

NEWSLETTER

International Regulatory Developments

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EUROPE

European Commission Zero Pollution Strategy

On 12 May 2021, the European Commission adopted the EU Action Plan: "Towards Zero Pollution for Air, Water and Soil" – a key deliverable of the European Green Deal and the main topic of this year's EU Green Week (see Forthcoming Conferences section below). It sets out the Commission's 'integrated vision' for 2050: a world where pollution is reduced to levels that are no longer harmful to human health and natural ecosystems, as well as the steps to get there. The plan ties together all relevant EU policies to tackle and prevent pollution, with a special emphasis on how to use digital solutions to tackle pollution. Reviews of relevant EU legislation are foreseen to identify remaining gaps and where better implementation is necessary to meet these legal obligations.

The Action Plan sets key 2030 targets to reduce pollution at source, in comparison to the current situation. The targets related to air quality are that it should be improved to reduce the number of premature deaths caused by air pollution by 55%, and that the EU ecosystems where air pollution threatens biodiversity should be reduced by 25%.

To achieve this, air quality standards will be aligned more closely to the latest recommendations of the World Health Organisation, zero pollution from production and consumption will be promoted, there will be a scoreboard of EU regions' green performance to promote zero pollution across regions, and stronger enforcement of zero pollution together with environmental and other authorities.

In parallel, the Commission will introduce stricter requirements to tackle air pollution at source, such as from agriculture, industry, buildings and energy, and transport, including through a number of European Green Deal measures and strategies (such as Sustainable and Smart Mobility, Renovation Wave, or Farm to Fork).

The Commission is planning to address the air pollution from transport through the new Euro 7 standards for road vehicles and improved emissions testing in roadworthiness checks, in synergy with CO₂ emission performance standards. Based on latest evidence, it will consider the need to limit the emissions of PM_{2.5} and nanoparticles from all types of combustion engines and from brakes in conventional and electric vehicles alike, together with the need to reduce pollutant emissions under a broader set of conditions of use and over the lifetime of vehicles.

The Commission says that overall, the goal of the Zero Pollution Action Plan is to ensure economic and social gains. It adds that working towards its zero pollution ambition will create clean business opportunities and it will help protect vulnerable people.

The Commission's press release is available at ec.europa.eu/commission/presscorner/detail/en/IP_21_2345

and the communication is at ec.europa.eu/environment/pdf/zero-pollution-action-plan/communication_en.pdf.

Commission Implementing Decision on HDV Manufacturers' CO₂ Emissions

On 12 May 2021, Commission Implementing Decision (EU) 2021/781 was published in the Official Journal of the European Union. This relates to the average specific CO₂ emissions of all new heavy-duty vehicles registered in the Union and reference CO₂ emissions for the reporting period of 2019.

Annex I details manufacturer-specific details of average specific CO₂ emissions, zero- and low-emission factors, CO₂ emissions reduction trajectory and emissions credits. The average specific CO₂ emissions of all new heavy-duty vehicles are also calculated. Annex II indicates the reference CO₂ emissions for the period from 1 July 2019 to 30 June 2020.

The Implementing Decision can be found at eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L..2021.167.01.0047.01.

12th Petersberg Climate Dialogue

On 6 and 7 May 2021, around 40 ministers from all over the world participated in the Petersberg Climate Dialogue via video conference. German Chancellor Angela Merkel, UK Prime Minister Boris Johnson and UN Secretary-General Antonio Guterres also took part.

Many of the participants agreed that the rhythm of the Paris Agreement, under which the international community revises and raises the ambition of its climate targets every five years, has proven effective. To enable more ambitious climate targets in developing countries too, they agreed that increased financial support from wealthier countries is required to enhance efforts the countries make themselves.

In advance of the conference, Germany had committed to reduce Germany's greenhouse gas emissions by 65% in 2030 compared with 1990 levels, and to make Germany climate neutral by 2045.

More information is available at bmu.de/pressemitteilung/petersberg-climate-dialogue-ministers-want-to-make-un-climate-change-conference-in-glasgow.

TRAN Amendments to Resolution on Future-Proof Inland Waterway Transport

On 20 May 2021, the Transport (TRAN) Committee of the European Parliament published amendments to the Resolution on Future-proof Inland Waterway Transport (IWT) in Europe by means of its 2021/2015(INI) document.

Several of the 235 amendments refer to the need to reduce pollutant and greenhouse gas (GHG) emissions and reach zero emissions by 2050. Although liquefied natural gas (LNG) is referenced in the original motion for a resolution as a

transitional solution to reduce GHG emissions in IWT, amendment 101 'recalls that methane emissions from LNG-powered ships have a significant impact on pollution levels and climate change and are detrimental to the EU's 2050 climate targets'. It should therefore only be seen as a short-term solution. Amendment 104 goes further by saying that LNG is not a viable alternative fuel for inland navigation and no investments should be made in new LNG vessels. Amendment 106 calls on the Commission to base targets for emission reduction on lifecycle greenhouse gas emissions.

Amendment 98, in addition to pointing out that 'inland waterway transport can be suitable for the deployment of hydrogen, LNG, sustainable fuels, biofuels, hybrid and electric vessels', also 'welcomes the use of all readily deployable options to reduce inland navigation emissions, including...improved catalysts and filters for existing ships'.

The full list of proposed amendments can be found at europarl.europa.eu/doceo/document/TRAN-AM-689856_EN.pdf.

Flanders Environment Agency Reports on Emissions Fraud Countermeasures

On 26 May 2021, the Flanders Environment Agency published a series of reports on a study about emissions fraud and how to counter it. This included reports by VUB and TNO on a remote sensing campaign carried out in five locations in June 2019 and by Emisia on an analysis of the emissions performance of the current fleet.

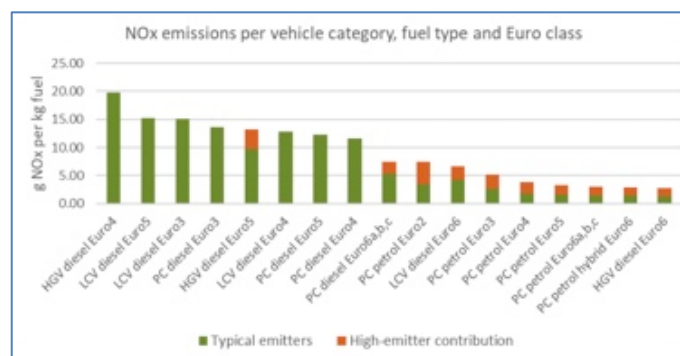
A combination of four possible policy strategies are suggested for Flanders to counter emissions fraud by either manufacturers or users: 1) take active role in type-approval; 2) build effective Periodical Technical Inspection; 3) sanction users as follow-up of road-side inspection including remote sensing; 4) contribute to better EU regulation.

The remote sensing testing identified that the introduction of Euro 6d-Temp regulations meant that lower NOx emissions were seen than have been reported for previous generations of diesel passenger cars. The report says however that pre-Euro 6d-Temp diesel cars remain a 'topic of concern' when it comes to NOx emissions. The same is said to be true for the whole set of sampled diesel light-commercial vehicles (LCV), for which very high real-world NOx emissions are reported for each Euro class. A small set of urban heavy-duty vehicle (HGV) samples confirms that urban NOx emissions for this vehicle category remain an issue that requires attention in future test campaigns.

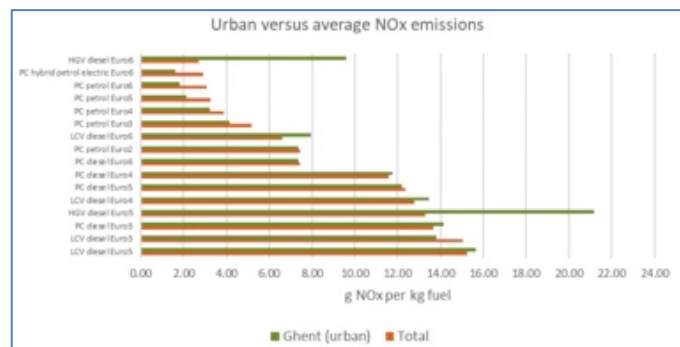
Petrol vehicles do show some increased nitrogen oxides (NOx) emission correlated with motorway conditions. The authors say that this increase is the result of a relatively limited number of high-emitting vehicles, presumably caused by occasional technological deviations from traditionally stoichiometric three-way catalyst (TWC) systems. They say that these results indicate the need for higher power demands to be better represented during type-approval testing.

Testing was also used to investigate tampering and repair issues on HGVs. The scanning of the fleet with remote sensing increased the detection success rate from 9% to 83%, while 9.5% Euro V and 4.8% Euro VI vehicles were deemed to have been tampered with or to be circulating with a defective SCR. As such, on fleet-level, their NOx emissions have increased by 24% and 67%, respectively, compared with a compliant fleet. This test-trial is said to indicate the potential for similar campaigns checking HGV diesel particulate filter (DPF) malfunctions.

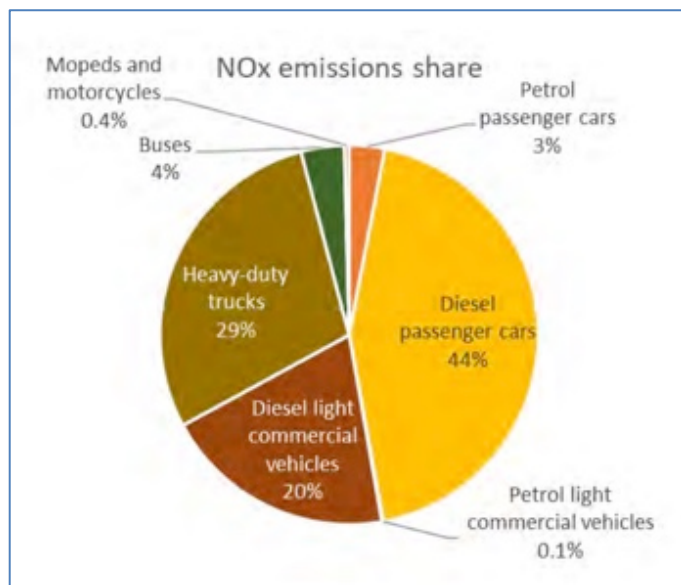
Pre-Euro 6d-Temp diesel cars generally perform poorly for NOx emissions, which the report says calls for air quality policies that apply to the general fleet. It adds that if new diesel vehicles are eventually proven to be clean, tampering and malfunctions will be the remaining cause of high emissions, calling for more focussed policies, dedicated detection and research. The difference between typical emissions and the contribution by high emitters can be seen below.



In terms of air quality problems related to nitrogen dioxide (NO₂), petrol cars, Euro 6d-Temp diesel cars and Euro VI diesel trucks combined contribute about one quarter of the emissions, per kilogram fuel, compared to the other diesel vehicle categories like vans, older trucks, and older diesel cars. Further nuance is that in urban conditions, NOx emissions by petrol cars are another 30% lower than the average based on all locations. On the contrary, NOx emissions by Euro VI trucks in urban conditions are three times the average NOx emissions of this group of vehicles on all road types combined. This indicates a flaw in heavy-duty ISC PEMS legislation, in which there is limited coverage as low engine load is excluded from the evaluation.



The report analysing the actual emissions performance of the Flemish road vehicle parc, concluded that NOx emissions are dominated by diesel passenger cars and light commercial vehicles, with Euro 5 and Euro 6 vehicles emitting several times above the respective limits. Heavy-duty trucks, despite being responsible for almost a third of the total NOx emissions, on average emit very close to the emission limits.



Diesel vehicles are also responsible for the majority of PM emissions, contributing to more than 90% of total emissions. All diesel vehicle categories of the latest Euro 5 and Euro 6 standards are reported to exceed the PM emission limits by up to two times. Petrol vehicles are the largest producers of CO and HC emissions, contributing more than 60% and 80% respectively to total emissions in Flanders. However, most vehicle classes comply with the respective emission limits, with very few exceptions.

The Flanders Environment Agency reports can be found at vmm.be/lucht/luchtqualiteit/emissiefraude-verkeer.

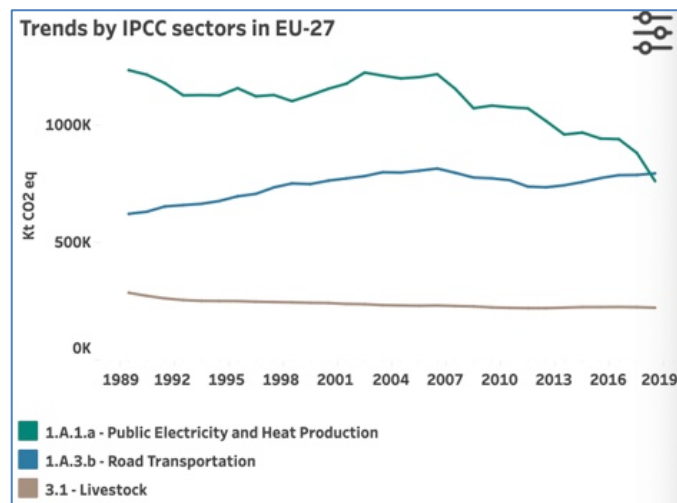
EEA 2019 Data on EU Greenhouse Gas Emissions

On 31 May 2021, the European Environment Agency (EEA) published data on greenhouse gas (GHG) emissions in the European Union for 2019.

The official data, submitted on behalf of the EU to the United Nations Framework Convention on Climate Change (UNFCCC), show that EU Member States managed to reduce collectively their emissions by 3.8% from 2018 to 2019. This decrease brought EU emissions to 24.0% below 1990 levels, not accounting for carbon dioxide removals from land use, land-use change and forestry (LULUCF) activities. When these removals are included, the overall reduction from 1990 to 2019 amounts to 25.9%.

Almost 80% of the net reduction in emissions achieved in 2019 took place in the heat and power sector, which is

covered by the EU Emissions Trading System (ETS). Increasing carbon prices and gas becoming relatively cheaper compared with coal led to a significant reduction in coal use, in favour of gas and renewable energy sources. Emissions also decreased in other industrial sectors and residential buildings, the latter due to a warmer winter and lower demand for heating.



However, CO₂ emissions from the transport sector continued their increasing trend in 2019. For road transport, the increase was mostly due to higher gasoline consumption in passenger cars.

The 2019 EEA data can be found at eea.europa.eu/highlights/major-drop-in-eus-greenhouse?utm_source=EEASubscriptions&utm_medium.

Introduction of Particle Counting for PTI Testing in Germany

On 3 May 2021, the International Motor Vehicle Inspection Committee (CITA) reported that in addition to Belgium and the Netherlands, Germany has now also passed a law to introduce particle number measurement into emissions testing at periodic technical inspections (PTI). In Germany, starting from January the 1st, 2023, the particle number measurement for diesel vehicles (cars and commercial vehicles) from Euro 6 will be mandatory. The new measurement method will replace the opacity (smoke) measurement for the vehicles concerned.

CITA says that all the necessary prerequisites for introducing the measurements have been met. The new test procedure and the limit value (250 000/cm³) were validated in a field test on real vehicles. The required measuring devices will be approved shortly, and the calibration of the devices is also in preparation. In the preface to the regulation it is described that "... the measurement procedure and the limit values are checked after 3 years at the latest with regard to possible adjustments to technical progress", and "... in addition, it must be checked whether the measurement method and the limit values can be extended to vehicles with petrol engine and direct injection".

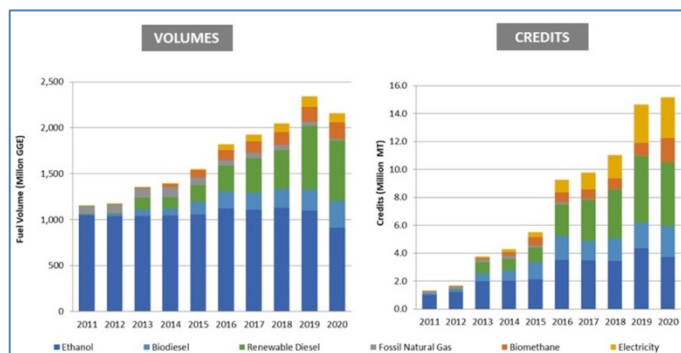
Further details can be found at citainsp.org/2021/05/03/introduction-of-particle-counting-for-pte-in-germany/.

NORTH AMERICA

California Greenhouse Gas Reductions from Renewable Diesel and Biodiesel

On 30 April 2021, the California Air Resources Board (CARB) published data showing that low carbon transport fuels powering internal combustion engines deliver the state's biggest reduction in transport-related sources of greenhouse gas (GHG) emissions.

CARB says that the Low Carbon Fuel Standard (LCFS) data recognises that the use of certain fuels results in greater greenhouse gas reductions than others. It adds that while ethanol makes up the largest amount of alternative fuel on a volume and energy basis, in 2020 about 75% of the LCFS credits were generated by non-ethanol fuels with lower carbon intensities, including biodiesel and renewable diesel.



More information can be found at arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm.

California Regulations on Heavy-Duty Emissions and Alternative Diesel Fuels

On 5 May 2021, the California Air Resources Board published proposed amendments to regulations relating to heavy-duty vehicle emissions, as well as alternative diesel fuels (ADF).

Modifications to the heavy-duty regulations include an optional low NO_x standard of 0.01 g/bhp-hr for 2024 and subsequent model year (MY) engines. The proposed modification is necessary to provide manufacturers with a mechanism to certify engines to NO_x standards that are significantly lower than required for the MY. It is also necessary to encourage manufacturers to further develop technologies that would provide NO_x emission benefits earlier than the Board adopted timeline for the mandatory standards. CARB staff believes that engines that are likely to achieve this level of optional NO_x standard in the 2022 to 2023 timeframe to be spark-ignited stoichiometric engines similar to those currently certified to the optional NO_x standard of 0.02 g/bhp-hr. Further improvements in aftertreatment systems, including catalyst formulations, improvements in air-fuel ratio controls, and other engine

calibration strategies could potentially reduce emissions further to achieve certification levels of 0.01 g/bhp-hr NO_x standards.

The amendments to the ADF regulation reinforce the emissions certification testing requirements and require biodiesel additives and ADF formulations to be uniformly certified according to new certification procedures. The amendments further ensure that additives or ADF formulations are certified to mitigate potential oxides of nitrogen (NO_x) emissions increases from the use of biodiesel, consistent with rigorous and appropriate protocols. In addition, renewable diesel is approved as a compliance option to meet the in-use requirements for biodiesel at R55B20 or R75B20 blends.

Full details of the California regulations can be found at arb.ca.gov/regact/2020/hdomnibuslownox/30daynotice.pdf?utm_medium=email&utm_source=govdelivery and arb.ca.gov/our-work/programs/alternative-diesel-fuels/about.

ASIA PACIFIC

Singapore In-Use Emission Standards for Older Motorcycles

On 7 April 2021, Singapore's National Environment Agency announced that it will tighten the in-use emission standards for local motorcycles registered before 1 July 2003. These motorcycles can continue to be used until 30 June 2028, as long as they meet the tightened in-use emission standards.

On 6 April 2018, NEA had announced plans to tighten in-use emission standards, when launching an incentive scheme to encourage owners of older motorcycles to de-register their motorcycles early. Hence from 6 April 2023, local motorcycles registered before 1 July 2003 will be required to meet the limits of 4.5% Carbon Monoxide (CO) by Volume; and 7 800 ppm Hydrocarbons (HC) (for 2-stroke engine) or 2 000 ppm HC (for 4-stroke engine).

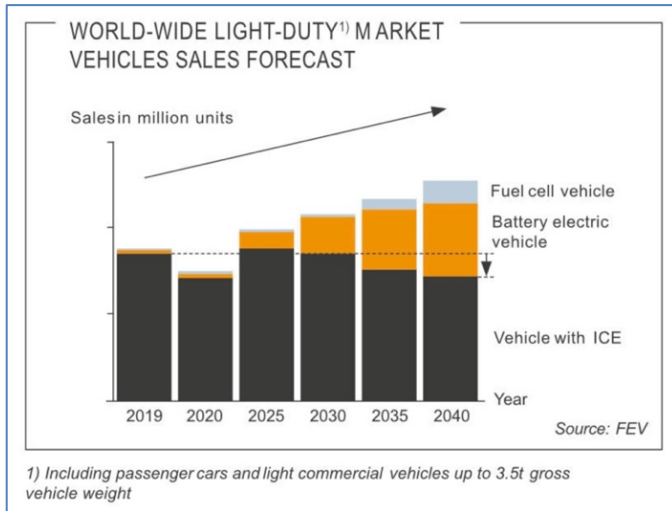
Full details of the new emission standards are at nea.gov.sg/media/news/news/index/in-use-emission-standards-for-older-motorcycles-will-be-tightened-in-april-2023.

GENERAL

FEV and VDMA Study on Mobility Transformation

On 5 May 2021, FEV Consulting and VDMA, the association representing the mechanical engineering industry in Europe, published a study titled 'Drivetrain in Transition'. The study continuously highlights developments and potentials in the automotive industry, and its latest results are based on current scenarios for the electrification of passenger cars and light commercial vehicles up to the year 2040.

The most recent data evaluated in the analysis show that by 2040, around 45% of passenger cars sold worldwide will be battery-electric and fuel cell-powered.



As a result of stricter pollutant and CO₂ emission legislation, the study forecasts a major shift away from technologies and components for the conventional, mature internal combustion engine toward components for the electric powertrain. In this respect, the study identifies possible scenarios, one of which deals with the possibility that new cars with internal combustion engines may no longer be sold in Europe by 2040. This could result in an 80% decline in conventional combustion technologies.

The study shows that the jobs generated by new technologies (420 000) will only partially compensate for the jobs lost by mature, conventional technologies (580 000). If it takes advantage of the opportunities offered by change, the study says that the mechanical engineering sector can maintain its level of 55 000 jobs in the automotive powertrain sector.

The press release can be found at [fev.com/coming-up/press/press-releases/news-article/article/fev-consulting-and-vdma-study-on-mobility-transformation](https://www.fev.com/coming-up/press/press-releases/news-article/article/fev-consulting-and-vdma-study-on-mobility-transformation).

ICCT Comments on Euro 7/VII Standards

On 10 May 2021, the International Council on Clean Transportation (ICCT) published a position paper supporting an ambitious proposal for Euro 7/VII pollutant emission standards. It also 'offers a critical assessment of the arguments put forward by other stakeholders on the feasibility and benefits of stringent pollutant emissions standards'.

The ICCT says that currently adopted policies are projected to steadily reduce tailpipe NO_x emissions over the next thirty years: it estimates that adopted policies will reduce NO_x emissions by 88% for light-duty and 82% for heavy-duty vehicles by 2050 compared to 2020 levels. The NGO believes that implementation of 'stringent' Euro 7/VII standards in 2027 could achieve these emission reductions much earlier—by 2040 for light-duty and 2035 for heavy-duty vehicles. It also says that Euro 7/VII standards could avoid around 35 000 premature deaths across the EU-27

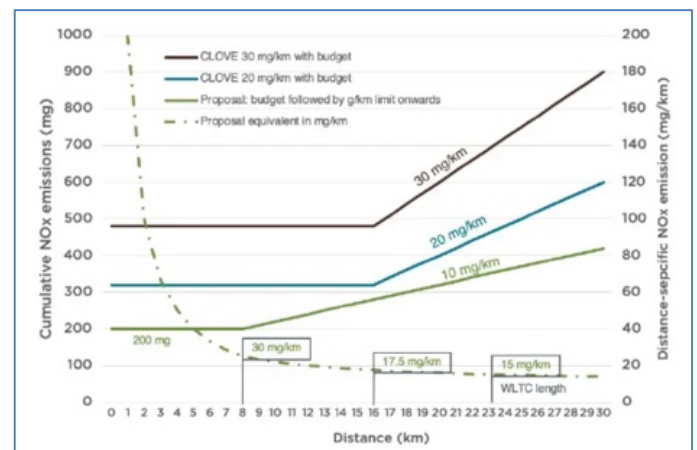
cumulatively from 2027–2050, compared to a scenario without Euro 7/VII standards.

Regarding the standards proposed by the CLOVE consortium, ICCT suggested shortening the emission 'budget' to a maximum distance of 8km (from 16km), recognising the 'disproportionate impact' of cold-start emissions in extended conditions.

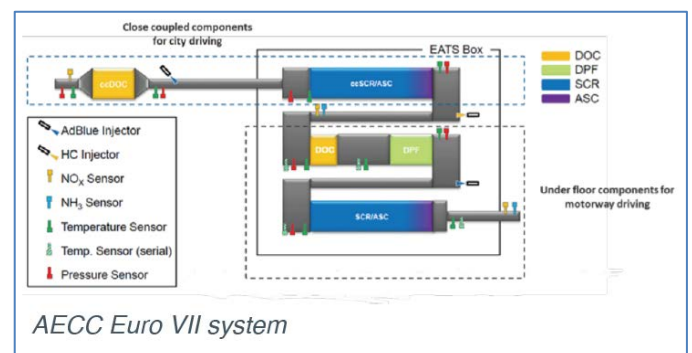
ICCT argues that cold-start urban emission limits must be decoupled from hot emission limits in order to pull the adoption of technologies already demonstrated by, for example, AECC.

A further proposal for on-road NO_x is presented, with a fixed 200 mg budget running up to 8 km, and a 10 mg/km limit onwards in normal conditions.

ICCT presents data suggesting that modern light-duty diesel and gasoline engines are almost fit to meet the CLOVE1 limits and therefore a more ambitious target is reasonable.



For heavy-duty, the ICCT urges the Commission to set more stringent limits for NH₃ and N₂O than those proposed by CLOVE in hot operation. It wants limits to be set at the level of what is technically feasible with future technologies, and not at what the best performing Euro VI vehicles can achieve. ICCT again references AECC data to demonstrate technology feasibility, saying that meeting the proposed CLOVE NO_x limits is feasible, even without a full technology deployment.



Based on demonstration programmes in the United States and the EU, ICCT concludes that the HD limits proposed by

CLOVE are all feasible, and that to exploit the same level of technology potential as California will, the Euro VII limits should be set at least the HD3 level—as proposed by CLOVE—and avoid any use of work correction for low power operation, which would distort the work-specific regulatory metric.

Finally, the ICCT presents a critique of the automotive industry’s air quality assessment, explaining why the AERIS assumptions are either overly optimistic or proposals are not ambitious enough.

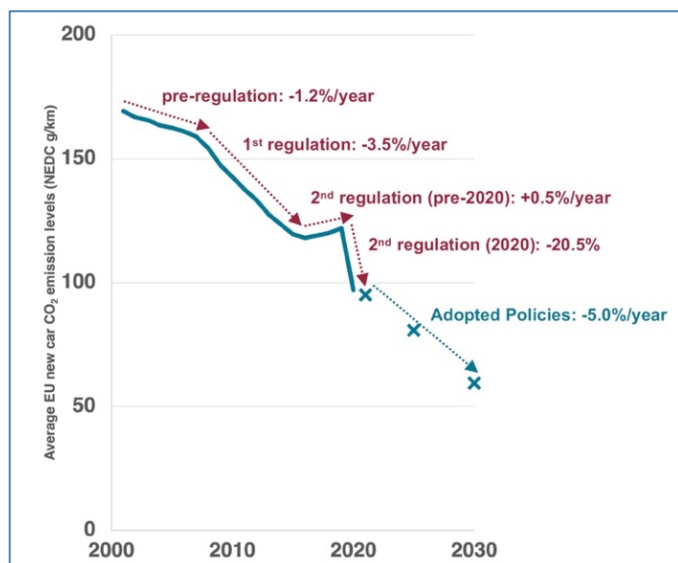
ICCT’s full set of comments can be downloaded from theicct.org/news/eu-commission-euro-7-and-VI-may2021.

Report on Importance of Interim CO₂ Reduction Targets

On 9 May 2021, the International Council on Clean Transportation (ICCT) published a blog looking at the potential impact of setting annual vehicle CO₂ reduction targets rather than the longer-term targets set by the European Union.

ICCT says that although the European CO₂ regulation for new passenger cars appears to be a complete success story, it was only from January 2020 onwards that ‘manufacturers changed course’, with type-approval emissions having increased from 118 g/km to 122 g/km between 2016 and 2019. According to ICCT, this reveals a weakness of the EU’s regulations, that European policymakers did not set annual targets, instead opting for five-year intervals.

It goes on to say that Europeans are on a pathway to repeat mistakes of the past. The currently adopted policies require manufacturers to reduce the average CO₂ emission level of new cars by 15% by 2025 and by 37.5% by 2030, all relative to a 2021 baseline. The resulting annual CO₂ reduction of about 5% is significantly lower than what manufacturers achieved in 2020 (20.5%) and close to the annual 3.5% reduction in the early years of the first CO₂ regulation.



ICCT says that not setting interim targets runs the risk that the required CO₂ reductions will only be delivered at the last minute. As well as a climate protection angle, the NGO says that there is an industrial angle, as interim targets would ensure market stability for planning the necessary investments in factories and workers.

According to ICCT, car manufacturers can meet the current 2025 CO₂ reduction target of 15% solely by improving the efficiency of conventional combustion engines and transitioning towards mild hybrid vehicles. Following this pathway, an increase in the market share of electric vehicles would not be necessary until as late as 2029. If however, manufacturers instead opt for a pathway focused more on electric vehicles, ICCT believes they could increase the weighted market share of zero- and low-emission vehicles (ZLEVs) to 20% by 2025. Manufacturers could also meet the 2030 CO₂ reduction target of 37% with a share of 23%-40% ZLEVs, depending on whether they choose the ‘ICE or EV pathway’. This increased EV uptake could happen ‘at the last minute’, assuming that manufacturers manage to triple their electric vehicle shares within one year, as they did in 2020.

ICCT predicts that following the ICE pathway, the share of electric vehicles could remain at the 2020 level until as long as 2029. Adding interim targets would avoid losing years with no development of the EV market. The NGO proposes therefore that when the European Commission comes forward with its new regulatory proposal this summer, it should strengthen the 2025 and 2030 CO₂ targets for new cars and introduce at least one interim target for 2027.

The blog in full can be read at theicct.org/blog/staff/interim-targets-europe-may2021.

Energy and Regulatory Effects on CO₂ Emissions of Alternative Powertrains

On 9 May 2021, Frontier Economics (FE) published an assessment of energetic and regulatory effects on the CO₂ emissions of alternative powertrain technologies and energy sources.

According to FE, the ‘supposed’ CO₂ benefits of electromobility are largely based on a shift of emissions from the transport to the power sector, as the shifted emissions caused by charging energy are valued at zero in the current fleet regulation. FE says that its current study contributes to the understanding of the feedback effects of an increase in power demand due to charging energy. It also investigates how the mix of energy sources in the power system changes due to the increase in demand and how the instruments of the EU ETS respond to this. It then analyses which regulatory requirements exist outside the power sector that influence the advantageousness of various powertrain technologies. In particular, it looks at the requirements of the Renewable Energy Directive on the emissions balance of synthetic fuels.

FE says that the increase in power demand due to the ramp-up of electromobility in Germany will lead to an increase in

emissions in the power sector for the foreseeable future. It adds that although the additional demand will also lead to an increase in investments in renewables, a large part will be met by existing gas-fired and, in the short term, coal-fired power plants. FE modelling shows that, even taking into account a renewable quota in the power sector of 65% as well as other current framework conditions in the German and European electricity market (e.g., coal phase-out), that the CO₂ intensity of charging energy will still be around the level of a gas-fired power plant (approx. 350 gCO₂/kWh) in the medium term until 2030.

FE concludes that its study shows that - despite regulation of emissions in the power sector by the EU ETS - the assumption of zero emissions for battery electric vehicles does not reflect the real emissions of the vehicle during the use phase. It says this contrasts with the regulation of synthetic fuels by the Renewable Energy Directive II (RED II) and that the physical emissions of an approved synthetic fuel (incidentally also those of an approved biofuel) are currently and in the medium term significantly below the emissions of European electricity production for the charging energy of electric vehicles.

The full report can be found at frontier-economics.com/media/4644/carbon-neutral-mobility-powered-by-green-electricity-en.pdf.

Progress on Introduction of Soot-Free Buses

On 26 May 2021, the International Council on Clean Transportation (ICCT) published a blog looking at progress on the introduction of 'soot-free' buses to cities around the world. Soot-free buses are those equipped with advanced emissions control technologies that are certified to meet Euro VI or EPA 2010 emission standards, as well as hybrid buses, and fully electric buses.

The Global Industry Partnership on Soot-Free Clean Bus Fleets was founded in 2017 with the aim of making soot-free technologies available to 20 cities worldwide. Partners agree to supply soot-free buses to bus operators and transit authorities in target cities in order to address climate change and toxic air pollution.

At the regional level, Latin American countries are benefitting from having a wide range of manufacturers willing to bring soot-free products. On the other hand, ICCT says that Africa seems underserved, with four of the eight cities not covered. The NGO says that the challenge in Africa continues to be the uncertain supply of ultra-low sulfur diesel and slow progress in transitioning vehicle emission standards to Euro VI. In the African countries where soot-free products were found, CNG was the preferred technology. In Turkey, the partners were not offering soot-free products although the country has been at Euro VI standards since 2015.

ICCT says that the most remarkable change is happening on the zero-emission bus front. Chinese OEMs are quick to react to calls for electric buses and are eager to explore new opportunities, meaning that Latin America has the largest e-

bus fleets outside China, with more than 1500 Chinese-built electric buses operating as of March 2021.

In early 2020, members of the Economic Community of West African States (ECOWAS) announced a harmonised effort to import and produce 50 ppm sulfur gasoline and diesel in 2021 and 2025. 50 ppm sulfur diesel is not the right fuel to enable soot-free vehicle deployments but according to ICCT, this level of commitment and progress in some of the world's least regulated fuel markets is extremely encouraging. Meanwhile, in Latin America, Euro VI-equivalent and electric bus tenders are being required in many of the latest tenders in Santiago and Bogota.

The ICCT blog is available to read at theicct.org/blog/staff/taking-global-pulse-soot-free-bus-progress-industry-partners.

RESEARCH SUMMARY

Effects of Emissions and Pollution

Association between ambient air pollution and childhood respiratory diseases in low- and middle-income Asian countries: A systematic review, Mohd Faizbrahim, et al.; *Atmospheric Environment* (in press), doi: [10.1016/j.atmosenv.2021.118422](https://doi.org/10.1016/j.atmosenv.2021.118422).

Associations between ambient air pollutants and blood pressure among children and adolescents: A systemic review and meta-analysis, Mengfan Yan, et al.; *Science of The Total Environment* (September 2021), Vol. 785, 147279, doi: [10.1016/j.scitotenv.2021.147279](https://doi.org/10.1016/j.scitotenv.2021.147279).

Early childhood exposure to ambient air pollution is associated with increased risk of paediatric asthma: An administrative cohort study from Stockholm, Sweden, David Olsson, et al.; *Environment International* (October 2021), Vol. 155, 106667, doi: [10.1016/j.envint.2021.106667](https://doi.org/10.1016/j.envint.2021.106667).

Are standardized diesel exhaust particles (DEP) representative of ambient particles in air pollution toxicological studies? Vahid Farahani, et al.; *Science of The Total Environment* (September 2021), Vol. 788, 147854, doi: [10.1016/j.scitotenv.2021.147854](https://doi.org/10.1016/j.scitotenv.2021.147854).

Assessment of hospitalizations from asthma, chronic obstructive pulmonary disease and acute bronchitis in relation to air pollution in Istanbul, Turkey, Özkan Çapraz and Ali Deniz; *Sustainable Cities and Society* (September 2021), Vol. 72, 103040, doi: [10.1016/j.scs.2021.103040](https://doi.org/10.1016/j.scs.2021.103040).

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FORTHCOMING CONFERENCES

The Role of Low-Carbon Liquid Fuels in Enabling Climate-Neutral Transport

31 May-14 June 2021, Online

fuelseurope.eu/mediaroom/refuels-week

Includes a session 'What impact on Urban Air Quality?' on 14 June, in partnership with AECC

Emission characteristics and control scenario analysis of VOCs from heavy-duty diesel trucks, Shifen Cheng, et al.; *Journal of Environmental Management* (September 2021), Vol. 293, 112915 doi: [10.1016/j.jenvman.2021.112915](https://doi.org/10.1016/j.jenvman.2021.112915).

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Promoted three-way catalytic activity of the Co₃O₄/TiO₂ catalyst by doping of CeO₂ under real engine operating conditions, Bilal Asif, et al.; *Atmospheric Pollution Research* (in press), doi: [10.1016/j.apr.2021.101088](https://doi.org/10.1016/j.apr.2021.101088).

Transport, Climate Change & Emissions

Can President Biden decarbonize the United States light vehicle fleet? Social-technical compromise scenarios for five automakers, Ray Galvin; *Energy Research & Social Science* (July 2021), Vol. 77, 102104, doi: [10.1016/j.erss.2021.102104](https://doi.org/10.1016/j.erss.2021.102104).

Potential and risks of hydrogen-based e-fuels in climate change mitigation, F. Ueckerdt, et al.; *Nature Climate Change* (2021), Vol. 11, pp 384–393, doi: [10.1038/s41558-021-01032-7](https://doi.org/10.1038/s41558-021-01032-7).

Integer Vehicle Emissions Live

15-17 June 2021, Online

argusmedia.com/en/conferences-events-listing/integer-vehicle-emissions-live

Hydrogen and P2X European Conference

16-17 June 2021, Copenhagen, Denmark (postponed from February 2021)

fortesmedia.com/hydrogen-p2x-2020,4,en,2,1,4.html

24th ETH Conference

22-24 June 2021, Online

nanoparticles21.scg.ch

AECC will make a presentation.

Cambridge Particle Meeting

25 June 2021, Online

cambridgeparticlemeeting.org/2021

AECC will make a presentation.

FEV Diesel Powertrains 3.0

29-30 June 2021, Online

fev-live.com/diesel

AECC will make a presentation.

VERT PTI Focus Event

7 July 2021, Online

vert-dpf.eu/f3/images/pdf/VERT_npti_focus_event/v20_save-the-date_NPTI-20210707.pdf

ICE 2021 - 15th International Conference on Engines & Vehicles

12-16 September 2021, Naples, Italy

drive.google.com/file/d/1ZXsA9F8fI8OP_2gOesDhLCC_4PzEsAem/view

AECC will make a presentation.

Cenex-LCV

22-23 September 2021, Millbrook, UK and online

cenex-lcv.co.uk

SAE Powertrains, Fuels & Lubricants Digital Summit

28-30 September 2021, Online

sae.org/attend/virtual-events/pfi

30th Aachen Colloquium Sustainable Mobility

4-6 October 2021, Aachen, Germany

aachener-kolloquium.de/en/?idU=1

AECC will make a presentation.

SAE Heavy-Duty Diesel Emissions Control Symposium

5-6 October 2021, Gothenburg, Sweden (postponed from October 2020)

sae.org/attend/heavy-duty-diesel-emissions-control-symposium

AECC will make a presentation.

EU Sustainable Energy Week

25-29 October 2021, Online

eusew.eu/

POLIS Annual Conference

1-2 December 2021, Gothenburg, Sweden

polisnetwork.eu/2021-annual-polis-conference/

Powertrain Systems for Net-Zero Transport

7-8 December 2021, London, UK

events.imeche.org/ViewEvent?code=CON7242

AECC will make a presentation.

Catalysis and Automotive Pollution Control (CAPoC12)

6-8 April 2022, Brussels, Belgium

capoc.ulb.ac.be

CITA International Conference

1-2 June 2022, Amsterdam, Netherlands

citainsp.org/cita-conferences

8th International MinNOx Conference

Spring/Summer 2022, Berlin, Germany (postponed from June 2021)

iav.com/en/events/minnox