

REVIEW OF THE CO₂ EMISSIONS STANDARDS FOR HEAVY-DUTY VEHICLES

Position paper – 14 December 2022

AECC welcomes the European Commission's initiative to prepare the review of the CO₂ emissions standards for heavy-duty vehicles. Trucks and buses travel on European highways and in cities and are moving people and goods every day. Such vehicles constitute a fundamental pillar, even the backbone, of the European economy and their usage is growing every year. It is essential that these vehicles are and remain clean and efficient through their lifetime and use.

AECC recognises the need to move towards net-zero technologies to achieve the EU Green Deal long term goals. CO₂ emissions standards for heavy-duty vehicles are a key opportunity to accelerate the transport sector's CO₂ emissions reductions by allowing all powertrain technologies, including electric, fuel cell and hybrid ICE vehicles, to contribute to achieve a 90% reduction in greenhouse gas emissions by 2050.

The Tank-to-Wheel approach, which is defined in the current tailpipe CO₂ emissions regulation, limits the CO₂ reductions that can otherwise be obtained by using heavy-duty hybrid ICE technologies with drop-in sustainable renewable fuels.

The review of these heavy-duty CO₂ emissions standards is an opportunity to implement a robust and technology neutral approach to fully consider the role of sustainable renewable fuels for the sector. This can be achieved by considering such novel fuels as an additional pathway within the zero-emission vehicle (ZEV) definition in addition to electrification and hydrogen technologies (FCEV and H₂-ICE), or to establish a Well-to-Wheel (WtW) approach as a first step towards life cycle assessment (LCA) of these CO₂ emissions.

AECC is fully committed to the climate objectives of the EU aiming to achieve a 90% reduction in transport-related greenhouse gas emissions by 2050, as laid out in the European Green Deal¹. AECC's vision² for clean, efficient, convenient and affordable mobility is fully aligned with the European Commission's objective on climate.

Based on the scientific work AECC has conducted, we confirm our commitment to support European legislators on the revision of the CO₂ emissions standards for heavy-duty vehicles.

AECC is convinced the transition towards the EU zero-emissions transport objectives can be best achieved by the contribution of all available powertrain technologies – hybrid Internal Combustion Engine (ICE), Battery Electric Vehicle (BEV), Fuel-Cell Electric Vehicle (FCEV) – to maximise the opportunities to reduce CO₂ emissions from the heavy-duty transport sector. A mixed technology scenario results in the lowest CO₂ emissions as shown by an FVV study³. We must keep in mind that it is the use of fossil fuels that should be banned, rather than the use of internal combustion engines, in order to truly decarbonise transport.

The review of the heavy-duty CO₂ emissions standards covers several important aspects including revision of the existing CO₂ emissions reduction targets and possible new targets for 2035 and 2040, as well as the role of sustainable renewable fuels produced with renewable energy, amongst others.

🔗 Role of sustainable renewable fuels produced with renewable energy, and CO₂ reduction targets

The review opens the possibility for a change of approach towards how CO₂ emissions for these vehicles are being declared and how a Zero Emission Vehicle (ZEV) could be defined.

Currently, the regulation is based on a declared CO₂ emissions value generated by the VECTO tool⁴. This tool calculates the CO₂ emissions and fuel consumption of heavy-duty vehicles for specific loads, fuels and mission profiles (e.g., long haul, regional delivery, urban delivery, etc.), based on input data from relevant vehicle components. The resulting value reflects the Tank-to-Wheel (TtW) CO₂ emissions of the vehicle. As is the case within the light-

duty CO₂ emissions standards, this approach limits the CO₂ emissions reductions that can otherwise be obtained by using heavy-duty hybrid ICE technologies with drop-in sustainable renewable fuels.

As the heavy-duty CO₂ emissions framework has been established for a number of years and it may be difficult to conduct a major overhaul of it, one option to fully grasp the benefits that sustainable renewable fuels can bring in these standards would be to integrate sustainable renewable fuels as an additional path within the ZEV definition. The methods mentioned in the call for evidence of the European Commission (crediting mechanism or carbon correction factor) are examples of a first step in the direction towards recognising the ICE with fully sustainable renewable fuels next to electrification and hydrogen technologies (FCEV and H₂-ICE). Sustainable renewable fuels are already defined within the Renewable Energy Directive (RED)⁵. These fuels and their greenhouse gas reduction targets could readily be considered within the VECTO tool to recognise the role of sustainable renewable fuels and their contribution to transport's decarbonisation.

Another option is to establish a Well-to-Wheel (WtW) CO₂ emissions approach in the legislation as soon as possible as a first step towards life cycle assessment (LCA). In this manner the CO₂ emissions standards for heavy-duty vehicles could ensure a truly technology-neutral approach, which is a core value of the European legislation and will continue to drive further innovations in the automotive industry.

Ambitious targets for CO₂ emissions reduction beyond 2030 can be accomplished when enabling conditions are available to achieve them, including using sustainable renewable fuels.

AECC has demonstrated that a heavy-duty vehicle including state-of-the-art emission control technologies and using sustainable renewable fuels can achieve ultra-low pollutant emissions and very low WtW CO₂ emissions⁶. In order to comply with future regulations including Euro 7 emission standards, and in order to adapt to the expected gradual introduction of sustainable renewable fuels in the market, future heavy-duty vehicles will be equipped with emission control technologies which fully operate in combination with drop-in sustainable renewable fuels. Figure 1 shows the WtW CO₂ emissions achieved by the AECC heavy-duty demonstrator vehicle when tested with sustainable renewable fuels. The graph shows the WtW CO₂ emissions reductions possible depending on the fuel (and feedstock) used.

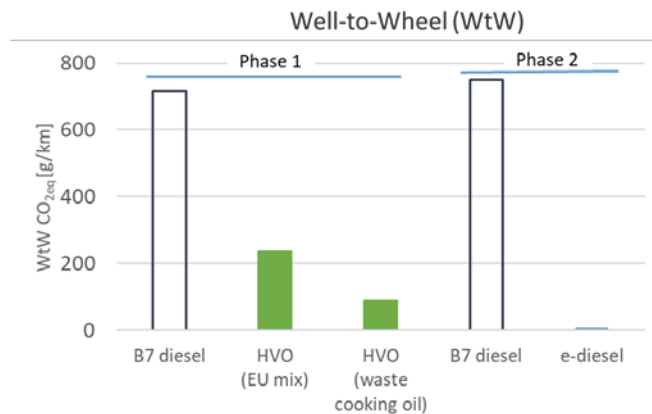


Figure 1. Well-to-Wheel CO₂ emissions reductions according to the different sustainable renewable fuels tested in the AECC heavy-duty demonstration vehicle project

Incentivising significantly higher volumes of sustainable renewable fuels will also enable the current fleet to contribute towards the decarbonisation of road transport to truly achieve the ambitious EU Green Deal goals. The current fleet should be able to run with these drop-in sustainable renewable fuels without any hardware or software modification.

Further to the benefits of reducing substantially the WtW CO₂ emissions from heavy-duty vehicles, using sustainable renewable fuels allows the use of current refuelling infrastructure. This will preserve accessible and affordable mobility for all.

AECC will continue to provide robust scientific data and facilitate informed discussions on how to improve local and global air quality whilst maintaining the competitiveness of the European automotive industry through the integration of modern emission control technologies within the vehicle powertrain system.

Should you need more information, you can contact AECC at info@aecc.eu.

References

¹ Transport and the Green Deal

ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/transport-and-green-deal_en

² AECC Vision document 2020-2025

aecc.eu/wp-content/uploads/2020/08/200203-AECC-Vision-Document-Web.pdf

³ Transformation of mobility to the GHG neutral post fossil age, FVV Fuel Study IVb, 6 October 2022

fvv-net.de/fileadmin/Storys/Wie_schnell_geht_nachhaltig/PR_1452_FVV_Fuels_Study_IVb_2022-10-06.pdf

⁴ European Commission's Vehicle Energy Consumption calculation TOol (VECTO)

climate.ec.europa.eu/eu-action/transport-emissions/road-transport-reducing-co2-emissions-vehicles/vehicle-energy-consumption-calculation-tool-vecto_en

⁵ Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources

eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001&from=EN

⁶ Bosteels, D., et al.; Combination of advanced emission control technologies and sustainable renewable fuels on a long-haul demonstrator truck, SIA Powertrain and Energy 2022, 2022.

aecc.eu/wp-content/uploads/2022/06/Bosteels_Dirk_technicalpaper.pdf

AECC is an international non-profit scientific association of European companies operating worldwide in the research, development, testing and manufacture of key technologies for emissions control. Their products are the ceramic substrates for catalysts and filters; catalysts (substrates with catalytic materials incorporated or coated); adsorbers; filter-based technologies to control engine particulate emissions; and speciality materials incorporated into the catalyst or filter. Members' technology is integrated in the exhaust emissions control systems of cars, commercial vehicles, buses, non-road mobile machinery and motorcycles in Europe. More information on AECC can be found at www.aecc.eu and www.dieselinformation.aecc.eu.

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