

NEWSLETTER

International Regulatory Developments

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EUROPE

Meeting of the Advisory Group on Vehicle Emission Standards

On 27 October 2020, the 6th AGVES (Advisory Group on Vehicle Emission Standards) meeting was conducted in a virtual setup and was chaired by EU Commission DG Growth's Dr Penny Dilara. The main part of the meeting was devoted to presentations by the CLOVE consortium.

CLOVE presented their current view on the new test regimes, lifetime compliance and associated emission limits (study part A) for future Euro 7. The proposal focuses on a 'wide on-road testing' range, with nearly no boundary conditions and beyond current RDE, for both light-duty (LD) and heavy-duty (HD) vehicles. The proposal mainly relies on emissions compliance verification during In-Service Conformity (ISC) and Market Surveillance (MaS). A chassis dyno testing option is included for CO₂ and pollutants that cannot be measured on-road with portable emissions measurement systems (PEMS). In CLOVE's view, durability requirements should be extended (240 000 km was mentioned for light-duty, and heavy-duty is still being analysed). Durability would be declared by the OEM at type approval, without a demonstration test, and verified during ISC and MaS. There would also be a requirement up to the end of life, but with an allowance of higher emissions. On-Board Monitoring (OBM) would be included when available.

CLOVE presented two scenarios for the Euro 7 limits. The limit would apply to all fuels and technologies without any correction factor, as well as during emission control system regeneration events.

Euro 7 scenarios	NO _x	SPN ₁₀	CO	CH ₄ (l)	N ₂ O (l)	NH ₃
EURO 6	60/80 (P/CI)	6×10 ¹¹ (SPN ₁₀)	1000/500 (P/CI)	-	-	-
A	30	1×10 ¹¹	300	10	10	5
B	10	6×10 ¹⁰	100	5	5	2

Euro 7 scenarios	NO _x	SPN ₁₀	CO	CH ₄ (l)	N ₂ O (l)	NMHC	NH ₃
EURO VI	460	6×10 ¹¹ (SPN ₁₀)	4000	500 (P)	-	160 (C, THC)	50ppm ~40 mg/kWh
A	120	4×10 ¹¹	1500	100	50	50	20
B	40	1×10 ¹¹	400	50	25	25 (l)	10

The European Commission stated the scenarios will not be dictated by the minimum that can be done to guarantee the air quality, especially when the ambient air quality thresholds are under review.

CLOVE presented current proposals for simplification of the legislation, although the targeted stakeholder consultation on the topics is still ongoing until 9 November 2020. Three

categories were defined for simplification: alignment (e.g. merging LD and HD, fuel- and technology-neutral limits); rationalisation of tests (alignment of CoP, MaS, ISC) and improved external consistency (EU vs. UNECE). CLOVE introduced a new concept, the so-called Test Conformity Indicator (TCI), which was described to be between the current On-Board Diagnostics (OBD) and future On-Board Monitoring (OBM). The last part of the meeting was devoted to stakeholder presentations. The US Truck and Engine Manufacturers Association (EMA) presented its view on the CARB low NO_x regulation; Bosch about OBM; T&E about unregulated pollutant test results on Euro 6d-TEMP diesel and gasoline plug-in hybrid electric vehicles; and POLIS about enabling cities and regions to improve air quality by reducing vehicle emissions.

The next session of AGVES will be held on 26 November 2020. A workshop on regulation simplification topics will be held on 16 November 2020.

European Commission Consultation on Zero Pollution Action Plan Roadmap

On 1 October 2020, the European Commission published its roadmap on an EU Action Plan "Towards a Zero Pollution Ambition for air, water and soil – building a Healthier Planet for Healthier People". As a key pillar of the European Green Deal, the Zero Pollution Ambition goes hand in hand with all Green Deal objectives and will build on initiatives in the field of energy, industry, mobility, agriculture, biodiversity, and in particular climate.

The roadmap for the Zero Pollution Action Plan maps four key areas to be explored: implementation and enforcement; existing legislation related to health and environment; monitoring and governance of pollution prevention and reduction policies; and societal change.

The roadmap on the Zero Pollution Action Plan was open for feedback for four weeks until 29 October 2020. It can be downloaded from ec.europa.eu/info/news/commission-outlines-road-zero-pollution-action-plan_en.

AECC submitted its response to the roadmap consultation. AECC commented that it supports the discussion and development of a Zero Pollution Action Plan and is ready to contribute with technical and scientific data from AECC testing programmes on light and heavy-duty vehicles.

AECC highlighted the importance to demonstrate the technical feasibility for reducing pollutant emissions using advanced emission control systems, relevant for the discussions of the new emissions standards for cars, vans, lorries and buses.

The AECC response to the roadmap consultation is available to read at www.aecc.eu/wp-content/uploads/2020/10/201028-AECC-comments-on-Zero-pollution-ambition-roadmap_clean-1.pdf.

European Committee of the Regions Opinion on EU Clean Air Policy

On 1 October 2020, the European Committee of the Regions (CoR) published its outlook opinion on the future of EU clean air policy in the framework of the zero-pollution ambition.

The document covers the different aspects of policy including legislative measures, funding, implementation and public engagement, and recommends further actions that can be taken to help improve air quality.

CoR emphasises the need to focus more on emissions regulation as a better way of achieving clean air by reducing emissions at source. This includes areas where there has been no recent regulation, such as inland shipping, non-exhaust road transport emissions (brake and tyre wear), diesel (urban power) generators, aviation, or small combustion plants such as residential wood- and coal-burning stoves and boilers. It says that special attention has to be given to real-drive and real-use conditions.

CoR's opinion goes on to say that "in some cases policies (e.g. promoting biomass combustion or supporting diesel cars) could have negative impacts on air quality". It underlines that the competitiveness of EU manufacturers must be taken into account when considering and proposing more stringent emissions standards for petrol and diesel vehicles — while it calls for an exit path of internal combustion engines from road traffic and appreciates the Member States, regions and cities that have already set a final date for the admission of cars with internal combustion engines. The CoR opposes premiums for the purchase of vehicles with such engines.

Looking at the next steps, CoR urges the European Commission to further strengthen certain aspects of the emission rules at EU level and to take further steps to ensure effective and enhanced horizontal and vertical cooperation, while urging Member States and local and regional authorities (LRAs) to find better methods of cooperation and communication. It recommends providing easily accessible air quality funding for local authorities and accredited air quality associations responsible for air quality plans in designated air quality zones, with priority for zones with higher air pollution. Finally, CoR draws attention to the need to coordinate and manage the relevant networks, initiatives, tools and guidance, which are already a source of broad knowledge and experience, and which would help LRAs to improve their work to achieve cleaner air based on additional technical expertise and guidance.

CoR's outlook opinion can be found at eur-lex.europa.eu/OJ.C_2020.324.01.0035.01.=OJ:C:2020.

Amendments to Regulation on Vehicle Test Procedures

On 16 October 2020, the European Commission published a Delegated Regulation amending Regulation (EU) 2019/631 to update the monitoring parameters and clarify certain aspects relating to the change in the regulatory test procedure.

This is in the context of the transition, from 1 January 2021 onwards, to using CO₂ emissions data determined according to the Worldwide Harmonised Light Vehicle Test Procedure (WLTP) for the purpose of the CO₂ emission standards.

The regulation states that the data parameters set out in Annexes II and III of Regulation (EU) 2019/631 should be adjusted, and references to data based on the New European Driving Cycle (NEDC) should be removed. In order to simplify the monitoring and reporting, the data parameters monitored and reported by EU Member States for passenger cars and light commercial vehicles should also be harmonised to the extent possible.

It is also necessary to clarify certain provisions related to the transition from NEDC to WLTP as regards the determination of the specific emissions targets set out in Annex I of Regulation (EU) 2019/631 for the period 2021 to 2024 for manufacturers of zero-emission vehicles, for vehicle manufacturers that enter the market of the European Union for the first time in that period and for the calculation of the derogation targets that may apply in that period.

The Delegated Regulation can be found at ec.europa.eu/transparency/regdoc/rep/3/2020/EN/C-2020-7027-F1-EN-MAIN-PART-1.PDF.

Delegated Regulation on Data on New Heavy-Duty Vehicles

On 30 October 2020, Delegated Regulation (EU) 2020/1589, amending Annex I to Regulation (EU) 2018/956 regarding the data on new heavy-duty vehicles to be monitored and reported by Member States and by manufacturers, was published in the Official Journal of the European Union.

Under the amendments, Member States should report additional parameters related to the technical specifications of the vehicles, in order to facilitate the matching of the data reported for each heavy-duty vehicle by Member States with those reported by manufacturers. To allow for verification of the quality of the data reported by manufacturers of heavy-duty vehicles, Member States should also report the imprint of the cryptographic hash of the manufacturer's records file included in the certificate of conformity of the vehicle.

To ensure uniform reporting of information on manufacturers of components, separate technical units or systems, references to Commission Regulation (EU) 2017/2400 (2) should be added. In addition, to allow the Commission to verify the quality of the data reported by manufacturers concerning the CO₂ emissions and fuel consumption of the

engine, manufacturers should also report the type-approval number of the engine.

The Delegated Regulation is available to read at eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2020.360.01.0004.01.

Delegated Regulation on Mass of New LCVs for CO₂ Calculations

On 30 October 2020, Delegated Regulation (EU) 2020/1590, amending Annex I to Regulation (EU) 2019/631 was published in the Official Journal of the European Union, in order to take into account the evolution of the mass of new light commercial vehicles registered in 2016, 2017 and 2018.

The amendment states that the EU fleet-wide average mass in running order used for the purpose of calculating the specific emission targets of CO₂ for each manufacturer of new light commercial vehicles, i.e. the M0 value, is to be adjusted regularly to take into account changes in the average mass of the new light commercial vehicles registered in the Union.

Based on the data in Commission Implementing Decisions (EU) 2018/143 (2), (EU) 2019/582 (3) and (EU) 2020/1035 (4), the average mass in running order of new light commercial vehicles in the calendar years 2016, 2017 and 2018, weighted according to the number of new registrations in each of those years, was 1 825.23 kg. The M0 value for the calendar years 2021, 2022 and 2023, referred to in point 4 of Part B of Annex I to Regulation (EU) 2019/631 should therefore reflect that mass.

The Delegated Regulation can be found at eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2020.360.01.0008.01.

Withdrawal of Pot-Pourri Proposal

On 29 September 2020, the European Commission withdrew its so-called Pot-Pourri proposal to reduce pollutant emissions from road vehicles (Euro 5 and 6).

The Commission had announced its intention to withdraw the proposal in its 2020 Commission Work Programme, arguing that most of the content of the proposal is covered by other files including Regulation (EU) 2018/858 (Type Approval Framework), adopted in the meantime.

Some other aspects will be covered more comprehensively under the proposal on NO_x and PN Conformity Factors (CF) and the upcoming proposal for the Euro 7 emission standards.

The withdrawal confirmation can be found at eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.C_.2020.321.01.0037.01.ENG&toc=OJ%3AC%3A2020%3A321%3ATOC.

Consultation on Impact Assessment of Car and Van CO₂ Regulation

On 29 October 2020, the European Commission published a consultation on the Inception Impact Assessment of the Regulation setting CO₂ emission standards for cars and vans.

The document states that, while CO₂ vehicle standards have proven to be an effective policy tool, without further policy intervention, emissions from road transport are not projected to be on a decreasing trajectory that allows achieving the new 2030 target and the climate neutrality objective by 2050. A higher uptake of zero emission vehicles than currently projected, will therefore be needed for achieving these objectives.

It says that the current policy is not fully in line with new climate objectives and therefore does not provide sufficiently long-term signal to channel the necessary investment in zero-emission vehicles and increase their market uptake over time. As a consequence, EU industry innovative developments in zero-emission technologies could make slower progress than possible and compared to its international competitors, putting at risk the technological leadership and competitiveness of the EU automotive value chain. The production of more zero emission models and their increased supply to the market is also key to make zero emission mobility more affordable and ensure a just transition.

The impact assessment will explore a variety of options on different elements of the CO₂ emission standards Regulation, including on: the levels of stringency of the CO₂ emission targets for cars and vans, including options to define new stricter target levels and their timing; the specific mechanism to incentivise and preference zero- and low-emission vehicles, including the type of mechanism and its elements, as well as the type of vehicles to be targeted; the appropriateness of a new mechanism to take into account the potential contribution of renewable and low-carbon fuel when determining manufacturers' compliance with their targets, including the option of voluntary crediting mechanism and in view of other EU policies and measures to decarbonise fuels; the possibility to assign potential revenues from fines to a specific fund or programme.

A preliminary assessment of expected impacts acknowledges potential negative as well as positive economic and social impacts, particularly as a result of changes in the automotive supply chain.

The Commission says that the impact assessment for this initiative will build upon the results of the impact assessment performed in the context of the Communication on stepping up Europe's 2030 climate ambition which considered the impacts of increasing the economy-wide greenhouse gas reduction target and its sectoral implications. The impact assessment will assess economic, social and environmental impacts, also in view of the COVID-19 crisis and recovery. It

will be prepared in coordination with other relevant impact assessments part of the same package.

The consultation is open until 26 November 2020, and can be found at ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12655-Revision-of-the-CO2-emission-standards.

Commission refers France to Court of Justice over Air Quality

On 30 October 2020, the European Commission decided to bring France to the Court of Justice of the European Union regarding poor air quality due to high levels of particulate matter (PM₁₀). The Commission says that France has not respected the daily limit values applicable to PM₁₀ particles which have been legally binding since 2005.

Data provided by France confirms the systematic failure to meet EU rules on PM₁₀ limit values in the zones of Paris and Martinique for twelve and fourteen years respectively. Therefore, the Commission is referring France to the Court of Justice of the EU.

This is the second referral of France to the Court regarding non-compliance with EU air quality standards. In its judgment of 24 October 2019, the Court found that the country did not comply with the limit values applicable to the concentrations of nitrogen dioxide (NO₂) in 12 air quality zones (Commission against France, C-636/18).

The Commission's press release is available to read at ec.europa.eu/commission/presscorner/detail/en/IP_20_1880.

Commissioner Response to Question on Effectiveness of PTI Soot Tests

On 2 October 2020, Commissioner Vălean responded to a parliamentary written question from MEP Petra De Sutter (Verts/ALE, BE) on the effectiveness of periodic vehicle roadworthiness tests for the detection of soot filter tampering.

In her question, Ms de Sutter had asked if the Commission considers that PN meters or particle counters can be regarded as equivalent alternative equipment under the provisions of Directive 2014/45/EU, for the purposes of detecting soot filter tampering at periodic technical inspections.

Commissioner Vălean stated that, although particle counters cannot be considered alternative measuring equipment to currently available opacity measurement technology, Member States are free to introduce particle number measurements in their national testing regime and use the equipment deemed suitable for this purpose.

She went on to say that the Commission will consider adding particle number measurement to the harmonised minimum requirements in the context of the revision of Directive

2014/45/EU, for which the evaluation will be launched next year.

MEP de Sutter's question is at www.europarl.europa.eu/doceo/document/E-9-2020-004320_EN.html and the response from Commissioner Vălean at www.europarl.europa.eu/doceo/document/E-9-2020-004320-ASW_EN.pdf.

European Parliament Vote to increase EU Emissions Reduction Targets

On 6 October 2020, European Parliament votes on the EU Climate Law confirmed that it wants all Member States to become climate neutral by 2050, as well as calling for ambitious 2030 and 2040 emissions reduction targets.

Parliament adopted its negotiating mandate on the EU climate law with 392 votes for, 161 against and 142 abstentions.

MEPs voted for both the EU and all Member States individually to become climate-neutral by 2050 and that thereafter the EU shall achieve "negative emissions". They also call for sufficient financing to achieve this.

In addition, the Commission must propose by 31 May 2023, through the ordinary decision-making procedure, a trajectory at EU level on how to reach carbon neutrality by 2050, say MEPs. It must take into account the total remaining EU greenhouse gas (GHG) emissions until 2050 to limit the increase in temperature in accordance with the Paris Agreement. The trajectory shall be reviewed after each stocktake at global level.

MEPs also want to set up an EU Climate Change Council (ECCC) as an independent scientific body to assess whether policy is consistent and to monitor progress.

The vote in Parliament called for a GHG reduction of 60% from 1990 levels by 2030, adding that national targets shall be increased in a cost-efficient and fair way. This is higher than the reduction of at least 55% proposed by the EC. MEPs also want an interim target for 2040 to be proposed by the Commission following an impact assessment, to ensure the EU is on track to reach its 2050 target.

Finally, MEPs say that the EU and Member States must also phase out all direct and indirect fossil fuel subsidies by 31 December 2025 at the latest.

The European Parliament press release is at www.europarl.europa.eu/news/en/press-room/eu-climate-law-meps-want-to-increase-2030-emissions-reduction-target.

European Council Conclusions on Climate Ambition

On 15 October 2020, the European Council met and discussed, amongst other topics, the Commission's Communication on 'Stepping up Europe's 2030 climate ambition', including the proposed emissions reduction target

of at least 55% by 2030, and the actions required to achieve that ambition.

The statement released after the meeting said that the European Council considers that the updated target should be delivered collectively by the EU in the most cost-effective manner possible. All Member States will participate in this effort, taking into account national circumstances and considerations of fairness and solidarity. All relevant EU legislation and policies need to contribute to the new 2030 target and to the fulfilment of the climate neutrality objective, while respecting a level playing field and preventing carbon leakage.

The European Council will return to the issue at its December meeting with a view to agreeing a new emissions reduction target for 2030.

The full press release can be found at www.consilium.europa.eu/en/press/2020/10/16/european-council-conclusions-on-covid-19-and-climate-change-15-10-2020.

European Council Agreement on Partial General Approach on Climate Law

On 23 October 2020, the European Council reached agreement on a partial general approach on the proposed European climate law. The aim of the proposal is to set in legislation the objective of a climate-neutral EU by 2050, which was endorsed by the European Council in December 2019.

In its position, the Council stresses the importance of promoting both fairness and solidarity among Member States and cost-effectiveness in achieving the climate neutrality objective. The Council's position is partial because it does not yet specify an updated 2030 greenhouse gas emission reduction target, given that further work is needed to reach agreement among Member States in this regard.

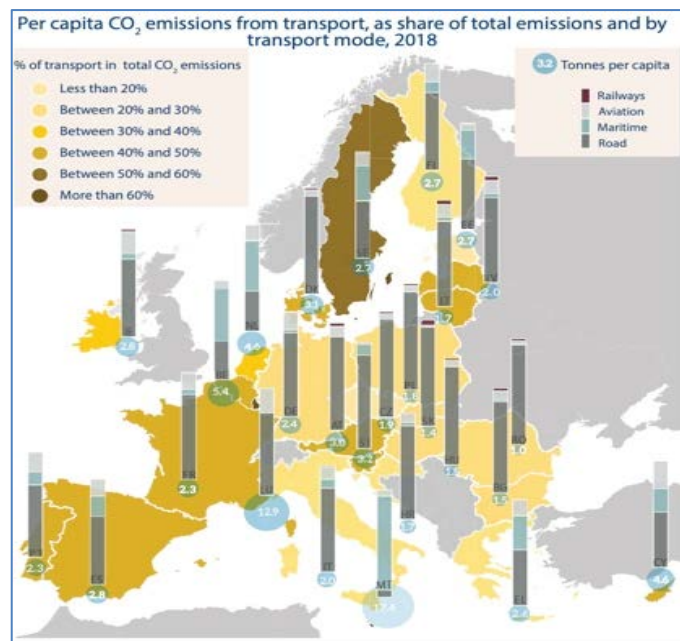
The Council has amended the part of the original proposal which would have allowed the Commission to adopt, by means of delegated acts, a trajectory for achieving climate neutrality. Instead, the Council asks the Commission to propose an intermediate target for 2040 after the first global stocktake of the Paris Agreement. The Council retains the concept of an indicative, linear trajectory but only as a tool to help the Commission in assessing progress.

The European Council press release can be found at www.consilium.europa.eu/en/press-releases/2020/10/23/climate-law-council-reaches-agreement.

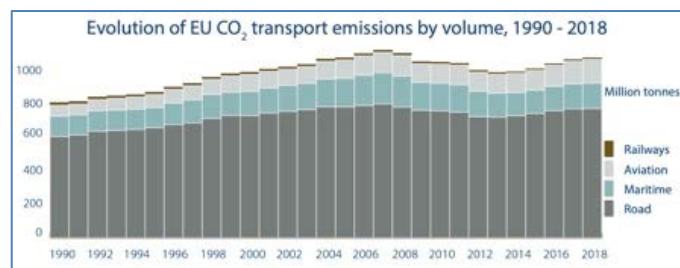
Parliament Think Tank Infographic on Transport CO₂ Emissions

On 7 October 2020, the European Parliament Think Tank published an infographic showing EU CO₂ emissions from transport in focus.

The map below gives the share of transport emissions (from fuel combustion, not including indirect emissions from electricity use) in the total CO₂ emissions of each Member State, and the volume contribution of different transport modes to the EU total.



While the volumes of total CO₂ emissions have decreased in most Member States between 1990 and 2018, those resulting from transport show increases, in some cases more than twofold.



Throughout the EU, although road transport emissions fell in the early part of the last decade, they can be seen to have risen in recent years.

The infographic can be found at [www.europarl.europa.eu/RegData/etudes/ATAG/2020/659265/EPRS_A_TA\(2020\)659265_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/ATAG/2020/659265/EPRS_A_TA(2020)659265_EN.pdf).

Meeting of Political Leaders from Automotive Regions

On 14 October 2020, political leaders from the European Committee of the Regions' interregional group on the Future of Automotive Industries (CoRAI) met with the European Commissioner for Budget, Johannes Hahn, members of the European Committee of the Regions' commission for territorial cohesion (COTER) and automotive industry

representatives to discuss the role automotive regions play in achieving a successful green transformation. Europe's Green Deal and the EU budget will play a key role in helping automotive regions and the industry to manage this transformation.

In his opening speech at the Green Transformation Summit, Commissioner Hahn underlined that "Europe's regions are at the heart of the green and digital transitions and the EU recovery plan. It is the SMEs, the European value chains and European industry that will trigger innovation, create employment and boost economic growth in Europe".

Mr Francisco Igea Arisqueta (ES/Renew Europe), Vice-President of the Regional Government of Castilla y León, said that in order to minimise damage to employment and industrial competitiveness, "the European Union must help to modernise and improve the current factories on the continent, for the successful upgrade of the sector in line with the Green Deal". He also said that "The objective must be to achieve an effective reduction of emissions, not to prioritise some technologies over others".

In contrast, Ms María Victoria Chivite Navascués (ES/PES), President of the Regional Government of Navarra, is leading her region towards e-mobility. She said that "Navarra has become a perfect automotive testing zone, directing the capacities of the industrial automotive sector towards the development of the electric vehicle and its components, as well as fostering the development and implementation of new mobility solutions in Navarra".

Putting the automotive industry perspective, Ms Sigrid de Vries, Secretary General of the European Association of Automotive Suppliers (CLEPA) said that Europe needs a strong automotive ecosystem to stay competitive and push ahead with ambitious environmental, digital and road safety targets. She stated that "We need a policy framework at all levels – regional, national and European – that is 'technology-open' and supports innovation as much as possible".

The press release from the summit can be found at cor.europa.eu/en/news/Pages/Green-Transformation-Summit-Automotive-Regions%E2%80%93Crucial-to-Success.aspx.

EU Chemicals Strategy for Sustainability

On 14 October 2020, the European Commission published its Chemicals Strategy for Sustainability, which is part of the EU's zero pollution ambition.

The chemicals strategy aims to better protect citizens and the environment and to boost innovation for safe and sustainable chemicals. It will do this by promoting the EU's resilience of supply and sustainability of critical chemicals, by playing a leading role globally by championing and promoting high standards and not exporting chemicals banned in the EU and by boosting the investment and innovative capacity for production and use of chemicals that are safe and sustainable by design, and throughout their life cycle. It will also ban the

most harmful chemicals in consumer products, account for the cocktail effect of chemicals when assessing risks from chemicals and establishing a simpler "one substance one assessment" process for the risk and hazard assessment of chemicals.

The strategy acknowledges that the automotive industry is a chemical-intensive sector that is growing, increasing the demand for chemicals and creating opportunities, but also risks.

The Commission's communication on the chemicals strategy for sustainability is at ec.europa.eu/environment/pdf/chemicals/2020/10/Strategy.pdf.

European Commission 2021 Work Programme

On 19 October 2020, the European Commission published its work programme for 2021.

The EC's Communication says that the 2021 programme sees a shift from strategy to delivery with an emphasis on new legislative initiatives and revisions of existing legislation, following up to the plans outlined across all six of the headline ambitions in the last year.

In relation to the European Green Deal, the Commission says that its focus will be overhauling relevant climate and energy legislation to align with the newly proposed target to reduce emissions by at least 55% by 2030, as compared to 1990 levels. This will be brought together in a "Fit for 55 Package" which will cover everything from CO₂ emissions targets for cars and light commercial vehicles to renewables and energy efficiency, buildings, as well as land use, energy taxation, effort sharing and emissions trading and a wide range of other pieces of legislation. The EC says that climate and energy diplomacy will remain a priority with its external partners.

The Commission will put forward a series of measures on sustainable and smart mobility, including a revision of the Regulation on the trans-European transport network and of the Directive on intelligent transport systems.

The sustainable and smart mobility package includes the development of post-Euro 6/VI emission standards for cars, vans, lorries and buses.

The programme also mentions the Commission will continue the implementation of the circular economy action plan, looking at eco-design and sustainable products.

The work programme and associated documents are at ec.europa.eu/info/publications/2021-commission-work-programme-key-documents_en.

IMCO Committee Report on Measures for L-Category End-of-Series Vehicles

On 13 October 2020, the Internal Market Committee (IMCO) of the European Parliament published its report on the Commission's proposal for a regulation regarding specific measures on L-category end-of-series vehicles in response to the COVID-19 outbreak.

As the committee responsible, IMCO agrees with the Commission proposal and calls on the Commission to refer the matter to Parliament again if it replaces, substantially amends or intends to substantially amend its proposal.

The IMCO report can be found at www.europarl.europa.eu/doceo/document/A-9-2020-0190_EN.html.

Updated ENVI Subject File on Air Quality

On 30 October 2020, the Environment (ENVI) committee updated its subject file on air quality in the EU.

This reiterates that on 29 November 2019, the European Commission published the results of the fitness check of the two Ambient Air Quality (AAQ) Directives, concluding that the Directives have been partially effective in improving air quality and achieving air quality standards, but that they have not been fully effective and not all their objectives have been met to date.

The ENVI Committee is working on an Implementation Report to address the performance of the AAQ Directives. In particular, the report will assess how far the Directives have been effective in achieving their overall objectives of reducing air pollution and curbing its adverse effects.

To support the work on the Implementation Report, the European Parliamentary Research Service (EPRS) has been commissioned to prepare a study, giving an overview and assessment of the policies designed and implemented at local level with the aim to reduce air pollution from relevant sources. The EPRS study is expected to be presented in the ENVI Committee, together with the draft Report, in February 2021.

The ENVI update is at www.europarl.europa.eu/committees/en/product/product-details/20201030CDT04401.

JRC Report on Research and Innovation in Road Vehicle Emissions Control

On 15 October 2020, the Joint Research Centre of the European Commission published a report on the Research and Innovation (R&I) in road vehicle emissions control.

The main objective of this report is to contribute to the development of future European road vehicle emission standards by assessing the most relevant publicly funded R&I projects and initiatives carried out in Europe after 2015. The assessment is largely based on the European

Commission's Transport Research and Information Monitoring and Information System (TRIMIS) methodology.

The report concludes with following policy recommendations: 1) there has been a change in R&I and regulations, taking into consideration more real driving conditions, 2) technology evolves very fast and, regulations should evolve to focus on upcoming issues for the transport sector and the industry, 3) R&I only addresses some of the novel and upcoming areas, 4) future R&I programmes should consider the need to reduce emissions and pollutants when distributing funding for the various key topics, with more effort in fields which have not received so much attention along the years, 5) regulations should cover also currently non-regulated pollutants and conditions and should be technologically neutral, regardless of the type of fuel.

The report can be read in full at ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/research-and-innovation-road-vehicle-emissions-control.

EEA Report on Europe's Pollution Challenge

On 15 October 2020, the European Environment Agency (EEA) published a report titled '*EEA Signals 2020 – Towards zero pollution in Europe*'.

This report gives an overview of air, water and soil pollution as well as other angles to the topic, based on previously published EEA information and data. The report presents measures to improve air quality, which would improve people's health, main pressures on Europe's freshwater bodies and seas, and how soil pollution is still a wide-spread and growing problem.

The section on air quality states that although European and national policies and local actions have been able to curb pollution from transport, industry and the energy sector, the EEA's annual Air quality in Europe assessments consistently show that air pollution still poses a danger to human health and the environment.

The report describes how the EEA has worked together with a number of European cities in a pilot project to better understand the challenges to improving air quality at the local level. The 10 cities that participated in the pilot project have, for example, expanded district heating, promoted cycling, lowered speed limits and issued congestion charges to improve local air quality. Other successful initiatives include relocating industrial facilities, modernising household stoves and boilers, using cleaner fuels for heating, switching to cleaner buses and trams, and introducing low-emission transport zones. These cities did however report important challenges, especially in engaging with citizens and making the political case for measures to improve air quality. For best results, local and regional actions go along with effective national and EU policies that often offer substantial co-benefits in reducing greenhouse gas emissions and air pollution at the same time.

The report can be read in full at www.eea.europa.eu/signals/signals-2020-towards-zero-pollution.

NORTH AMERICA

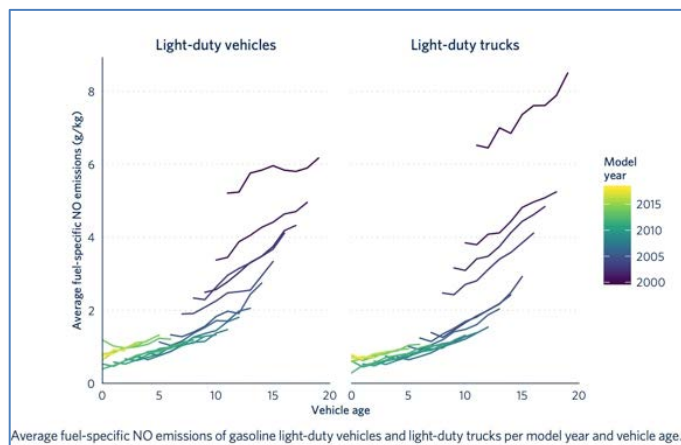
TRUE Report on Real-World Emissions in the USA

On 30 October 2020, the International Council on Clean Transportation (ICCT) published a fact sheet of The Real Urban Emissions Initiative (TRUE) on real-world emissions in the United States, based on the TRUE remote sensing database.

TRUE has compiled remote sensing data from the states of Colorado and Virginia and the University of Denver to investigate the emissions of U.S. cars and trucks. The TRUE U.S. database includes nearly 60 million emissions records and is intended to support further research and the development of evidence-based emissions control policies in the United States.

The study showed that the nitric oxide (NO) emissions from light-duty vehicles of all model years increase with vehicle age as emission control technologies deteriorate. In older model years, the deterioration can exceed 0.2 g NO/kg fuel per year, an approximate median increase in emissions of 200% over the vehicle useful life defined in U.S. EPA emission standards. The rate of emissions increase declines with newer model years, suggesting that emissions deterioration is less pronounced in modern vehicles.

For light-duty vehicles, the contribution of the oldest vehicles in the fleet to total NO mass emissions has increased over time. In 2010, vehicles 15 years old and older made up approximately 14% of the fleet but were responsible of 50% of total NO mass emissions. By 2018, the percentage of the fleet responsible for 50% of total NO emissions had decreased to 11%.

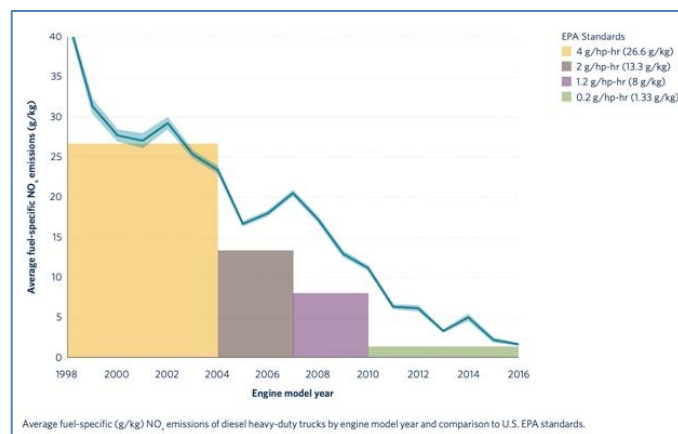


The NO emissions distribution for heavy-duty vehicles has also become more skewed with time and the implementation of more stringent NOx engine emission

standards. Between 2010 and 2018, the proportion of the oldest vehicles in the fleet contributing to 50% of total mass emissions decreased from 30% to 16%.

The analysis revealed a doubling of NO emissions for certain diesel pickup trucks under cold weather conditions. TRUE says that this finding warrants further investigation and highlights the value of remote sensing data in identifying vehicles with atypical real-world emissions performance.

Although there was a 94% reduction in heavy-duty vehicle NOx emissions from model year 2004 engines to model year 2016 engines, real-world emissions of most model years exceed EPA engine emission standards. Data show a considerable lag of six years or more between the adoption of EPA 2010 standards and the time when real-world emissions approached certification limits.



The ICCT fact sheet can be viewed at theicct.org/sites/default/files/publications/US-TRUE-fact-sheet-oct2020.pdf.

ASIA PACIFIC

Technology Roadmap and Costs for Chinese Car Fuel Efficiency Increase

On 23 October 2020, the International Council on Clean Transportation (ICCT) published a study on the Technology Roadmap and Costs for Fuel Efficiency Increase and CO₂ Reduction from Chinese New Passenger Cars in 2030.

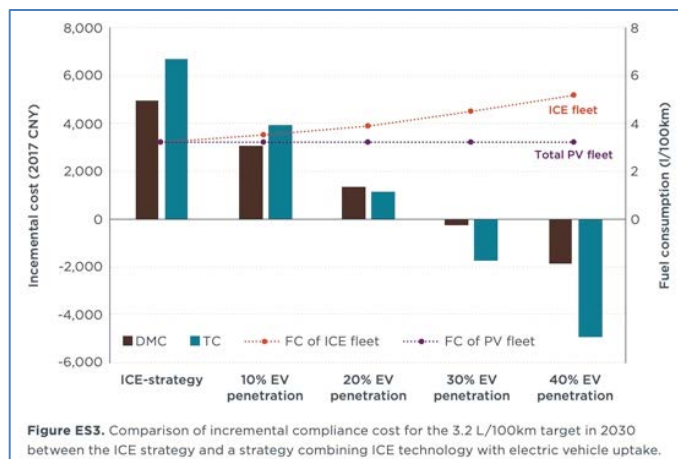
Made in China 2025, released in 2015, outlined a preliminary fuel efficiency target of 3.2 litres (L) per 100 kilometres (km), equivalent to about 75 grams (g) of carbon dioxide (CO₂) per km, from average new passenger cars by 2030. To support the development of stringent yet cost-effective fuel efficiency standards for Chinese passenger cars for the 2025–2030 time frame, this ICCT study evaluates the potential technology pathways for and incremental costs of meeting the 2030 target proposed by Made in China 2025.

The resulting incremental compliance cost estimation consists of two compliance strategies—one reflecting the level of CO₂ reduction that can be achieved through the

introduction of more effective internal combustion engine (ICE) technology, and the other reflecting the CO₂ reduction that can be achieved by combining ICE technology improvement with increased market penetration of electric vehicles.

ICCT estimates that a passenger vehicle fuel consumption standard of 3.2 L/100km can be attained by 2030 for around ¥4,900 (€629) in direct manufacturing cost (DMC) or ¥6,700 (€860) in total cost (TC), which includes DMC and mark-ups per vehicle compared with the 2017 baseline. This is without deploying electrification technologies. Passenger vehicle fleet average fuel consumption as low as 2.5 L/100km can be achieved without electric vehicle penetration at an incremental compliance cost of around ¥11,100 (€1 424) DMC or ¥15,600 (€2 001) TC.

The figure below compares the compliance cost to meet the 3.2 L/100km target in 2030 through ICE technology only with a strategy that combines ICE technology with electric vehicle uptake. Because the incremental cost of most electric vehicles will be cheaper than alternative ICE vehicles by 2030, increasing electric vehicle share in the passenger car fleet will be a more cost-effective pathway to comply with fuel consumption standards. Under the electric vehicle strategy, any increase of electric vehicle uptake in the fleet will reduce the fleet average incremental cost to comply with the fuel consumption standards in 2030. To meet the 3.2 L/100km target, the total incremental cost of compliance is ¥1,100 (€141) per vehicle with a fleet average electric vehicle penetration of 20%. The incremental compliance cost will turn into a cost saving of ¥5,000 (€641) compared with the 2017 vehicle production cost when the 3.2 L/100km target is met by a fleet average electric vehicle penetration of 40%.



The developed incremental compliance costs are technology neutral and do not consider the impacts associated with any potential regulations or incentives that might discount the cost of any ICE or electric vehicle technology. Additionally, the compliance costs presented apply only to the average vehicle market.

Nonetheless, the study shows that increasing electric vehicle penetration will likely reduce the incremental cost to comply with future fuel consumption targets in 2030 in China. However, challenges remain in securing the supply chain, consumer awareness of this relatively new technology, and inadequacy of charging infrastructure that can hinder a quick transition into electrification.

The ICCT study is available to read at theicct.org/sites/default/files/publications/China-cost-curves-oct2020.pdf.

China Proposals for NRMM Phase 3 and 4 Regulation

On 23 September 2020, China's Ministry of Ecology and Environment published draft proposals on Phase 3 and 4 Non-Road Mobile Machinery (NRMM) regulations.

NRMM Phase 4 is proposed to be implemented on 1 December 2022 for engines with rated powers <560 kW. For engines with a rated power >560 kW, the implementation date will be 1 December 2023.

The major change in this latest draft regulation is that machinery manufacturers will need to take full responsibility for emissions compliance, which is consistent with the China VI heavy-duty engine/vehicle regulation. This avoids taking an engine from an in-use machine for emissions compliance testing. PEMS-based testing and OBD checks will be the primary in-use tools for compliance enforcement.

The proposed regulation can be found at www.mee.gov.cn/xxgk2018/xxgk/xxgk06/202009/t20200928_800890.html.

China New Energy Vehicle Roadmap

On 27 October 2020, the Energy-saving and New Energy Vehicle Technology Roadmap 2.0 was released in Shanghai. The roadmap was revised and compiled by more than 1 000 experts across the industry organised by the China Society of Automotive Engineers (China SAE) under the guidance of the Ministry of Industry and Information Technology (MIIT).

Technology Roadmap 2.0 confirms the development direction of "decarbonisation, information-based and intelligent" of global automotive technology, and objectively evaluates the technological progress and weaknesses since the release of Technology Roadmap 1.0.

It puts forward six major objectives for the development of China's automotive industry in 2035. Included in these objectives is that the carbon emissions of China's automotive industry will reach its peak around 2028 ahead of the national carbon reduction commitment, and by 2035, the total carbon emissions will be reduced by more than 20% compared with the peak.

Technology Roadmap 2.0 further emphasises the battery electric drive development strategy: by 2035, the market

share of new energy vehicles will exceed 50%, the car parc of fuel cell vehicles will reach about 1 million, energy-efficient vehicles will be fully hybrid, and the automotive industry will achieve “electrified transformation”.

More details on Technology Roadmap 2.0 are at en.sae-china.org/a3967.html.

UNITED NATIONS

UNEP Report on Global Trade in Used Vehicles

On 26 October 2020, the United Nations Environment Programme (UNEP) published a report titled *Used Vehicles and the Environment*, which provides a global overview of the trade in used light-duty vehicles.

It says that millions of used cars, vans and minibuses exported from Europe, the USA and Japan to low- and middle-income countries are hindering efforts to combat climate change. They are contributing to air pollution and are often involved in road accidents. According to the report, many of them are of poor quality and would fail roadworthiness tests in the exporting countries. This is the first-ever report of its kind, and calls for action to fill the current policy vacuum with the adoption of harmonised minimum quality standards that will ensure used vehicles contribute to cleaner, safer fleets in importing countries.

The UNEP says that the lack of effective standards and regulation is resulting in the dumping of old, polluting and unsafe vehicles. It adds that developed countries must stop exporting vehicles that fail environment and safety inspections and are no longer considered roadworthy in their own countries, while importing countries should introduce stronger quality standards.

The report shows that where countries have implemented measures to govern the import of used vehicles – notably age and emissions standards – these give them access to high-quality used vehicles, including hybrid and electric cars, at affordable prices. For example, Morocco only permits the import of vehicles less than five years old and those meeting the Euro 4 European vehicles emission standard; as a result, it receives only relatively advanced and clean used vehicles from Europe.

A recent review conducted by The Netherlands of its exports found that most of these vehicles did not have a valid roadworthiness certificate at the time of export. Most vehicles were between 16 and 20 years old, and most fell below Euro 4 standards. For example, the average age of used vehicles exported to Gambia was close to 19 years old, while a quarter of used vehicles exported to Nigeria were almost 20 years old.

UNEP concludes that urgent action needs to be taken to improve the quality of used vehicles exported from Europe, with a coordinated European approach, and close

cooperation between European and African governments, to ensure that the EU only exports vehicles that are fit for purpose.

The UNEP report can be found at www.unep.org/news-and-stories/press-release/new-un-report-details-environmental-impacts-export-used-vehicles.

GENERAL

High-Level Events on Role of Hydrogen in Heavy-Duty Transport

In the beginning of October, two high-level events dedicated to the role of hydrogen in the decarbonisation of the heavy-duty industry took place.

On 1 October 2020, CEOs and experts from key industries, EU decision-makers, end-users and infrastructure providers met to discuss how zero-emission commercial vehicles can help decarbonise the road transport sector. The conference – jointly organised by the European Automobile Manufacturers’ Association (ACEA) and Hydrogen Europe (HE) – focused on how to accelerate the market deployment of hydrogen fuel cell commercial vehicles.

The conference covered issues such as the strategies to develop fuel cell trucks, hydrogen corridors, hydrogen infrastructure suitable for trucks, the role of equipment suppliers, urban logistics and transport operators. Speakers highlighted that many equally important factors would have to be in place for a successful transition: efficient and commercially viable zero-emission vehicles, a sufficiently dense network of hydrogen re-fuelling stations, and a supportive policy framework to enable profitable operations.

The second event – organised by Politico and co-sponsored by CNH Industrial and Nikola Corporation – discussed the best pathway to decarbonise heavy transport and what role hydrogen can play in those ongoing efforts.

Ms Adina-Ioana Vălean, European Commissioner for Transport, spoke at the event. She said that hydrogen will be an intrinsic part of the Sustainable and Smart Mobility Strategy, as it can serve all modes of transport. Ms Vălean added that technologically neutral policies have to be adopted to reach climate neutrality, using all available fuels. Commissioner Vălean later added that “Hydrogen is an essential part of the story because there is a lot of hope that hydrogen can help us meet the need for a sustainable alternative fuel for the future”.

More information on the conferences is available at hydrogeneurope.eu/news/scaling-zero-emission-commercial-vehicles-across-europe-0 and www.politico.eu/event/decarbonize-heavy-transport.

Prince William announces Earthshot Prize

On 8 October 2020, His Royal Highness Prince William announced the Earthshot Prize, said to be the most ambitious

and prestigious of its kind – designed to incentivise change and help to repair our planet over the next ten years.

The Earthshot Prize is centred around five ‘Earthshots’ – simple but ambitious goals for our planet which, if achieved by 2030, will improve life for us all, for generations to come. Five, one million-pound prizes will be awarded each year for the next ten years, providing at least 50 solutions to the world’s greatest environmental problems by 2030.

The Earthshots are: Protect & Restore Nature; Clean our Air; Revive our Oceans; Build a Waste-free World; and Fix our Climate. With regard to the Clean our Air prize, the Earthshot organisation says that “We choose to end outdated transport that emits toxic fumes, remove pollution from the air using both technology and nature, and eliminate the burning of fossil fuels, choosing 100% renewable energy for everyone – from big cities to rural villages”.

The Earthshot Prize will be awarded to “innovators who create job opportunities in green transport and clean energy; to the businesses who remove more pollution from the air than they put into it; and to the communities who let us heat our homes, travel to work and feed our families without polluting the air that we breathe”.

Nominations open on 1 November, with over 100 nominating partners from across the world being invited to submit nominations of those individuals, communities, businesses and organisations who could win The Earthshot Prize. Nominators will include the Earthshot Global Alliance, but also academic and non-profit institutions from across the world.

More details on the Earthshot Prize can be found at earthshotprize.org.

RESEARCH SUMMARY

Effects of Emissions and Pollution

Neurodegenerative hospital admissions and long-term exposure to ambient fine particle air pollution, Edwin van Wijngaarden, et al.; *Annals of Epidemiology* (in press), [doi: 10.1016/j.annepidem.2020.09.012](https://doi.org/10.1016/j.annepidem.2020.09.012).

Effects of PM_{2.5} exposure on reproductive system and its mechanisms, Lingjuan Wang, et al.; *Chemosphere* (February 2021), Vol. 264, 128436, [doi: 10.1016/j.chemosphere.2020.128436](https://doi.org/10.1016/j.chemosphere.2020.128436).

Long-term exposure to NO₂ and O₃ and all-cause and respiratory mortality: A systematic review and meta-analysis, Peijue Huangfu and Richard Atkinson; *Environment International* (November 2020), Vol. 144, 105998, [doi: 10.1016/j.envint.2020.105998](https://doi.org/10.1016/j.envint.2020.105998).

Effects of long-standing exposure to heavy-duty diesel vehicle traffic on respiratory symptoms and airway inflammation in older adults, Regiani Carvalho-Oliveira, et al.; *Environmental Pollution* (in press), [doi: 10.1016/j.envpol.2020.115893](https://doi.org/10.1016/j.envpol.2020.115893).

Air Quality, Sources and Exposure

A methodological framework for improving air quality monitoring network layout. Applications to environment management, David Galán

Madrugá; *Journal of Environmental Sciences* (April 2021), Vol. 102, pp. 138-147, [doi: 10.1016/j.jes.2020.09.009](https://doi.org/10.1016/j.jes.2020.09.009).

Changes in Ambient Air Quality and Atmospheric Composition and Reactivity in the South East of the UK as a Result of the COVID-19 Lockdown, K.P. Wyche, et al.; *Science of The Total Environment* (in press), [doi: 10.1016/j.scitotenv.2020.142526](https://doi.org/10.1016/j.scitotenv.2020.142526).

Effects of COVID-19 lockdown on global air quality and health, Feng Liu, et al.; *Science of The Total Environment* (in press), [doi: 10.1016/j.scitotenv.2020.142533](https://doi.org/10.1016/j.scitotenv.2020.142533).

SHERPA-city: A web application to assess the impact of traffic measures on NO₂ pollution in cities, B. Degraeuwe, et al.; *Environmental Modelling & Software* (January 2021), Vol. 135, 104904, [doi: 10.1016/j.envsoft.2020.104904](https://doi.org/10.1016/j.envsoft.2020.104904).

Impact of lockdown on air quality over major cities across the globe during COVID-19 pandemic, Pratima Kumari and Durga Toshniwal; *Urban Climate* (December 2020), Vol. 34, 100719, [doi: 10.1016/j.uclim.2020.100719](https://doi.org/10.1016/j.uclim.2020.100719).

Emissions Measurements and Modelling

Impact of Mileage on Particle Number Emission Factors for EURO5 and EURO6 Diesel Passenger Cars, François Boveroux, et al.; *Atmospheric Environment* (in press), [doi: 10.1016/j.atmosenv.2020.117975](https://doi.org/10.1016/j.atmosenv.2020.117975).

Particle number measurements within periodic technical inspections: A first quantitative assessment of the influence of size distributions and the fleet emission reduction, Markus Bainschab, et al.; *Atmospheric Environment: X* (in press), [doi: 10.1016/j.aeaoa.2020.100095](https://doi.org/10.1016/j.aeaoa.2020.100095).

Assessing the impact of multi-dimensional driving behaviours on link-level emissions based on a Portable Emission Measurement System (PEMS), Qian Yu, et al.; *Atmospheric Pollution Research* (in press), [doi: 10.1016/j.apr.2020.09.022](https://doi.org/10.1016/j.apr.2020.09.022).

Quantifying Metal Emissions from Vehicular Traffic Using Real World Emission Factors, Jonathan Wang, et al.; *Environmental Pollution* (in press), [doi: 10.1016/j.envpol.2020.115805](https://doi.org/10.1016/j.envpol.2020.115805).

Characteristics of instantaneous particle number (PN) emissions from hybrid electric vehicles under the real-world driving conditions, Yachao Wang, et al.; *Fuel* (February 2021), Vol. 286, 119466, [doi: 10.1016/j.fuel.2020.119466](https://doi.org/10.1016/j.fuel.2020.119466).

Real-World CO₂ and NO_x Emissions from Refrigerated Vans, Zhuoqian Yang, et al.; *Science of The Total Environment* (in press), [doi: 10.1016/j.scitotenv.2020.142974](https://doi.org/10.1016/j.scitotenv.2020.142974).

Impact of test cycle on mass, number and particle size distribution of particulates emitted from gasoline direct injection vehicles, Zhiyuan Hu, et al.; *Science of The Total Environment* (in press), [doi: 10.1016/j.scitotenv.2020.143128](https://doi.org/10.1016/j.scitotenv.2020.143128).

Emissions Control, Catalysis, Filtration

The opportunities and challenges of iron-zeolite as NH₃-SCR catalyst in purification of vehicle exhaust, Qian Liu, et al.; *Applied Catalysis A: General* (October 2020), Vol. 607, 117865, [doi: 10.1016/j.apcata.2020.117865](https://doi.org/10.1016/j.apcata.2020.117865).

Performance of a Diesel Particle Filter Damaged by Drilling Holes in the Filter Walls to Simulate Internal Micro-cracks, Denis Bémer, et al.; *Emis. Control Sci. Technol.* (in press), [doi: 10.1007/s40825-020-00172-0](https://doi.org/10.1007/s40825-020-00172-0).

Surface Modification of LaMnO₃ Perovskite Supported on CeO₂ Using Argon Plasma for High-performance Reduction of NO, Hamid Khaledian, et al.; *Journal of Environmental Chemical Engineering* (in press), [doi: 10.1016/j.jece.2020.104581](https://doi.org/10.1016/j.jece.2020.104581).

Tracking the formation, fate and consequence for catalytic activity of Pt single sites on CeO₂, Florian Maurer, et al.; *Nat Catal* (in press), doi: [10.1038/s41929-020-00508-7](https://doi.org/10.1038/s41929-020-00508-7).

For cleaner exhaust of a high performance motorcycle: A macroscopic comparative study of catalytic converters under world-wide motorcycle test cycle, Kaihong Hou, et al.; *Journal of Cleaner Production* (in press), doi: [10.1016/j.jclepro.2020.124730](https://doi.org/10.1016/j.jclepro.2020.124730).

The Reactions and Role of Ammonia Slip Catalysts in Modern Urea-SCR Systems, T. Maunula, et al.; *Emiss. Control Sci. Technol* (in press), doi: [10.1007/s40825-020-00171-1](https://doi.org/10.1007/s40825-020-00171-1).

Unexpected Low-Temperature deNO_x Activity of AdSCR Systems for Cold Start NO_x Abatement, Federica Gramigni, et al.; *Emiss. Control Sci. Technol* (in press), doi: [10.1007/s40825-020-00174-y](https://doi.org/10.1007/s40825-020-00174-y).

Enhancing of low-temperature OHC-SCR activity of Ag/TiO₂ with addition of MnO₂ nanoparticles, and performance evaluation using diesel engine exhaust gases, Zeycan Keskin; *Environmental Technology & Innovation* (in press), doi: [10.1016/j.eti.2020.101205](https://doi.org/10.1016/j.eti.2020.101205).

Investigations on the soot combustion performance enhancement of an improved catalytic gasoline particulate filter regeneration system under different electric heating powers, Yong Xie, et al.; *Fuel* (January 2021), Vol. 283, 119301, doi: [10.1016/j.fuel.2020.119301](https://doi.org/10.1016/j.fuel.2020.119301).

Novel soot loading prediction model of diesel particulate filter based on collection mechanism and equivalent permeability, De-yuan Wang, et al.; *Fuel* (February 2021), Vol. 286, 119409, doi: [10.1016/j.fuel.2020.119409](https://doi.org/10.1016/j.fuel.2020.119409).

Pd supported on alumina modified by phosphate: Highly phosphorus-resistant three-way catalyst for natural gas vehicles, Guochen Zhang, et al.; *Journal of the Taiwan Institute of Chemical Engineers* (in press), doi: [10.1016/j.jtice.2020.09.032](https://doi.org/10.1016/j.jtice.2020.09.032).

Transport, Climate Change & Emissions

Global CO₂ impacts of light-duty electric vehicles, Abbas Ghandi and Sergey Paltsev, et al.; *Transportation Research Part D: Transport and Environment* (October 2020), Vol. 87, 102524, doi: [10.1016/j.trd.2020.102524](https://doi.org/10.1016/j.trd.2020.102524).

FORTHCOMING CONFERENCES

ONLINE 5th Green & Sustainable Chemistry Conference

8-11 November 2020

www.elsevier.com/events/conferences/green-and-sustainable-chemistry-conference

ONLINE 4th International FEV Conference: Zero CO₂ Mobility

10-11 November 2020, Aachen, Germany

www.fev.com/en/coming-up/fev-conferences/fev-conference-zero-co2-mobility

ONLINE 2020 Annual POLIS Conference

30 November-3 December 2020

www.polisnetwork.eu/2020-annual-polis-conference

The Polis Annual Conference provides an opportunity for cities and regions to showcase their transport achievement to large audience of mobility experts, practitioners and decision makers.

Hydrogen and P2X European Conference

9-10 February 2021, Copenhagen, Denmark (postponed from November 2020)

fortesmedia.com/hydrogen-p2x-2020_4.en.2.1.4.html

11th VERT Forum

25 March 2021, Dübendorf, Switzerland (postponed from March 2020)

www.vert-certification.eu

International Transport and Air Pollution Conference

30-31 March 2021, Graz, Austria (postponed from September 2020)

www.tapconference.org

The main topics of the 24th TAP Conference include energy consumption and GHG emissions from vehicles, open issues for pollutant emissions, such as tampering, retrofits of software and hardware and non-regulated pollutants, emissions from non-road mobile machinery and other transport modes and measurements and simulation of traffic related environmental impacts and air quality.

9th AVL Large Engines Techdays

21-22 April 2021, Graz, Austria

www.avl.com/large-engines-techdays

42nd International Vienna Motor Symposium

28-30 April 2021, Vienna, Austria

wiener-motorensymposium.at/en/

8th International MinNOx Conference

16-17 June 2021, Berlin, Germany (postponed from September 2020)

www.iav.com/en/events/minnox

SAE Heavy-Duty Diesel Emissions Control Symposium

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

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

CITA International Conference

1-2 June 2022, Amsterdam, Netherlands

citainsp.org/cita-conferences/