

NEWSLETTER

International Regulatory Developments

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EUROPE

European Commission adopts Co-decision Proposal on Real-Driving Emissions

On 14 June 2019, in response to a ruling by the General Court, the European Commission adopted legislative proposal COM(2019) 208 final which reinserts certain aspects of Real-Driving Emissions testing (RDE) in the Euro 6 emissions Regulation.

In December 2018, the General Court annulled some of the provisions of EU legislation on Real-Driving Emissions. The Court judged that so-called "conformity factors" set in the RDE Package 2 should not have been adopted via comitology procedure, but via ordinary legislative procedure. The annulment is of a partial nature and does not affect the actual RDE test procedure, which remains in force and must still be conducted at type-approval.

The Court delayed the effects of the partial annulment until February 2020 to give time to the Commission to implement the judgment. To avoid legal uncertainty on the Euro 6d-temp type-approvals granted since September 2017, the Commission proposes to reinsert the same conformity factors into the legal text (see table). The date of application of the Euro 6d-temp and Euro 6d stages remain unchanged compared to RDE Package 2.

In Annex I to Regulation (EC) No 715/2007, the following Table 2a is inserted:

"Table 2a

Real Driving Emissions Conformity Factors

	Oxides of nitrogen (NO _x)	Number of particles (PN)	Carbon monoxide (CO) ⁽¹⁾	Total hydrocarbons (THC)	Combined hydrocarbons and oxides of nitrogen (THC + NO _x)
$CF_{pollutant}^{final}$ ⁽²⁾	1,43	1,5	-	-	-
$CF_{pollutant}^{temp}$ ⁽³⁾	2,1	1,5	-	-	-

⁽¹⁾ CO emissions shall be measured and recorded for all RDE tests.

⁽²⁾ $CF_{pollutant}^{final}$ is the conformity factor used to determine compliance with the Euro 6 emission limits by taking into account the technical uncertainties linked with the use of the Portable Emission Measurement Systems (PEMS).

⁽³⁾ $CF_{pollutant}^{temp}$ is the temporary conformity factor that may be used upon request of the manufacturer as an alternative to $CF_{pollutant}^{final}$ during a period of 5 years and 4 months following the dates specified in Article 10(4) and (5)."

In the explanatory memorandum, the Commission notes that during the stakeholder consultation process on: the composition of the new diesel vehicle fleet regarding NO_x reduction technologies; any available data on the current real-driving emission performance of these vehicles; and information on the generic improvement potential of their NO_x emission performance, only AECC and one Tier 1 supplier provided relevant information and data.

The Commission is tabling the legal proposal via the ordinary legislative procedure (i.e. co-decision), as requested by the General Court.

Once adopted by the European Parliament and the Council, the Regulation will be directly applicable in all Member States and will become mandatory three days after publication in the EU Official Journal.

The legislative proposal is at <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1560514030186&uri=COM:2019:208:FIN>.

Council adopts CO₂ Standards for Trucks

On 13 June 2019, the Council adopted Europe's first-ever CO₂ emission standards for trucks and other heavy-duty vehicles.

Under the new rules, manufacturers will be required to cut carbon dioxide emissions from four categories of new trucks on average by 15% from 2025 and by 30% from 2030, compared with 2019 levels.

Those targets are binding, and truck manufacturers which do not comply will have to pay a financial penalty in the form of an excess emissions premium.

In addition, specific measures will ensure the availability of robust and reliable data. Data will be obtained through on-board devices which monitor the actual fuel and energy consumption of heavy-duty vehicles.

The Commission presented the proposal on this new regulation on 17 May 2018. It sets CO₂ emission performance standards for new heavy-duty vehicles and thereby helps Member States achieve their emission reduction targets agreed under the effort sharing regulation. A provisional agreement was struck between the European Parliament and the Council presidency on 19 February 2019.

The formal adoption of the regulation by the Council is the final step in the procedure. The Regulation will enter into force on the twentieth day following that of its publication in the Official Journal of the EU. It is binding in its entirety and directly applicable in all Member States.

CO₂ emissions from heavy-duty vehicles including lorries, buses and coaches, represent around 6% of total CO₂ emissions in the EU and 27% of total road transport CO₂ emissions. Already a year ago, in June 2018, the Council had adopted a regulation which provides the technical basis for the new rules by setting out in detail how CO₂ emissions will need to be monitored and reported.

The full text of the Regulation is available at <https://data.consilium.europa.eu/doc/document/PE-60-2019-INIT/en/pdf>.

EU boosts Market for Clean Vehicles with Binding Procurement Targets

On 13 June 2019, the Council adopted the revision of the 2009 Clean Vehicle Directive with binding targets for zero- and low-emission vehicles in public procurement in each Member State.

The new rules will increase market certainty, stimulate innovation and promote the global competitiveness of European industry. Clean vehicles will play a key role in cutting greenhouse gas emissions and air pollutant emissions, helping the EU to meet its Paris Agreement commitments.

The reform sets out minimum procurement targets at national level for clean light-duty vehicles (cars and vans) and heavy-duty vehicles (trucks and buses), with a simple method for their calculation. The measures involve two different reference periods, one ending in 2025 and the other in 2030.

The text includes a new definition of a 'clean vehicle'. The definition of a clean light-duty vehicle is based on CO₂ emission standards, with a zero CO₂ emission threshold from 2026 onwards. The definition of clean heavy-duty vehicles is based on the use of alternative fuels. In addition, there are sub-targets for zero-emission buses.

The scope of the rules is extended in terms of the procurement practices covered. The new rules will also apply to a wider range of services, including public road transport services, special-purpose passenger services, refuse collection, and postal and parcel delivery services.

A provisional agreement was reached between the Romanian presidency and the European Parliament on 11 February 2019. The European Parliament voted on 18 April 2019.

The Directive will now be published in the EU Official Journal. It will enter into force 20 days after publication. Member States will then have two years in which to adopt national provisions. They will need to report to the Commission on the implementation of the rules every three years, with the first report due by 18 April 2026.

The full text of the Directive is at <http://data.consilium.europa.eu/doc/document/PE-57-2019-INIT/en/pdf>.

Parliament Rapporteur on “Pot-Pourri” Proposal to be replaced

The Rapporteur of the European Parliament's Environment Committee (ENVI) on the proposal to reduce pollutant emissions from road vehicles (Euro 5 and 6), the so-called “pot-pourri” proposal, will be replaced. Rapporteur Albert Dess (EPP, Germany) together with the Shadow Rapporteurs Jørn Dohrmann (ECR, Denmark) and Keith Taylor (Greens/EFA, UK) will be replaced as they were not re-elected.

On the other hand, as the MEPs Miriam Dalli (S&D, Malta), Nils Torvalds (Renew Europe, Finland), Eleonora Evi (non-attached, Italy) and Jean-François Jalkh (Identity & Democracy, France) have been re-elected, they are likely to remain as Shadow Rapporteurs on the standstill proposal if attached to a political group.

The confirmation of Rapporteur and Shadow Rapporteurs is expected over the summer, once the new members of the ENVI Committee are officially announced.

The new ENVI Committee will be asked to decide whether to resume work, to ask the Commission to withdraw the proposal or to modify it. This will mean that work on the file is likely to be delayed until the end of 2019, as the

Parliament will need some time to reorganise following the elections.

The “Pot-pourri” proposal would amend: (1) Regulation (EC) 715/2007 on type approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6); and (2) Regulation (EC) 595/2009 on type-approval of motor vehicles and engines with respect to emissions from heavy duty vehicles (Euro VI). The aim of this proposal is to introduce a number of amendments in order to reduce pollutant emissions from road vehicles. More specifically, the proposal would include individual measures in the following areas: (1) accounting for the greenhouse gas effects of methane emissions as CO₂-equivalents in the vehicle type approval information; (2) low temperature emission limits for carbon monoxide, hydrocarbons and NO_x/NO₂; and (3) application of the ammonia limit with regard to heavy-duty vehicles.

Stakeholder Concerns on Heavy-duty Euro VI-E

During the public consultation period on the draft Regulation amending EU rules on the type-approval of motor vehicles and engines with respect to emissions from heavy duty vehicles (Euro VI-E), some stakeholders provided comments to the Commission.

The European Automobile Manufacturers' Association (ACEA) proposed delaying the compliance deadline from 1 January to 1 September 2021 for new types of vehicle or engine, and from 1 January to 1 September 2022 for all vehicles. In addition, ACEA called on the Commission to take into account the gas engines taking advantage of the derogation for PN in Step E.

It suggested using complete step 'E' for (a) diesel vehicles and engines from September 2021 for new type vehicles and September 2022 for all vehicles, and (b) for gas vehicles and engines from 2023 for new type vehicles and September 2024 for all vehicles. An earlier sub-step for gas engine (E-Temp) would be used from 2021 or 2022.

On the other hand, Transport & Environment (T&E) together with the International Council on Clean Transportation (ICCT) disagreed with the application date of Step E set in the proposal to 24 months as it would allow gas truck manufacturers to gain unfair competitive advantages over other drivetrain technologies. Therefore, T&E and the ICCT proposed reducing the difference in implementation between gas and diesel from the currently proposed 24 months to the originally proposed 12 months.

T&E also declared that, should Euro VI step E be enacted as now proposed, the majority of cold-start emissions would not be included in the data evaluation, allowing heavy-duty vehicles to continue to break emissions limits at cold start. It also called on the Commission to reintroduce its provision on coolant temperature and ambient temperature deviation limits as set in its previous draft.

Moreover, T&E opposed the proposed warm Conformity Factor (CF) and proposed it to be equal to the highest CF determined for that pollutant. Finally, it suggested that the Commission should reduce the CF for NO_x emissions for heavy-duty vehicles in line with the one for light-duty.

Following the consultation, amendments have been made, although not to the implementation dates.

During the meeting of the 'Technical Committee for Motor vehicles' (TCMV) held on 4 July 2019, Member States' experts adopted the draft measure, taking into account the comments submitted to the four-week public consultation.

As the TCMV issued a favourable opinion on the draft measure, the Commission will send it to the European Parliament and the Council to scrutinise for three months. If no objections are raised by co-legislators, the Commission will adopt the measure. It will then be published in the Official Journal and enter into force twenty days following its publication.

The link to the public consultation with stakeholder responses is at https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2019-3257202_en.

EC calls on Member States to step up Plans to implement Paris Agreement

On 18 June 2019, the European Commission published its assessment of Member States' draft plans to implement the EU's Energy Union objectives, and in particular the agreed EU 2030 energy and climate targets.

The Commission's assessment finds that the national plans already represent significant efforts but points to several areas where there is room for improvement, notably as concerns targeted and individualised policies to ensure the delivery of the 2030 targets and to stay on the path towards climate-neutrality in the longer term. The European Union is the first major economy to put in place a legally binding framework to deliver on its pledges under the Paris Agreement and this is the first time that Member States have prepared draft integrated National Energy and Climate Plans (NECPs).

In its analysis of the draft national plans, the Commission looked at their aggregated contribution to meeting the EU's Energy Union objectives and 2030 targets. As they stand, the draft NECPs fall short both in terms of renewables and energy efficiency contributions. For renewables, the gap could be as big as 1.6 percentage points. For energy efficiency, the gap can be as big as 6.2 percentage points (if considering primary energy consumption) or 6 percentage points (if considering final energy consumption).

Member States now have six months to raise their national levels of ambition.

Full details of the Commission's assessment are at http://europa.eu/rapid/press-release_IP-19-2993_en.htm.

European Council launches New Strategic Agenda 2019-2024

On 20 June 2019, the European Council launched its new Strategic Agenda for the next five years.

"In recent years, the world has become increasingly unsettled, complex and subject to rapid change. That creates both opportunities and challenges. Over the next five years, the EU can and will strengthen its role in this changing environment. Together, we will be determined and focused, building on our values and the strengths of our model. This is the only effective way to shape the future world, promote the interests of our citizens, businesses and societies, and safeguard our way of life", the Council said.

This Strategic Agenda provides an overall framework and direction for that response. It is intended to guide the work of the Institutions in the next five years. It focuses on four main priorities:

- protecting citizens and freedoms,
- developing a strong and vibrant economic base,
- building a climate-neutral, green, fair and social Europe,
- promoting European interests and values on the global stage.

Lastly, it sets out how to deliver on those priorities. In relation to the vision for a climate-neutral and green Europe, it states that Europe needs inclusiveness and sustainability, embracing the changes brought about by the green transition, technological evolution and globalisation while making sure no-one is left behind.

As the effects of climate change become more visible and pervasive, action to manage this existential threat needs to step up urgently. The EU can and must lead the way, by engaging in an in-depth transformation of its own economy and society to achieve climate-neutrality. This will have to be conducted in a way that takes account of national circumstances and is socially just.

The climate transition will offer a real opportunity to modernise and at the same time to become a global leader in a green economy. EU policies should be consistent with the Paris Agreement but the EU cannot be the only one to act: all countries should move forward and step up their climate action.

The Strategic Agenda says that the success of the green transition will depend on significant mobilisation of private and public investments, on having an effective circular economy, and an integrated, interconnected and properly functioning European energy market that provides sustainable, secure and affordable energy, in full respect of the Member States' right to decide on their energy mix. The EU will accelerate the transition to renewables, increase energy efficiency, reduce dependence on outside sources, diversify its supplies, and invest in solutions for the mobility of the future.

In parallel, the environment in our cities and our countryside must continue to improve and the quality of our air and waters must be enhanced; sustainable agriculture should be promoted, which is vital to guaranteeing food safety and fostering quality production.

Full details can be seen at www.consilium.europa.eu/en/press/press-releases/2019/06/20/a-new-strategic-agenda-2019-2024/.

European Environment Agency Provisional Data on New Vehicle CO₂ Emissions

On 24 June 2019, the European Environment Agency (EEA) published provisional data showing that average carbon dioxide (CO₂) emissions from new passenger cars registered in the EU in 2018 increased for the second consecutive year, reaching 120.4 grams of CO₂ per kilometre.

After a steady decline from 2010 to 2016, by almost 22 g/km of CO₂, average emissions from new passenger cars increased in 2017 by 0.4 g/km. According to provisional data, the upward trend continued with an additional increase of 2.0 g/km CO₂ in 2018.

Vans registered in the EU in 2018 emitted on average 158.1 g/km CO₂, 2.0 grams more than in 2017. This is the first increase in average CO₂ emissions from new vans since the regulation came into force in 2011, following a sharp decrease in 2017.

The main factors contributing to the increase in 2018 include the growing share of petrol cars in new registrations, in particular in the sport utility vehicle (SUV) segment. Moreover, the market penetration of “zero- and low-emission” vehicles, including electric cars, remained slow in 2018. With the 2021 target of 95 g/km CO₂ approaching, much faster deployment of cars with low emissions is needed across Europe.

Many factors affected the increase in CO₂ emissions from new vans in 2018, including an increase in the mass, engine capacity and size of the vehicles. The market share of petrol vehicles also increased, constituting 3.6% of the new vans fleet (2.4% in 2017). The share of “zero- and low-emission” vans remained at the same level (1.7%) as in 2017. Further efficiency improvements are needed to reach the EU target of 147 g/km CO₂ set for 2020.

The full EEA announcement is available at www.eea.europa.eu/highlights/average-co2-emissions-from-new.

Joint Research Centre Report on the Future of Road Transport

On 21 June 2019, the Joint Research Centre (JRC) of the European Commission published a report into the Future of Road Transport. It looks at the implications of automated, connected, low-carbon and shared mobility.

The report shows that these changes represent an opportunity to move towards a transport system that is

more efficient, safer, less polluting and more accessible than the current one centred on private car ownership.

The authors assess current and future trends in the road transport sector and identify two key success factors:

- Improved governance of the multimodal transport system where the role of all actors is defined and coordinated by accountable public authorities;
- Establishment of a network of European 'living labs' where innovative mobility solutions are introduced and tested with the direct involvement of citizens.

Between 1995 and 2015, the total number of passenger kilometres (pkm) in the EU-28 increased by 23.8% to 6 602 billion. The growth in road passenger transport is estimated at 16% during 2010-2030 and at 30% for 2010-2050. Road freight transport is projected to increase by 33% by 2030 and 55% by 2050.

By 2050, experts project that 84% of people in Europe will live in urban areas. People above 60 will make up one third of the population. This will require mobility systems that are inclusive and accessible to everyone.

The century-old car-centred view of personal transport takes a heavy toll on the economy, society and environment. For instance, in 2015, over 1 million road accidents causing personal injuries and 26 000 deaths occurred in the EU.

In some urban areas, such as London, commuters lose up to 100 hours per year in congestion. Productivity losses from road congestion account for 1% of the EU's gross domestic product.

Road transport is also a significant and growing contributor to air pollution and climate change, responsible for up to 30% of small particulate matter emissions in European cities, as well as for over 70% of CO₂ emissions in the EU from all modes of transport. Overall, more than half a million premature deaths are estimated yearly in the EU.

The results of the study show that global GHG emissions in transport could be halved between 2015 and 2050, contributing to mitigation of global warming to 2°C and below by the end of the century (see chart below).

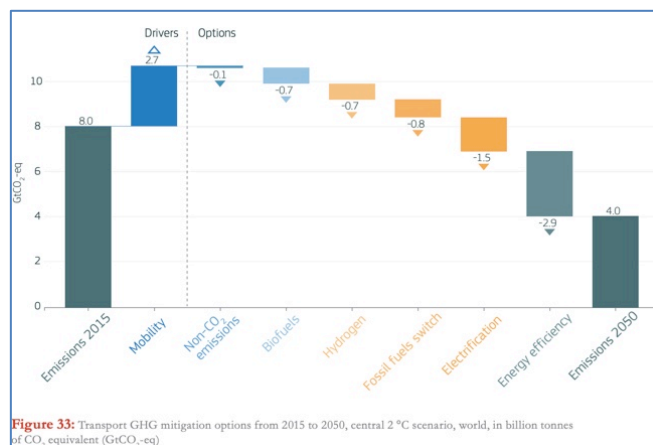
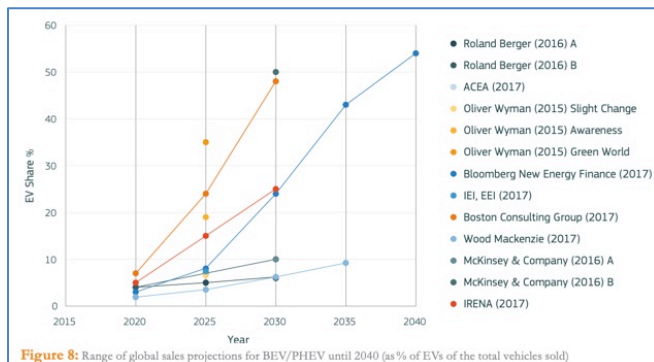


Figure 33: Transport GHG mitigation options from 2015 to 2050, central 2°C scenario, world, in billion tonnes of CO₂ equivalent (GtCO₂-eq)

From all the scenarios analysed in the different studies, it is clear that a significant contribution to reducing CO₂ emissions from transport will come from vehicle electrification.

The new European CO₂ targets for passenger cars set an ambitious 37.5% reduction of CO₂ emissions in 2030 compared to 2020 levels – this cannot be achieved without a significant market share of PHEVs, BEVs and FCEVs. As the chart below shows however, forecasts vary significantly as to the extent of electrification over the period being investigated.



The full report is at <https://ec.europa.eu/jrc/en/news/future-road-transport-what-we-will-drive-if-we-still-drive-all>.

EU increases JRC Testing Budget to enable Test Cars to be rented

On 26 June 2019, *EU Observer* reported that part of the JRC's increased budget for 2020 will be used to rent cars for testing rather than borrow them from vehicle manufacturers.

This will enable the JRC to freely publish test results, whereas now they can be subject to confidentiality clauses imposed by OEMs.

The report is available at <https://euobserver.com/environment/145264>.

CJEU says MS Courts have Jurisdiction on AQ Measurement & Implementation

On 26 June 2019, the Court of Justice of the European Union (CJEU) ruled that Member States have an obligation to establish air quality sampling points in such a way that they provide information on the most polluted locations, and the obligation to establish at least a minimum number of sampling points.

It is for the national courts to verify whether those obligations have been complied with. The case was brought by ClientEarth and residents of Brussels against Brussels-Capital Region and the Brussels Institute for Environmental Management.

While accepting that the competent national authorities have discretion to determine the actual location of the sampling points, the Court emphasises that that discretion is not exempt from judicial review. The location of sampling points is central to the air quality assessment and

improvement system, in particular where pollution level exceeds a certain threshold.

It is the responsibility of the competent national authorities to choose the location of sampling points in such a way as to minimise the risk that incidents in which limit values are exceeded may go unnoticed. Those authorities are required to base their decisions on sound scientific data and to prepare comprehensive documentation that includes evidence supporting the choice of the location of all monitoring sites. That documentation must be updated regularly to ensure that the selection criteria remain valid.

National courts also have jurisdiction to take all necessary measures in respect of the national authority concerned, to ensure that such points are sited in accordance with the criteria laid down in the European Air Quality directive.

As regards whether it is possible to establish an average value to assess whether limit values have been complied with, the CJEU states that the determination of the average of the values measured at all sampling points in a zone or agglomeration does not provide a valid indication as to the population's exposure to pollutants. In particular, such an average does not make it possible to determine the level of exposure of the population in general. That level must be measured at specific sampling points. Consequently, the CJEU finds that, for the purposes of the assessment as to whether limit values have been complied with, the pollution level measured at each individual sampling point is decisive.

The full press release can be read at

<https://curia.europa.eu/jcms/upload/docs/application/pdf/2019-06/cp190082en.pdf>.

French Mobility Orientation Bill

On 12 June 2019, the lower house of Parliament in France adopted in the Mobility Orientation Bill an article setting the goal of achieving carbon neutrality of land transport by 2050. This was welcomed by the French Minister for Transport, Elisabeth Borne.

To reach this goal, the draft law also sets a clear intermediate path, consistent with the objectives of the EU, the 2017 Climate Plan and the national low carbon strategy. It includes two steps: 37.5% reduction in CO₂ emissions by 2030 and the end of the sale of cars using "fossil carbon energy" by 2040.

For Ms Borne, the draft bill has the necessary tools to support the development of less polluting transport modes (public transport, cycling, etc) and encourage the transition to clean vehicles. This includes a 40% increase in public transport investments, continuation of the scrapping scheme for the most polluting vehicles, incentives for purchasing electric or hydrogen cars, the objective to have five times more electric charging points in 2022, car-sharing schemes and incentives, the bicycle plan aiming at increasing the bicycle share in transport from 3 to 9%, and the aim to include aviation and shipping in the ecological transition.

More info (in French) is at www.ecologique-solidaire.gouv.fr/projet-loi-dorientation-des-mobilites-fin-des-ventes-voitures-energies-fossiles-carbonees-dici-2040.

Commission approves €431m Support for Cleaner Transport in German Cities

The European Commission has found German plans to support the retrofitting of municipal and commercial diesel vehicles to be in line with EU State aid rules. The measure should contribute to reducing nitrogen oxides (NOx) emissions by 1 450 tonnes per year, while limiting distortions of competition.

Commissioner Margrethe Vestager, in charge of competition policy, said: "Tackling air pollution is one of Europe's greatest challenges. So these three schemes provide a good incentive for vehicle operators in Germany to invest in cleaner vehicles in the most polluted German cities. This is a good example of how Member States can work to introduce measures that reduce air pollution, in line with both our rules and our common European objective of cleaner air for all."

The three schemes that Germany intends to set up, with an overall budget of around €431 million, will support the retrofitting of municipal and commercial vehicles (such as cleaning vehicles, garbage trucks and delivery vehicles) equipped with diesel engines. The public support will be available in over 60 municipalities (German Kommunen) where national limits NOx emissions were exceeded in 2017 and will cover the costs of both the retrofitting systems and their installation.

The measures are part of the German Federal Government's "Immediate Clean Air Programme for 2017-2020" (Sofortprogramm Saubere Luft 2017-2020), which aims to reduce NOx emissions as quickly as possible.

The planned support for the retrofitting is expected to lead to substantial reductions of NOx emissions in a very short period of time, improving air quality and public health, in particular in cities. More specifically, the German authorities estimate that the retrofitting will have the following impact:

Category of Vehicle	Expected Number of Vehicles Retrofitted	Expected Annual NO _x Reduction
Heavy Municipal (>3.5 tonnes)	8,120	750 tonnes
Heavy Commercial (3.5-7.5 tonnes)	20,000	400 tonnes
Light Municipal and Commercial (2.8-3.5 tonnes)	84,000	300 tonnes

The Commission approved the measures under EU State aid rules, because they contribute to EU environmental goals without unduly distorting competition. In November 2018, the Commission approved a German State aid scheme to support the retrofitting of diesel buses used for local public transport.

Full details of the ruling are available at http://europa.eu/rapid/press-release_IP-19-3247_en.htm.

France loses Landmark Court Case over Air Pollution

The French State has failed to do enough to limit air pollution around Paris, according to a landmark court ruling delivered after a woman and daughter with respiratory problems sued the nation.

The Administrative Court holds that the State was guilty of a fault due to insufficient measures taken in terms of air quality, between 2012 and 2016, in the Ile-de-France region. On the other hand, it considers that the prefect of police was not at fault in the management of the episode of pollution at the end of 2016.

A former inhabitant of the Paris suburb Seine-Saint-Denis, acting in her own name and on behalf of her minor daughter, has asked for compensation for damage resulting from failure to manage air pollution in Ile-de-France. The court however considered that there is not enough evidence that the poor health conditions of the applicant and her daughter are directly caused by insufficient measures taken by the State.

The court notes in its judgment that the concentration thresholds of certain air pollutants were repeatedly exceeded between 2012 and 2016 in the Ile-de-France region. It concludes that the air quality plan for Ile-de-France adopted on 7 July 2006 and revised on 24 March 2013, as well as its implementation, are insufficient with regard to the obligations fixed by the EU Air Quality Directive 2008/50/EC. Consequently, the court considers that is the responsibility of the State.

The full court ruling (in French) can be found at <http://montreuil.tribunal-administratif.fr/Actualites/Actualites-Communiqués/Communiqué-de-presse-du-25-juin-2019>.

LowCVP publishes Resources to help Vehicle Operators tackle Air Pollution

On 20 June 2019, to coincide with National Clean Air Day, the Low Carbon Vehicle Partnership (LowCVP) published a Clean Vehicle Retrofit Technology Guide to highlight the role that the wide range of retrofit technologies can play in improving air quality by cleaning up the existing vehicle fleet.

As part of the UK plan for tackling roadside nitrogen dioxide (NO₂) concentrations, the Department for Environment (DEFRA) and the Department for Transport (DfT) have defined the introduction of Clean Air Zones (CAZ) to discourage the use of older, more polluting vehicles in areas where air quality is worst. To support business and vehicle operators in meeting the emissions standards, the Joint Air Quality Unit (a collaboration between DEFRA and DfT) commissioned the Energy Saving Trust and the LowCVP to produce a robust accreditation process for retrofit technologies; the Clean Vehicle Retrofit Accreditation Scheme (CVRAS).

The Clean Vehicle Technology Guide provides an in-depth explanation of the proven retrofit technology solutions and

suppliers that have been approved under the CVRAS, demonstrating that they can help existing vehicles achieve Euro 6/VI-equivalent emissions levels.

NOx abatement technologies such as Selective Catalytic Reduction (SCR) and Euro VI engine repower can provide cost-effective alternatives to purchasing new CAZ- or ULEZ-compliant vehicles. Of course, retrofitting a fully electric drivetrain will also eliminate tailpipe emission, but these too, need to be accredited to ensure robust conversion standards.

The CVRAS standards have also been adopted by Transport Scotland and Transport for London (TfL), so that a vehicle with CVRAS-approved technology installed can enter the Low Emission Zones in Scotland, the CAZs across England and the Ultra-Low Emission Zone (ULEZ) in London, without receiving a penalty charge.

The Clean Vehicle Retrofit Technology Guide also provides insight into the developing policy framework relating to air quality in the UK's towns and cities as well as national and local funding schemes designed to support vehicle operators and businesses in retrofitting their vehicles.

The CVRAS covers buses, coaches, trucks, refuse collection vehicles and black cabs. Van and passenger car processes have been established to allow options in these categories too. The scheme is open to all retrofit technologies that can demonstrate Euro VI-equivalent emissions or better. Technologies currently approved under CVRAS are:

- Exhaust aftertreatment: Selective Catalytic Reduction
- Diesel Euro VI System Repower
- Battery Electric Repower
- Repower and LPG Conversion

Full details of these resources are available at www.lowcvp.org.uk/news/lowcvp-publishes-new-resources-to-help-vehicle-operators-tackle-air-pollution-on-clean-air-day_3961.htm.

NORTH-AMERICA

EPA National Programme Guidance prioritises stopping Defeat Devices

On 7 June 2019, the U.S. Environmental Protection Agency (EPA) released its 2020-2021 National Programme Guidance for the Office of Enforcement and Compliance Assurance (OECA).

The guidance is a preliminary planning document and identifies the national compliance and enforcement activities that the EPA should perform in FY 2020-2021 consistent with the budget and the Administrator's priorities. Included in the report are EPA's high priority areas of focus, referred to as National Compliance Initiatives (NCIs). EPA selected six NCIs for the FY 2020-2023 cycle, three of which are directly related to air quality.

The six National Compliance Initiatives are:

- Creating cleaner air for communities by reducing excess emissions of harmful pollutants from stationary sources,
- Reducing hazardous air emissions from hazardous waste facilities,
- Stopping aftermarket defeat devices for vehicles and engines,
- Reducing significant non-compliance with national pollutant discharge elimination system permits,
- Reducing non-compliance with drinking water standards at community water systems,
- Reducing risks of accidental releases at industrial and chemical facilities.

Regarding the NCI for defeat devices, the report says it will focus on stopping the manufacture, sale, and installation of aftermarket defeat devices on vehicles and engines used on public roads, as well as on non-road vehicles and engines.

For a copy of the guidance, go to www.epa.gov/sites/production/files/2019-06/documents/fy-20-21-oeqa-np-guidance.pdf.

Canada and California sign Agreement to work on Cleaner Transportation

On 26 June 2019, California and Canada signed a Memorandum of Understanding committing both governments to work together on developing their respective regulations to cut greenhouse gas emissions from light-duty vehicles, such as those currently in effect in Canada, California and the 13 U.S. states that have adopted California's standards.

Canada is currently reviewing its light-duty vehicle standards to help people drive fuel-efficient cars that can cut pollution and reduce fuel costs.

The partnership will see Canada and California work together to accelerate the adoption of zero-emission vehicles like electric cars. This could include sharing lessons learned by both jurisdictions about requirements, incentives, and dealer inducements to boost sales, along with sharing approaches to developing charging infrastructure.

The two jurisdictions will also share technical information and best practices in regulating cleaner fuels, as California does today through its Low-Carbon Fuel Standard. Canada is developing a Clean Fuel Standard that will cut emissions by 30 million tonnes in 2030.

The cooperation will take a variety of forms, including establishing a working group that meets annually, sharing policy information and programme design, providing capacity building and technical support, exchanges of personnel, cooperative research and development, and joint organisation of symposia and training. The two regulatory agencies will also work together on emissions testing and enforcement of vehicle regulations.

The full Memorandum of Understanding is at www.climatechange.ca.gov/climate_action_team/intergovernmental/ECCC-CARB-MOU-June-26.pdf.

ASIA PACIFIC

China's Clean Diesel Action Plan: 2018-2020

On 29 May 2019, the International Council on Clean Transportation (ICCT) published a summary of China's clean diesel action plan for 2018-2020.

In January 2019, China launched a new action plan to address air pollution by cleaning up diesel-powered on-road vehicles, off-road equipment, and ships. This plan is one part of the larger, three-year National Plan of Blue-Sky Defence, and it places stricter requirements on air pollution-prone areas.



The plan details 18 different actions over four programme areas: clean diesel vehicles, clean diesel engines, clean transportation, and clean diesel fuel; with three overarching targets:

- ensure that 90% of diesel vehicles are in compliance with current emission standards (95% in key regions);
- ensure that 95% of diesel fuel meets 10 ppm sulfur content limit, and that 95% of urea (by volume) is in compliance with current national standards (98% in key regions); and
- increase railroad freight transportation by 30% compared with 2017 level.

The ICCT summary is at www.theicct.org/sites/default/files/publications/ICCT_China_Clean_Clean_Diesel_2018_2020_20190529.pdf.

Japan announces more stringent 2030 Auto Average Fuel Economy Standard

In early June 2019, the Japanese government announced new standards that require automakers to boost their average fuel economy by 32% (to 25.4 km/l) by fiscal year 2030 from fiscal year 2016.

Japan already mandates a 24% improvement by fiscal year 2020 from 11 years prior. *Nikkei Asian Review* reports that

the relevant rules will be revised by March 2020. Acknowledging that the new mandate will be challenging, the government claims that the new standards are necessary for the Japanese automotive industry to remain competitive with their European and Chinese counterparts. The move will mean that Japanese automobile manufacturers will have to sell more electric and hybrid cars. When calculating the average fuel efficiency of the vehicle, the new rules will also take into account the carbon dioxide (CO₂) emitted when generating electricity to operate the electric vehicle, converting it into a measure of fuel efficiency.

According to Japan's Ministry of Industry, only 24 000 electric cars were registered in Japan in 2017, which corresponds to a market share of less than 1%. With the new rules, the market share of electric and plug-in hybrid vehicles is expected to increase to 20-30% by 2030, or the equivalent of approximately one million plug-in vehicles in the fleet.

More info is at <https://asia.nikkei.com/Business/Automobile/Japan-mandates-cars-to-be-30-more-fuel-efficient-by-2030>.

AFRICA

East African States working to harmonise Vehicle Emission Standards

On 10-11 June 2019, East African Community (EAC) representatives met to discuss harmonisation of vehicle emission standards within the sub-region. This is the next step needed to reduce vehicle emissions after cleaner fuels were introduced in 2015.

Over 50 participants from Kenya, Uganda, Tanzania, Rwanda, Burundi and the East Africa Community Secretariat recommended the importation and assembly of cleaner vehicles – at a minimum of Euro 4/ IV emission standards for all vehicle types through a harmonised process. The workshop, organised by UN Environment (UNEP) with funding from the Climate and Clean Air Coalition, brought together representatives from government, oil and vehicle industry, academia, media and non-governmental organisations.

The challenges of air pollution in East Africa attributed to the transport sector - as well as the realisation that the region has an old and ageing vehicle fleet - were identified as the major threat to public health and the environment. Country vehicle analysis showed that a lack of stringent vehicle regulations in the region was leading to the importation or assembly of vehicles with no or obsolete emission technologies. Stakeholders agreed that a "business as usual" culture would not achieve the shift needed towards better air quality and to meet the Paris Climate Agreement targets. Consequently, the sub-region agreed to move towards Euro 4/IV vehicle emission standards as well as legislate for periodic emissions testing for in-use vehicles. The role of the media in promoting cleaner consumer choices was emphasised, along with

partnerships amongst the various stakeholders in policy and standards development and implementation.

Better information on the region’s vehicle profile, health impact assessments, and cost-benefit analysis of cleaner vehicle technologies were highlighted as integral to inform policy making. As a way forward, draft regionally harmonised standards will be prepared by Tanzania Bureau of Standards for consideration by the other countries.

More details including presentations are available at

www.unenvironment.org/events/workshop/east-africa-community-harmonize-vehicle-emission-standards

UNITED NATIONS

Beat Air Pollution to protect Health: World Environment Day 2019

On 5 June 2019, governments, industry, communities and individuals around the world commemorated World Environment Day, the United Nations’ biggest annual event for positive environmental action, encouraging worldwide awareness and commitment to protect our planet.

This year’s celebrations, held under the theme ‘Beat Air Pollution’, called upon people to explore renewable energy and green technologies, and improve air quality in cities and regions across the world. More than 6 billion people – one third of them children – regularly breathe air that is so polluted it puts their health and well-being at risk.

Spearheaded by China, the official host of the global World Environment Day celebrations, UN Environment’s campaign to #BeatAirPollution culminated into a record number of registered events and commitments.

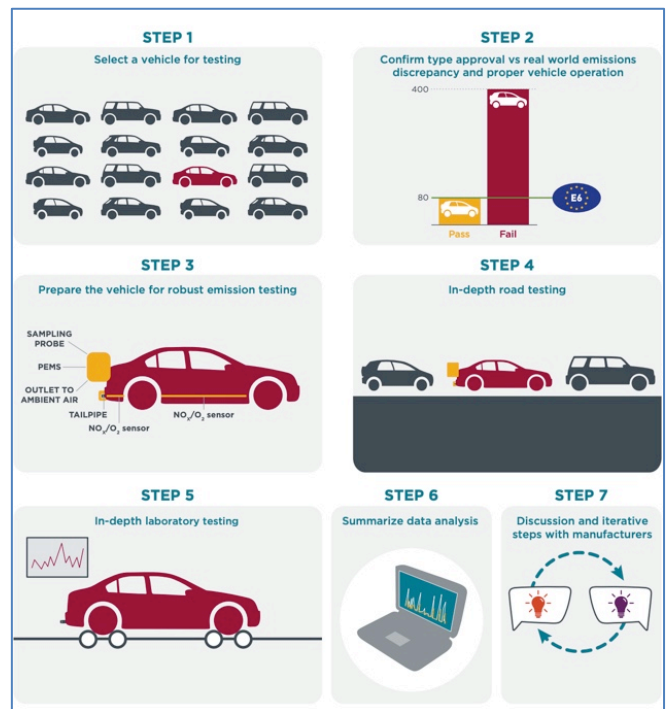
“Protecting our blue skies may be difficult, but our future relies on it,” Joyce Msuya, acting Executive Director of UN Environment, said during the global celebrations in Hangzhou. “And they are our blue skies. It doesn’t matter if you’re in Beijing or Beirut, when we look up, we see the same sky. And I think when we look to China, we see many examples of how to protect it.”

In China, by implementing far-reaching measures at the national- and state-level government, such as 100% electric public transportation, curtailing outputs from factories and allocating more than \$10 billion (€8.7 billion) to address air quality, several cities saw the concentration of PM_{2.5} drop dramatically.

GENERAL

ICCT Methodology for Vehicle Testing to catch Defeat Devices

On 20 June 2019, the International Council on Clean Transportation (ICCT) published a fact sheet detailing a practical, seven-step vehicle testing methodology that can be adapted to different regulatory contexts and research purposes.



The methodology was demonstrated in tests performed using two non-RDE compliant Mercedes-Benz C-Class Euro 6b vehicles, the diesel versions of a C180 and a C200. The paper claims to identify defeat devices likely being employed on the C180 and C200 to optimise NOx emissions control under type-approval testing conditions and reduce emissions-control effectiveness in real-world driving. While the study focuses on excess NOx, emissions from diesel passenger cars in the EU, the techniques and procedures described can be readily applied to other regions, pollutants, and vehicle types.

The study categorised the potential defeat devices, all of which would likely be considered illegal under U.S. regulatory guidance, as follows:

- Reduced exhaust gas recirculation (EGR) based on ambient temperature, around 12°C
- Reduced EGR based on some measure of engine temperature, such as coolant temperature
- Reduced selective catalytic reduction (SCR) efficiency based on ambient temperature, around 12°C
- Reduced SCR efficiency based on some function of time, distance, or accumulated urea consumption since engine-on

ICCT says that robust regulatory guidance is important for enforcing defeat-device provisions, but rigorous enforcement testing outside the type-approval process, like the procedure demonstrated in the study, is also needed to determine whether manufacturers are in compliance. It says this testing methodology provides a sound basis for government agencies to engage with manufacturers, for third parties to urge vehicle alterations, and for regulators to begin enforcement actions.

The ICCT's report is available at www.theicct.org/publications/fact-sheet-catching-defeat-devices-201906.

OECD Report on Opportunities to improve Transport Tax

On 5 June 2019, the Organisation for Economic Co-operation and Development (OECD) Centre for Tax Policy and Administration published a report titled "Taxing vehicles, fuels, and road use: Opportunities for improving transport tax practice".

The paper discusses the main external costs related to road transport and the design of taxes to manage them. It provides an overview of evolving tax practice in the European Union and the United States and identifies opportunities for better alignment of transport taxes with external costs. It says that there is considerable scope for improving transport tax practice, notably by increasing the use of taxes based on road use. Distance charges offer great promise in delivering more efficient road transport. In heavily congested areas, targeted charges are a cost-effective way of reducing congestion. Fiscal objectives provide an impetus for change as improving vehicle fuel efficiency and fleet penetration of alternative fuel vehicles erode traditional tax bases, particularly those relating to fossil fuel use. A gradual shift from an energy-based approach towards distance-based transport taxes has the potential to establish a stable tax base in the road transport sector in the long run.

The OECD paper is at www.oecd-ilibrary.org/docserver/e7f1d771-en.pdf?expires=1559813831&id=id&accname=quest&checksum=53403BB6D4CE79BC6341491F694B5F31.

London Children's Day-Long Pollution Exposure in and outside Classrooms

On 18 June 2019, the Health & Environment Alliance (HEAL) published a study entitled "Healthy Air, Healthier Children", highlighting that air quality inside – as well as outside – primary schools across Europe must be improved to protect children's health and ensure optimal learning.

Data issued for London is built on a citizen science monitoring initiative that measured indoor and outdoor air pollutants at seven schools in Lambeth, which is one of the most polluted boroughs in London. It shows the presence of nitrogen dioxide (NO₂) inside and outside all classrooms, highlighting the urgent need to further tackle traffic pollution. The monitoring also found high levels of carbon dioxide (CO₂) inside classrooms, indicating the need for better ventilation.

Air pollution is the number one environmental threat to health in Europe and globally, leading to 400 000 premature deaths and hundreds of billions of euros in health costs in the EU each year. In the UK alone, around 40 000 deaths are attributable to exposure to air pollution. Evidence demonstrates that children are particularly at risk from polluted air, which can increase the risk of a child developing asthma and lead to an increase in the number

and severity of asthma attacks, especially if a child lives close to a busy road. Indeed, the UK has the highest prevalence of childhood asthma across Europe. Air pollution can also impact a child's heart, brain and nervous system development, even before birth.

For the HEAL citizen science monitoring project, particulate matter (PM), NO₂ and CO₂ were monitored during March-April 2019, with the active participation of schools and children and HEAL's partner organisation Sustrans. The initiative was also rolled out in five more European capitals – Warsaw, Berlin, Paris, Madrid and Sofia – totalling 50 schools.

In London, outdoor NO₂, measured at the school entrances for one month, came close to the annual EU legal limit and WHO guideline of 40 µg/m³, with averages of 35 µg/m³ and 36 µg/m³ NO₂ at two schools. These levels are averages, however, and are likely to have been higher during school hours, particularly drop off and pick up times, due to higher traffic volumes compared to evenings and weekends. The project also found NO₂ inside each of the seven classrooms ranging from an average of 12 µg/m³ up to 26 µg/m³. As there are no indoor sources of NO₂, this pollutant is travelling in from outside.

Keeping windows and doors closed to prevent pollution from entering is not a solution, as there is a need to air out classrooms, especially to decrease CO₂ levels. A previous study expressed the need to limit CO₂ to 1000 ppm to prevent a negative impact on academic performance, as higher concentrations can contribute to headaches, dizziness and the inability to concentrate. The HEAL study found levels of between 1195 ppm and 2750 ppm in London classrooms.

The report includes recommendations for policymakers, but also for school authorities, parents and the health sector. These focus on the need for comprehensive, long-term monitoring, but also a range of measures that will clean up the air outside, so pollution does not travel inside the classrooms.

The HEAL report is at www.env-health.org/wp-content/uploads/2019/06/Healthy-air-children_London.pdf.

A Comparison of Light-duty Vehicle NOx Emissions measured by Remote Sensing

On 27 June 2019, the International Council on Clean Transportation (ICCT) published a report comparing remote sensing measurements and emissions in Zurich to a large dataset (the CONOX dataset) of other European remote sensing measurements, focusing on the effect of estimated engine load on NO_x emissions.

ICCT states that a comparison of the CONOX and Zurich datasets for diesel passenger cars shows that while Euro 6 diesel vehicles do show significant reductions in average real-world NO_x emissions, some Euro 6 vehicle families still emit as much NO_x as the worst Euro 5 families. The three manufacturer groups with the lowest average diesel NO_x emissions had comparatively low emissions across a

wide range of operating conditions. However, diesel vehicle manufacturers with higher emissions experienced large increases in fuel-specific NO_x emissions as engine load increased. This is said to be most likely primarily related to emission control systems and calibration that are not robust as engine loads increase. Average gasoline NO_x emissions were lower in Zurich than for the average of the other measurement sites, suggesting that gasoline vehicles control emissions better at higher engine load.

In terms of annual NO_x emissions in Zurich, all high-emitting vehicle families were diesel-fuelled, and the majority were Euro 5 vehicles. Out of all Euro standard and fuel type combinations, diesel Euro 5 vehicles were estimated to emit almost half of annual NO_x emissions. Ten popular vehicle families, most of them Euro 5 vehicles, were estimated to account for more than one-third of passenger car NO_x emissions in Zurich while they made up approximately one-eighth of the Zurich passenger car fleet.

The ICCT report is at <https://theicct.org/publications/LDV-comparison-NOx-emissions-Zurich>.

FORTHCOMING CONFERENCES

Low Carbon Vehicle Partnership's 2019 Annual Conference

8 July 2019, London, UK

www.lowcvp.org.uk/events/conference/2019.htm

The LowCVP's 2019 Annual Conference will focus on the low carbon fuels agenda; acknowledging the momentum behind moves to 'electrify everything', while analysing which other fuel types can support the drive to cut emissions in the short, medium and long-term as well as which policy interventions are required to support them. The event will feature discussions around sustainable biofuels, hydrogen and new generation, low emission fuels.

Reducing Driving Emissions: Ensuring compliance with RDE and WLTP

9 July 2019, London, UK

<https://events.imeche.org/ViewEvent?code=CMP6888>

The protection of air quality and reduction of greenhouse gas emissions is a priority for industry and governments worldwide. While vehicle emission standards are in place to combat the issue, technological development also needs to be encouraged to reduce air pollution. Learn about the latest testing technologies and facilities available to reduce emissions and maximise the chance of testing success.

SAE Powertrains, Fuels and Lubricants

26-29 August 2019, Kyoto, Japan

www.pfl2019.jp

ACEA Summit 2019: 'Leading the mobility transformation: The future of the EU auto industry'

4 September 2019, Brussels, Belgium

www.acea.be/events/event/leading-the-mobility-transformation-the-future-of-the-eu-auto-industry

14th International Conference on Engines & Vehicles

15-19 September 2019, Capri, Italy

www.sae-na.it

Topics of the conference include engine modelling and diagnostics; engine combustion; new engines, components, actuators and sensors; hybrid and electric powertrains and eco-CAV; fuels and lubricants; and exhaust aftertreatment and emissions.

RESEARCH SUMMARY

Effects of Emissions and Pollution

Ultrafine Particles and Children's Health: Literature Review, Juliana Regisda Oliveira, et al.; Paediatric Respiratory Reviews (in press), doi.org/10.1016/j.prrv.2019.06.003

Emissions Measurements and Modelling

Simulation and Modelling of Vehicle Emissions – A Review Paper, Hussam Achour, et al.; Reference Module in Materials Science and Materials Engineering (2019), doi.org/10.1016/B978-0-12-803581-8.11677-7

Emissions Control, Catalysis, Filtration

Improving high-temperature NO_x conversion in the combined NSR-SCR system with an SCR catalyst mixed with an NH₃ adsorbent, Masatoshi Sakai, et al.; Applied Catalysis A: General (in press), <https://doi.org/10.1016/j.apcata.2019.06.003>

Model-Based Analysis of TWC-Coated Filters Performance, M. Mitsouridis, et al.; Emission Control Science and Technology (in press), doi.org/10.1007/s40825-019-00124-3

Transport, Climate Change & Emissions

Biodiesel fuels: A greener diesel? A review from a health perspective, Krystal Pollitt, et al.; Science of The Total Environment (in press), <https://doi.org/10.1016/j.scitotenv.2019.06.002>

AECC and IAV will present a joint paper on “Diesel Vehicle with ultra-low NOx emissions on the road”

Annual Automotive Exhaust System Summit

19-20 September 2019, Prague, Czech Republic
<https://curtiswyss.com/agenda/exhaust.pdf>

IAQM Routes to Clean Air

16-17 September 2019, London, UK
<https://iaqm.co.uk/event/rtca19/>

The Institute of Air Quality Management (IAQM) presents Routes to Clean Air 2019, where air quality, public health and transport professionals share their experiences of improving traffic emissions. Speakers will discuss a range of topical issues offering their insight into the steps required to improve air quality, including best practice examples and practical challenges faced during implementation.

3rd Annual Real Driving Emissions Forum

24-25 September 2019, Berlin, Germany
www.rde-realdrivingemissions.com

The Forum will showcase the forefront practices and approaches towards RDE and Energy Consumption reduction, compliance with recent update of the legislation on RDE, main automotive technology trends based on cost-and-energy-efficient solutions.

28th Aachen Colloquium Automobile and Engine Technology

7-9 October 2019, Aachen, Germany
www.aachener-kolloquium.de

The congress provides a wide range of technical presentations addressing current challenges of the vehicle and engine industry.

AECC and IAV will present a joint paper on “Contribution of light-duty diesel mild-Hybrid electric Vehicle and novel exhaust aftertreatment systems in the context of future post Euro 6 RDE and CO₂ requirements”

European Transport Conference

9-11 October 2019, Dublin, Ireland
www.aetransport.org

The conference attracts transport practitioners and researchers from all over Europe where they can find in-depth presentations on policy issues, best practice and research findings across the broad spectrum of transport.

7th Annual Conference Real-Driving Emissions 2019

15-17 October 2019, Berlin, Germany
www.automotive-iq.com/events-real-driving-emissions

13th Conference on Gaseous Fuel Powered Vehicles

22-23 October 2019, Stuttgart, Germany
<https://fkfs-veranstaltungen.de/3/conference-on-gaseous-fuel-powered-vehicles>

3rd International FEV Conference Zero CO₂ Mobility

7-8 November 2019, Aachen, Germany
www.fev.com/coming-up/fev-conferences/fev-conference-zero-co2-mobility/introduction.html

Integer Emissions Summit USA

12-13 November 2019, Indianapolis, USA
www.integer-research.com/conferences/ies-usa-2019/

12th International ECMA Conference & Exhibition 2019 on Cleaner IC Engines for Sustainable Environment with Innovative Emission Control Technologies

14-15 November 2019, Pune, India
www.ecmaindia.in/eventsdetails.aspx?mpgid=41&pgidtrail=42&Eventsid=21

The ECT 2019 conference will address implementation of Bharat Stage VI emission norms and will look beyond, to forthcoming regulations such as RDE and World Harmonized Test procedures which will ensure that vehicles that come on the road in future are emissions-compliant in the true sense.

9th China International Diesel Engine Summit 2019

21-22 November 2019, Beijing China
www.borscon.com/2019de9/cn/index.html

The 9th China International Diesel Engine Summit will provide an opportunity to discuss China's energy-saving and emission-reduction policies and regulations for diesel engine, the latest technology progresses and future trends of new energy and alternative fuels, as well as innovative ideas in business modes.

POLIS Annual Conference

27-28 November 2019, Brussels, Belgium
www.polisnetwork.eu/2019conference

Europe's leading event on sustainable urban mobility in cities and regions

EU Clean Air Forum

28-29 November 2019, Bratislava, Slovakia
https://ec.europa.eu/info/events/eu-clean-air-forum-2019-nov-28_en

The European Commission is organising the 2nd Clean Air Forum in close collaboration with the Ministry of Environment of the Slovak Republic. It will focus on three themes: air quality and energy; air quality and agriculture; and clean air funding mechanisms.

Internal Combustion Engines and Powertrain Systems for Future Transport

11-12 December 2019, West Midlands, UK
<http://events.imeche.org/ViewEvent?code=CON6849>

The 2019 conference will provide a forum for IC engine, fuels and powertrain experts to look closely at developments in powertrain technology required to meet the demands of the low carbon economy

SAE World Congress Experience (WCX)

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

TRA2020

27-30 April 2020, Helsinki, Finland
<https://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.

SAE Powertrains, Fuels and Lubricants

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

Call for abstracts opens in August 2019
Deadline for abstract: 18 February 2020

SAE Heavy-Duty Diesel Emissions Control Symposium

13-14 October 2020, Gothenburg, Sweden