

Impact Assessment on Heavy Duty Vehicles (HDV) CO₂ emission standards

Fields marked with * are mandatory.

Impact Assessment on Heavy Duty Vehicles (HDV) CO₂ emission standards

The July 2016 Commission's strategy for low-emission mobility recalls that mobility is an essential component of the shift to the low-carbon, circular economy needed for Europe to stay competitive and be able to cater to the mobility needs of people and goods. The strategy set the ambition for the transport sector to reduce greenhouse gas emissions at least by 60% compared to 1990 by mid-century and be firmly on the path towards zero. Action on vehicles' fuel/CO₂ emission performance is one of the key levers to tilt the transport sector in the right direction.

The 2030 climate and energy framework agreed by EU Heads of State and Government in October 2014 requires a 30% reduction in non-ETS sector GHG emissions by 2030 compared to 2005. Road transport represents 1/3 of the non-ETS GHG emissions and heavy-duty vehicles contribute to about 1/4 of road transport emissions and some 5% of total EU GHG emissions.

The May 2014 Strategy Communication on reducing HDV fuel consumption and CO₂ emissions ([COM/2014/0285](#)) emphasises the importance of closing the knowledge gap regarding the CO₂ emissions of lorries and buses with a view to improving market transparency.

The July 2016 Strategy for low-emission mobility furthermore announced that there is a need to curb CO₂ emissions from HDVs.

On 11 May 2017 the Technical Committee for Motor Vehicles has approved under type approval legislation a certification procedure for the determination of the CO₂ emissions and fuel consumption of new HDVs, using the results from [VECTO simulations](#), which has been developed by the European Commission since 2010. HDV manufacturers will have to run VECTO at the end of the production line and declare such information at the time of registration as of 2019.

On 31 May 2017, as part of the Europe on the Move set of initiatives, the Commission adopted a proposal for the monitoring and reporting of such HDV CO₂ emissions and fuel consumption. The data collected will be made publicly available by the European Environment Agency, starting in 2020 to cover data monitored in 2019.

This [inception impact assessment](#) will look into different options for setting the first EU measures to actively curb CO₂ emissions from HDVs, including CO₂ emission standards.

It should be noted that EU manufacturers account for some 40% of global production. Furthermore, other parts of the world, such as the United States, China, Japan and Canada, have already introduced HDV fuel economy standards, and some European manufacturers participate in these schemes.

For the purposes of the present consultation the term HDV should be understood as including (For the definition of vehicle categories see [Directive \(EC\) 2007/46](#), Annex II, part A):

- goods vehicles of categories N2 and N3 and
- passenger vehicles of categories M2 and M3 and
- all trailers of categories O3 and O4.

The Commission is carrying out this consultation in order to be properly informed by public opinion in preparation for possible future legislative action in the area of CO₂ emissions from HDVs, the results of which will be published in consolidated form.

Parts 1 to 5 of this consultation are intended to be completed by every respondent to the extent possible. Part 6 is mainly intended for experts in the field but of course every respondent may complete it as he wishes.

If data, other information or studies are available which are relevant to the assessment, these can be submitted as part of a stakeholder's general comments or directly to the mail box.

1. General information about respondent

* 1.1. In what capacity are you completing this questionnaire?

- ☐ As an individual / private person
- ☐ Public authority
- ☐ Academic/research institution
- ☐ International organisation
- ☐ Civil society organisation
- ☐ Professional organisation
- ☐ Private enterprise
- ☐ Other

* If other, please specify:

Text of 3 to 200 characters will be accepted

1.2. If private enterprise

* 1.2.1. Business sector

- ☐ Individual vehicle manufacturer
- ☐ Automotive component supplier
- ☐ Vehicle fleet operator
- ☐ Logistics operator
- ☐ Customer/user of transport services
- ☐ Consultancy
- ☐ Research
- ☐ Other industry

* If other, please specify:

Text of 3 to 200 characters will be accepted

1.2.2. Is your company an SME? ([What is an SME?](#))

- ☐ Yes - medium-sized enterprise (i.e. having less than 250 staff and/or turnover below €50m and/or a balance sheet below €43m)
- ☐ Yes - small enterprise (i.e. having less than 50 staff and/or turnover below €10m and/or a balance sheet below €10m)
- ☐ Yes - micro enterprise (i.e. having less than 10 staff and/or turnover below €2m and/or a balance sheet below €2m)
- ☒ No
- ☐ I don't know

1.3. If professional organisation

* 1.3.1. Please indicate the sectors your organisation represents

- ☐ Vehicle manufacturers association
- ☐ Automotive component suppliers association
- ☐ Vehicle fleet operators association
- ☐ Logistics operators association
- ☐ Customers and users organisation
- ☐ Labour rights organisation
- ☐ Other organisation

* If other, please specify:

Text of 3 to 200 characters will be accepted

Gas infrastructure sector

* 1.3.2. Where are your member companies located?

Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, the Netherlands, United Kingdom

1.4. If civil society organisation

* If civil society organisation, please indicate your main area of focus:

200 character(s) maximum

* 1.5. Please give your name if replying as an individual/private person, otherwise give the name of your

organisation:

Text of 3 to 200 characters will be accepted

Gas Infrastructure Europe

1.6. If your organisation is registered in the [Transparency Register](#), please give your Register ID number:

20 character(s) maximum

76130992074-15

If your organisation is not registered, you can [register now](#). Please note that contributions from respondents who choose not to register will be processed as a separate category 'non-registered organisations/business'.

* 1.7. Please give your country of residence/establishment:

- | | | | |
|--|-------------------------------|-----------------------------------|--------------------------------------|
| <input type="radio"/> Austria | <input type="radio"/> Finland | <input type="radio"/> Lithuania | <input type="radio"/> Slovenia |
| <input checked="" type="radio"/> Belgium | <input type="radio"/> France | <input type="radio"/> Luxembourg | <input type="radio"/> Spain |
| <input type="radio"/> Bulgaria | <input type="radio"/> Germany | <input type="radio"/> Malta | <input type="radio"/> Sweden |
| <input type="radio"/> Croatia | <input type="radio"/> Greece | <input type="radio"/> Netherlands | <input type="radio"/> United Kingdom |
| <input type="radio"/> Cyprus | <input type="radio"/> Hungary | <input type="radio"/> Poland | <input type="radio"/> Iceland |
| <input type="radio"/> Czech Republic | <input type="radio"/> Ireland | <input type="radio"/> Portugal | <input type="radio"/> Norway |
| <input type="radio"/> Denmark | <input type="radio"/> Italy | <input type="radio"/> Romania | <input type="radio"/> Other |
| <input type="radio"/> Estonia | <input type="radio"/> Latvia | <input type="radio"/> Slovakia | |

* If other, please specify:

Text of 3 to 200 characters will be accepted

1.8. If your organisation is involved in the implementation of the HDV legislation, please indicate its role (e.g. manufacturer, system supplier, technical service,...):

200 character(s) maximum

* 1.9. Please indicate your preference for the publication of your response on the Commission's website: (Please note that regardless of the option chosen, your contribution may be subject to a request for access to documents under [Regulation 1049/2001](#) on public access to European Parliament, Council and Commission documents. In this case the request will be assessed against the conditions set out in the Regulation and in accordance with applicable [data protection rules](#).)

☒ Under the name given:

I consent to publication of all information in my contribution and I declare that none of it is subject to copyright restrictions that prevent publication

☐ Anonymously:

I consent to publication of all information in my contribution and I declare that none of it is subject to copyright restrictions that prevent publication

Questions

The questions below are based on the initial analysis carried out by the Commission and presented in its Inception Impact Assessment to which you may refer for further background on each specific question. Fuel consumption and CO₂ emissions of Heavy-Duty Vehicles' (HDVs) are treated together as they are strongly correlated and proportional: both would be certified and monitored together.

2. Main problem to address

The following 3 key problems have been identified in the context of the Inception Impact Assessment where more detailed information can be found. In your view, how important are the problems to be addressed?

	Very important	Important	Somewhat important	Not important	I don't know/ no views
Growing GHG emissions from the heavy-duty vehicle sector	x				
Increasing competitiveness challenges for vehicle manufacturers					x
Transport operators and their clients miss out on possible fuel savings and reduced fuel bills		x			

Are there other key problems to be addressed?

200 character(s) maximum

- The human toll for poor air quality is worse than for road traffic accidents, making it the number one environmental cause of premature death in Europe, with over 400 000 premature deaths every year. It also impacts on quality of life by causing or exacerbating asthma and respiratory problems. Air pollution causes lost working days, and high healthcare costs, with vulnerable groups such as children, asthmatics and the elderly the worst affected. It damages ecosystems through excess nitrogen pollution (eutrophication) and acid rain. Improving air quality especially in urban areas must be seen as crucial and should be properly reflected in the regulation. The regulation should therefore also include legislation setting HDV air pollution targets at EU level.

3. The need for EU action

There is a single market for HDVs across the EU. If no EU action was taken to address the problem, Member States might adopt individual approaches to reduce HDV CO₂ emissions, in order to achieve the needed reductions for the non-ETS sector. In your view, what would be likely to happen without EU action?

	Likely	Neutral	Unlikely
Member States would individually implement legislation to reduce HDV CO ₂ emissions		x	
Legislation introduced by individual Member States would lead to market fragmentation and higher costs	x		
Member States would have difficulty to achieve the necessary reductions to meet EU climate goals		x	

Are there other potential effects?

200 character(s) maximum

Ensuring interoperability and harmonization of regulations are important measures to make sure that we avoid market fragmentations and failure to meet the EU-wide goals.

4. Main policy objectives

The following 3 key policy objectives have been identified in the context of the Inception Impact Assessment where more detailed information can be found.

1. Reduce the climate impact of HDVs in line with the requirements of EU climate policy and the 2030 climate and energy framework.
2. Contribute to the improvement of the competitiveness of HDV and component manufacturers (suppliers to HDV manufacturers)
3. Facilitate a reduction in the total cost of ownership for transport operators, most of which are SMEs.

In your view, how important are the following policy objectives?

	Very important	Important	Somewhat important	Not important	I don't know
Reduce the climate impact of HDVs	x				

Contribute to the improvement of the competitiveness of the European HDV and component manufacturers		x			
Facilitate a reduction in the total cost of ownership for transport operators		x			

Are there other key objectives to be reached?

200 character(s) maximum

- Due to the different technologies both available and under development it is important that the regulation is based on a methodology that guarantees technology neutrality.
- It is therefore important to distinguish between technologies and level of maturity in the setting of threshold and methodologies as this may result in unintentional restrictions which may increase the overall cost of transitioning the transport sector. E.g. natural gas engines are well-developed and can provide imitate GHG reductions as opposed to e.g. electric HDVs.
- Solely relying on tail-pipe emission, as currently proposed for LDVs, will in principle only benefit e-fuels as the utilization of e.g. renewable gasses will not be recognized.
- A well to wheel (LCA) approach should therefore also be a possible methodology as a mean to comply with the regulation.
- As it is not possible to separate the injected renewable gasses and natural gas, a CO2 correction factor should be implemented as it will enable the recognition of renewable gasses e.g. through guarantees of origin.

5. Form that action should take to reduce HDV CO₂ emissions

Please indicate, by order of importance, your preferred options to reduce new HDVs CO₂ emissions, and contribute to the 2030 Energy and Climate Targets (with 1st being your most preferred option and 7th the least preferred)?

	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
Legislation setting HDV CO ₂ emissions targets at EU level	x							
Legislation defining a CO ₂ labelling scheme at EU level		x						
Use of vehicle or fuel taxes or other incentives by Member States to affect vehicle choice and use				x				
A voluntary agreement with industry to reduce new vehicle CO ₂ emissions			x					

Member State actions to influence vehicle choice and use in other ways such as labelling schemes based on VECTO, best practice dissemination					x			
Development of international standards for HDV fuel economy						x		
No action								x
Other option							x	

If other, please specify:

200 character(s) maximum

- With a reduction potential of 80% to even a negative CO2 balance from renewable gasses it is important that the legislation encompass the utilization of all renewable energy sources.

6. Options to consider for regulating CO₂ emissions of HDV

If CO₂ emissions of HDVs will be regulated by defining binding targets, the following options are considered.

6.1. Options for the basic regulatory approach

- Option A: CO₂ emission standards would be defined for the engines only.
- Option B: CO₂ emission standards for the whole vehicles, to be based on VECTO simulations
- Option C: Separate CO₂ emission standards for engines and complete vehicles

Please indicate the order of your preference (numbers 1, 2, 3) for the different options:

	1 st	2 nd	3 rd	4 th
A		x		
B	x			
C			x	
Other option				x

If other, please specify:

200 character(s) maximum

Comments on your choices on options for the basic regulatory approach:

300 character(s) maximum

- A view on well to wheel emissions should be given with standards for engines and complete vehicles, including an appropriate CO₂ labelling. A CO₂ credit/ bonus to be implemented in addition to the tailpipe CO₂ emissions, as it will reward "cleaner" technology.
- It should be possible to calculate CO₂ emissions on the basis of VECTO, including for those HDVs running on natural gas. A correction factor should be introduced for the monitoring phase to account for the addition of renewable gas, which is fully compatible with natural gas.

6.2

- Option A: targets at the level of each individual vehicle; CO₂ emissions would be limited at the level of individual vehicles/engines (i.e. specification of limit values)
- Option B: average targets per vehicle group on the basis of the vehicles placed on the market by each manufacturer (similar approach as for cars and light commercial vehicles)

Please indicate the order of your preference (numbers 1, 2, 3) for the different options:

	1 st	2 nd	3 rd
A		<input checked="" type="checkbox"/>	
B	<input checked="" type="checkbox"/>		
Other option			<input checked="" type="checkbox"/>

If other, please specify:

200 character(s) maximum

Comments on your choices on the options for the types of targets:

300 character(s) maximum

In DAFI natural gas as a transport fuel is classified as a clean fuel technology. This principal should of cause also be reflected in this proposal. HDVs running on natural gas should be recognized as clean powered technology

6.3. Options for the timing of the targets

- Option A: fixed dates of application
- Option B: annual reduction targets

	1 st	2 nd	3 rd
A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other option	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If other, please specify:

200 character(s) maximum

Comments (please indicate also your suggestions for the first application date of targets as well as the quantitative annual reductions (for option B)):

300 character(s) maximum

The readiness of the VECTO tool to take the alternative powertrains) is important (it must have all the changes to be able to account for the alternative modes and alternative fuels such as natural/renewable gas). Also, the infrastructure has to be ready - a target that is too closely combined with incomplete infrastructure would not lead to positive results.

6.4. Options for the setting of the quantitative targets

- Option A: Targets (initial values and annual reductions, if applicable) are defined ex-ante by the legislation by relative technology improvements over some baseline (as for cars and vans)
- Option B: Targets for the year $y + n$ ($n \geq 1$) are defined by the performance of a certain percentile of best performing vehicles in the year y ("top runner" approach) with a minimum yearly target

	1 st	2 nd	3 rd
A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other option	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If other, please specify:

200 character(s) maximum

Comments your choices on options for the setting of the quantitative targets:

300 character(s) maximum

Industrial investments are needed for long term targets; intermediate checks could be an option to quantify the progress from the implementation of the new technologies.

6.5. Options for the scope of the legislation

VECTO and the underlying type approval legislation will provide certified CO₂ emission values for the four main groups of HDVs (Vehicle groups 4, 5, 9 and 10 as defined in Table 1 of Annex I of the [draft](#)

[Commission Regulation](#) implementing Regulation (EU) No 595/2009 as regards the determination of the CO₂ emissions and fuel consumption of heavy-duty vehicles, which are responsible for about 65% of all HDV CO₂ emissions), which would also be addressed by the first step of regulatory binding targets.

Currently VECTO provides the CO₂ emission values for these trucks only for the long haul and regional delivery mission profiles.

However, there are also a limited (between 2 – 10% (indicative figures to be confirmed in the IA)) number of vocational vehicles in these groups, which serve for special purposes, for instance construction sites or waste collection.

- Option A: the targets are applied to all vehicles within the 4 main vehicle groups, regardless of their use and on the basis of the long haul and regional delivery mission profiles
- Option B: Separate targets are applied to vocational vehicles within the 4 main vehicle groups, on the basis of VECTO urban, municipal and construction mission profiles
- Option C: certain vocational vehicles to be specified are excluded for this first regulatory step

Please indicate the order of your preference (numbers 1, 2, 3) for the different options:

	1 st	2 nd	3 rd	4 th
A	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
B	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
C	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other option	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

If other, please specify:

200 character(s) maximum

Comments on your choices on options for the scope of the legislation:

300 character(s) maximum

Since the VECTO tool is now completely ready it is important, as a first step, to cover the groups already covered by VECTO. Vocational vehicles should be excluded from the regulatory step.

Can you suggest technical criteria for the definition of 'vocational' trucks?

200 character(s) maximum

6.6. Options for the metric for expressing the targets

The CO₂ emission targets will have to be formulated in terms of a certain "metric", meaning that the regulatory target corresponds to CO₂ mass emissions divided by some "transport utility parameter", e.g. mileage travelled (km), mileage travelled times weight (km x t) or volume (km x m³) transported.

- Option A: targets expressed in g CO₂/km,
- Option B: targets expressed in g CO₂/(km x t)
- Option C: targets expressed in g CO₂/(km x m³)
- Option D: targets expressed in a combination of several metrics listed in options A to C

	1 st	2 nd	3 rd	4 th	5 th
A	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
D	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other option	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

If other, please specify:

200 character(s) maximum

Comments on your choices on options for the metric for expressing the targets:

300 character(s) maximum

Targets expressed in g CO₂/(km x t) should be the preferred choice as it represents the utilization of HDVs.

Would you suggest any other metric for expressing the targets?

200 character(s) maximum

6.7. Options regarding mission profiles

For mainstream HDVs used for the transport of goods, VECTO simulations provide four different CO₂ emission values: for a regional delivery and long haul driving pattern, each driven "empty" and a "typically full" payload. Targets may apply to each of these four emission profiles separately or as a weighted average.

	YES	NO	Neutral
Should all four mission profiles be applied to all HDVs?			<input checked="" type="checkbox"/>
Should the targets be defined for each mission profile separately?			<input checked="" type="checkbox"/>
Should the targets be compared with a weighted average of the mission profiles?			<input checked="" type="checkbox"/>

If no, according to what criteria should certain mission profiles not be applied and to what sorts of HDVs?

200 character(s) maximum

If yes on the last question, how should the mission profiles be weighted?

200 character(s) maximum

If you think that the weighing of the mission profiles should depend on some technical characteristics of the vehicles, please explain and suggest these characteristics:

200 character(s) maximum

6.8. Options regarding utility parameters

Any future legislation defining targets aims at achieving a certain level of CO₂ savings for the least overall costs while ensuring that the requested transport utility is still available. If the design of a vehicle (e.g. stronger engine or higher transport volume) has an impact on CO₂ emissions and the vehicle's utility, it may have to be factored into the applicable target (e.g. by choosing appropriate utility factors and formulas setting the targets as a function of thereof). In the case of cars and vans, mass is used as an utility parameter in the current legislation on CO₂ emission standards.

Should utility parameters be used for regulating CO₂ emissions from HDVs?

☐ YES ☐ NO ☒ Neutral

If yes, what utility parameter should be used and factored in for setting the targets?

200 character(s) maximum

6.9. Options for elements supporting cost-effective implementation of the targets

Several options can be considered to support the cost-effective implementation of the targets, which may however also create additional administrative burden:

- Pooling: Several manufacturers may decide to combine their vehicle fleets for assessing the compliance with the regulatory targets (as in the case in the cars and vans CO₂ legislation.)
- Banking and borrowing: A manufacturer may compensate non-compliance with targets in a given calendar year by over-achievements in previous ("banking") or future ("borrowing") years according to well defined regulatory rules.
- Trading: a manufacturer over-achieving its targets may sell corresponding credits in order to facilitate compliance of other manufacturers.
- Transfer of credits between vehicle groups of a manufacturer. In the case of targets set at the level of each vehicle group, a manufacturer may transfer credits between the different groups of its vehicles.

What are your views on these options?

	YES	NO	Neutral
Pooling of manufacturers	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Banking and borrowing	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Trading between manufacturers	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Transfer of credits between vehicle groups of a manufacturer	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Please provide your comments on these or possible other elements for supporting cost-effective implementation:

500 character(s) maximum

7. Governance - HDV CO₂ certification and real driving emissions

Under the current process, CO₂ emissions of HDVs are certified on certain pre-defined mission profiles, the design of which is inspired by real driving data.

What are your views:

	YES	NO	Neutral
Will it be important to develop processes assessing the certified CO ₂ emissions against real driving emissions of HDVs?		<input checked="" type="radio"/>	

If such processes are being developed, should there be some ex-post feedback mechanism requiring compliance of the certified CO ₂ emissions with real driving emissions (within certain tolerances)?		X	
---	--	---	--

Can you suggest such a process?

500 character(s) maximum

8. Additional comments and Upload of Documents

If you wish to add further information, comments or suggestions – within the scope of this questionnaire – please feel free to do so here:

1000 character(s) maximum

In addition, you could also upload a document providing further information, comments or suggestions.