

NEWSLETTER

International Regulatory Developments

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EUROPE

EU Presidency Conclusions from COP26

On 13 November 2021, the Slovenian Presidency of the European Union issued a press release on the conclusion of the COP26 climate conference in Glasgow.

Andrej Vizjak, Slovenian Minister of the Environment and Spatial Planning and current chair of the Environment Council, said that the EU has sought to set highly ambitious goals in all areas, insisting on several elements: reference to science, processes to maintain the momentum, the call for ambitious NDCs and strategies to achieve net zero emissions by mid-century, as well as the need to increase climate finance to help developing countries, including for adaptation to climate change.

The press release stated that good progress has been made on financial issues, with increased financial contributions to developing countries so that the target of USD 100 billion per year is reached in the coming years. In addition, the meeting launched a process on providing assistance on the part of developed countries to developing countries in order to set a new collective financial target after 2025.

All parties were also invited to strengthen their NDCs by the end of 2022 in line with the Paris Agreement goal and the latest scientific findings. Agreement has therefore been reached on convening an annual ministerial meeting to strengthen the 2030 climate ambition.

The Paris Agreement rulebook was also finalised at the conference. The last missing elements were adopted, i.e., the time frames for nationally determined contributions, the rules for international carbon markets (Article 6) and the rules on transparency in reporting. In addition, the Global Methane Pledge was adopted, committing the signatories to reduce methane emissions by 30% by 2030. In addition, the Declaration on Forest and Land Use was adopted.

The press release can be found at slovenian-presidency.consilium.europa.eu/en/news/cop26-significant-progress-made-but-further-efforts-needed.

Commission President Ursula von der Leyen also commented on the outcome of the conference. She said that COP26 is a step in the right direction and that the target of 1.5 degrees Celsius increase remains within reach.

Ms von der Leyen commented on the Global Methane Pledge and climate finance, and said COP26 is sending a "clear message that time is up for fossil fuel subsidies and unabated coal". She emphasised that the EU will cut emissions by at least 55% by 2030 and will become the first climate neutral by 2050.

Ms von der Leyen's speech is at ec.europa.eu/commission/presscorner/detail/en/STATEMENT_21_6023.

Slovenian Presidency Progress Report on 'Fit for 55' Package

On 22 November 2021, the Slovenian Presidency of the Council presented a progress report on the 'Fit for 55' Package. Within the Council, the proposals are being dealt with in four different formations: Environment, TTE (Energy), TTE (Transport) and ECOFIN.

As far as the European Parliament is concerned, the proposals under the package are being dealt with by five Committees being Environment (ENVI), industry (ITRE), transport (TRAN), employment (EMPL) and economic affairs (ECON), with a series of other Committees being associated or consulted under various procedural rules. Most of the rapporteurs and shadow rapporteurs for the proposals have been appointed. Work is at a very early stage and according to available information no final timetables have formally been established for work on any of the proposals.

The Energy and Transport Councils will discuss the proposals in their areas of competence at their respective meetings in December 2021.

The focus of discussions in the Environment Council has been the light-duty CO₂ standards, particularly the levels of ambition of the target both for cars and vans, including the 100% target for 2035, which requires all new cars and vans to be zero-emission vehicles by that date. The main issue raised has been the pace of transition to zero emission vehicles, i.e., whether the Commission's proposal has struck the right balance in this respect, or the transition could and should happen faster (2030) or whether it is premature, and more time is needed.

There are questions around the contribution of renewable and low carbon fuels when assessing the vehicle manufacturers' compliance with their targets; the need to consider differences between Member States in the uptake of low and zero-emission vehicles due to affordability; differentiation between cars and vans, the appropriateness of ending the small volume derogation; and the incentives for zero- and low emission vehicles by 2030.

The Energy Council of the Transport, Telecommunications and Energy (TTE) has considered the Renewable Energy Directive (RED), underlining the importance of flexibility for Member States to apply the most cost-efficient measures, of coherence with existing legislation, and of the respect of the subsidiarity and technology-neutrality principles.

The Alternative Fuels Infrastructure Regulation (AFIR) has been considered in the TTE Transport Council, with agreement that more infrastructure will be needed to support faster transition to the use of alternative fuels in transport.

More information is available in a Council document at data.consilium.europa.eu/doc/document/ST-13977-2021-INIT/en/pdf.

Third EU Clean Air Forum

On 18 and 19 November 2021, the European Commission organised the third EU Clean Air Forum in Madrid.

Decision-makers, stakeholders and experts from across the European Union gathered to discuss further improvements in air quality.

Opening the Forum, Mr Timmermans, European Executive Vice-President responsible for the European Green Deal, stated that air pollution is still the first environmental cause of premature death in Europe and in the world. It leaves the most vulnerable, those who cannot move away when air pollution spikes, at particularly high risk. The good news is that in most cases, climate action also helps to reduce air pollution. Vice versa, acting for clean air will help to speed up climate action.

Mr Sinkevičius, Commissioner for Environment, Oceans and Fisheries, said that over the past decades, EU Clean Air Policy has achieved some successes, but we need to do more to reach our zero-pollution ambition and provide EU citizens with clean air. The third EU Clean Air Forum offers an opportunity to discuss what and how with policymakers at the national, local and international level, as well as leading scientists in the field.

The Third EU Clean Air Forum addressed six topics in more detail (1) zero pollution: air quality & health; (2) engagement with cities and citizens; (3) linking clean air, climate and recovery; (4) air pollution, climate change and biodiversity; (5) access to justice and a right to clean air; and (6) air quality: revision of EU rules.

The Forum saw the launch of the mobile application 'European Air Quality Index'. Developed by the European Environment Agency and the European Commission, the index allows users to understand more about air quality and related impacts where they live, work or travel – now including on their smartphones and other mobile devices.

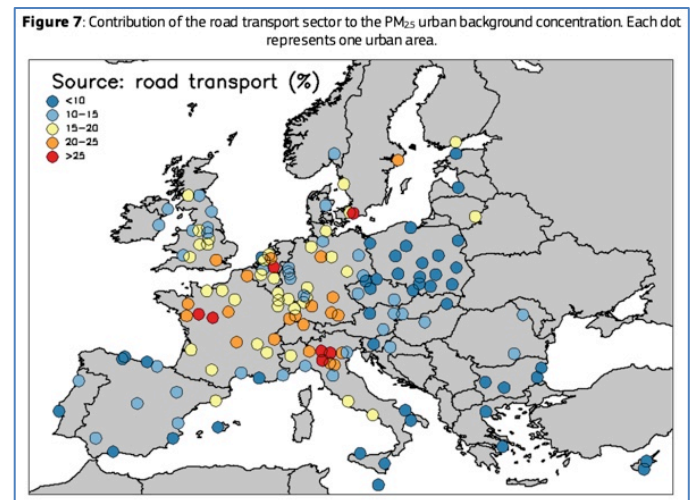
The outcome of the discussions at the Forum will inform the on-going revision of EU rules on ambient air quality. In parallel, an open public consultation will continue to collect views on the future of EU Clean Air Policy and remains open for feedback until 16 December 2021.

The 'European Air Quality Index' application can be found at airindex.eea.europa.eu/Map/AQI/Viewer/ the public consultation can be accessed at ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12677-Revision-of-EU-Ambient-Air-Quality.

Air Quality Atlas for Europe

On 17 November 2021, the European Commission's Joint Research Centre (JRC) published the Air Quality Atlas for Europe, showing the major categories of PM_{2.5} emission sources – and where those sources originate – for 150 cities across Europe.

The Atlas gives a detailed picture of how transport, agriculture, industry, residential heating and shipping emissions affect PM_{2.5} pollution. Their contributions to air pollution vary greatly from one city to another. For example, in Malmö, the dominant source is transport. In Ljubljana, it is residential heating. Knowing emission contributions and their origin can help cities develop measures that target their most polluting activities. It can also help in understanding whether local, national or European level interventions will be most effective.



The Atlas shows that transport emissions represent an important contribution to the PM_{2.5} levels in several European cities. This is the case for cities such as Malmö (39% of overall PM_{2.5}), Brescia (28%) and Parma (27%), Angers, and Verona (26%).

The Air Quality Atlas can be downloaded from publications.jrc.ec.europa.eu/repository/handle/JRC126221.

Commission Report on HDV CO₂ and Fuel Consumption Data

On 8 November 2021, the European Commission published its first report under Regulation (EU) 2018/956 analysing the data transmitted by Member States and manufacturers for the reporting period 2019 on CO₂ emissions from and fuel consumption of new heavy-duty vehicles.

This analysis covers the performance of the heavy-duty vehicle fleet of the Union, the performance of the heavy-duty vehicle fleet of each Member State, and the performance of the heavy-duty vehicle fleet of each manufacturer. All three areas are estimated on the basis of the CO₂ emissions for selected representative heavy-duty vehicle groups for different mission profile load combinations and different fuels. Additionally, selected values on the average fuel consumption of the heavy-duty vehicle fleet of the Union are included. The analysis covers the available data on the uptake of new and advanced CO₂ reducing technologies, as well as of alternative powertrains. Results of on-road verification

tests could not be added to the report as they are not available to the Commission for the reporting period 2019.

The report says that within the representative group for medium lorries, i.e., group 2, significant CO₂ differences among the fleets of different Member States and manufacturers can be observed. The relative difference between the best- and the worst-performing Member State's fleet is of more than 30%. For the manufacturers, the relative difference accounts to 25%.

As for the heavy lorries, the performances of the 5-Long Haul fleets of different Member States and manufacturers are more aligned. The relative difference in the performance of fleets is of around 7% amongst Member States, and around 12% amongst manufacturers.

According to the report, the higher variation of average specific CO₂ emissions of medium lorries as compared to heavy lorries can be explained by two elements. Firstly, medium lorries are simulated with slightly different payloads depending on their technically permissible maximum laden mass, while the payload used at the simulations of heavy lorries does not depend on the technical characteristics of the individual vehicle. Secondly, there are more than one order of magnitude more heavy than medium lorries. As a result, coincidental fluctuations of CO₂ emissions, in particular in smaller Member States, are more likely to occur for medium lorries.

At present, diesel vehicles still account for more than 97% of all EU's newly registered heavy-duty vehicles. Only a limited number of vehicles use alternative fuels or alternative powertrains. The share of vehicles using alternative fuels, i.e., ethanol, CNG, or LNG, significantly varies between the Member States. While it is very low (below 0.5%) in Cyprus, Greece, Hungary, Lithuania, Luxemburg, Malta, and Slovenia, it reaches more than 7% and 6% in Bulgaria and Italy, respectively. This is mainly due to a relatively high share of natural gas (LNG, CNG, NG) vehicles, reflecting a quite well-developed gas refilling infrastructure in these countries.

The full report can be downloaded from [ec.europa.eu/transparency/documents-register/detail?ref=COM\(2021\)679&lang=en](https://ec.europa.eu/transparency/documents-register/detail?ref=COM(2021)679&lang=en).

European Union Adoption of UN Regulation No 154

On 26 November 2021, UN Regulation No 154, with provisions concerning the approval of light-duty passenger and commercial vehicles with regards to criteria emissions, emissions of carbon dioxide and fuel consumption and/or the measurement of electric energy consumption and electric range (WLTP) [2021/2039], was published in the Official Journal of the European Union. This regulation is published in the context of acts created by international agreements and adopted by the European Union.

The intention of this Regulation is to establish uniform provisions concerning the approval of motor vehicles with regard to the emissions of light-duty vehicles based on the new World harmonised Light vehicle Test Procedure (WLTP) included in UN GTR No 15 and the updated Evaporative Emissions test procedure (Type 4 test) which has been developed in UN GTR No 19. It will enable Contracting Parties (CPs) to issue and accept approvals based on these new type-approval tests.

The WLTP Type 1 test replaces both the current Type 1 test in UN Regulation No 83 and UN Regulation No 101, whilst the updated Evaporative Emissions test procedure (Type 4 test) replaces that currently in UN Regulation No 83.

In addition, this new Regulation includes an update to the Type 5 test for verifying the durability of pollution control devices and updated On-Board Diagnostic (OBD) requirements. These updates are in order to reflect the changes from the previous NEDC based Type 1 test to the new WLTP Type 1 test.

The 00 series of this Regulation covers two sets of requirements – termed Level 1A and Level 1B. Level 1A is based on a four phase test cycle (Low, Medium, High and Extra-High), whilst Level 1B is based on a three phase test cycle (Low, Medium and High), with different type 1 limits applying to these different levels. The majority of the regulatory text is applicable to both Level 1A and Level 1B. Where the requirements are specific to either Level 1A or Level 1B the relevant sections are labelled accordingly. This series of amendments covers regional requirements and does not require mutual recognition by other Contracting Parties.

The 01 series of this Regulation includes a harmonised procedure which contains the most stringent procedures/limits which shall be subject to full mutual recognition. A type-approval to the 01 series shall therefore be accepted by all CPs having adopted this Regulation.

The Regulation can be found at eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:42021X2039&from=EN.

Commission Action Against Portugal for Poor Air Quality

On 12 November 2021, the European Commission decided to refer Portugal to the Court of Justice of the European Union over poor air quality caused by high levels of nitrogen dioxide.

The Commission says that Portugal has continually and persistently exceeded the annual nitrogen dioxide limit value in three air quality zones ('Lisboa Norte', 'Porto Litoral', and 'Entre Douro e Minho'). Air pollution from nitrogen dioxide in these air quality zones results mostly from road traffic, in particular from diesel vehicles. Portugal has also failed to

adopt appropriate measures to keep the exceedance period as short as possible.

The Commission sent a Letter of Formal Notice to Portugal on air quality in May 2019, followed by a Reasoned Opinion in February 2020. The Commission therefore considers that efforts by the Portuguese authorities have to date been unsatisfactory and insufficient and is referring Portugal to the Court of Justice of the European Union.

The Commission press release is available to read at ec.europa.eu/commission/presscorner/detail/en/IP_21_5353.

European Parliament Resolution on Critical Raw Materials

On 25 November 2021, the European Parliament passed a resolution on a European strategy for critical raw materials.

The resolution states that critical raw materials (CRMs) are crucial for producing a broad range of goods and technologies and that the transition towards digital, highly energy-efficient and climate-neutral European economies will lead to a significantly higher demand for CRMs. The technologies requiring them, such as batteries and electric engines, will be key to achieving the goals under the Paris Agreement.

Parliament calls for an EU strategy to boost Europe's strategic autonomy and resilience regarding the supply of CRMs, by creating a secondary market for recycled resources containing these materials. Under the Parliament's proposals, more CRMs will have to be sourced from within the EU and its neighbourhood, sources for these materials will need to be diversified, and more research should focus on sustainable alternatives to these scarce materials.

MEPs say that, in the short- to mid-term, focusing on recycling will not be enough on its own to meet the increasing demand for CRMs. They call for sustainable sourcing possibilities to be explored in CRM-rich Member States. They also call on EU Member States to consider the strategic stockpiling of CRMs in order to secure their supplies and say that future EU free trade and partnership agreements should include specific provisions on CRMs.

The resolution is available to read at europarl.europa.eu/doceo/document/TA-9-2021-0468_EN.pdf with the Parliament's press release at europarl.europa.eu/news/en/press-room/20211118IPR17620/critical-raw-materials.

Think Tank Report on Alternative Fuel Infrastructures for Heavy-Duty Vehicles

On 10 November 2021, the European Parliament's Policy Department for Structural and Cohesion Policies (Think Tank) published a study on alternative fuel infrastructures for heavy-duty vehicles.

The report says that given the Green Deal decarbonisation targets, there is a need to decarbonise truck transport, but at

present there is only minimal publicly accessible refuelling and recharging infrastructure for battery electric trucks (BETs) and hydrogen-fuelled trucks. It adds that there is only limited time for testing and revision of national policies and revision of the AFIR before 2030. One option would be to speed up the development of national policy frameworks.

Regarding hydrogen refuelling, the report states that the choice for at least 700 bar hydrogen refuelling points seems to be justified, since both heavy-duty and light-duty vehicles can make use of these refuelling points. Although liquid hydrogen can be a game changer in the coming years, the introduction of binding targets for liquid hydrogen might be too early given the early phase of development of liquid hydrogen technology. The Think Tank points out that the European Commission has decided to extend the 2020 targets for LNG until 2025, but no further policy incentives will be provided. LNG and other fossil fuels need to be replaced by biofuels or low carbon synthetic fuels. Given the technological developments, it says these choices seem to be justified.

The study concludes that lack of investment security as well as a lack of a stable long-term policy framework and of a targeted, uniform approach are hampering the accelerated roll-out and increasing realisation times of infrastructure. The AFIR proposal therefore places a strong emphasis on technological standardisation to reach harmonisation.

The executive summary of the study can be found at [europarl.europa.eu/RegData/etudes/STUD/2021/690901/IPOL_STU\(2021\)690901\(SUM01\)_EN.pdf](https://europarl.europa.eu/RegData/etudes/STUD/2021/690901/IPOL_STU(2021)690901(SUM01)_EN.pdf) with the full report at [europarl.europa.eu/RegData/etudes/STUD/2021/690901/IPOL_STU\(2021\)690901_EN.pdf](https://europarl.europa.eu/RegData/etudes/STUD/2021/690901/IPOL_STU(2021)690901_EN.pdf).

EP Think Tank Appraisal of EC LDV CO₂ Proposal Impact Assessment

On 29 November 2021, the European Parliamentary Research Service (Think Tank) published an initial appraisal of the European Commission's impact assessment (IA) on the CO₂ emission performance standards for new passenger cars and new light commercial vehicles.

According to the IA, there are three problems with the proposed regulation. The first is that the contribution of light-duty vehicles to the increased ambition on greenhouse gas emissions is insufficient. With the current standards, CO₂ emissions from road transport would diminish by around 16% in 2030 and by 44% in 2050, compared to 2015. However, to be consistent with at least 55% GHG emission reductions by 2030 and the climate neutrality objective by 2050, emissions from road transport would need to diminish by between 19% and 21% by 2030, and by between 98% to almost 100% by 2050, compared to 2015. The IA explains that 'sustainable advanced biofuels are barely starting to be produced at scale, while power-to-liquid and power-to-gas fuels as well as clean hydrogen from renewable sources are

available only at demonstration scale'. The IA therefore considers that the insufficient reduction of fossil fuels in transport should be addressed through the deployment of zero-emission vehicles (ZEV) and the use of electricity as fuels.

The IA also says that consumers risk missing out on the benefits of zero-emission vehicles if these vehicles are not sufficiently deployed on the market. According to the IA, in the absence of stricter CO₂ emission standards and clear longer-term regulatory signals, there is a significant risk that manufacturers may not produce and offer enough zero emission vehicles for the EU market to contribute to the overall 55% GHG emission reduction target for 2030 and the climate neutrality objective for 2050. With the current CO₂ emission standards, the share of ZEV in the total vehicle stock is projected to be 11% for cars and 7% for vans by 2030; the share of zero- and low-emission vehicles (ZLEV) is projected to reach 54% of the stock in 2050.

In addition, the Automotive value chain in the EU risks losing its technological leadership as a result of a lack of clear regulatory signals.

The IA calculates that the preferred options are projected to decrease the CO₂ emissions from cars and vans by around 32-33% in 2030, 56-66% in 2035 and 83-89% in 2040, as compared to 2005. Net economic savings for society and end-users over the vehicle lifetime for new cars are estimated to amount to €860-1 600 per car in 2030, €1 500-3 400/car in 2035, and €4 600-5 100/car in 2040. For new vans, the estimated ranges of net economic savings are: €1 000-1 200/van in 2030, €4 000-5 100/van in 2035, and €5 600-6 400/van in 2040. Furthermore, the combination of preferred options is expected to generate savings in the total costs of ownership for first and second users and decrease the final energy demand of new cars and vans. The projected costs for manufacturers are €300-550/car in 2030, €940-1 700/car in 2035 and €1 400-1 700/car in 2040. For new vans, the projected costs for manufacturers are €450-940/van in 2030, €1 500-2 800/van in 2035 and €2 300-2 700/van in 2040.

The report concludes that the Commission's legislative proposal appears to follow the IA recommendations, in that it is based on the preferred options, except for the emission reduction target for new cars from 2030, which is set at 55% compared to 2021, instead of 60% as indicated in the preferred option of the IA.

The Think Tank report can be found at [europarl.europa.eu/RegData/etudes/BRIE/2021/694249/EPRS_BRI\(2021\)694249_EN.pdf](https://europarl.europa.eu/RegData/etudes/BRIE/2021/694249/EPRS_BRI(2021)694249_EN.pdf).

EEA Report on Health Impacts of Air Pollution in Europe

On 15 November 2021, the European Environment Agency (EEA) published a briefing on 'Health impacts of air pollution in Europe'. The briefing presents updated estimates on how

three key pollutants – fine particulate matter, nitrogen dioxide, ground-level ozone – affected Europeans' health in 2019. It also assesses the potential benefits of improving air quality towards new guideline levels recommended by the World Health Organization (WHO).

According to the EEA's latest estimates, 307 000 people died prematurely due to exposure to fine particulate matter pollution in the EU in 2019. At least 58%, or 178 000, of these deaths could have been avoided if all EU Member States had reached the WHO's new air quality guideline level of 5 µg/m³.

EEA says that air quality in Europe was better in 2019 than in 2018, which also resulted in fewer negative health impacts. The decline in pollution follows a long-term trend, driven by policies to reduce emissions and improve air quality.

As part of the European Green Deal, the EU Zero Pollution Action Plan sets a target to reduce the number of premature deaths due to exposure to fine particulate matter by more than 55% by 2030, as compared to 2005. According to EEA's analysis, the EU is currently on track to reach the target, as the number of these deaths has decreased by about a third from 2005 to 2019.

The EEA briefing is available to read in full at eea.europa.eu/highlights/cleaner-air-could-have-saved?utm_source=EEASubscriptions&utm_medium=RSS.

UK Pledge for Zero Emission HGVs by 2040

On 10 November 2021, the UK government, during the COP26 conference, pledged that all new heavy goods vehicles in the UK will be zero-emission by 2040.

This makes the UK the first country in the world to commit to phasing out new, non-zero emission heavy goods vehicles weighing 26 tonnes and under by 2035, with all new HGVs sold in the UK to be zero emission by 2040.

The announcement is at gov.uk/government/news/uk-confirms-pledge-for-zero-emission-hgvs-by-2040-and-unveils-new-chargepoint-design.

German Coalition Agreement

On 24 November 2021, the parties involved in discussions to form a new governing coalition in Germany, headed by the SPD under Olaf Scholz, announced an 'Alliance for Freedom, Justice and Sustainability'.

The coalition document says that the coalition will support the transformation of the automotive sector in order to achieve climate goals. It will make Germany a leading market for electromobility, with a goal of at least 15 million fully electric cars by 2030. Germany will impose an earlier date than the 2035 deadline proposed by the European Commission for only CO₂-neutral cars to be permitted. The coalition adds that it is committed to ensuring that only vehicles that can be refuelled with e-fuels can be registered.

The parties also advocate the adoption of an ambitious and implementable Euro 7 standard and will take into account value creation and jobs. They also advocate further development of the CO₂ fleet limits for commercial vehicles.

The new government will also support the European Commission's project to amend the EU Air Quality Directive in order to gradually achieve the latest standards.

From August 2023, funding will only be given for electric and electrified vehicles if their electric range is more than 80 km. After 2025, a flat-rate tax of 0.5% will apply to emission-free (electric) vehicles. The document goes on to say that this will also apply to 'CO₂-neutral vehicles analogous to fully electric vehicles'.

The coalition agreement (in German) can be found at spd.de/fileadmin/Dokumente/Koalitionsvertrag/Koalitionsvertrag_2021-2025.pdf.

AECC Technical Note on Euro 7/VII

On 16 November 2021, AECC published a Technical Note on the Euro 7/VII emission standards for cars, vans, buses and trucks. This complements the AECC position paper that was released on 28 June 2021.

AECC stated that it supports an ambitious proposal for future Euro 7/VII emission legislations for light- and heavy-duty vehicles to further decrease road traffic pollutant emissions by the use of advanced emission control systems integrated in engine systems.

Euro 7/VII is a key element of the Smart and Sustainable Mobility Strategy under the EU's Green Deal. It should embrace an all-inclusive strategy in a technology neutral context ensuring all powertrain technologies contribute to the EU's Green Deal long-term goals.

This note considers some of the content presented by the CLOVE consortium (Consortium for ultra-Low Vehicle Emissions) to the meetings of the Advisory Group on Vehicle Emission Standards (AGVES).

Specific comments on light- and heavy-duty vehicles emissions are given based on the latest AECC test programme data.

The note highlights that in respect of particle number, it is challenging to achieve the expected Euro 7/VII emission reduction performance, because extra changes with a similar effect as a reduction in the limit value (e.g., PN23 to PN10) require a higher improvement factor compared to gaseous emissions. For gaseous emissions, technology modifications may need to be required to overcome interdependencies of emission components, e.g., NO_x and N₂O.

The technical note has been sent to AECC contacts and has been uploaded on the European Commission's CIRCAB website.

The Technical Note can also be accessed at aecc.eu/wp-content/uploads/2021/11/211115-AECC-position-on-Euro-7-technical-note-final.pdf.

AECC Response to Consultation on CO₂ Emissions for Cars and Vans

On 8 November 2021, AECC responded to the European Commission consultation on the proposed revision of the CO₂ emissions performance standards for cars and vans.

AECC stated that it fully supports the revision of the CO₂ emissions performance standards for cars and vans. The EU Green Deal zero-emissions transport objective can best be achieved by a truly technology-neutral CO₂ emissions standard for cars and vans. AECC pointed out that the Tank-to-Wheel approach currently limits the CO₂ reductions that can otherwise be obtained by using hybrid ICE technologies with drop-in sustainable renewable fuels in addition to the ongoing electrification of the cars and vans fleets.

The paper emphasizes that emission control technologies fully operating in combination with these drop-in sustainable renewable fuels enable ultra-low pollutant emissions while contributing towards net-zero CO₂ emissions.

AECC call for sustainable renewable fuels to be integrated as an additional path within the Zero Emission Vehicles (ZEV) definition. As an example, a voluntary crediting mechanism could be included when determining manufacturers compliance with their CO₂ targets. 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 AECC consultation response can be found at aecc.eu/wp-content/uploads/2021/11/211108-AECC-comments-on-CO2-target-for-LD-vehicles-final.pdf.

AECC Response to Consultation on Alternative Fuel Infrastructure Directive

On 18 November 2021, AECC responded to the European Commission consultation on its proposal for a Regulation on the deployment of Alternative Fuels Infrastructure (AFIR).

AECC stated that it is fully committed to the climate objectives of the EU aiming to have zero-emission transport by 2050, as laid out in the European Green Deal.

AECC pointed out that as road transport, including cars, vans, trucks and buses, is responsible for around 20% of total EU emissions of CO₂, it is important to have all available paths to decarbonise this sector. Electrifying the fleet is not enough as fleet renewal and renewable electricity ramp-up will take some time. A holistic approach is required. A truly technology neutral legislation allowing all available powertrain technologies – hybrid Internal Combustion Engine (ICE), hydrogen ICE, Battery Electric Vehicle (BEV), Fuel-cell Electric Vehicle (FCEV), etc. – to contribute towards reducing these emissions, is needed.

The European Commission's proposal for having a regulation for the Alternative Fuels Infrastructure instead of a directive is appropriate. This will allow swift and coherent implementation of the national fleet-based minimum deployment targets of refuelling and recharging infrastructure set at Member State level. This will support the necessary accelerated market uptake of zero- and low-emission vehicles expected in the following years.

The paper also states that as this initiative is complementing the regulations setting CO₂ emission performance standards for new passenger cars and vans, and heavy-duty vehicles, as well as revision of the Renewable Energy Directive, it is absolutely necessary that the new regulation supports the deployment of sustainable renewable fuels.

The AECC consultation response can be found at ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12251-Levs-improving-EU-refuelling-recharging.

AECC Response to Consultation on Renewable Energy Directive

On 18 November 2021, AECC responded to the European Commission consultation on its proposal for amending the EU renewable energy rules.

The comments emphasise sustainable renewable fuels can contribute substantially to the reduction of CO₂ emissions from road transport. AECC states that this needs to be fully recognised in the Renewable Energy Directive (RED) as drop-in sustainable renewable fuels can be used in current and future hybrid ICE vehicles. These will contribute to transport CO₂ reduction in addition to the ongoing electrification of the European vehicle fleet.

More sustainable renewable fuels are needed at the pump and thus, the greenhouse gas (GHG) intensity reduction target in road transport should be as ambitious as possible. The RED ambition level should align to the overall 'Fit for 55' ambitions and set a clear pathway to achieve 100% GHG intensity reduction of road transport. Ambitious GHG intensity reduction targets need to be set for 2030 and beyond. Emission control technologies fully operating in combination with these drop-in sustainable renewable fuels enable ultra-low pollutant emissions from internal combustion engines (ICEs) while contributing to net-zero CO₂ emissions.

To fully grasp the benefits that sustainable renewable fuels can bring, the obligation to decrease the carbon intensity of transport included in the proposal is a good way forward. However, increasing the ambition level of greenhouse gas intensity reduction in road transport to only 13% in 2030 is not ambitious enough. The aim of the RED should be to have a substantial GHG intensity reduction of the road transport fuels by 2035 in line with the ambitions set in the 'Fit for 55' package.

AECC calls for the RED's aim to increase the GHG intensity reduction in road transport to at least 40% by 2030. Besides increasing the 2030 ambition level, a clear pathway to achieve 100% GHG intensity reduction for road transport is needed to support the net-zero road transport by 2050 target. Investments are based on certainty and a clear business case, so targets after 2030 are necessary to incentivise sustainable renewable fuels production in view of achieving 100% carbon neutral liquid fuels in 2050.

The AECC consultation response can be found at aecc.eu/wp-content/uploads/2021/11/211118-AECC-comments-on-RED-final.pdf.

AECC-Concawe Journal Paper

On 17 November, a joint journal paper from AECC and Concawe was published in a special issue of the journal Sustainability, titled 'Advanced Emission Controls and Sustainable Renewable Fuels for Low Pollutant and CO₂ Emissions on a Diesel Passenger Car'. It describes results obtained on the AECC diesel demonstrator vehicle.

The abstract states research efforts into advanced emission control systems led to significant reduction of pollutant emissions of modern internal combustion engines. Sustainable renewable fuels are used to further reduce their Well-to-Wheels (WtW) greenhouse gas emissions.

The novel aspect of this paper is the compatibility investigation of existing advanced emission control technologies for achieving low pollutant emissions with the use of sustainable renewable fuels with vehicle tests. This is done on a diesel demonstrator vehicle, equipped with Lean NO_x trap and dual-SCR technologies in combination with a 48V mild-hybrid powertrain. Tailpipe pollutant and CO₂ emissions are measured for market diesel fuel with 7% renewable fatty-acid-methyl-ester (FAME) (B7), diesel fuel with 30% FAME (B30), and 100% renewable hydrotreated vegetable oil (HVO).

Results show no significant difference in pollutant emissions between the different fuels used. In a second part of the study, a WtW analysis is conducted. This includes different pathways for the biomass-to-liquid fuels that were tested on the vehicle, as well as a power-to-diesel (e-diesel) assessment. Results show that significant WtW CO₂ reductions are possibly compared to the state-of-the-art market diesel fuel. Part of this reduction is already possible for the existing fleet as most of paraffinic compounds are drop-in for market diesel fuel.

The open access paper is available at mdpi.com/2071-1050/13/22/12711.

NORTH AMERICA

CARB Workshop on Off-Road Standards Development

On 3 November 2021, the California Air Resources Board (CARB) presented initial regulatory concepts in its first public workshop on the development of Tier 5 emission standards. CARB's overall goal is to further reduce NOx and PM emissions from off-road engines by 50-90% in the 2028-2030 timeframe.

A CARB presentation gave several reasons why it believes the off-road engine emission regulations need to be tightened. It said that current Tier 4 final standards do not reflect best available control technologies (BACT) as over 50% of newly certified engine families are certified without a DPF.

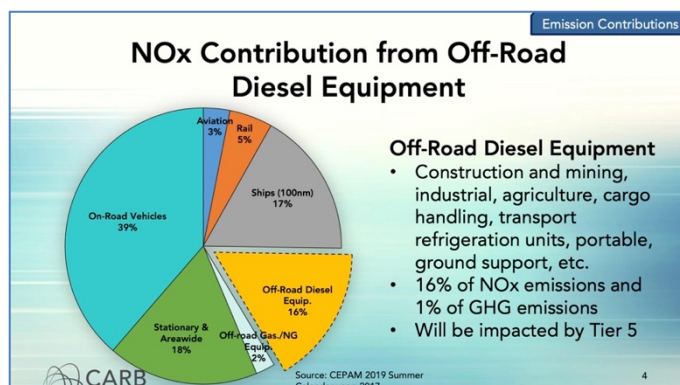
Standards

The Need for Tier 5 Standards

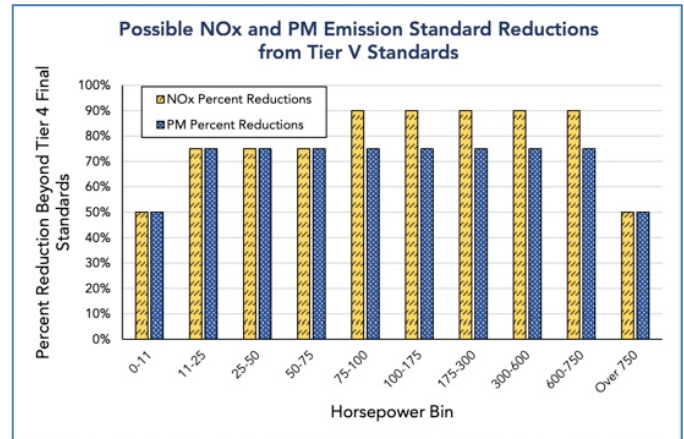
- Current Tier 4 Final off-road diesel standards for new engines do not reflect best available control technologies (BACT)
 - Over 50% of Tier 4 Final engines are certified without Diesel Particulate Filters (DPFs)
- Additional emission reductions are needed for attainment of federal and State ambient air quality standards
- Off-road emissions disproportionately affect disadvantaged communities
- Current test cycles may not adequately demonstrate emissions control during low load off-road engine operation

7

Incorporating current DPF technology is sufficient to meet the PM emission goal, so a DPF will likely be specifically required as a part of the final aftertreatment system, and the ongoing technology effort will focus on meeting the NOx target.



CARB is considering a 75% NOx and PM reduction for diesel engines between 19 and 56 kW, with 90% and 75% reductions respectively for NOx and PM from engines between 56 and 560 kW. The target for engines above 560 kW is to have 50% lower NOx and PM.



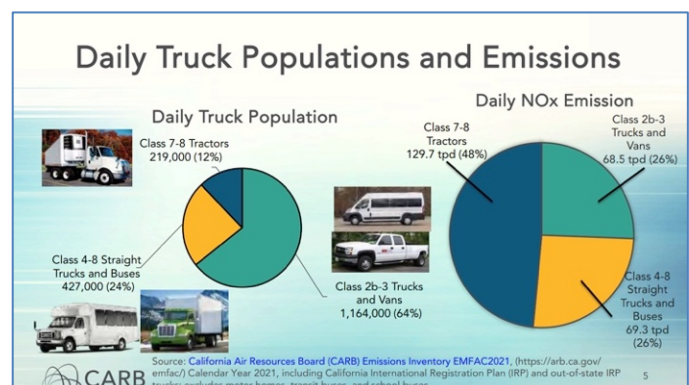
Additional measures would include a low load certification, increased full useful life and warranty requirements, and elimination of flex and transition period flexibilities.

Full details of the workshop are at arb.ca.gov/es/our-work/programs/tier-5/meetings-workshops.

CARB Advanced Clean Fleets Emissions Inventory Workgroup

On 17 November 2021, the California Air Resources Board (CARB) held its first meeting of the Advanced Clean Fleets (ACF) Emissions Inventory Workgroup. The goal of the workgroup was to establish accepted vehicle populations under the four major fleet categories to be used to develop distinct emissions inventories.

CARB reviewed source information of Class 2b through to Class 8 vehicle inventories under the Public Fleet, Drayage Truck, Higher Priority and Federal Fleet rules and the timing of requirements for these fleets to adopt zero emissions trucks where feasible. CARB also presented an overall daily NOx emissions inventory for the entire California Class 2b/3 trucks and vans, Class 4-8 straight trucks and buses, and Class 7-8 tractors.



Staff also presented initial modelling results of projected technology distributions by vehicle class under the Advanced Clean Truck (ACT) regulation and ACF proposal.

The CARB workshop presentation can be found at arb.ca.gov/sites/default/files/2021-11/211117acfpres_ADA.pdf.

AFRICA

Greening the Future Johannesburg Bus Fleet

On 30 November 2021, the International Council on Clean Transportation (ICCT) published a report on an emissions control strategy for the Metrobus fleet in Johannesburg, South Africa. The Johannesburg Integrated Development Plan (IDP) for 2017/2018 and South Africa's National Green Transport Strategy (GTS) have endorsed deployment of diesel dual-fuel (DDF) engines as a key technology solution for reducing greenhouse gas (GHG) emissions. DDF technology converts a diesel engine into a dual diesel and compressed natural gas engine, and the national GTS is South Africa's government plan for the sector in support of meeting its nationally determined contribution under the Paris Agreement.

The first of two papers presents an assessment of technology and fuel pathways, emissions modelling, and total cost of ownership analysis. The authors find that although DDF buses provide a minor GHG emissions benefit relative to older diesel buses in the current fleet, the benefit is not enough to offset the increased activity projected for the fleet in the future. The ongoing procurement of DDF buses with no DDF optimisation programme and no change in the existing fuel mix would increase, not decrease, fleetwide GHG emissions. This would therefore not contribute to achieving South Africa's climate goals.

Results show the procurement of dedicated Euro VI gas engines in the near term, accompanied by a transition from fossil gas to biomethane, can deliver a 55% reduction in fleetwide GHG emissions by 2040. Alternatively, the procurement of Euro VI diesel engines in the near term, operated without coal-to-liquids fuel and followed within 10 years by the exclusive procurement of zero-emission engines, would deliver a 73% reduction in fleetwide GHG emissions by 2040.

The second paper in the report presents an operational and environmental assessment of the Diesel Dual-Fuel (DDF) Programme implemented in 2016 by focusing on fuel consumption and real-world emissions measured by portable emissions measurement systems (PEMS).

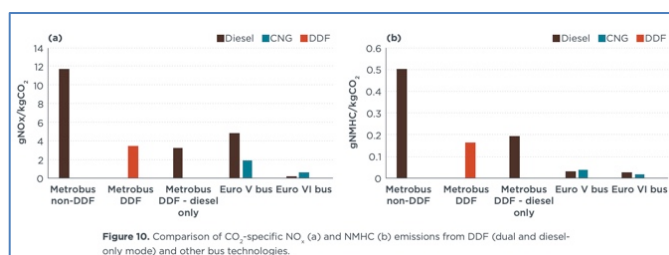


Figure 10. Comparison of CO₂-specific NO_x (a) and NMHC (b) emissions from DDF (dual diesel-only mode) and other bus technologies.

The PEMS tests reveal that, compared to the legacy Metrobus fleet, the DDF buses provide significant reductions in nitrogen oxide and carbon dioxide emissions. Although a 20-year analysis of global warming potential also shows that total greenhouse gas (GHG) emissions from the DDF buses are slightly lower than the legacy buses, excess methane emissions mean higher GHG emissions from the DDF buses than all other technology options available today. This suggests that DDF can be an effective intermediate technology toward soot-free, cleaner technology, but in order to deliver long-term reductions in the air pollution and GHG emissions of the fleet, Metrobus must move beyond Euro V DDF technology.

The two papers can be downloaded from <https://theicct.org/publications/south-africa-hdv-metrobus-fleet-pt1-nov21> and theicct.org/publications/south-africa-hdv-metrobus-fleet-pt2-nov21.

UNITED NATIONS

COP26 World Leaders Summit: Statement on Breakthrough Agenda

On 2 November 2021, a group of countries launched the Breakthrough Agenda – a commitment to work together internationally this decade to accelerate the development and deployment of the clean technologies and sustainable solutions needed to meet the Paris Agreement goals, ensuring they are affordable and accessible for all.

The nations say they will endeavour to work together in each sector, including through public-private collaboration and by mobilising finance at scale, to make the global transition to a clean economy faster, lower cost and easier for all, while making solutions to adaptation more affordable and inclusive.

The Glasgow Breakthroughs are global goals that aim to make clean technologies and sustainable solutions the most affordable, accessible and attractive option in each emitting sector globally before 2030. They cover the areas of power, road transport, steel and hydrogen.

The Road Transport Breakthrough is that zero emission vehicles are the new normal and accessible, affordable, and sustainable in all regions by 2030. The IEA is invited to lead an assessment of global progress towards this breakthrough, including reporting on evidence of the share of new light- and heavy-duty vehicle sales that are zero emission, the amount of available recharging infrastructure for zero emission vehicles, investments in both the research, development and demonstration and the deployment of zero emission vehicles and of key components, and the relative cost, affordability and accessibility of zero emission vehicles and of key components such as batteries, compared to alternatives.

For the Hydrogen Breakthrough, the goal is for affordable renewable and low carbon hydrogen to be globally available by 2030. The participants have invited the IEA to lead an assessment of global progress towards this breakthrough,

including reporting on evidence of production cost, and cost at point of supply, of renewable and low carbon hydrogen (and affordability and accessibility compared to alternatives), volume of renewable and low carbon hydrogen production globally, greenhouse gas abatement, across the full value chain, from the production and take-up of renewable and low carbon hydrogen, along with investments in the research, development and demonstration and deployment, of renewable and low-carbon hydrogen technologies.

The Breakthrough Agenda statement can be found at ukcop26.org/cop26-world-leaders-summit-statement-on-the-breakthrough-agenda/.

COP26 Declaration on Transition to 100% Zero Emission Cars and Vans

On 10 November 2021, representatives of some governments, businesses, and other organisations with an influence over the future of the automotive industry and road transport, committed to rapidly accelerate the transition to zero emission vehicles to achieve the goals of the Paris Agreement. They said that they will work towards all sales of new cars and vans being zero emission globally by 2040, and by no later than 2035 in leading markets. The declaration is not legally binding.

Governments in emerging markets and developing economies, committed to 'work intensely towards accelerated proliferation and adoption of zero emission vehicles'. Cities, states, and regional governments, said they will work towards converting owned or leased car and van fleets to zero emission vehicles by 2035 at the latest, as well as putting in place policies that will enable, accelerate, or otherwise incentivise the transition to zero emission vehicles as soon as possible. A total of 26 nations signed the pledge, including COP26 host, the United Kingdom, Canada, and India, as well as EU countries Poland, the Netherlands, and Austria.

The automotive manufacturers who signed the declaration committed to work towards reaching 100% zero emission new car and van sales in leading markets by 2035 or earlier, supported by a business strategy that is in line with achieving this ambition, helping build customer demand. Only six major carmakers signed the pledge, among them Mercedes-Benz, Ford, and Volvo.

The declaration can be found at gov.uk/government/publications/cop26-declaration-zero-emission-cars-and-vans/cop26-declaration.

UNECE Statement on Hydrogen

On 12 November 2021, the United Nations Economic Commission for Europe (UNECE) published a statement about hydrogen as part of the solution to decarbonise world economies, along with a technology brief.

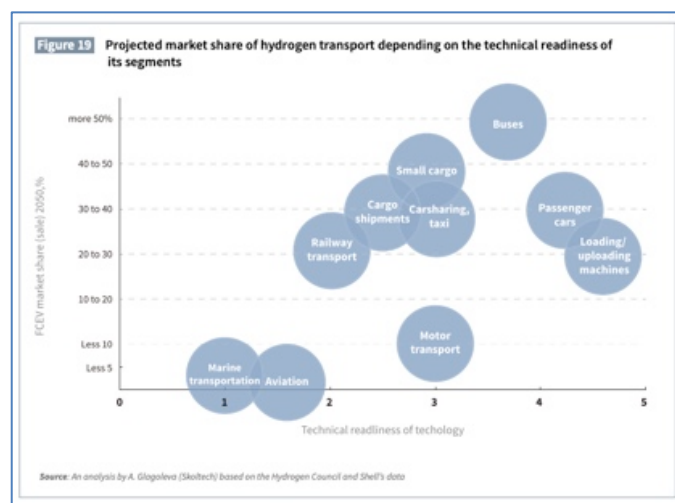
The document says that delivering on the potential of hydrogen – which can be used in transport, homes, industry and power generation – to contribute to the Paris Agreement and 2030 Agenda will require public and private investment on a massive scale and sustained political commitment, especially as “clean hydrogen” is today 2-3 times more expensive to produce than hydrogen from natural gas or other hydrocarbons, which currently accounts for 95% of production.

According to the EU Hydrogen Strategy, cumulative investments of €180-470bn would be required by 2050 for renewable hydrogen development in Europe, while an estimated €3-18bn would be needed for low-carbon hydrogen (fossil-based with Carbon Capture Use and Storage).

UNECE says it will continue to facilitate policy dialogue at regional level on hydrogen and the development of norms and regulations for its safe transport, storage and use, which are essential for the shift to a hydrogen economy. It goes on to say that there is no single solution to decarbonise our economies on the scale required, but hydrogen has an important role to play.

The technology brief says that hydrogen Fuel Cell Electric Vehicles (FCEVs) offer a low carbon alternative to fossil fuels and are the only vehicles alongside battery electric vehicles (BEV) that offer no exhaust emissions. BEVs may be more competitive in light-duty and lower utilisation applications while FCEVs will have an advantage in heavier duty and higher utilisation applications. Any road transport can use hydrogen either by a fuel cell or by hydrogen-based fuels.

There are estimated to be around 2 000 buses, 1 500 trucks, and 30 000 forklifts that are in use today. Passenger hydrogen fuel cell electric vehicles are expected to rapidly increase from the current number of 15 000 following the widespread availability and cost-effectiveness of fuel cell technology.



At the end of 2020, Europe, the Middle East and Africa region accounted for only 36% the 580 hydrogen stations worldwide.

Current estimations of hydrogen costs 'at the pump' are between €7-9/kg. By 2030, hydrogen costs are expected to be less than €6/kg and competitive with fossil fuels. By 2030, current estimations indicate that the US will have over 7,000 hydrogen refuelling stations and 5.3 million FCEVs, with Europe close behind with 3.7 million FCEVs. Assuming that the hydrogen is zero carbon sourced, this could save more than 29MtCO₂ transport emissions per year.

The UNECE press release is at unece.org/climate-change/news/hydrogen-can-be-part-solution-decarbonize-our-economies.

The technology brief can be found at unece.org/sites/default/files/2021-10/Hydrogen%20brief_EN_final_0.pdf.

GENERAL

Impact of London ULEZ Expansion on Real-World Car Emissions

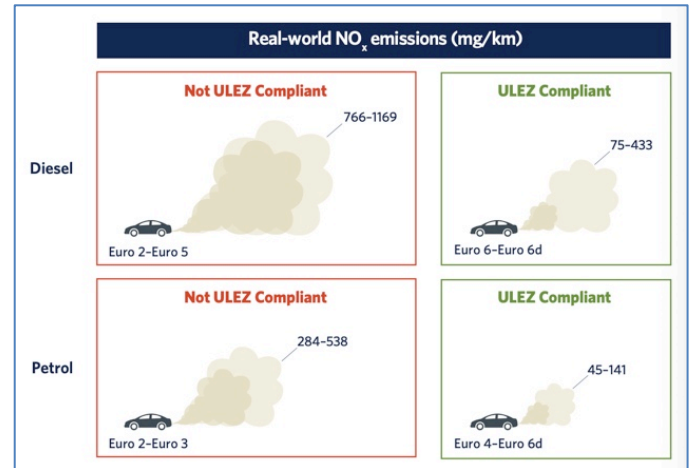
On 1 November 2021, the International Council on Clean Transportation (ICCT) published a technical note on the real-world emissions of passenger cars impacted by the London Ultra Low Emission Zone (ULEZ) expansion.

ICCT says that the TRUE (The Real Urban Emissions) Initiative's extensive collection of real-world emissions data provides a unique opportunity for independent insight into the emissions impacts of the recent expansion of the London ULEZ. The database contains emission measurements of vehicles during on-road operation from remote-sensing campaigns across Europe. More than two million emission records are compiled in the database, including approximately 100 000 records from a 2018 TRUE study in London that measured vehicle emissions at nine locations throughout the city.

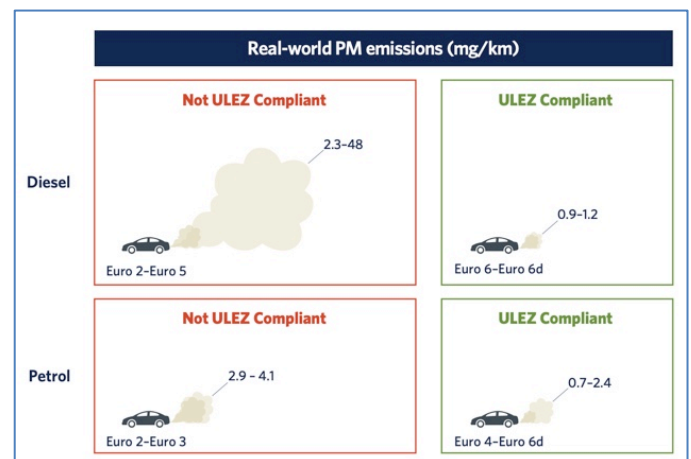
The TRUE results show that in almost all cases the London ULEZ requirements impact those vehicle groups with the highest real-world NO_x and PM emission levels. The ULEZ charge applies to all diesel passenger vehicles that are not equipped with particulate filters. The TRUE data show that PM emissions from these older diesel vehicles are particularly high, with Euro 2 to Euro 4 vehicles emitting 17–41 times more PM than diesel vehicles compliant with Euro 6–6d standards, which are exempt from ULEZ access charges.

The technical note adds that TRUE studies have also added to the evidence base documenting the excess NO_x emissions from diesel passenger cars in real-world operations relative to type-approval limits. The ULEZ requirements apply to the vehicle groups with the highest demonstrated real-world NO_x emission levels, including Euro 4 and Euro 5 diesel cars, which emit up to 18 times more

NO_x than the cleanest vehicles compliant with ULEZ standards.



The note concludes that TRUE data indicate that replacing a diesel car that does not meet ULEZ standards with a new Euro 6d diesel car would result in a 90%–94% reduction in NO_x emissions and a 61%–98% reduction in PM emissions. For petrol vehicles, a switch from a Euro 2 or Euro 3 vehicle to a new Euro 6d vehicle would result in an 84%–92% reduction in NO_x emissions and 76%–83% reduction in PM emissions.



The technical note can be found at theicct.org/sites/default/files/publications/true-london-eu-ulez-nov21.pdf.

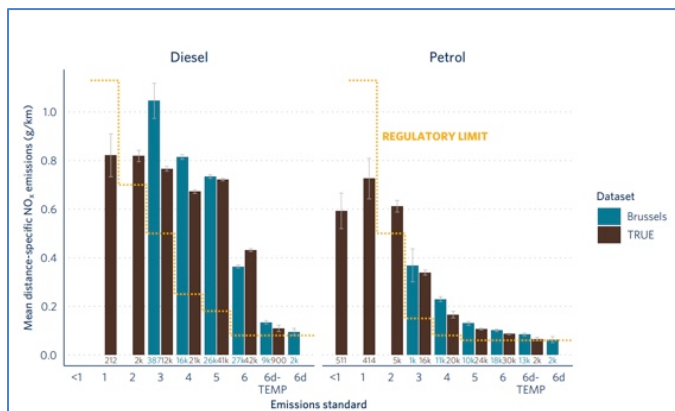
Evaluation of Real-World Vehicle Emissions in Brussels

On 22 November 2021, the International Council on Clean Transportation (ICCT) published analysis of a vehicle emissions testing study in Brussels, conducted by The Real Urban Emissions (TRUE) Initiative.

TRUE performed more than 260 000 in-use emissions measurements of 130 588 unique vehicles using remote sensing technology. During the study, researchers also used

a portable instrument to measure the tailpipe particle number (PN) emissions of close to 600 light-duty vehicles. The data collected was analysed with the dual goals of identifying the real-world effectiveness of key policies and regulations impacting the Brussels fleet and providing recommendations for their future development.

The study found that real-world NO_x emissions from diesel passenger cars operating in Brussels greatly exceed regulatory limits for vehicle groups not subject to Real Driving Emissions (RDE) type-approval requirements. These groups include vehicles certified to Euro 4, 5, and 6 (pre-RDE) standards. The NO_x emissions of Euro 6d-TEMP and 6d diesel cars, which are subject to RDE testing, are 63% and 74% lower, respectively, than those from vehicles certified to previous stages of the Euro 6 standard. However, ICCT says that average emissions from Euro 6d-TEMP diesel cars remain 60% greater than those of petrol vehicles certified to the same standard.



Euro 4 diesel cars accounted for only 12% of the passenger cars measured during this study. However, the study estimates that they contribute 26% of total passenger car NO_x emissions and 47% of total particulate matter (PM) emissions. Similarly, Euro 4 diesel light commercial vehicles (LCV) constituted 15% of the measured fleet but account for more than half of total PM emissions from this vehicle type.

The report says that an earlier than 2025 phase-out of Euro 5 diesel cars and LCVs would accelerate the NO_x emissions reduction benefits achievable from removing these high-emitting vehicles from the streets of the city. They are estimated to contribute approximately 40% of total NO_x emissions from passenger cars and nearly 50% of emissions from LCVs.

Tailpipe PN testing showed that approximately 5% of the measured light-duty diesel vehicles that were equipped with a diesel particulate filter (DPF) for which a type-approval limit for PN applies (Euro 5b and higher) were found to have PN emissions indicative of some level of failure of the emission control system.

The full report is available to download from theicct.org/publications/true-brussels-emissions-nov21.

T&E Euro VII Position Paper

On 8 November 2021, Transport & Environment (T&E) published a position paper on Euro VII based on test results of a Euro VI truck.

Testing of a single Euro VI-D long-haul truck is reported to show that it does not comply with the Euro VI NO_x emission limit during official on-road tests. The truck exceeded the on-road NO_x emission limit (690 mg/kWh) by 11 %, emitting 768 mg/kWh on the test.

T&E says that the truck had particularly high urban NO_x emissions on tests replicating a typical supermarket delivery trip and low speed driving typical in towns and cities. Emissions during the urban part of the test were at least double the Euro VI NO_x emission limit. On one of the city driving tests the NO_x emission control system malfunctioned resulting in significantly increased NO_x emissions on the road. The Adblue® dosing system critical for NO_x control failed. The NGO states that, while a fault light did show up on the dashboard, the malfunction resulted in NO_x emissions which were 11 times higher than the Euro VI limit during urban driving.

T&E goes on to make recommendations for a new Euro VII standard. The first is to reduce emission limits to the lowest levels technically possible. Only the lowest emission limits will ensure that the best available emission control technology such as double AdBlue® dosing and exhaust pre-heating is fitted to new trucks and buses to reduce emissions to the lowest technically possible levels. T&E says that the limits should be aligned with the most ambitious limits proposed by CLOVE consortium, and that cold-start NO_x emissions requirements need to be strengthened in order to reduce emissions to the lowest technically feasible levels. These should also apply to gas trucks to ensure limits are technology neutral.

T&E calls for regulations to apply to all pollutants which are harmful to human health and the environment and can be effectively regulated at the tailpipe. These include small particles and nitrous oxide.

The NGO also wants to see improved testing, approval and certification of vehicles to make sure buses and trucks meet emission limits whenever and wherever they are driven, as well as ensuring that emission limits are met throughout the lifetime of the vehicle.

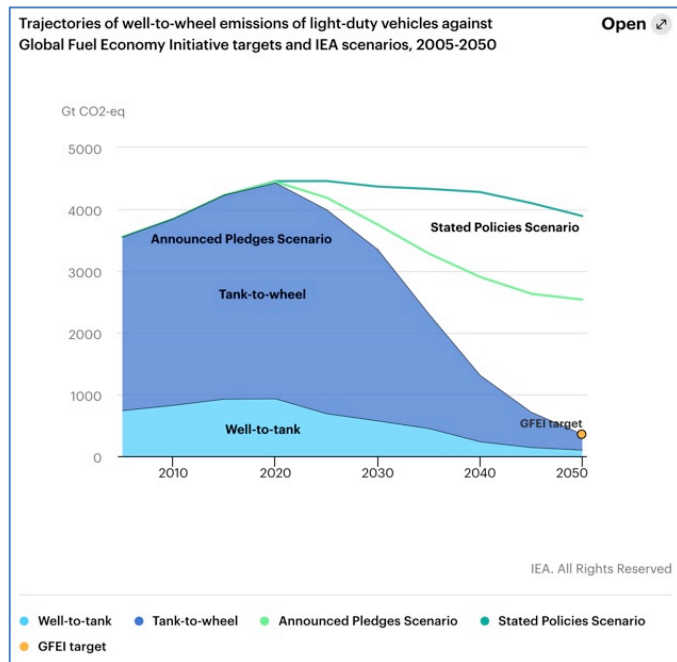
T&E concludes that the technology needed is affordable and that without an ambitious and comprehensive Euro VII standard in 2025, unnecessarily polluting buses and trucks will continue to be sold and remain on the EU's roads for at least another quarter of a century.

The position paper can be found at transportenvironment.org/wp-content/uploads/2021/11/2021_11_Euro_VII_HD.pdf.

IEA Report on Need for Acceleration in Vehicle Fuel Economy

On 4 November 2021, the International Energy Agency (IEA) published the Global Fuel Economy Initiative (GFEI) report on light-duty vehicle sales. It concludes that global average fuel consumption has improved very slowly or even increased over the last few years in some major car markets such as the European Union and the United States. Globally, average fuel consumption declined 0.9% over the past two years, helped by China where it fell on the back of stricter standards.

IEA says that given this slow overall global progress, achieving the GFEI's target of halving fuel consumption of new cars and vans by 2030 relative to 2005 will require a near tripling of the average annual pace of improvement seen over the past 15 years.



This year's edition of the report extends the scope to include for the first time a well to wheel analysis, which looks at emissions produced from the extraction, refining and processing of a fuel up to the point when it is consumed in a vehicle engine.

IEA says that countries around the world have historically set fuel economy standards with the aim of reducing the fuel consumption of vehicles over time. The slowing pace of improvement between 2017 and 2019 results from a number of factors. These include stagnating fuel economy standards in the US and the EU up to 2019; the rising market share of SUVs, which can use almost one-third more fuel than a medium-sized car; the rising cost of squeezing out further efficiency gains from mature technologies; and the slow

adoption of more efficient alternative powertrains such as electric cars to compensate for larger vehicles.

The analysis in the new report shows that in practically all countries in 2019, battery electric vehicles had the lowest emissions, followed by plug-in hybrids and hydrogen fuel cell electric vehicles. Hybrid vehicles have the lowest well-to-wheel emissions among vehicles with internal combustion engines using gasoline, diesel or compressed natural gas. By 2030, the difference is set to be even starker because the production of electricity and hydrogen becomes less emissions-intensive as low-carbon sources increasingly displace fossil fuels.

The new report includes several recommendations to improve fuel consumption trends, such as stronger policies to increase the market share of efficient zero emissions cars, to foster technological advances in vehicles using mainly gasoline or diesel, and to discourage the trend of ever-increasing vehicle size and power.

The IEA report can be downloaded from [iea.org/news/meeting-climate-targets-requires-a-rapid-acceleration-in-the-fuel-economy-of-vehicles](https://www.iea.org/news/meeting-climate-targets-requires-a-rapid-acceleration-in-the-fuel-economy-of-vehicles).

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FORTHCOMING CONFERENCES

Powertrain Systems for Net-Zero Transport

7-8 December 2021, London, UK

events.imeche.org

AECC will make a presentation.

SAE WCX World Congress

5-7 April 2022, Detroit, USA and Online

sae.org/attend/calls-for-papers

Catalysis and Automotive Pollution Control (CAPoC12)

6-8 April 2022, Brussels, Belgium

capoc.ulb.ac.be

Vienna Motor Symposium

27-29 April 2022, Vienna, Austria

wiener-motorensymposium.at/en/

CITA International Conference

1-2 June 2022, Amsterdam, Netherlands

citainsp.org/cita-conferences

8th International MinNOx Conference

15-16 June 2022, Berlin, Germany

iav.com/en/events/minnox

SIA Powertrain & Electronics

15-16 June 2022, Rouen, France

sia.fr/evenements/263-sia-powertrain-energy-rouen-2022

The ETH Conference on Combustion-Generated Nanoparticles

12-14 July 2022, Zurich, Switzerland

nanoparticles.ch/

31st Aachen Colloquium Sustainable Mobility

10-12 October 2022, Aachen, Germany

aachener-kolloquium.de/en/

Transport Research Arena 2022

14-17 November 2022, Lisbon, Portugal

traconference.eu/about-tra/