

NEWSLETTER

International Regulatory Developments

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AECC and Coronavirus

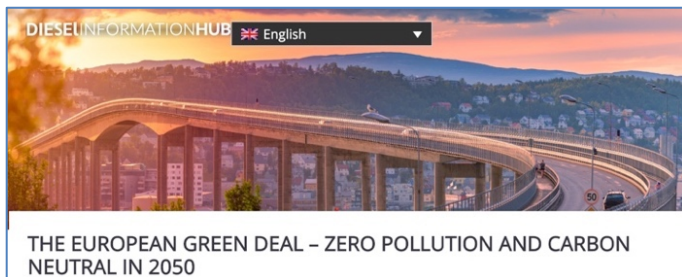
Along with many others in Europe, AECC is taking precautions against the coronavirus pandemic and is following government guidelines.

All AECC staff are working from home and joining meetings remotely. The health and safety of the AECC employees and member representatives is the priority.

We hope you and your families are all staying safe and well and that we can get back to 'normal' before too long.

AECC Article on European Green Deal published on Diesel Information Hub

On 5 March 2020, AECC published its latest article, The European Green Deal – Zero Pollution and Carbon Neutral in 2050, on the Diesel Information Hub.



The article looks at how the emissions control industry can help the European Commission achieve its goals of zero pollution and further reducing greenhouse gas emissions. It explains that AECC has already demonstrated that advanced emission control systems can help vehicles achieve near-zero levels of nitrogen oxides and particulates under all driving conditions. The piece goes on to say that giving citizens a choice of technology and fuels will contribute to the EU achieving a successful and just transition towards a sustainable future.

The article can be read at dieselinformation.aecc.eu/the-european-green-deal-zero-pollution-and-carbon-neutral-in-2050.

EUROPE

Commission Proposed Roadmap for Euro 7/VII Impact Assessment

On 27 March 2020, the European Commission published its roadmap for the Euro 7/VII inception impact assessment.

The roadmap lists preliminary policy options identified. The Commission stresses that, as the evaluation has not yet been conducted, the policy options will be revised once the results of the evaluation and the study are available.

The policy options are:

- Baseline Scenario: no legislative changes to Euro 6/VI.

- Option 1: A narrow revision of Euro 6/VI. It would involve setting up a single air pollutant emissions standard for cars, vans, lorries and buses. It would also involve simplifying the existing emission tests while keeping a focus on real-world testing.
- Option 2: A wider revision of Euro 6/VI by including, in addition to the measures in the first option, more stringent air pollutant emission limits for all vehicles. This would involve stricter emission limits for regulated air pollutants and/or new emission limits for currently non-regulated air pollutants, including non-CO₂ greenhouse gas emissions.
- Option 3: A comprehensive revision of Euro 6/VI by introducing, in addition to the measures in option 2, real-world emission monitoring over the entire lifetime of a vehicle.

The data on air pollutant emissions collected through on-board monitoring (OBM) would subsequently support market surveillance and in-service conformity testing. These data may also be used for roadworthiness tests (i.e. periodic technical inspections and technical roadside inspections), and/or for automatically enabling a zero-emission mode depending on the location of a vehicle ("geo-fencing").

The roadmap includes a preliminary assessment of expected impacts. The three options are expected to have a positive impact on public health, the automotive industry and its supply chain. All three are also expected to have a positive environmental impact on air quality and also on climate change.

The roadmap is open for public consultation until 24 April 2020. It can be downloaded from ec.europa.eu/info/law/have-your-say/initiatives/12313-Development-of-Euro-7-emission-standards.

Commission Proposal for European Climate Law

On 4 March 2020, the European Commission presented a proposal to enshrine in legislation the EU's commitment to be climate neutral by 2050. The European Climate Law sets the 2050 target and the direction of travel for all EU policy, and is intended to give predictability for public authorities, businesses and citizens. At the same time, the Commission is launching a public consultation on the future European Climate Pact.

The EU Institutions and the Member States are collectively bound to take the necessary measures at EU and national level to meet the target for net zero greenhouse gas (GHG) emissions by 2050. Progress will be reviewed every five years, in line with the global stocktake exercise under the Paris Agreement.

In the shorter term, based on a comprehensive impact assessment, the Commission will propose a new 2030 EU

target for GHG emission reductions. The Climate Law will be amended once the impact assessment is completed. By June 2021, the Commission will review, and where necessary propose to revise, all relevant policy instruments to achieve the additional emission reductions for 2030.

The press release and associated documents are at ec.europa.eu/commission/presscorner/detail/en/IP_20_335.

Public Consultation on 2030 Climate Target Plan

On 31 March 2020, the European Commission published a public consultation on the EU climate ambition for 2030 and for the design of certain climate and energy policies of the European Green Deal.

As part of the Green Deal, the Commission intends to propose to increase the EU's 2030 target for greenhouse gas emission reductions to at least -50% and towards -55% compared to 1990 levels. The Commission will assess the feasibility and the social, economic and environmental impacts of increasing the 2030 target. It says that the assessment will look into how to increase ambition in a way that enhances EU competitiveness, ensures social fairness and access to secure, affordable and sustainable energy and other material resources, benefits citizens and reverses biodiversity loss and environmental degradation. The Commission intends to present a comprehensive plan in the third quarter of 2020 to increase the EU 2030 climate target.

The Commission will review and propose to revise, where necessary, the key relevant energy and climate legislation by June 2021. It says this will include a coherent set of changes to the existing 2030 climate, energy and transport framework, notably related to the EU Emissions Trading System Directive, the Effort Sharing Regulation and the Land Use, Land Use Change and Forestry Regulation, CO₂ Emissions Performance Standards for Cars and Vans and, as appropriate, the Renewable Energy Directive and the Energy Efficiency Directive.

The roadmap is open for public consultation until 15 April 2020. It can be accessed from ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12265-2030-Climate-Target-Plan.

Revision of Energy Taxation Directive

On 4 March 2020, in parallel with the presentation of the proposal for a European Climate Law, the Commission presented a Roadmap for a Revision of the Energy Taxation Directive (ETD). The Roadmap sets out a number of problems that the revision of the ETD would aim to address.

Fossil fuel subsidies continue across the EU and result in a wide range of tax exemptions and reductions across the EU. The resulting subsidies are not in line with the objectives of the European Green Deal. Furthermore, there is not a level

playing field due to the differences in sectors that are exempt.

The current ETD is not aligned with key EU climate and energy policies, including, among others, the EU Emission Trading System (EU ETS), the Renewable Energy Directive and the Energy Efficiency Directive. According to the Roadmap, the ETD does not adequately promote greenhouse gas emission reductions, energy efficiency, or alternative fuels.

As highlighted in the recently completed evaluation of the ETD, the Directive no longer achieves its objectives of contributing to the proper functioning of the internal market.

One of the main objectives of the review of the ETD is to align taxation of energy products and electricity with EU energy and climate policies with a view to contributing to the EU 2030 targets and climate neutrality by 2050 in the context of the European Green Deal. Another is to preserve the EU internal market by updating the scope and the structure of rates as well as by rationalising the use of optional tax exemptions and reductions by Member States.

The roadmap can be downloaded from ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12227-Revision-of-the-Energy-Tax-Directive and responses received are available to read at ec.europa.eu/info/law/have-your-say/initiatives/12227-Revision-of-the-Energy-Tax-Directive/feedback?p_id=7587258.

European Commission presents new Industrial Strategy

On 10 March 2020, the European Commission presented its new Industrial Strategy for a globally competitive, green and digital Europe.

The strategy aims to drive Europe's competitiveness and its strategic autonomy and to support all players of European industry, including big and small companies, innovative start-ups, research centres, service providers, suppliers and social partners. It includes actions to support industry towards climate neutrality and build a more circular economy.

A variety of plans will support these actions, including comprehensive measures to support sustainable and smart mobility industries, to promote energy efficiency, strengthen current carbon leakage tools and secure a sufficient and constant supply of low carbon energy at competitive prices. There will also be a Clean Hydrogen Alliance, followed by an alliance on low carbon industries, in addition to further legislation and guidance on green public procurement.

In the context of the European Green Deal, the main goal is for a competitive industry to help Europe become the first climate-neutral continent by 2050.

Reducing emissions across industry will depend on an 'energy efficiency first' principle and a secure and sufficient supply of low-carbon energy at competitive prices. This will

require planning and investment in low-carbon generation technologies, capacity and infrastructure.

All carriers of energy, including electricity, gas and liquid fuels will need to be used more effectively by linking different sectors. This will be the aim of a new strategy for smart sector integration, which will also set out the Commission's vision on clean hydrogen. There should also be a special focus on sustainable and smart mobility industries. These have both the responsibility and the potential to drive the twin transitions, support Europe's industrial competitiveness and improve connectivity.

Further information can be found at ec.europa.eu/commission/presscorner/detail/en/IP_20_416.

Council adopts Conclusions on Air Quality

On 5 March 2020, the Council of the EU adopted conclusions on air quality which give political guidance for further work on combatting air pollution.

The Council considers that established air quality standards, in particular limit values, have been effective and remain essential to protect the health of citizens. It also accepts that there is room for improvements to the legislative framework to ensure good air quality across the EU. It welcomes the aim of the Commission, as set out in its Communication on the European Green Deal, to further tackle pollution through preventive and remedial actions, including by revising air quality standards. The statement released also 'underlines the importance of striving to achieve the World Health Organization air quality guideline levels'.

The Council welcomes the Commission's intention to take further action towards zero-emission mobility and to propose more stringent emissions standards for petrol and diesel vehicles, taking into account also pollutants that are not yet regulated, as well as to reduce emissions from maritime transport and to improve air quality in ports and near airports.

The Council underlines the importance of prioritisation and take-up of available funding for air quality improvements, suggesting using the joint benefits of climate goals and air quality as leverage for private investments.

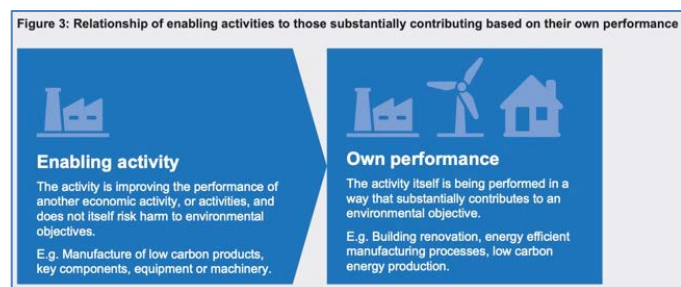
The press release and conclusions of the Council are at www.consilium.europa.eu/en/press/press-releases/2020/03/05/air-quality-council-adopts-conclusions/.

Technical Expert Group on Sustainable Finance - Taxonomy Report

On 9 March 2020, the EU Technical Expert Group on Sustainable Finance published its report on *Financing a Sustainable European Economy*. It reports on the EU Taxonomy, a tool to help stakeholders navigate the transition to a 'low carbon, resilient and resource-efficient economy'.

The Taxonomy sets performance thresholds for economic activities which either directly or indirectly: make a

substantive contribution to one of six environmental objectives; do no significant harm (DNSH) to the other five, where relevant; and meet minimum safeguards (e.g., OECD Guidelines on Multinational Enterprises and the UN Guiding Principles on Business and Human Rights). The environmental objectives are climate change mitigation and adaptation; sustainability and protection of water and marine resources; transition to a circular economy; pollution prevention and control; and protection and restoration of biodiversity and ecosystems.



The Technical Annex published alongside the main report provides guidance as to which activities fulfil these criteria. In the area of transportation, zero direct emissions light-duty vehicles (e.g. electric, hydrogen) are eligible because the generation of the energy carriers used by zero tailpipe emissions vehicles is assumed to become low or zero carbon in the near future (for instance, in the scenario called EUCO 3038 that meets the EU targets in the clean energy package, 70% of electricity in the EU is generated from decarbonised sources in 2030). Vehicles with tailpipe emission intensity of maximum 50g/km CO₂ (WLTP) are eligible until 2025 because the post-2020 CO₂ Regulation for cars and vans sets this threshold as an ambitious mid-term target that is significantly below the expected average emissions of new cars and vans. The 50g/km CO₂ threshold does not apply to motorcycles due to their lower weight and high electrification potential.

For road freight transport, those vehicles with zero direct emissions vehicles (e.g. electric, hydrogen) are eligible because the generation of these energy carriers is assumed to become low or zero carbon in the near future. The definition is aligned with the heavy-duty CO₂ regulation, which provides the most recent legislative point of orientation. Road freight transport with low emission heavy-duty vehicles defined in the same regulation, and dedicated vehicles solely using a narrowly defined range of bio- or other renewable fuels are also eligible due to the relatively high challenges in electrifying this vehicle category. Substantial contribution to climate mitigation from fuel substitution is in line with the agreed taxonomy regulation.

The full report and the Technical Annex are at ec.europa.eu/info/banking_and_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy_en.pdf, and ec.europa.eu/banking_and_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy-annexes_en.pdf.

EEA Briefing on GHG Effort Sharing Targets

On 10 March 2020, the European Environment Agency (EEA) published a briefing urging all sectors to cut emissions in order to achieve EU climate targets by 2030.

According to the EEA briefing, EU Member States and the United Kingdom (UK) have reduced greenhouse gas emissions in Effort Sharing sectors by 11% from 2005 to 2018. If Member States and the UK were to fully implement their existing and planned policies and measures, the Effort Sharing emissions could further decrease by 2030 to a level 27% below that of 2005. The briefing says that the annual pace of emission cuts needs to nearly double from 2018 onward, in order to achieve the EU Effort Sharing target of 30% reduction from 2005 to 2030. The effort sharing target is part of the EU's commitment of reducing all greenhouse gas emissions at least by 40% from 1990 to 2030.

Transport emissions have increased every year since 2014 due to a growing demand for passenger and freight transport. Member States expect large future reductions in transport emissions, but these reductions mostly rely on measures that are still to be adopted and fully implemented. Most of the 111 planned measures on transport target the promotion of low carbon fuels or electric vehicles (34 measures), the promotion of a modal shift to more efficient, public or non-motorised transport systems (33 measures) and the promotion of vehicle efficiency improvements (27 measures).

The EEA briefing is available at www.eea.europa.eu/highlights/member-states-must-cut-emissions.

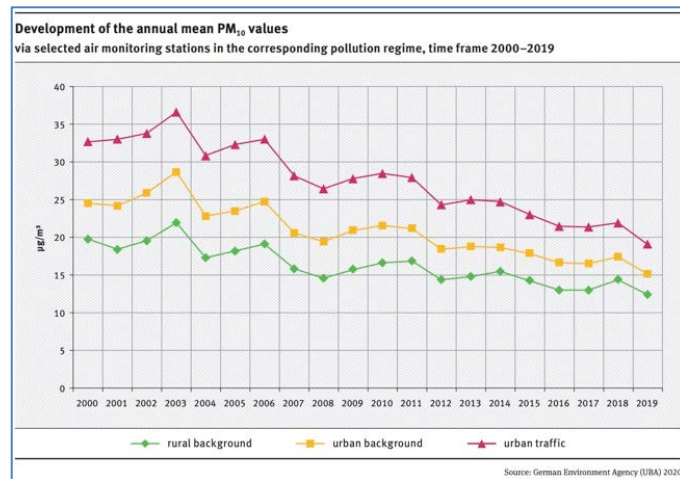
Preliminary Evaluation of 2019 Air Quality in Germany

On 31 March 2020, the German Environment Agency (Umweltbundesamt) published its preliminary evaluation of air quality for 2019.

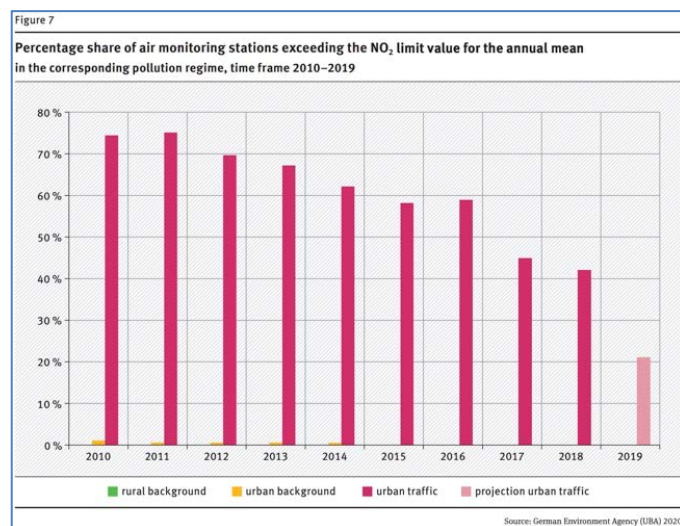
The limit value for 24-hour PM₁₀ was for the first time not exceeded at any German monitoring station, i.e. none of the 380 stations measured PM₁₀ 24-hour values over 50 µg/m³ on more than 35 days in 2019. This continues the positive trend of the past years. In the previous year the limit value was only exceeded at one industrial station. The recommendations of the World Health Organization (WHO) were not complied with at 36% of all air monitoring stations.

In 2019 the decreasing trend of mean PM₁₀ pollution continued. The annual mean PM₁₀ values show a clear fall in all pollution regimes throughout the entire period of observation. The progression is also characterised by strong inter-year variations, however, particularly due to the different weather conditions. The PM₁₀ limit of 40 µg/m³ as the annual mean value was complied with throughout Germany. However, 13% of the air monitoring stations recorded values that infringed the air quality guidelines

proposed by the WHO. The vast majority of these stations were in urban traffic locations.



It is estimated that the proportion of all air monitoring stations in urban traffic locations that exceeded the nitrogen dioxide (NO₂) annual mean limit and thus the identical WHO recommendation in 2019, is approximately 21%. Nitrogen dioxide pollution shows a clear decrease over the last decade. The levels of pollution are primarily determined by local emission sources – particularly the traffic in urban conurbations – and only show limited inter-year variations due to weather.



The full report is available to read at www.umweltbundesamt.de/sites/default/files/medien/1410/publikation/en/2020-03-20_hgp_air-quality-2019_bf.pdf.

ICCT Report on Impacts of Paris Low Emission Zone

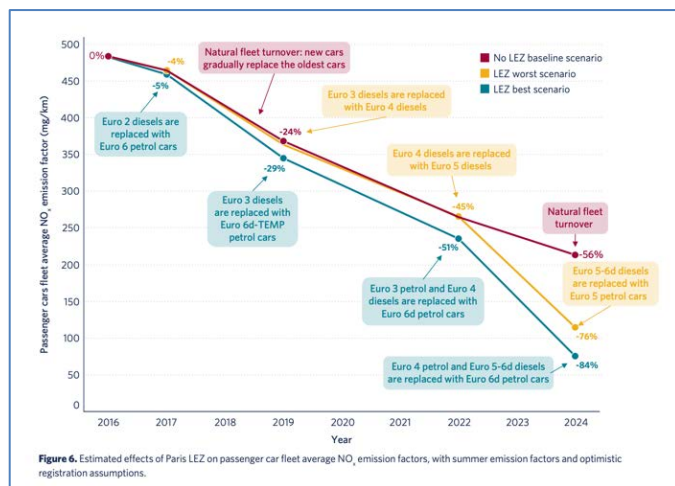
On 12 March 2020, the International Council on Clean Transportation (ICCT) published a report on the impacts of the Paris low emission zone (LEZ) and the implications for other cities.

At present, the LEZ excludes only diesel passenger cars not certified to the Euro 4 standard at minimum, but the criteria for entry into the zone will become progressively more stringent from now until 2030. By 2030, under the current implementation plan, only battery-electric and hydrogen fuel cell vehicles will be permitted to enter the LEZ.

This study estimates the reductions in nitrogen oxide (NOx) emissions under the current implementation schedule for the LEZ and also estimates benefits from accelerating the implementation schedule.

The analysis projects that with the implementation of the more stringent entrance requirements for access to the LEZ, passenger car NOx emissions in 2024 will be 76% to 87% below 2016 levels. In contrast, without the LEZ Paris would likely not see similar reductions in vehicle NOx emissions until 2031–2034, and in 2024 average passenger car NOx emission factors would be only 47% to 62% below 2016 levels.

Accelerating the implementation schedule would also accelerate the air quality benefits of the LEZ. Moving implementation of Phase 5 (in which petrol cars not certified to at least Euro 5 and all diesel cars except plug-in hybrid-electrics will be excluded from the zone) from 2024 to 2020 would mean a 72%–77% total reduction in passenger car NOx emissions in 2020 compared to 2016. Beginning Phase 5 in 2022 would yield a 66%–71% reduction that year over 2016.



The report goes on to say that, because enforcement of the LEZ in Paris currently relies entirely on visual inspections by police, automating enforcement using technologies such as license plate recognition could more effectively restrict access by high-emitting vehicles.

The report can be downloaded from theicct.org/publications/true-paris-low-emission-zone.

NORTH AMERICA

US EPA publishes Safer Affordable Fuel-Efficient Vehicles Rule

On 30 March 2020, the US Environmental Protection Agency (EPA) and National Highway Traffic Safety Administration (NHTSA) published the final rules to amend and establish CO₂ and Corporate Average Fuel Economy (CAFE) standards for passenger cars and light trucks.

The CAFE and CO₂ emissions standards established by these final rules will increase in stringency at 1.5% per year from model year (MY) 2020 levels over MYs 2021-2026. Both the CAFE and CO₂ standards are vehicle-footprint-based, as are the standards currently in effect. These standards will become more stringent for each model year from 2021 to 2026, relative to the MY 2020 standards. Generally, the larger the vehicle footprint, the less numerically stringent the corresponding vehicle CO₂ and miles-per-gallon (mpg) targets. As a result of the footprint-based standards, the burden of compliance is distributed across all vehicle footprints and across all manufacturers. Each manufacturer is subject to individualised standards for cars and light trucks, in each model year, based on the vehicles it produces.

EPA's standards are projected to require, on an average industry fleet-wide basis, 201 grams per mile (g/mi) of CO₂ in model year 2030, while NHTSA's standards are projected to require, on an average industry fleet-wide basis, 40.5 miles per gallon (mpg) in model year 2030. The agencies note that real-world CO₂ is typically 25% higher and real-world fuel economy is typically 20% lower than the CO₂ and CAFE compliance values discussed here, and also note that a portion of EPA's expected "CO₂" improvements will in fact be made through improvements in minimising air conditioning leakage and through use of alternative refrigerants, which will not contribute to fuel economy but will contribute towards climate-related emissions reductions.

The agencies say that these standards fit the pattern of gradual, tough, but feasible stringency increases that take into account real world performance, shifts in fuel prices, and changes in consumer behaviour towards crossovers and SUVs. They also say that the costs to both industry and automotive consumers would have been too high under the originally proposed standards, and by lowering the auto industry's compliance costs, the standards enhance the ability of the fleet to turn over to newer, cleaner and safer vehicles.

It is claimed that purchase costs to U.S. consumers for new vehicles would be \$977 to \$1,083 (€905 to €1 003) lower, on average, than they would have been if the agencies had retained the standards proposed in 2012.

The final rules are on the EPA website at www.epa.gov/sites/production/files/2020-03/documents/final-fr-safe-preamble-033020.pdf.

US EPA Automotive Trends Report

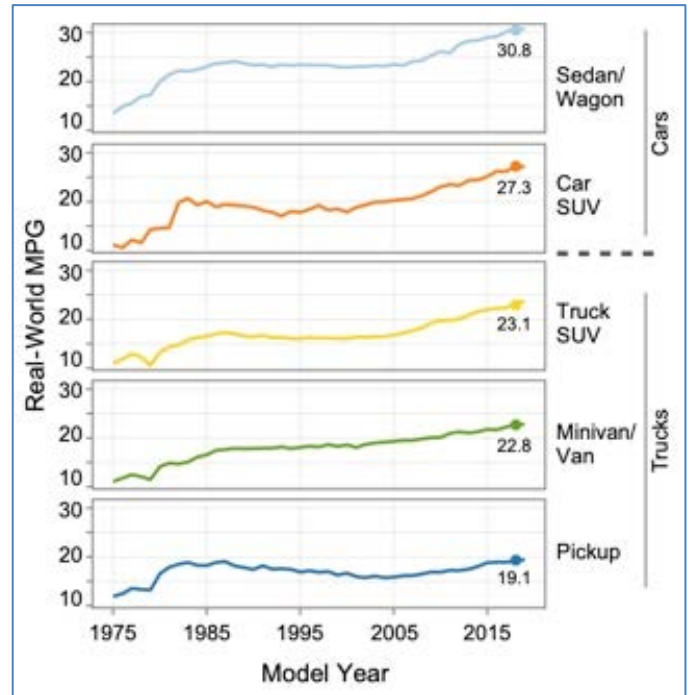
On 2 March 2020, the United States Environmental Protection Agency (US EPA) published its 2019 Automotive Trends Report.

The report states that for model year 2018 vehicles, the average estimated real-world CO₂ emission rate for all new vehicles fell by 4 grams per mile (g/mi) to 353 g/mi, the lowest level ever measured. Fuel economy increased by 0.2 miles per gallon to 25.1 mpg, achieving a record high.

The overall market continues to move towards both car SUVs and truck SUVs. Combined, car and truck SUVs captured a record high 46% market share in model year 2018. Truck SUVs improved fuel economy by 0.8 mpg and CO₂ emissions by 14 g/mile in model year 2018, while car SUVs improved fuel economy by 1.2 mpg and CO₂ emissions by 15 g/mile. Sedan/wagons fell to 37% of the market.

All five vehicle types are at record low CO₂ emissions and record high fuel economy and have steadily improved in recent years. However, the market shift towards SUVs and away from sedan/wagons has offset some of the fleetwide benefits that otherwise would have been achieved.

All of the large manufacturers ended the 2018 model year in compliance with the regulations.



The EPA report is at www.epa.gov/automotive-trends.

ASIA PACIFIC

ICCT Report on Diesel Fuel Quality Compliance in China

On 4 March 2020, the International Council on Clean Transportation (ICCT) published a working paper on motor vehicle diesel fuel quality compliance and enforcement in China.

The report says that the China 6/VI vehicle emission standards are among the most stringent in the world for the post-2020 timeframe, but their success depends on amongst other things, the quality of fuels available. Compliance remains a challenge in some regions and some private fuel stations are still supplying non-compliant diesel fuel.

After an overview of the current state of motor vehicle diesel fuel quality compliance in China, the working paper summarises international best practices and identifies specific policy approaches that could help China improve compliance and enforcement.

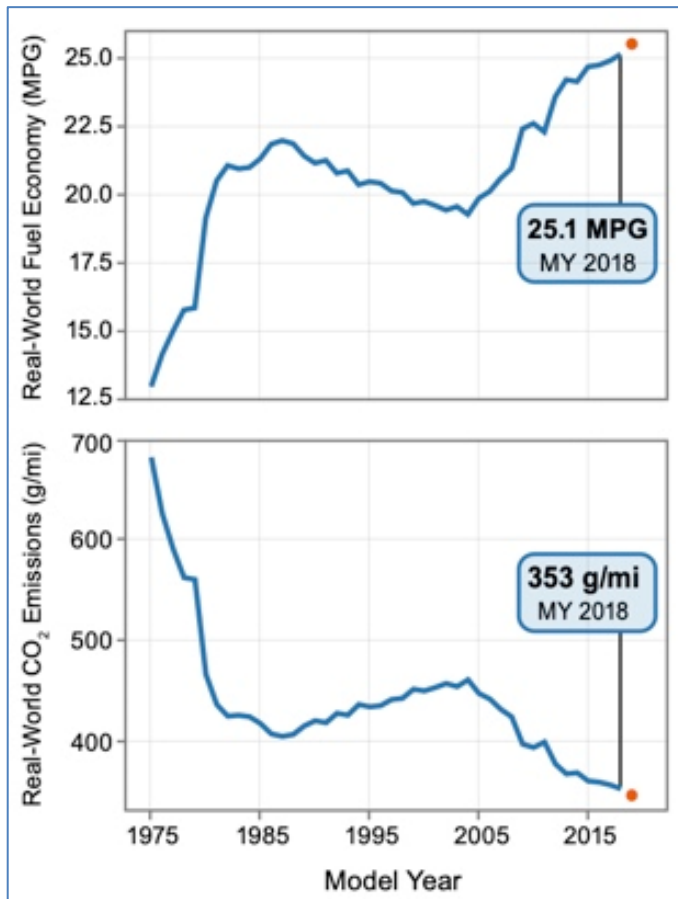


Table 8. Summary of fuel quality compliance and enforcement programs

	U.S.	California	Japan	EU	China
Authority	EPA	CARB	METI	DG ENV	Historically SAMR and SAC
Current sulfur limit	15 ppm	15 ppm	10 ppm	10 ppm	10 ppm
Fuel testing program	++	++	++	++	+
Presumptive liability	++	++	++	++	--
Fuel registration and tracking	++	++	++	+	--
Penalties	++	++	++	++	+
Overall noncompliance rates	<1% every year	1% in 2017	<0.1% in 2019	2% in 2016	3%-40% in 2019 Varying numbers from different sources and regions

++Strong, +Medium, --Weak

The first of these is that clear roles and responsibilities should be defined for regulatory agencies involved in setting and implementing fuel quality standards. ICCT recommends that each party involved in the fuel market be registered and certified. It also suggests placing presumptive liability on all parties in the supply chain - refiners, importers, and other fuel handlers - to make them liable for any violation found unless they establish an affirmative defence. The final recommendation is to strengthen supervision and enforcement, as the low fines imposed and high profit potential from breaking the law are said to contribute to the prevalence of non-compliant fuels on the market.

ICCT points out that all of this is important because better fuel quality both reduces pollutants from combustion directly and enables the use of exhaust aftertreatment technologies like diesel particulate filters.

The ICCT working paper can be found at theicct.org/sites/default/files/publications/Motor-diesel-fuel-quality-China.3.4.2020.pdf.

China Trade Association Request to delay Introduction of China 6 PN Limit

In its March 2020 Update, Dieselnets reports that the China Association of Automobile Manufacturers (CAAM) has sent a proposal to regulators asking for postponement of the China 6 particle number (PN) limit of $6 \times 10^{11}/\text{km}$ that is to be applied to new light-duty gasoline vehicles in the country from 1 July.

The proposal to delay is intended to give automakers more time to sell older models from their inventories that do not qualify for the new rules. These stocks have increased as a result of the downturn that has been exacerbated by the spread of the COVID-19 virus. Without a delay, carmakers risk having to scrap or refit millions of vehicles that will not be able to be sold in China under the new rules. A delay would also give carmakers more time to reconfigure their production lines and testing processes.

While China 6 requirements have been adopted in parts of the country already, a PN limit of $6 \times 10^{12}/\text{km}$ applies to gasoline vehicles prior to 1 July. Diesel vehicles have had to comply with a $6 \times 10^{11}/\text{km}$ PN limit since the China 5 stage.

The Dieselnets Update (available on subscription) is at dieselnets.com/newsletter/2020/03.php. The website of the CAAM is at www.caam.org.cn/english/.

ICCT Report on reducing Vehicle Emissions in Delhi

On 18 March 2020, the International Council on Clean Transportation (ICCT) reported on the commitment of the recently elected government in Delhi to reduce air pollution to a third of current levels.

The main priority, according to ICCT, is to add more than 11 000 buses to the existing fleet, as well as improving bus maintenance, depots and route planning.

Providing incentives, regulation and infrastructure for electric vehicles is also required, along with improving emissions from the existing vehicle fleet. This should include a scrappage scheme for two-wheelers. ICCT also says that the government should consider implementing a low or zero emission zone giving preferential access to electric vehicles.

The ICCT paper is available to read at theicct.org/blog/staff/reducing-vehicular-air-pollution-delhi-roadmap-new-government.

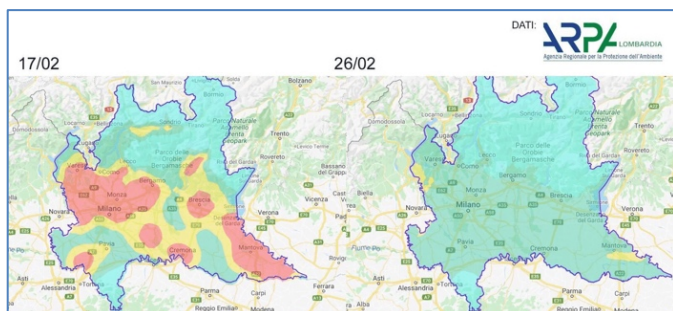
GENERAL

Coronavirus link to Air Pollution

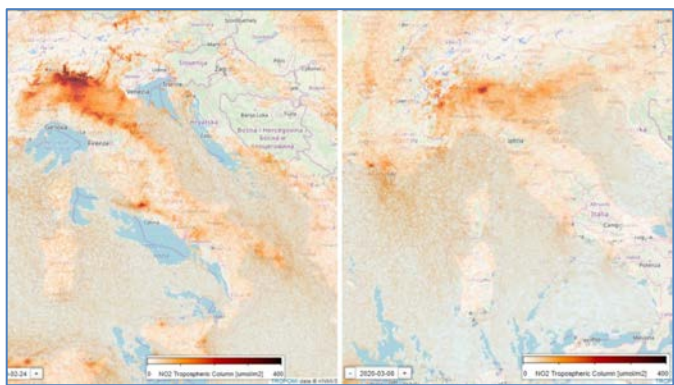
On 16 March 2020, the European Public Health Alliance (EPHA) warned that those living in polluted cities are more at risk from COVID-19.

The organisation says that air pollution can cause hypertension, diabetes and respiratory diseases, conditions that doctors are starting to link to higher mortality rates for COVID-19. A 2003 study on victims of the coronavirus SARS found that patients in regions with moderate air pollution levels were 84% more likely to die than those in regions with low air pollution.

EPHA points out that air pollution is the biggest environmental health risk in Europe and notes that Northern Italy is a pollution hotspot. It shares maps showing that levels of PM₁₀ and nitrogen dioxide (NO₂) have fallen significantly in that area since the introduction of social distancing measures.



PM₁₀ levels in Lombardy (17 and 26 February 2020)



NO₂ levels across Italy (24 February and 8 March 2020)

EPHA's press release can be found at epha.org/coronavirus-threat-greater-for-polluted-cities/.

European Space Agency images also show changes in NO₂ levels over China between December and March, with sharp reductions at the height of the outbreak followed by increases as the restrictions start to be lifted.

A video showing Chinese NO₂ emissions is at www.esa.int/Applications/Observing_the_Earth/Copernicus/Sentinel-5P/COVID-19_nitrogen_dioxide_over_China.

On 25 March, the European Environment Agency (EEA) issued a statement confirming the large decreases in air pollutant concentrations, seen through EEA's own data – recorded hourly through a network of more than 4 000 measurement stations.

NO₂ levels across Europe have fallen by up to about half of the previous week's levels and those of 2019 in some cities. Levels in Barcelona and Lisbon were both down by more than 50% from the same week in 2019 and by 40% the second to the third week of March. NO₂ reductions in major Italian cities (Milan and Rome) were less marked, down approximately a quarter for the last four weeks compared with the previous four-week period.

Hans Bruyninckx, EEA's Executive Director, said that the drop in air pollution is especially due to reduced traffic in cities. He went on to say that "...addressing long-term air quality problems requires ambitious policies and forward-looking investments. As such, the current crisis and its

multiple impacts on our society work against what we are trying to achieve, which is a just and well-managed transition towards a resilient and sustainable society."

The EEA statement is available to read in full at www.eea.europa.eu/highlights/air-pollution-goes-down-as.

London ULEZ suspended to help Key Workers during COVID-19 Pandemic

On 23 March 2020, the Mayor of London, Sadiq Khan, announced the suspension of the city's Ultra Low Emission Zone (ULEZ) and other charging schemes in order to ensure that key workers and delivery vehicles can move freely around the capital.

More information is at tfl.gov.uk/media/press-releases/2020/march/tfl-suspends-all-road-user-charging-schemes-to-help-critical-workers.

RESEARCH SUMMARY

Effects of Emissions and Pollution

Associations of personal exposure to air pollutants with airway mechanics in children with asthma, Linchen He, et al.; *Environment International* (May 2020), Vol. 138, 105647, [doi: 10.1016/j.envint.2020.105647](https://doi.org/10.1016/j.envint.2020.105647).

Impact of urban environmental exposures on cognitive performance and brain structure of healthy individuals at risk for Alzheimer's dementia, Marta Crous-Bou, et al.; *Environment International* (in press), [doi: 10.1016/j.envint.2020.105546](https://doi.org/10.1016/j.envint.2020.105546).

Association between diesel engine exhaust exposure and lung function in Australian gold miners, Mengran Du, et al.; *International Journal of Hygiene and Environmental Health* (May 2020), Vol. 226, 113507, [doi: 10.1016/j.ijheh.2020.113507](https://doi.org/10.1016/j.ijheh.2020.113507).

Temperature modulation of the adverse consequences on human mortality due to exposure to fine particulates: A study of multiple cities in China, Ying Zhang, et al.; *Environmental Research* (June 2020), Vol. 185, 109353, [doi: 10.1016/j.envres.2020.109353](https://doi.org/10.1016/j.envres.2020.109353).

Air Quality, Sources and Exposure

Pollution exposure and willingness to pay for clean air in urban China, Dong Guo, et al.; *Journal of Environmental Management* (May 2020), Vol. 261, 110174, [doi: 10.1016/j.jenvman.2020.110174](https://doi.org/10.1016/j.jenvman.2020.110174).

Air quality and health impacts from using ethanol blended gasoline fuels in China, Xinyu Liang, *Atmospheric Environment* (in press), [doi: 10.1016/j.atmosenv.2020.117396](https://doi.org/10.1016/j.atmosenv.2020.117396).

Spatial estimation of outdoor NO₂ levels in Central London using deep neural networks and a wavelet decomposition technique, Sheen Cabaneros, et al.; *Ecological Modelling* (May 2020), Vol. 424, 109017, [doi: 10.1016/j.ecolmodel.2020.109017](https://doi.org/10.1016/j.ecolmodel.2020.109017).

Implementation of various hypothetical low emission zone scenarios in Greater Paris: Assessment of fine-scale reduction in exposure and expected health benefits, Sabine Host, et al.; *Environmental Research* (in press), [doi: 10.1016/j.envres.2020.109405](https://doi.org/10.1016/j.envres.2020.109405).

Emissions Measurements and Modelling

Minimizing secondary pollutant formation through identification of most influential volatile emissions in gasoline exhausts: Impact of the vehicle powertrain technology, Kawsar Mehsein, et al.; *Atmospheric Environment* (in press), doi: [10.1016/j.atmosenv.2020.117394](https://doi.org/10.1016/j.atmosenv.2020.117394).

Characterization of renewable diesel particulate matter gathered from non-premixed and partially premixed flame burners and from a diesel engine, Marlon Cadrazco, et al.; *Combustion and Flame* (April 2020), Vol. 214, pp. 65-79, doi: [10.1016/j.combustflame.2019.12.018](https://doi.org/10.1016/j.combustflame.2019.12.018).

On-road emission measurements of reactive nitrogen compounds from heavy-duty diesel trucks in China, Liqiang He, et al.; *Environmental Pollution* (July 2020), Vol. 262, 114280, doi: [10.1016/j.envpol.2020.114280](https://doi.org/10.1016/j.envpol.2020.114280).

A holistic evaluation of the impact of UK renewable strategy on emissions from compression ignition engines, A. van Niekerk and P. Kay; *Fuel* (July 2020), Vol. 271, 117586, doi: [10.1016/j.fuel.2020.117586](https://doi.org/10.1016/j.fuel.2020.117586).

Study on Exhaust Emission Test of Diesel Vehicles Based on PEMS, Shan Guor, et al.; *Procedia Computer Science* (2020), Vol. 166, pp. 428-433, doi: [10.1016/j.procs.2020.02.070](https://doi.org/10.1016/j.procs.2020.02.070).

Comparison between idling and cruising gasoline vehicles in primary emissions and secondary organic aerosol formation during photochemical ageing, Yanli Zhang, et al.; *Science of The Total Environment* (June 2020), Vol. 722, 137934, doi: [10.1016/j.scitotenv.2020.137934](https://doi.org/10.1016/j.scitotenv.2020.137934).

Driving cycles that reproduce driving patterns, energy consumptions and tailpipe emissions, Luis Quirama, et al.; *Transportation Research Part D: Transport and Environment* (May 2020), Vol. 82, 102294, doi: [10.1016/j.trd.2020.102294](https://doi.org/10.1016/j.trd.2020.102294).

Emissions Control, Catalysis, Filtration

A MnO₂-based catalyst with H₂O resistance for NH₃-SCR: Study of catalytic activity and reactants-H₂O competitive adsorption, Ningqiang Zhang, et al.; *Applied Catalysis B: Environmental* (August 2020), Vol. 270, 118860, doi: [10.1016/j.apcatb.2020.118860](https://doi.org/10.1016/j.apcatb.2020.118860).

The origin, transport, and evolution of ash in engine particulate filters, Yujun Wang, et al.; *Applied Energy* (April 2020), Vol. 263, 114631, doi: [10.1016/j.apenergy.2020.114631](https://doi.org/10.1016/j.apenergy.2020.114631).

Simulation of Flow Patterns in Particulate Filters with Various Viscous Models, Ileana Mesquida, et al.; *Emiss. Control Sci. Technol.* (2020), doi: [10.1007/s40825-020-00158-y](https://doi.org/10.1007/s40825-020-00158-y).

Impacts of Exhaust Transfer System Contamination on Particulate Matter Measurements, Jiacheng Yang, et al.; *Emiss. Control Sci. Technol.* (2020), doi: [10.1007/s40825-020-00155-1](https://doi.org/10.1007/s40825-020-00155-1).

g-C₃N₄ catalyst material preparation and application in automobile exhaust purification, Shengchao Cui, et al.; *Materials Chemistry and Physics* (in press), doi: [10.1016/j.matchemphys.2020.122867](https://doi.org/10.1016/j.matchemphys.2020.122867).

Property and structure of various platinum catalysts for low-temperature carbon monoxide oxidations, S.Dey and G. Dhal; *Materials Today Chemistry* (June 2020), Vol. 16, 100228, doi: [10.1016/j.mtchem.2019.100228](https://doi.org/10.1016/j.mtchem.2019.100228).

Analysis of methods towards reduction of harmful pollutants from Diesel engines, Ante Kozina, et al.; *Journal of Cleaner Production* (in press), doi: [10.1016/j.jclepro.2020.121105](https://doi.org/10.1016/j.jclepro.2020.121105).

Effect of after-treatment systems on particulate matter emissions in diesel engine exhaust, Barbara Apicella, et al.; *Experimental Thermal and Fluid Science* (August 2020), Vol. 116, 110107, doi: [10.1016/j.expthermflusci.2020.110107](https://doi.org/10.1016/j.expthermflusci.2020.110107).

Phase-separated Ce-Co-O catalysts for CO oxidation, Ruishi Zhang, et al.; *International Journal of Hydrogen Energy* (in press), doi: [10.1016/j.ijhydene.2020.02.210](https://doi.org/10.1016/j.ijhydene.2020.02.210).

Effects of iron-based fuel borne catalyst addition on microstructure, element composition and oxidation activity of diesel exhaust particles, Junheng Liu, et al.; *Fuel* (June 2020), Vol. 270, 117597, doi: [10.1016/j.fuel.2020.117597](https://doi.org/10.1016/j.fuel.2020.117597).

A highly effective urchin-like MnCrO_x catalyst for the selective catalytic reduction of NO_x with NH₃, Yuan-zhen Liu, et al.; *Fuel* (July 2020), Vol. 271, 117667, doi: [10.1016/j.fuel.2020.117667](https://doi.org/10.1016/j.fuel.2020.117667).

Transport, Climate Change & Emissions

On the effects of increased coolant temperatures of light duty engines on waste heat recovery, Vikram Singh, et al.; *Applied Thermal Engineering* (May 2020), Vol. 172, 115157, doi: [10.1016/j.applthermaleng.2020.115157](https://doi.org/10.1016/j.applthermaleng.2020.115157).

Tyre and road wear particles (TRWP) - A review of generation, properties, emissions, human health risk, ecotoxicity, and fate in the environment, Beate Bänsch-Baltruschat, et al.; *Science of The Total Environment* (in press), doi: [10.1016/j.scitotenv.2020.137823](https://doi.org/10.1016/j.scitotenv.2020.137823).

Non-exhaust particle emissions under various driving conditions: Implications for sustainable mobility, A. Beji, et al.; *Transportation Research Part D: Transport and Environment* (April 2020), Vol. 81, 102290, doi: [10.1016/j.trd.2020.102290](https://doi.org/10.1016/j.trd.2020.102290).

Car sharing and transformations in households travel patterns: Insights from emerging proto-practices in Norway, Tom Julsrud and Eivind Farstad; *Energy Research & Social Science* (August 2020), Vol. 66, 101497, doi: [10.1016/j.erss.2020.101497](https://doi.org/10.1016/j.erss.2020.101497).

Energy performance and well-to-wheel analysis of different powertrain solutions for freight transportation, Simone Lombardi, et al.; *International Journal of Hydrogen Energy* (in press), doi: [10.1016/j.ijhydene.2020.02.181](https://doi.org/10.1016/j.ijhydene.2020.02.181).

Net emission reductions from electric cars and heat pumps in 59 world regions over time, Florian Knobloch, et al.; *Nature Sustainability* (2020), doi: [10.1038/s41893-020-0488-7](https://doi.org/10.1038/s41893-020-0488-7).

FORTHCOMING CONFERENCES

CANCELLED SAE World Congress Experience (WCX)

21-23 April 2020, Detroit, USA
www.sae.org/attend/wcx

CANCELLED 41st International Vienna Motor Symposium

22-24 April 2020, Vienna, Austria
wiener-motorensymposium.at/en

CANCELLED TRA2020 Rethinking Transport towards Clean and Inclusive Mobility

27-30 April 2020, Helsinki, Finland
traconference.eu

TRA, The Transport Research Arena is the biggest European Research and Technology Conference on transport and mobility. In 2020 TRA is themed "Rethinking transport - towards clean and inclusive mobility" and brings together the experts from around the world to discuss the newest innovations and the future of mobility and transport.

CANCELLED 9th AVL Large Engines Techdays

28-29 April 2020, Graz, Austria
www.avl.com/large-engines-techdays

POSTPONED Integer Emissions Summit & AdBlue Forum Europe

27-29 May 2020, Frankfurt, Germany
www.argusmedia.com/en/conferences-events-listing/integer-emissions-summit-europe

32nd International AVL Conference "Engine & Environment" - Zero-impact Mobility

28-29 May 2020, Graz, Austria
www.avl.com/engine-environment

POSTPONED Sustainable Internal Combustion Engine Symposium

16-18 June 2020, Stuttgart, Germany
www.sustainable-ic-engine.com/en

The Sustainable Internal Combustion Engine Symposium discusses and debates the future of gasoline, diesel and alternative-fuel IC engines. This conference is about how the traditional automotive powertrain has a long future ahead of it when it is developed and advanced beyond its current brief and design constraints.

Cambridge Particle Meeting

19 June 2020, Cambridge, England
www.cambridgeparticlemeeting.org

CANCELLED 24th ETH-Conference on Combustion Generated Nanoparticles

22-25 June 2020, Zürich, Switzerland
www.nanoparticles.ch

The ETH Conference on Combustion-Generated Nanoparticles serves as an interdisciplinary platform for expert discussions on all aspects of nanoparticles, freshly emitted from various sources, aged in ambient air, technical mitigation aspects, impact of particles on health, environment and climate and particle legislation. The conference brings together representatives from research, industry and legislation.

8th International Conference of the Fuel Science Center

23-25 June 2020, Aachen, Germany
www.fuelcenter.rwth-aachen.de/cms/Fuelcenter/Austausch/Internationale-Konferenz/~dcsks/8-Internationale-Konferenz/lidx/1/

4th Real Driving Emissions Forum

30 June-1 July 2020, Prague, Czech Republic
bisgrp.com/event/real-driving-emissions-conference-berlin-2/

CO₂ Reduction for Transport Systems Conference

7-8 July, Turin, Italy
conferences.ata.it

6th International Conference Diesel Powertrains 3.0

8-9 July 2020, Turin, Italy
www.fev.com/en/coming-up/fev-conferences/fev-conference-diesel-powertrains-30/introduction.html.

Despite the ongoing public discussion, the modern Diesel engine represents a highly attractive powertrain. The latest developments demonstrate, that Diesel-powered vehicles are among the cleanest vehicles available in the marketplace, while maintaining their superior fuel economy compared to other propulsion systems. Its high efficiency positions the Diesel engine as an attractive element for future powertrain line-ups, even under more tightened regulatory boundary conditions and simultaneously altering market conditions. The conference is for the first time integrating heavy-duty On-/Off-Highway themes into the programme.

SIA Powertrain & Energy

2-3 September 2020, Rouen, France (postponed from June)
www.sia.fr/evenements/193-sia-powertrain-energy-rouen-2020

International Transport and Air Pollution Conference

15-16 September 2020, Graz, Austria
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.

11th VERT Forum

17 September 2020, Dübendorf, Switzerland (postponed from March)
www.vert-certification.eu

8th International MinNO_x Conference

22-23 September 2020, Berlin, Germany
www.iav.com/en/events/minnox

SAE Powertrains, Fuels and Lubricants

22-24 September 2020, Krakow, Poland
www.sae.org/pfl

FVV 2020 Autumn Conference

24-25 September 2020, Würzburg, Germany
www.fvv-net.de/en/events

29th Aachen Colloquium

5-7 October 2020, Aachen, Germany
www.aachener-kolloquium.de/en

SAE Heavy-Duty Diesel Emissions Control Symposium

13-14 October 2020, Gothenburg, Sweden
www.sae.org/attend/heavy-duty-diesel-emissions-control-symposium

IRU World Congress

19-21 October 2020, Berlin, Germany
www.iruworldcongress.com

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/introduction.html

Deadline for abstract: 20 April 2020.

2020 Annual POLIS Conference

2-3 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.

Call for speakers opens in March 2020