 9 800; 17 400 - 26 000 and 39 100 - 46 600 EUR/vehicle in 2030, 2035 and 2040. TCO for second users and third users of new HDV shows similar trends, with smaller benefits. Achieved savings for **second users** equal to the ranges 5 900 - 10 900; 15 200 - 22 900 and 20 500 - 31 100 EUR/vehicle in 2030, 2035 and 2040, while for **third users** are 5 800 - 9 400; 11 000 - 15 100 and 12 200 - 16 900 EUR/vehicle in 2030, 2035 and 2040. Net economic savings from a **societal perspective** over the vehicle lifetime for the average HDV amount to the ranges 2 100 - 4 800; 14 900 - 24 800 and 29 000 - 49 600 EUR/vehicle in 2030, 2035 and 2040. **Net economic savings from reduction in energy consumption in trailers and semi-trailers** Net economic savings for trailers and semi-trailers from different perspectives are calculated as the difference, between the policy options and the baseline, of the total costs, averaged over the new EU vehicle fleet of trailers and semi-trailers registered in 2030 compared to a 2020 baseline trailer. TCO for **first users** of new trailers registered in 2030 show savings ranging from nearly EUR 9 000 for reefer drawbar trailers to EUR 29 000 semi-trailer with box body. Net economic savings over the vehicle lifetime from a **societal perspective** scale up from nearly EUR 11 500 in the case of reefer drawbar trailers to over EUR 42 500 from an average semi-trailer with box body. **Net economic savings from reduction in energy consumption in buses** Net economic savings from setting a 100% mandate for new urban buses by 2030 for 1st, 2nd and 3rd owners are positive and respectively around 21 500, 20 000 and 17 000 EUR higher than for the medium ambition scenario. From a societal perspective, the additional average saving brings an additional benefit of 36 000 EUR per regulated bus in the 2030 new fleet.	The deployment of energy-efficient vehicles, including zero-emission vehicles, will provide energy-related benefits. Transport operators and passengers will get lower energy bills. Consumers will get indirect benefits too through reduced transportation costs as a result of lower fuel expenditures by the transport operators.

[1] Based on "Handbook on the external costs of transport – Version 2019 – 1.1 (CE Delft) - https://op.europa.eu/en/publication-detail/-/publication/9781f65f-8448-11ea-bf12-01aa75ed71a1

	Air quality impoovements A higher share of ZEVs will reduce the emission of air pollutants. Emissions of CO, NOx, PM2.5 and SO_2 from heavy duty vehicles are expected to decrease by 7 to 17% in 2035, by 15% to around 38% in 2040 and by 66 to 80% in 2050, compared to the baseline. Additional savings of air pollutants, in particular in urban areas, would appear also from setting a zero-emission mandate for urban buses.	
Technological and innovation leadership of EU industry strengthening by channelling investments into zero-emission technologies.	Stricter CO_2 target levels are expected to drive the development and supply of zero-emission technologies, leading to a positive impact on innovation and industry's technological leadership and competitiveness. ZEV shares will raise to around (%) 20-35, 35-57 and 57-100 by 2030, 2035 and 2040 respectively. The number of additional jobs spurred by the increased economic output are estimated among the ranges 9 - 13, 22 - 41 and 38 - 83 thousand in 2030, 2035 and 2040, respectively.	Manufacturers, component suppliers, petroleum refining, power and hydrogen suppliers, electronics and electrical equipment suppliers, metal.
Costs faced by manufacturers	**Manufacturing costs per motor vehicle** The costs for manufacturers, averaged over the EU-wide new lorries, buses and coaches, correspond to 3 400 - 9 700, 5 300 – 11 800 and 6 500 - 13 100 EUR/vehicle in 2030, 2035 and 2040, respectively. **Manufacturing costs per trailer** The extra 2030 costs for manufacturers from average trailers and semi-trailers compared to a 2020 baseline vehicle are between over EUR 2 500 for drawbar trailers with box body and EUR 5 250 for a reefer semi-trailer. **Additional investments by manufacturers** The HDV motor vehicles manufacturing sector is expected to need additional investments of around (billion EUR per year) 0.46-0.98 across the period 2021-2030 and 4.36 - 8.55 for 2021-2040. This represents an increase of around (%) 0.5-1.1 for the period 2021-2030 and 4.0-7.8 for 2021-2040, compared to the annual investments needed to meet the current CO2 emission standards. The considered costs comprise direct manufacturing costs, including materials and labour, and indirect manufacturing costs (R&D, warranty costs, depreciation and amortisation, maintenance and repair, general other overhead costs).	Manufacturers of lorries, buses, coaches and trailers

Macro-economic impact (GDP)	The CO_2 emissions standards alone will contribute to increase the EU-27 GDP by around (%) 0.01-0.02, 0.04-0.07 and 0.06-0.11 in 2030, 2035 and 2040, compared to the baseline.	Society as a whole
Impact on SMEs operators	Medium and small enterprises find no affordability restrictions across any of the three ambition target scenarios and different vehicles classes. Only microenterprises may find some affordability issue for purchasing new ZEV in group 5 (long haul, > 16 ton), and only in 2030 and 2035. This issue is not present for purchasing ZEV on the second-hand market. Furthermore, also thanks to the effect of stricter CO2 standards, ZEV become more affordable with time, benefitting also micro enterprises	Small and medium transport operators
Investment in zero-emission alternative fuels infrastructure	It is estimated that investments needed in publicly accessible recharging and refuelling infrastructure to support the projected market uptake of ZEV vehicles will amount to around EUR 0.16-0.5 bn per year over the period 2021-2040	Installers of recharging and refuelling zero-emission alternative fuel infrastructure
Administrative cost savings related to the 'one in, one out' approach*		
(direct/indirect)	The proposal is not leading to any significant administrative costs. The certification, monitoring and reporting obligations, which drive the administrative burden, are already set in different regulations. The heavy-duty vehicles currently not regulated are already subject to the same requirements as the regulated ones. In addition, the few policy options (Fuel2 and the flexibility options), in which an additional administrative burden could be created, would set up voluntary mechanisms, i.e. manufacturers would make use of such provisions only on a voluntary basis.	

II. Overview of costs –							
		Citizens/Consumers		**Businesses**		**Administrations**	
		One-off	**Recurrent**	**One-off**	**Recurrent**	**One-off**	**Recurrent**
Action (a)	Direct adjustment costs	N/A	N/A	N/A	<u>Manufacturing costs per motor vehicles</u> Projected costs for manufacturers and average heavy-duty vehicle (lorries, buses and coaches) are between 3 400 -9 700;5 300 – 11 800 and 6 500-13 100 EUR/vehicle in 2030, 2035 and 2040. The additional annual investment costs are projected to be (billion Euro per year): 0.46 - 0.98 across the period 2021 - 2030 and 4.36 - 8.55 for 2021 - 2040. <u>Manufacturing costs per trailer</u> Projected costs for manufacturers for average trailers and semi-trailers, compared to a 2020 baseline vehicle, are 2 500-5 250 EUR/vehicle.	N/A	N/A
	Direct administrative costs	N/A	N/A	N/A	N/A	N/A	N/A
	Direct regulatory fees and charges	N/A	N/A	N/A	N/A	N/A	N/A
	Direct enforcement costs	N/A	N/A	N/A	N/A	N/A	N/A
	Indirect costs	N/A	N/A	Indirect investments needed in publicly accessible recharging and refuelling infrastructure to support the projected market uptake of ZEV vehicles will amount to around 0.16-0.5 billion Euro per year over the period 2021-2040.	See qualitative assessment in section 3.1 of this Annex.	N/A	N/A
Costs related to the 'one in, one out' approach							
Total	Direct adjustment costs	N/A	N/A	N/A	N/A		
	Indirect adjustment costs	N/A	N/A	N/A	N/A		
	Administrative costs (for offsetting)	N/A	N/A	N/A	N/A		

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Opinion

Title: Impact assessment / Revision of the CO2 emission standards for Heavy Duty Vehicles

Overall opinion: NEGATIVE

(A) Policy context

The European Climate Law sets out the EU's commitment to cut greenhouse gas emission by at least 55% by 2030 and to achieve climate neutrality by 2050. The Sustainable and Smart Mobility Strategy calls for a shift to zero-emission mobility. In this context, in 2021 the Commission proposed a package of policy proposals as part of the 'Fit for 55' package'.

Much of the heavy-duty vehicles (HDV) sector is already subject to CO2 standards. Regulation (EU) 2019/1242 sets out the current CO2 emission standards for certain HDVs, requiring manufacturers to decrease the average CO2 emissions by 15% from 2025 and by 30% from 2030. This initiative aims to revise the CO2 emission standards for HDVs.

(B) Summary of findings

The Board notes the additional information provided in advance of the meeting and commitments to make changes to the report.

However, the Board gives a negative opinion, because the report contains the following significant shortcomings:

(1) The report does not clearly identify the remaining CO2 emission reduction gap that the initiative aims to address.

(2) The report does not sufficiently describe the dynamic baseline justifying the added value of the initiative.

(3) The cost benefit analysis presented in the report is incomplete and unclear. The report does not present and compare the overall costs and benefits of each option and subsequently the most relevant combinations of options. It is not clear on the choices left open for the decision-makers.

(C) What to improve

(1) The report should clearly identify and specify the remaining CO2 emission reduction gap that the initiative seeks to address. It should better justify the need to revise the Regulation so soon after adoption, given the lack of data on its effectiveness. It should further elaborate on the articulation of the proposal with other initiatives that directly influence the HDV CO2 emissions and explain if and to what extent those initiatives would provide a contribution from the HDV sector to the EU climate targets and what precisely the remaining gap this initiative would address is. It should be clear how the estimates of the gap relate to the Fit for 55 or RePowerEU scenarios. It should clearly define the criteria for determining a "fair" or "sufficient" contribution of the HDV sector to the achieving the CO2 reduction targets and explain how these would be implemented in practice.

(2) The report should present the dynamic baseline both in qualitative and quantitative terms more clearly. In particular, it should explain how the provisions in the current Regulation, all relevant policy initiatives and expected market and technological developments were taken into account. The report should also explain differences compared to the scenarios used for the Fit for 55 package. In this respect, it should explain how the baseline takes into account the revised renewable and energy efficiency targets proposed in the RePowerEU Plan. It should also clarify how more recent market developments were taken into account, including announcements by EU HDVs manufacturers. The definition of problem related to "missed benefits" due to zero emission vehicles not being sufficiently deployed on the market is vague and should be reformulated to allow it to be measurable.

(3) The report should provide a complete and transparent cost benefit analysis that is understandable and meaningful for decision makers. The issue of technology availability in terms of zero emission HDVs, the necessary operating infrastructure and sufficient quantities of green energy being available should be sufficiently reflected when assessing the risks of targets not being achieved. The report should be clear on whether each of the combinations of options is effective in closing the identified HDV CO2 reduction gap in a "fair" manner, clearly indicating potential over or under delivery.

(4) The report should monetise the environmental benefits and bring the estimates into the cost benefit analysis. It should clearly specify the appraisal period and consistently use it in the analysis. Both the costs and benefits for each option (and subsequently the most relevant combinations of options) should be presented in an aggregated way, discounted over the appraisal period and the Benefit Cost Ratios and net benefits calculated. This should help to better assess and compare the proportionality of different combination of measures and better inform decisions on issues left open for decision makers, such as the appropriate target level.

(5) As modelling is the main source of information and data for the assessment of the impacts, the report should provide as much additional data and analysis as possible to support the credibility of the analysis. The main and most relevant assumptions underpinning the models should be transparently presented in the report and the details of the models included in the Annex. Uncertainties, in particular the ones influencing the results, should be clearly identified and analysed. The results of the sensitivity analysis should also be included in the Annex to the report. A sensitivity analysis of the

key elements of the Total Cost of Ownership should be included. Key information on the methodologies underpinning the economic analysis of the REPowerEU Plan as well as the monetisation of environmental benefits should be summarised and included.

(6) The report should systematically include the views of stakeholder groups, including dissenting views, when analysing the impacts of the different options. It should clarify whether a dedicated SME test has been carried out. It should further elaborate the distributional impacts, including whether some Member States will be more affected than others.

(7) The report should clarify whether the monitoring and reporting obligations are already in place for the vehicle groups brought into scope and should add a separate section on the one in, one out approach and be clear on the costs and savings in scope of that approach taking the above into account.

Some more technical comments have been sent directly to the author DG.

(D) Conclusion

The DG must revise the report in accordance with the Board's findings and resubmit it for a final RSB opinion.

Full title	Revision of the CO2 emission standards for Heavy Duty Vehicles
Reference number	PLAN/2021/11035
Submitted to RSB on	20 July 2022
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