Newsletter

July - August 2016

INTERNATIONAL REGULATORY DEVELOPMENTS

Table of Contents

Association for Emissions Control by Catalyst AISBL
Diamant Building
Boulevard A. Reyers, 80
B-1030 Brussels
Belgium
Tel: +32 2 706 81 60
Fax: +32 2 706 81 69
info@aecc.eu
www.aecc.eu

EUROPE

Parliament and Council adopt Non-Road Mobile Machinery's Stage V Regulation

On 5 July 2016 the European Parliament adopted at its plenary session the final draft Stage V emissions Regulation for Non-Road Mobile Machinery (NRMM). This was followed by its adoption in the Council of the EU on 18 July 2016.

The new Stage V Regulation will cover all kinds of combustion engines, used for example in small handheld equipment, generating sets, harvesting and agricultural machinery, construction machinery, snowmobiles, railcars and locomotives, and inland waterway vessels.

The Stage V of emissions requirements introduces a Particle Number limit of 10^{12}/kWh for diesel engines between 19 and 560 kW in the main category "NRE", for inland waterway vessels engines above 300 kW, and for all railcar engines.

Stage V requirements will be introduced on 1 January 2018 for engine type-approval and on 1 January 2019 for placing on the market of engines; except for NRE engines between 56 and 130 kW which benefit from a one-year delay and rail engines, both for railcars and locomotives, which benefit from a two-year delay.

Machinery equipped with Stage V engines will be subject to in-service monitoring (not conformity) testing where gaseous emissions are measured with Portable Emissions Measurement Systems (PEMS) during field operation.

The new Stage V Regulation is now expected to be published in the Official Journal in September 2016.

The NRMM Stage V legislative text is at www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+TA+P8-TA-2016-0296+0+DOC+PDF+V0//EN.

Further EP EMIS Committee Hearings

During July and August 2016 the European Parliament Committee of Inquiry into Emission Measurements in the Automotive Sector (EMIS) held further hearings.

On 4 July 2016 Mr Günther Lichtblau from the Austrian Umweltbundesamt (Environment Agency) presented the study on legal obligations relating to emissions measurements in the EU's automotive sector.

The time period provided by a type-approval authority for the duration of the type-approval process seems to be of importance to vehicle manufacturers in their decision regarding which authority to choose. This could explain why manufacturers opted for Luxembourg instead of Germany, Lichtblau said.

Off-cycle emissions effects noticed during emissions measurements were already presented to the Commission during the development of Euro 5 & 6 standards in 2006, he said. The industry would however have argued that solutions would be too expensive and would cost jobs. He confirmed that the Commission was aware of the problems in 2007, but choose to align its position with the industry's position and not deal with the issue, when Mr Verheugen was the Commissioner for Industry. The Commission would furthermore have argued that the technology was not yet ready at the time, even though AECC had stated that the required technology was already available.

Lichtblau explained that Commission's working groups often have multiple subgroups focusing on specific issues. In these subgroups, manufacturers would be overrepresented, compared to Member State experts, as they were the only actors with the required technical expertise. He felt that the industry aimed to keep the legislation complex, as they were the only ones capable of overseeing the whole procedure and legislation. Although technical experts and independent laboratories indicated that the legislation was too complex, neither Member States nor manufacturers had voiced similar concerns.

Lichtblau regarded the revision of the type-approval framework Directive as a clear step in the right direction, although it would be more important to have in-service conformity checks. Either a centralised authority for type-approval should be established, or unified standards and supervision of authorities should be set up, he added.

That meeting of 4 July 2016 continued with the hearing of Mr Jos Dings, Executive Director of NGO Transport and Environment (T&E).

Dings stated that the principle that 'what is not explicitly forbidden, is allowed' underpinned the current problems. He furthermore indicated the structural political issue, as he felt that the Commissioner responsible for air quality should also be responsible for vehicle emissions standards, which is not the case.

Dings felt that the biggest problem was the implementation and enforcement of the current rules by Member States. The language of the legal text should not be used as an excuse to evade responsibility.

He said that manufacturers and Member States had delayed the introduction of the Real Driving Emission (RDE) legislation. He explained that a procedure had emerged during the last two years, in which the industry proposed a change, technical analysis or new points of view during discussions on the legislation, after which one or more Member States would have indicated to be interested and proposed it for discussion at the next meeting, thereby delaying the process. Italy, Spain and Germany in particular did not play a progressive role, he said, while Belgium, the Netherlands, Sweden and Denmark were progressive. He furthermore felt that the

first part of the RDE legislation would still have been under discussion today, had 'dieselgate' not happened.

Dings hoped that the introduction of RDE testing would dissuade manufacturers from using defeat strategies. However, even though the new WLTP test procedure would address several loopholes of the NEDC, Dings was not confident that no new loopholes would not be found.

Dings expressed concern that the investigation of the EMIS Committee would not be completed in time in order to have a meaningful impact on the proposal for the revision of the type-approval framework, and regarded that revision as the opportunity to reform the system. He recommended that the ultimate authority should lie with a single independent authority at EU level, and that there should be transparency regarding the data and testing of vehicles.

The hearings of Lichtblau and Dings can be watched at www.europarl.europa.eu/EMIS_160704.

On 13 July 2016 the EMIS meeting started with the unanimous adoption of the interim report of activities of the Committee. Then two hearings were held, first with Mr Abellan, Executive Vice President Engineering of Renault, and then with Mr Eichhorn, Chief Technical Officer of Volkswagen.

Abellan said that Renault was conscious of the three main environmental impacts of vehicles: consumption of resources, contribution to global warming, and impact on air quality. He underlined that vehicles produced by Renault were not equipped with similar software (defeat device) as had been found in VW vehicles. He furthermore informed MEPs that Renault was already working on measures reducing pollutant emissions, and in the long term would focus on the development of technologies reducing pollution as well as of hybrid and electric vehicles.

On 'thermal windows' within which the emissions control systems operate, Abellan said that the systems were fully operational between 17 and 35°C. Systems are partially operating below 17°C but are only switched off at temperatures below -20°C, due to technology limitations.

Regarding the trade-off between CO_2 and NOx emissions policies, Abellan felt that enough attention to NOx emissions had been paid by European legislators, as it was addressed in several regulatory steps.

Several MEPs also asked about a recall Renault had initiated after the discovery of the use of defeat devices by VW but Abellan replied that the recall concerned the correction of a calibration error in the vehicles' software.

At the start of VW's hearing, Eichhorn acknowledged that VW had made a "huge mistake", and that ethical and moral imperatives had been breached.

He furthermore welcomed the RDE legislation as well as the new WLTP test procedure, and underlined that VW vehicles were among the cleanest Euro 6 vehicles in a number of independent testing programmes.

Eichhorn considered the incriminated software was not necessary to meet the European emissions limits. However it is necessary for a vehicle to detect whether the vehicle is used on a chassis dyno, in order to disable certain systems, such as ABS, which would make lab testing impossible, he said.

Several MEPs questioned the decision by VW to consider that a software update was sufficient for European customers, while US customers received financial compensation. But Eichhorn explained that the legislative framework differed. VW felt that the software was not a defeat device.

The hearings of Abellan and Eichhorn can be watched at www.europarl.europa.eu/EMIS_160713.

On 14 July 2016 the EMIS hearing consisted of three parts, with Mr Greening and Mr Jonnaert of ACEA and Mitsubishi representatives in the morning and then Mr Dimas, former Commissioner for Environment and Climate (from 2004 to 2010), in the afternoon.

Greening explained that ACEA was involved in the legislative framework, as it analysed Commission proposals with regards to their technical feasibility and to ensure that the draft text was clear. ACEA furthermore contributed by making its own proposals, based on test programmes it carried out, he added.

With regards to the RDE test procedure, Greening told MEPs that it was not introduced in 2007 because neither the equipment nor a common testing protocol was ready.

When asked why manufacturers sell diesel vehicles, Greening stated that the industry had decided to invest in diesel technology in order to meet the EU's CO_2 legislation. He indicated that the trade-off between CO_2 emissions and NOx emissions was known in 2007, as was the gap in measurements between laboratory and road testing. In that context, he reminded of Emissions Factors established already from Euro 0-1 onwards.

A majority of the discussion focused on the clarity of the provisions of the Euro 5&6 Regulation, notably with regards to the definition of 'normal use' and the exceptions for defeat devices. Greening indicated that 'normal use' was understood as the durability period of the vehicle.

When asked under which conditions manufacturers had to meet the emissions limits, Greening indicated that under the current legislation this would be the NEDC test cycle.

Greening indicated he only knew about the use of the defeat device by VW after it had been revealed and

explained that ACEA was not involved in the legislation's implementation by manufacturers.

Greening told MEPs that they were slightly disappointed that the RDE legislation, currently the biggest challenge for manufacturers, had not come with a cost assessment.

With regards to the 'thermal windows', Greening explained that Exhaust Gas Recirculation (EGR) systems had to be adapted to the temperature and operating conditions, in order to address several issues which could affect the performance such as need for power during accelerations.

Finally, Greening advocated awareness around Selective Catalytic Reduction (SCR) technology and AdBlue® amongst consumers, and accessibility by providing it next to diesel fuel pumps at gas stations.

Mitsubishi representatives said that they had disappointed their customers with wrong measurements of fuel consumption of minivans in Japan but ensured that this did not apply to any cars sold in the EU.

Mitsubishi could not explain why the thermal window for the use of its EGR systems was much wider (-12° to 56°C) than that of its competitors, as they did not know the competitions' engine control strategies.

With regards to the RDE procedure, Mitsubishi expressed concerns that achieving a Conformity Factor of 1 would be very difficult, and indicated that margins should be added.

When asked why CO_2 emissions of the Japanese car fleet were lower than the EU's, without the decision to invest in diesel, Mitsubishi indicated that this was due to the focus on better fuel economy. With regards to the future, Mitsubishi stated that there were limitations to the use of the internal combustion engine, and therefore expressed its intention to move forward with electric vehicles.

The ACEA and Mitsubishi hearings can be watched at www.europarl.europa.eu/EMIS_160714AM.

Former Commissioner Dimas explained that during the years in which the Euro 5&6 Regulation was prepared and adopted, the focus of the EU had been on reducing CO_2 emissions as well as particulate matter (PM).

At that time, it was well known that the NEDC did not represent Real-Driving Emissions. A decision had to be made by the Commission whether to put the Euro 5&6 legislation on hold and develop new and more representative test procedures, or whether to put forward the Euro 5&6 legislation and subsequently develop new test procedures. The Commission had opted for the latter approach to avoid any delay. The test cycle review was therefore included in the Euro 5&6 legislation.

Dimas noted that industry always overestimated the cost of complying with new legislation before its adoption, while trying to bring down costs afterwards. Legislators had to take this into account.

Dimas did not agree with statements that there was a battle between DG-Environment and DG-Enterprise. He acknowledged that there had been disagreements between him and former Commissioner for Industry Verheugen, but these disagreements had been useful in finding the right solution.

The hearing of former Commissioner Dimas can be watched at www.europarl.europa.eu/EMIS_160714PM.

On 30 August 2016 the EMIS Committee heard Peter Lakin, Vice President of Faurecia, and Günter Verheugen, Commissioner for Enterprise and Industry between 2004 and 2010.

Questions to Faurecia's Lakin related mostly to ways to produce cleaner diesel engines. He explained there is a trade-off between CO_2 and NOx emissions: efficient diesel engines consume less fuel and emit less CO_2 than comparable petrol engines, but they produce more NOx, which must then be reduced with a range of different technologies.

Verheugen argued that as Commissioner for Industry his main responsibility was to keep the EU car industry globally leading and competitive, with rules best suited for technological development, including pollutants' limits. He relied on experts for the drafting of Euro 5 (on particles) and Euro 6 (on NOx). It was clear that type-approval tests did not represent real-driving conditions and therefore a new test started to be developed in 2007 but no one suspected that manufacturers would cheat using so-called defeat devices, he said.

MEPs pressed him on the question if the rules are so vague that they allow for misinterpretation but Verheugen insisted that defeat devices had already been banned at an earlier stage of legislation and that those provisions were copied into ensuing rules. MEPs nevertheless stressed that this was the case for trucks only, not for cars. Verheugen conceded that at the time nobody considered the possibility of sophisticated cheating at emissions tests.

MEPs also questioned the former Commissioner on the lengthy procedure for developing new tests and on the Commission decision to focus mainly on the reduction of CO_2 emissions, neglecting NOx. Verheugen insisted that changes to the type-approval was on the right track at the time but he declined to speculate on why it took so long to complete. The Commission focused on CO_2 reduction as that was part of the EU global commitment in the fight against climate change.

The hearings of Lakin and Verheugen can be viewed at www.europarl.europa.eu/EMIS160830.

ACEA Web Page for Access to Euro 6 RDE Monitoring Data

On 29 July 2016 the European Automobile Manufacturers Association ACEA launched a web page that provides access to Real-Driving Emissions (RDE) results of vehicles type-approved during the RDE monitoring phase.

The page provides the public user with access to that RDE data according to the defined data input parameters and most ACEA members have decided to share it there (BMW Group, Daimler, Ford of Europe, Hyundai Motor Group, Jaguar Land Rover, Opel Group, PSA Group, Renault Group, Toyota Motor Europe and Volvo Cars). Volkswagen Group and Renault Group members will provide the RDE data of their models via their own websites.

The ACEA web page for access to Euro 6 RDE monitoring data is at www.acea.be/publications/article/access-to-euro-6-rde-monitoring-data.

Commission's Communication on EU Strategy for Low-Emission Mobility

On 20 July 2016 the European Commission presented a package of measures to accelerate the transition to low-carbon emissions in all sectors of the economy in Europe, including a Communication on "A European Strategy for Low-Emission Mobility".

The low-emission mobility strategy frames the initiatives that the Commission is planning in the coming years, and it maps the areas in which it is exploring options.

The strategy supports jobs, growth, investment and innovation; provides with available funding to support actions; benefits to the European citizens and consumers; aims at making the transport system more efficient; promotes the use of low-emission energy in transport; creates a market for zero-emission vehicles; steps up action on lorries, coaches and buses; and commits to action at global level.

The main elements of the strategy are increasing the efficiency of the transport system by making the most of digital technologies, smart pricing and further encouraging the shift to lower emissions transport modes; speeding up the deployment of low-emissions alternative energy for transport, such as advanced biofuels, electricity, hydrogen and renewable synthetic fuels and removing obstacles to the electrification of transport; and moving towards zero-emission vehicles.

The Commission is working on post-2020 CO_2 standards for cars and vans. Emissions from conventional combustion engines will need to be further reduced after 2020. Zero- and low-emission vehicles will need to be deployed and gain significant market share. Their deployment will significantly improve air quality in particular in cities.

The Commission will also accelerate work to curb CO_2 emissions from lorries, buses and coaches.

With regard to available funding, the Commission announced that €70 billion is available for transport under the European Structural and Investment Fund, including €39 billion for supporting the move towards low-emission mobility, of which €12 billion are for low-carbon and sustainable urban mobility alone. Under the research programme Horizon2020, €6.4 billion are available for low-carbon mobility projects.

The Communication on low-emission mobility is at http://ec.europa.eu/transport/themes/strategies/news/2016-07-20-decarbonisation_en.htm.

The Commission also proposed binding annual greenhouse gas (GHG) emissions targets for Member States from 2021-2030 for the transport, buildings, agriculture, waste, land-use and forestry sectors as contributors to EU climate action, based on the principles of fairness, solidarity, cost-effectiveness and environmental integrity.

The 2030 GHG target compared to 2005 goes from status quo in Bulgaria to 40% reduction in Luxembourg and Sweden. The 2030 GHG target is -38% for Germany, and -37% for France and the UK.

Commission Roadmap on Post-2020 Light-Duty Vehicles CO_2 Regulation

On 20 July 2016 the European Commission published a roadmap on the revision of Regulation (EU) No 443/2009 and Regulation (EU) No 510/2011 regulating CO_2 emissions from passenger cars and light commercial vehicles respectively.

The roadmap states that the Commission currently assesses the options presented in the public consultation (see below). It furthermore states that soft law is not considered, as it was found to be inadequate prior to the current CO_2 Regulations, and that the inclusion of road fuel in the EU Emission Trading System would not sufficiently encourage vehicle efficiency improvements. International emission standards are also not considered due to the regulatory and market differences.

The roadmap furthermore sets out options for reviewing the scope of existing legislation, and new technological developments. It also sets out a preliminary assessment of expected impacts related to the economy, social conditions, environment, administrative burden, Small and Medium Enterprises (SMEs), competitiveness and innovation, public administrations, as well as third countries and international trade.

The roadmap indicates that consideration can be given to new approaches to gathering information on fuel consumption and emissions in real world operation of cars and vans. New possibilities are actually raised from Portable Emissions Measurement Systems (PEMS) and access to vehicle On Board Diagnostics (OBD) port and CANbus (controller area network) data.

The Commission intends to present a proposal during the first quarter of 2017. The expected proposal would establish the CO_2 emissions targets for new passenger cars and vans for the period beyond 2020, including a realistic and achievable target for 2025.

The proposal is expected to take into account the change from the New European Drive Cycle (NEDC) to the Worldwide harmonized Light vehicles Test Procedure (WLTP), other powertrain technologies in addition to petrol and diesel, and CO_2 savings achieved outside the normal test procedure.

The Light Vehicles CO_2 roadmap is at http://ec.europa.eu/smart-regulation/roadmaps/docs/2015_clima_019_iaa_light_duty_vehicles_en.pdf.

Public Consultation on Post-2020 CO_2 Targets for Light-Duty Vehicles

The European Commission has launched a public consultation on post-2020 CO_2 targets for cars and light commercial vehicles.

The questionnaire is divided into two parts. The first part includes general questions related to the policy on reducing CO_2 emissions; the second asks policy design questions.

The Commission is carrying out this consultation in order to be properly informed by public opinion in preparation for possible future legislative action in this area. The results of the consultation will be summarised and published as well as being used to inform the Impact Assessment.

The consultation on CO_2 from cars and vans is at https://ec.europa.eu/eusurvey/runner/LDV-post-2020-consultation and is open until 28 October 2016.

Commission Roadmap on Heavy-Duty Vehicles' CO_2 Monitoring

On 20 July 2016 the European Commission also published a roadmap on the expected proposal on the monitoring and reporting of CO_2 emissions and fuel consumption from Heavy-Duty Vehicles (HDV) with a view to improving purchaser information.

The roadmap sets out the HDV CO_2 and fuel consumption reporting options. Option 1 would mirror the monitoring carried out for Light-duty vehicles, with manufacturers reporting registrations to national authorities, which report to the Commission or an agency such as the European Environment Agency (EEA), who in turn publishes annual averages.

Option 2 would put HDV manufacturers in charge of the monitoring, with reporting to the Commission or an agency, which subsequently publishes the annual average values. The data could be annual sales-based data of the vehicle manufacturers.

Option 3 is an intermediate between the first two options in which national authorities report annually to the Commission or an agency the Vehicle Identification Numbers (VINs) of newly registered vehicles. Upon notification of the VIN numbers by the Commission or agency, the manufactures would have to submit relevant monitoring information.

Alternative policy instruments listed in the roadmap include voluntary cooperation between national authorities and manufacturers. However harmonised checks and controls of data collected this way would not be easy, and cooperation cannot be taken for granted.

The Commission envisages to present a proposal during the first quarter of 2017. The expected proposal would be on the monitoring and reporting of new HDV CO_2 emissions, as calculated by computer simulation tool VECTO, by Member States to the Commission.

The HDV CO_2 monitoring roadmap is at http://ec.europa.eu/smart-regulation/roadmaps/docs/2015_clima_018_iaa_heavy_duty_vehicles_en.pdf.

Public Consultation on Heavy-Duty Vehicles' CO_2 Monitoring and Reporting

The European Commission has launched a public consultation on the monitoring and reporting of CO_2 emissions from Heavy-Duty Vehicles (HDV).

According to the Commission, tackling emissions from HDV interacts with several other overarching policies including energy security (lower CO_2 emissions means less fuel consumption and therefore reduced imports of fossil fuels); air quality (lower fuel consumption means fewer emissions of pollutants); innovation and competitiveness (requirements for improved vehicle efficiency creates research and development into better technologies which enhances the EU's international industrial competitiveness).

Part A of the questionnaire addresses the preparation of the legislation on monitoring and reporting of HDV fuel consumption and CO_2 emissions data.

Part B offers a possibility to provide views and input on the preparation of future HDV CO_2 standards.

A further consultation will be launched in due time to discuss the details of options for standards.

The consultation on HDV CO_2 emissions and fuel consumption is at https://ec.europa.eu/eusurvey/runner/HDV-

monitoring-emissions-consultation and is open until 28 October 2016.

EU Reference Scenario 2016

On 17 August 2016 the European Commission released the EU Reference Scenario 2016 which projects energy, transport and greenhouse gas (GHG) emissions trends in the EU up until 2050.

The report is an update of the previous Reference Scenario published in 2013 and is a projection of where current sets of EU policies coupled with market trends are likely to lead.

The EU has set objectives for 2020, 2030 and 2050 on climate and energy, so the Reference Scenario allows to analyse the long-term economic, energy, climate and transport outlook based on the current policy framework. It is not designed as a forecast of what is likely to happen in the future. Rather, it provides a benchmark against which new policy proposals can be assessed.

For instance, decarbonisation of the energy system progresses under current policies, but falls short of agreed longer-term climate objectives. Total GHG emissions are projected to be 26% below 1990 levels in 2020, 35% below by 2030 and 48% by 2050.

Road transport's contribution to the transport sector CO_2 emissions is decreasing over time but at a slower pace than other sectors and therefore the transport sector becomes the largest source of CO_2 emissions after 2030.
The main drivers of declining emissions are the CO_2 emissions standards for Light-Duty Vehicles (LDV) which result in significantly lower carbon intensity for the total passenger cars and vans fleet by 2050, with the highest reduction taking place in the period 2010-20. Beyond 2035, CO_2 emissions from passenger road transport stabilize as no further policies are assumed.

Car manufacturers are expected to comply with the CO_2 standards by marketing vehicles equipped with hybrid systems on their powertrain, which are becoming more appealing to consumers thanks to their lower additional costs. Electrically chargeable vehicles (EVs) emerge around 2020 as a result of EU and national policies as well as incentive schemes aiming to boost their penetration.

The sales of Plug-in Hybrid Electric Vehicles (PHEVs) hold a significantly larger share in sales of electrically chargeable vehicles in the mid-term. PHEVs do not pose range limitations and are relatively less capital intensive than Battery Electric Vehicles (BEVs) resulting in their increased sales compared to BEVs especially over the period 2020-25. BEVs present higher levels of maturity beyond 2025. The share of activity of total electric vehicles in the activity of LDVs reaches 15% in 2050. Fuel cells would add an additional 2% by 2050.

Diesel is projected to maintain its share in total energy demand in transport by 2030 (i.e. represents over half of total energy consumption), slowly decreasing its share only during 2030-50.

For road freight, the increased activity surpasses improvements in specific fuel consumption, especially for Heavy Goods Vehicles (HGV). Diesel continues to be the primary fuel for Heavy-duty vehicles (HGVs, buses and coaches).

Non-CO_2 GHG emissions are expected to decline from 940 to 664 Mt CO_2eq between 2005 and 2030 and to 656 Mt CO_2eq in 2050. The agricultural sector is a major contributor to non-CO_2 emissions with almost 50% in 2005 and only a minimal decline expected in the future. Transport/mobile combustion is expected to generate an increasing share of non-CO_2 emissions within the energy sector source (N_2O from road transport being the most important contributor), growing from 12% in 2005 to 15% in 2030 and 20% in 2050 within the energy aggregate.

A new feature of the Reference Scenario 2016 is interactive graphs that can help exploring the energy, transport and greenhouse gas emissions outlook for the years ahead at EU or Member State level.

The EU Reference Scenario 2016 is at http://ec.europa.eu/energy/en/data-analysis/energy-modelling.

JRC's Green Driving Tool

The EU Commission's Joint Research Centre (JRC) has launched an online 'Green Driving Tool' in support of the Commission's initiatives for the decarbonisation of transport in Europe.

The interactive web-based tool allows estimating the fuel costs and CO_2 emissions of individual car journeys on the basis of variables such as car segment, engine power, fuel type and driving style.

The Green Driving Tool uses detailed map data and vehicle simulations to estimate fuel consumption, costs and CO_2 emissions for any given car journey. It will therefore help raise awareness of the impact of car journeys, supporting citizens looking to make decisions on their use of cars.

The detailed vehicle simulations and the estimates returned by the Green Driving tool are powered by CO2MPAS (CO_2 Module for Passenger and commercial vehicles Simulation). CO2MPAS was developed by the JRC to support the introduction of the Worldwide harmonized Light vehicles Test Procedures (WLTP) in the type-approval of Light-duty vehicles for what concerns the CO_2 targets.

More information on the JRC's 'Green Driving Tool' is at https://green-driving.jrc.ec.europa.eu.

Evaluation of Car Labelling Directive

On 20 July 2016 the European Commission published a staff working document on the evaluation of the car labelling Directive 1999/94/EC which defines consumer information on fuel consumption and CO_2 emissions of new passenger cars.

An ex-post evaluation of the car labelling Directive was carried out between September 2015 and May 2016 to examine the actual implementation and the achievements compared to what was expected.

All Member States have transposed the Directive into national legislation meeting the minimum requirements of the Directive. However, a number of them have gone beyond by adding further mandatory or voluntary requirements such as copying the format of the EU energy label (in 14 Member States) or the provision of information on annual fuel costs.

The evaluation shows that the car labelling Directive continues to be relevant given the need to further reduce greenhouse gas emissions from road transport and to continue to raise consumers' awareness on fuel use and CO_2 emissions of new passenger cars in order to help them take an informed car purchase decision.

The increasing discrepancy between test cycle fuel consumption values, as used for car labelling purposes, and those experienced by consumers may have undermined consumers' trust in the label though. The introduction of the Worldwide harmonized Light vehicles Test Procedure (WLTP) – to replace the current NEDC test procedure – will provide for more realistic test results and more robust information to consumers.

The evaluation has identified some issues where relevance, effectiveness, efficiency, and coherence could be improved. For instance, there are no specific requirements for alternatively-fuelled vehicles which could provide consumers relevant and comparable information on such vehicles. Also, the absence of information on air pollutant emissions may have limited the Directive's effectiveness in view of the increasing attention to air pollution in urban areas. Robust information on air pollutant emissions for labelling purposes will only become available with the introduction of Real-Driving Emissions tests in 2017.

The car labelling Directive evaluation is at http://ec.europa.eu/transparency/regdoc/rep/10102/2016/EN/10102-2016-270-EN-F1-1.PDF.

Commission fines Truck Manufacturers for participating in a Cartel

On 19 July 2016 the European Commission announced a record fine of €2.9 billion on truck manufacturers who broke EU antitrust rules.

MAN, Volvo/Renault, Daimler, Iveco, and DAF were found to have colluded for 14 years, from 1997 to 2011, on truck pricing and on passing on the costs of compliance with stricter emissions rules. All companies acknowledged their involvement and agreed to settle the case. MAN was not fined as it revealed the existence of the cartel to the Commission.

The collusion identified by the Commission concerned the new emissions technologies required by the Euro III to Euro VI standards, specifically coordination on timing and on passing on of costs of emissions technologies for trucks compliant with newly introduced emissions standards. The collusion was not aimed at avoiding or manipulating compliance with emissions standards, the Commission clarified. Investigations did not reveal any link between this cartel and allegations or practices on circumventing the anti-pollution system of certain vehicles ('defeat devices').

The total fines imposed are:

Manufacturer	Fine (€)
MAN	0
Volvo/Renault	670 448 000
Daimler	1 008 766 000
Iveco	494 606 000
DAF	752 679 000
Total	2 926 499 000

Investigations with regards to Scania are still under way, the Commission added.

ENVI Committee Draft Opinion on Revision of Type-Approval Framework

On 13 July 2016 the European Parliament's Environment Committee draft Opinion on the proposal for a revision of the type-approval framework, prepared by Rapporteur MEP Christofer Fjellner (EPP, Sweden), was released.

The draft Opinion considers it essential to reinforce the EU type-approval system, particularly by putting in place appropriate supervisory mechanisms to guarantee harmonised application of the procedures across the Member States. Furthermore, it is essential that the legislation functions smoothly and does not lead to an increase of red tape neither for national administrations nor for the industry.

Since some Member States perform a limited number of type-approvals, funding for market surveillance should not be linked to type-approvals; it would indeed risk creating serious gaps in the market surveillance, the draft Opinion says. Member States should be free to set up market surveillance fee systems of their own in order to ensure that the required funds are secured.

In addition, the resources needed for the Commissions' market surveillance activities should be found within the budget of the EU rather than be covered by national fee structures.

To truly ensure the credibility of type-approvals the Rapporteur suggests that they shall be audited by a type-approval authority other than the issuing one every five years. This will contribute to eliminating differences in interpretation between type-approval authorities and ensure a uniform application of the legislation. The draft Opinion also deletes the 5-year limit for type-approvals that was suggested by the Commission.

According to the draft Opinion, the duration between receipt of all documents from the manufacturer and decision by the type-approval authority to accept or not the type-approval should be kept unchanged and not be increased from the current 60 days to three months, as proposed by the Commission.

In order to maintain confidentiality and secure intellectual property the draft Opinion restricts the availability of data needed for compliance verification testing to "market surveillance authorities and the Commission" rather than to "third parties" as proposed by the Commission.

Finally, the Commission proposal to amend the Euro 5&6 Regulation (EC) 715/2007 by requiring authorities to verify that "CO_2 emissions and fuel consumption (fc) values determined through the applicable test procedure are representative of emissions measured under real-driving conditions" is deleted. The Rapporteur indicates that comparing type-approval CO_2/fc values to CO_2/fc values from RDE testing could be very complicated since results from RDE tests on road will vary. He invites the Commission to explain how the inclusion of RDE could be done whilst ensuring credibility of the procedure.

MEPs in the ENVI Committee can table further amendments until 14 September 2016.

The Opinion from the ENVI Committee will feed into the work of the lead Committee for this dossier in the European Parliament, the Internal Market and Consumer Protection (IMCO) Committee.

The ENVI draft opinion is at www.europarl.europa.eu/sides/getDoc.do?type=COMPARL&reference=PE-585.489&format=PDF&language=EN&secondRef=01.

Draft Parliamentary Report on proposed Type-Approval Framework Regulation

On 23 August 2016 the draft Report of the Committee on the Internal Market and Consumer Protection (IMCO) on the proposal for a new Regulation on the vehicle type-approval framework was published. It has been prepared by the Rapporteur MEP Daniel Dalton (ECR, UK) and introduces almost 200 amendments to the Commission's proposal.

Type-approval authorities must have access to all the relevant information about the software of the vehicles and any engine management strategies used by the manufacturer, according to the Rapporteur. In addition, in the case of whole-vehicle type approval, the approval authority and technical services must have access to any engine management strategies which may be deployed.

It is also proposed to delete the requirement for type-approval authorities to send every three months to the approval authorities of the other Member States and the Commission a list of the EU type approvals it has issued, amended, refused to grant or withdrawn during the preceding period.

The requirement to establish a national fee structure to cover market surveillance costs is also deleted; as well as the requirement for Member States to levy fees on technical services to cover the costs of type-approval authorities.

The response of market surveillance authorities in case of unconformity is strengthened.

Finally, new provisions are introduced to require vehicle manufacturers to make public the data which are needed for the purpose of compliance verification testing by third parties.

MEPs in the IMCO Committee can table further amendments to the draft Report by 13 October 2016.

The draft IMCO Report is at www.europarl.europa.eu/sides/getDoc.do?pubRef=-%2f%2fEP%2f%2fNONSGML%2bCOMPARL%2bPE-585.750%2b01%2bDOC%2bPDF%2bV0%2f%2fEN.

Environment Committee approves National Emission Ceilings Agreement

On 12 July 2016 the Environment (ENVI) Committee in the European Parliament approved the trilogue agreement on the revision of the National Emission Ceilings (NEC) Directive.

The new Directive sets national limits for the emissions of five pollutants: sulfur dioxide (SO_2), nitrogen oxides (NOx), non-methane volatile organic compounds (NMVOCs), ammonia (NH_3) and fine particulate matter ($PM_{2.5}$). Methane is excluded from the agreement.

There were 43 votes in favour, 14 against, and 3 abstentions in the ENVI Committee.

The proposal will go the Parliament for a plenary vote, currently expected in November 2016. After that the EU Council will need to officially endorse the changes.

ADAC Test Results after VW Golf Defeat Device Fix

ADAC, the German automobile club, has published the results of tests performed on a VW Golf 2.0 TDI BlueMotion 103 kW, purchased after the software update for this version.

ADAC evaluated changes in power, driveability, fuel consumption and emissions that would have resulted from the software update. In the various tests, no significant disadvantages for the customer could be determined. The software update actually brings significant improvement in pollutant emissions when measured on WLTC and the ADAC Ecotest, especially for Nox.

Further measurements with the 1.2 TDI and the 1.6 TDI will be carried out when the appropriate update is available from VW.

The ADAC test results are at www.adac.de/infotestrat/tests/eco-test/diesel_messung/default.aspx?ComponentId=266205&SourcePageId=31832.

UK releases Data from Diesel Emissions Investigation

On 7 July 2016 the UK Department for Transport published the data from the tests conducted during their investigations into defeat devices and real-world diesel emissions.

The data is provided in Excel spreadsheets (one sheet per vehicle model tested) and complement the UK report which was published in April 2016.

The UK investigations report and the emissions data are at www.gov.uk/government/publications/vehicle-emissions-testing-programme-conclusions.

London Mayor announces First Clean, Green Bus Routes

On 8 August 2016 the Mayor of London, Sadiq Khan, confirmed plans for the first of a series of 'Low Emission Bus Zones', prioritising the greenest buses on the most polluted routes.

From February 2017, the first route along Putney High Street will see exclusive use of hybrid or diesel buses with 'top-of-the-range anti-pollutant systems' that meet or exceed Euro VI emissions standards. The second route, between Brixton and Streatham, will be converted in October 2017.

Low Emission Bus Zones are one of a number of measures the Mayor has asked Transport for London to lead by example to reduce emissions from the capital's bus fleet including:

- Making sure all buses operating in the central Ultra Low Emission Zone comply a year earlier by 2019, meaning each of the 3100 double-deck buses operating in the zone will be Euro VI hybrid;
- Expanding the ULEZ retrofit programme up to 3000 buses outside the central zone;
- Procuring only hybrid or zero-emission double-decker buses from 2018.

French Report on Emissions Testing published

On Friday 29 July 2016 the French committee on emissions testing published its report on pollutant and CO_2 emissions measured on 86 vehicles.

The committee was set up in October 2015 by French Environment Minister Ségolène Royal following the "Volkswagen emissions scandal" that raised suspicions about other car manufacturers' behaviour. The committee includes members from the environment ministry, French MPs, research institutes, environmental and consumer groups, and industry.

France's car certification body (UTAC) is carrying out emissions tests on 100 selected vehicles from which 86 vehicles have been tested so far. The report includes interim measurement results and related findings.

French authorities found that many diesel cars were emitting much higher pollutants on the road than in the laboratory and they are discussing these findings with car manufacturers.

Thirteen recommendations are proposed in the report. The Minister has already taken action in the direction of strengthening the real-world reduction of vehicle emissions, transparency and effectiveness of the training process and vehicle control. It is said that the tests will continue and further measures are planned to enhance the environmental performance of vehicles currently on the market, to anticipate regulatory changes (including tests in real driving situations), to act early to change the European regulatory framework and to encourage the purchase of low-emission vehicles.

The French report is at www.developpement-durable.gouv.fr/IMG/pdf/Rapport_Commission_independante.pdf.

France to add NOx Emissions Test during Periodic Technical Inspection

A Decree was published in the French Official Journal on 19 June 2016 that introduces more stringent emissions tests during vehicle technical inspection.

In the context of the "energy transition law for green growth" recently adopted in France, additional tests will be introduced during vehicles' periodic technical inspection as of 1 January 2019.

For gasoline vehicles, measurements of nitrogen oxides (NOx) and fine particles will be added to the CO

test. For diesel vehicles, the standard periodic inspection tests will be complemented with measurements of carbon monoxide (CO), unburnt hydrocarbons, NOx, CO_2, and oxygen.

Between September 2016 and March 2017 experiments will be conducted to establish reference values and suitable measuring techniques. Details of the measurements and requirements are expected to be published by 1 July 2017 at the latest.

Clean Trucks and Environmental Zones in the Netherlands

On 12 July 2016 the Netherlands notified the European Commission of the renewal of its Agreement promoting clean trucks and environmental zones.

The Agreement allows local authorities to restrict access to cities' Low Emission Zones to diesel trucks of more than 3.5 tons of a certain Euro standard only. It has been in effect in the Netherlands since July 2007 and has been renewed three times already in the past. It currently runs until 31 December 2016.

Since some Dutch cities still face air quality problems, the Ministry for Infrastructure and Environment of the Netherlands is renewing the Agreement for a period of three years, until 31 December 2019.

The extension of the Agreement ensures uniformity of the access regime in 13 cities in the Netherlands with an environmental zone for freight traffic.

NORTH AMERICA

US Assessment of Greenhouse Gas Emissions Standards for Cars

On 18 July 2016 the US Department of Transportation (DOT), the US Environmental Protection Agency (EPA), and the California Air Resources Board (CARB) released a draft Technical Assessment Report (TAR) on the mid-term evaluation of the national program for greenhouse gas emissions and fuel economy standards for Light-duty cars and trucks of model years (MY) 2022-2025.

The draft TAR shows that automotive manufacturers are innovating and bringing new technology to market at a rapid pace, and that they will be able to meet the MY 2022-2025 standards established in 2012 with a wide range of cost-effective technologies. Moreover, it indicates that these standards can be achieved by relying primarily on advanced gasoline vehicles. The report also shows that manufacturers will be able to meet the stricter standards at similar or even a lower cost than was anticipated in the 2012 rulemaking, with substantial savings on fuel costs for consumers.

While the draft TAR analysis focuses on the MY 2022-2025 standards, the report also shows that manufacturers over-complied with the standards for each of the first three years of the program, and in 2014 outperformed the standards by 1.4 miles per gallon (0.6 km/l).

Amongst other findings in the draft TAR is the fact that battery costs are already lower today than they were originally anticipated to be 10 years from now.

The draft TAR is open for comments until 26 September 2016. It is at www3.epa.gov/otaq/climate/mte.htm.

US Greenhouse Gas and Fuel Efficiency Standards for Heavy-duty Trucks

On 16 August 2016 the US Environmental Protection Agency (EPA) and the US Department of Transportation's National Highway Traffic Safety Administration (NHTSA) announced the final Phase 2 standards for medium- and heavy-duty vehicles (HDV) for greenhouse gases (GHG) and fuel efficiency, including trailers for the first time.

The new Phase 2 regulations will be implemented from model years (MY) 2018 to 2027 of semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks. It builds upon the initial Phase 1 standards that cover MY 2014 to 2018. This rulemaking finalizes the standards proposed in June 2015.

The final Phase 2 standards are expected to lower CO_2 emissions by approximately 1.1 billion metric tons, save vehicle owners fuel costs of about $170 billion (€152 billion), and reduce oil consumption by up to two billion barrels over the lifetime of the vehicles. Overall, the program will provide $230 billion (€206 billion) in net benefits to society, including benefits to climate and public health. These benefits outweigh costs by about an 8-to-1 ratio.

More information can be found at https://www3.epa.gov/otaq/climate/regs-heavy-duty.htm.

On 25 August 2016 the International Council on Clean Transportation (ICCT) issued a summary of the final Phase 2 standards to reduce HDV fuel consumption and GHG emissions.

Phase 1 reduced diesel engines' fuel use by 5-9%, Phase 2 brings a further 5% reduction for diesel engines. Predominant technology pathway for compliance with the standards will include friction reduction, reduced parasitic loads, variable valve timing, and improvements in the Exhaust Gas Recirculation (EGR), combustion, and fuel injection systems.

For tractor trucks, the Phase 2 standards require CO_2 emission reductions per ton-mile of freight moved of 15% (heavy-haul) to 27% (sleeper cab, high roof, Class 8) from MY 2017 to 2027.

The ICCT summary is at www.theicct.org/sites/default/files/publications/US%20HDV%20Phase%202%20FRM_policy-update_08252016_vF.pdf.

US fine Harley-Davidson for Aftermarket Parts increasing Emissions

On 19 August 2016 the US Environmental Protection Agency (EPA) and the US Department of Justice (DOJ) announced a settlement with Harley-Davidson that requires the company to stop selling devices that increase air pollution from their motorcycles.

Harley-Davidson allegedly manufactured and sold 340 000 devices, known as "super tuners," that increased power and performance but also caused motorcycles to emit higher amounts of HC and NOx than certified. Harley-Davidson also sold more than 12 000 motorcycles that were not covered by an EPA certification that ensures a vehicle meets federal clean air standards.

Under the settlement, Harley-Davidson stops selling the illegal aftermarket devices in the US by 23 August 2016. Harley-Davidson will also offer to buy back all such tuners in stock at their dealerships across the country and destroy them. The company will also pay a $12 million (€10.6 million) civil penalty and spend $3 million (€2.6 million) to mitigate air pollution through a project to replace conventional woodstoves with cleaner-burning stoves in local communities.

The US EPA discovered the violations through a routine inspection and information Harley-Davidson submitted after subsequent information requests.

CENTRAL & SOUTH AMERICA

Mexico to introduce Euro VI Heavy-duty Emissions Standard

On 22 July 2016 *Reuters* reported that Mexico's undersecretary for Environmental Policy and Planning, Rodolfo Lacy Tamayo, said in an interview that new Heavy-duty vehicles will have to meet Euro VI emissions standards in 2020.

Mexico currently uses the Euro IV standard for Heavy-duty vehicles and new Heavy-duty trucks will have to meet Euro V emissions standard as from 1 July 2018.

Lacy Tamayo said the Euro VI implementation date would coincide with greater availability of cleaner ultra-low sulfur fuel in the country. He also said the Government would not offer subsidies to consumers who purchase new vehicles.

The details of the new Regulation are still to be officially published.

EURASIA

ICCT Report on reducing Vehicle Emissions in Turkey

On 17 August 2016 the International Council on Clean Transportation (ICCT) released a report on reducing vehicle emissions in Turkey.

ICCT indicates that vehicle sales and vehicle emissions are steeply rising in Turkey. A set of distinct policy measures can help increase the efficiency and reduce the emission levels of the vehicle fleet in Turkey. They include introducing mandatory CO_2 standards, CO_2-based vehicle taxation, and enhanced vehicle emissions testing for new passenger cars.

Mandatory CO_2 emission standards for new vehicles are successfully applied in other markets but have not yet been introduced in Turkey. For the analysis within this report, two scenarios were assessed in more detail by ICCT, allowing for an annual CO_2 reduction rate of 4% and 6% for newly registered cars and resulting in an average new car fleet CO_2 level of 84 g/km and 69 g/km by 2023, respectively. The required additional investment in new vehicle technologies to meet these future CO_2 targets was found to be reasonably low and to result in a consumer payback period as short as four to five years, thanks to the fuel cost savings associated with lower CO_2 emission levels.

In order to address the increasing discrepancy between official and real-world emission data, Turkey should introduce the new Worldwide harmonized Light vehicles Test Procedure (WLTP) as soon as possible, ICCT said, and introduce mandatory on-road emission tests for new vehicle models, both for CO_2 and other pollutants.

As a third pillar of a comprehensive low-emissions policy, regular retesting of the emission levels of in-use vehicles, carried out by the authorities or independent third parties, is strongly advised.

The ICCT report is at
www.theicct.org/sites/default/files/publications/Reducing%20VE%20Turkey%20White%20Paper_ICCT_08172016.pdf.

ASIA PACIFIC

UNEP Report on Air Pollution Control in Beijing, China

UNEP, the United Nations Environment Programme, has released a new report titled "A review of air pollution control in Beijing: 1998-2013".

The aim of the report is to assess the effectiveness of the air pollution control measures taken by the capital city of Beijing since 1998 and to summarize its experience in air pollution control.

Chapter 1 is a background and introduction to the report. Chapter 2 reviews the historical trend of ambient air quality in Beijing from 1998 to 2013. Chapter 3 discusses the various air pollution control and prevention measures implemented in Beijing. Chapter 4 assesses the effectiveness of air pollution control measures implemented in Beijing by evaluating the emission reduction benefits.

Chapter 5 looks at achieving air quality goals during special events and Chapter 6 summarizes the city's experience in air pollution control and outlines its direction on air pollution control.

The UNEP report is at www.ccacoalition.org/en/resources/review-air-pollution-control-beijing-1998-2013.

Indian Supreme Court lifts Ban on Sale of Diesels in Delhi

On 12 August 2016 the Indian Supreme Court lifted the ban on sale of diesel cars and SUVs above 2000 cc in Delhi/NCR (National Capital Region).

The Court first levied the decision to ban the registration of big diesel vehicles in Delhi/NCR on 16 December 2015.

The Supreme Court of India has now lifted this ban on registration of diesel vehicles with engines bigger than 2000 cc. However, the Supreme Court has ordered the automakers to pay 1% of the showroom price of the vehicles as green tax to resume sales in the NCR. This will however be a temporary charge and may be enhanced later. The Court will also decide later whether it should not be imposed at all as contested by the central Government.

The Indian media source is at http://auto.economictimes.indiatimes.com/news/industry/sc-lifts-ban-on-sale-of-diesel-vehicles-over-2000cc-in-delhi-ncr/53668341.

South Korea investigates Car Emissions

On 18 August 2016 *Bloomberg* reported that the South Korean Environment Ministry expanded investigations into emissions and noise-level test results to 23 foreign automakers involving 110 diesel models.

Earlier in August 2016, South Korea blocked sales of 80 VW models and fined the company 17.8 billion won (€14 million) for fabricated documents related to emissions and noise-level tests.

The results of the investigations will be announced in two to three months.

GENERAL

AECC Technical Seminar on RDE PN

On 4 July 2016 AECC organized in Brussels a technical seminar on Real-Driving Emissions of Particles (RDE PN).

The event was attended by 58 people with representatives from the European Commission, European Parliament, eleven EU Member States, AECC Member companies as well as other organizations and Non-Governmental Organizations.

After an introduction by AECC's Dirk Bosteels, Thomas Henrichs of the European Commission's DG-Environment gave an update on the Clean Air Programme for Europe, and Alessandro Marotta of the DG-Growth presented the development of the third RDE legislative package. Cécile Favre presented the success story of filters, from Diesel Particulate Filter (DPF) to Gasoline Particulate Filter (GPF); followed by T&E's Greg Archer considerations on how to avoid a "gasolinegate". Joachim Demuynck of AECC presented the results of the recent Gasoline Direct Injection (GDI) RDE PN test programme that showed how a GPF allows the control of ultrafine particles of a state-of-the-art Euro 6 GDI car under all driving conditions and with various gasoline fuels.

Ricardo's Jon Andersson presented PN measurement experiences from the 2016 AECC GDI project including on sub-23 nm particles; Francesco Riccobono of the European Commission's Joint Research Centre (JRC) presented the inter-laboratory PEMS PN comparison exercise that concludes on the feasibility of the RDE PN measurement via PEMS-PN instruments; and Joel Danzer of Horiba presented their commercially available PEMS-PN equipment. The last presentation was given by AECC's Joachim Demuynck and highlighted the importance of tackling cold-start RDE.

At the end of the day, Bosteels introduced the new AECC position paper on the third RDE regulatory package that was launched at the occasion of the AECC technical seminar.

Presentations and pictures of the technical seminar are available at www.aecc.eu/en/Publications/RDE%20PN_Technical_Seminar.html and the AECC position paper on the third RDE regulatory package is at www.aecc.eu/content/pdf/160630%20AECC%20position%20on%20RDE%20package%203.pdf.

Emissions Analytics launches EQUA Carbon Monoxide Index

On 21 July 2016 Emissions Analytics (EA) launched the EQUA index for CO that looks at whether vehicles' carbon monoxide emissions regulations are being achieved in real-world operation.

In the same way that EA rates emissions of NOx from diesel, gasoline and hybrid vehicles with a single scale on the EQUA Aq Index, the EQUA CO Index awards a universal rating regardless of fuel type. Thus, despite the regulations setting different limits, the EQUA CO Index allows comparisons between vehicles.

Of the 734 vehicles currently on the EQUA CO Index, 96% emit the regulated amount of CO or less. However, there are some exceptions. Several Mercedes C-Class diesels are over 500 mg/km, out of a small number of cars over the limit. Additionally, 8% of gasoline vehicles, that is 24 models tested by EA, do not meet the regulated limit, with one outlier being more than six times over.

Of the hybrid vehicles tested, all achieve the regulated limit apart from the Mitsubishi Outlander which scored a D-rating when not running on its electric engine.

More info is available at http://equaindex.com/equa-carbon-monoxide-index/.

ICCT Report on Passenger Car Emission Control Defect Reporting System

On 19 July 2016 the International Council on Clean Transportation (ICCT) published a report on improving emissions standards compliance with a defect reporting system for in-use passenger cars.

An emission control defect reporting program is used in California to improve compliance with passenger vehicle emissions standards. The California Air Resources Board (CARB) regulation requires the manufacturer of passenger vehicles to report how many warranty claims for emissions control parts (as a percentage) it receives within the warranty period for the vehicle. An excessive percentage suggests there is a defect in the part that is causing or will lead to increased emissions.

Based on the defect reports, CARB may seek voluntary agreement with the vehicle manufacturer to recall the affected vehicles and replace the defective emissions control part with one of an improved design. This prevents future failure of the part and thus reduces in-use emissions. Basing the recall (or other corrective action) on defect reporting can avoid costly test vehicle procurement and emissions testing to demonstrate an emissions standard has been exceeded, which otherwise would be a prerequisite to a recall. CARB may also use the defect reports to prioritize models for emissions testing in its in-use compliance testing program. In either case the defect reporting system complements and increases the efficiency of CARB's overall in-use compliance program.

The US Environmental Protection Agency (EPA) has a similar program, which applies to vehicles sold in US states not subject to CARB's requirements.

The ICCT report is at www.theicct.org/sites/default/files/publications/ICCT_PV-emission-stds-compliance-defect-reporting_201607.pdf.

ICCT-commissioned Legal Note on EU and US Defeat Devices

On 12 August 2016 the International Council on Clean Transportation (ICCT) published a legal note they commissioned to legal experts at Défense Terre and which analyses the EU and US regulations on defeat devices.

Although the language in the US and EU regulations on vehicle emissions testing prohibiting defeat devices, and defining exemptions or exceptions, is very similar, the regulations have been implemented quite differently. Consequently, similar real-world emissions control strategies have been found illegal in the US but not in Europe.

One reason for this discrepancy is the extensive supplemental documentation that the US regulatory agencies have issued to clarify and guide the implementation of the regulation. The US guidance also explicitly puts the burden on manufacturers to prove they are not using a prohibited defeat device. This type of guidance is missing in the EU system, ICCT said, and the lack of guidance has contributed to inconsistency and uncertainty in how the regulations are to be enforced.

There is an opportunity to improve the language of the defeat device prohibition through the new type-approval framework Regulation recently proposed by the European Commission and which is now being considered by the European Parliament and the Council. The legal note includes 9 specific recommendations for how the type-approval framework as well as existing EU emissions regulations could be amended to more effectively prevent manufacturers' use of defeat devices.

The legal note on EU and US defeat devices is at www.theicct.org/sites/default/files/publications/DefTerre_StrengtheningDefeatDeviceRegulation_Briefing_jun2016.pdf.

Concawe Report on Urban Air Quality

On 1 July 2016 Concawe published a report on urban air quality prepared by AERIS Europe.

The report explores the effect of emissions reduction scenarios on compliance with the ambient air quality limit values for NO_2 and PM in the EU27 countries with a particular focus on urban environments. The study utilised a suite of emissions and air quality modelling tools developed and maintained by AERIS Europe which together facilitate the assessment of $PM_{2.5}$, PM_{10} and NO_2 air quality compliance at individual monitoring station level for the whole of the EU.

A number of scenarios have been evaluated to better understand the current and future contribution of road transport, and in particular diesel road transport to overall urban air quality in Europe. The study was

undertaken in two phases. The first phase (scenarios A to D) was aimed at understanding the maximum possible improvements in $PM_{2.5}$, PM_{10} and NO_2 compliance from taking action that targets road transport and domestic combustion. This included exploring some extreme scenarios 'beyond the Base Case' such as the hypothetical immediate replacement of all diesel-powered road transport with zero exhaust emission vehicles (Scenario B). In the specific context of $PM_{10}/PM_{2.5}$ compliance, the impact of a complete removal of solid fuel burning emissions from the domestic sector was also explored (Scenario A). The second phase (Scenario E) focussed on NO_2 compliance and the contribution from diesel passenger cars. This included exploring the impact on NO_2 compliance of varying degrees of conformity with legislated Euro 6 emissions limits under real driving conditions. The main conclusions were that for PM, removal of solid burning emissions from the domestic sector would have the biggest impact on future compliance and replacement of diesel vehicles none. For NO_2, in the short term targeted measures will be important in improving compliance whilst in the longer term the importance of meeting Euro 6 requirements fully is highlighted.

The Concawe study is at www.concawe.eu/uploads/Modules/Publications/rpt_16-11.pdf.

PSA publishes On-Road Fuel Consumption Data from 28 Vehicles

On 6 July 2016 PSA published on-road fuel consumption data from 28 of their vehicles.

The results come from a test procedure established with two non-governmental organizations, Transport & Environment (T&E) and France Nature Environnement (FNE), and have been audited by Bureau Veritas. Reliable and reproducible, the test procedure measures the real-world fuel consumption of PSA customers, the car manufacturer said.

The measurements were made on public roads open to traffic (25 km urban, 39 km rural and 31 km motorway) and under real-life driving conditions, notably with passenger and luggage loads, road gradients, and the use of air-conditioning systems. The procedure measures fuel consumption by means of a Portable Emissions Measurement System (PEMS) installed on the vehicle.

Fuel consumption of 14 Peugeot, 11 Citroën, and 3 DS cars were published. The measurements are comparable to those obtained from independent PSA customer surveys.

By the end of 2016, the Peugeot, Citroën and DS brands will offer a simulator on their websites to enable customers to predict their vehicles' fuel consumption based on driving style and conditions (city/country/motorway mix, vehicle load, etc.). At the same time, an eco-driving application will also be made available online to help customers manage their fuel consumption.

FEMA Survey on Emissions from Motorcycles

On 1 August 2016 the Federation of European Motorcyclists' Associations, FEMA, launched a survey on emissions from motorcycles.

FEMA's mission is to promote riders' interests, to defend riders' rights and to protect and preserve motorcycling throughout Europe and globally. With growing pressure from city Councils on older motorcycles (< Euro 3) and threats or even concrete plans to ban them from cities, or toll them like in Paris, London and several Italian cities, riders experience a growing pressure to switch from older motorcycles to new, less fuel consuming and cleaner motorcycles.

FEMA wants to know how motorcycle riders feel about this subject. The survey is at www.fema-online.eu/website/index.php/2016/08/01/survey-on-emissions and will close on 31 October 2016.

RESEARCH SUMMARY

Effects of Emissions and Pollution

Estimated Excess Morbidity and Mortality Caused by Air Pollution above American Thoracic Society-Recommended Standards, 2011-2013, Kevin Cromar, Laura Gladson, Lars Perlmutt, et al.; *Ann. Am. Thorac. Soc.* (Aug 2016), Vol. 13 (8), pp. 1195-1201, doi: 10.1513/AnnalsATS.201602-103AR.

Air pollutants degrade floral scents and increase insect foraging times, Jose Fuentes, Marcelo Chamecki, T'ai Roulston, et al.; *Atmospheric Environment* (September 2016), Vol. 141, pp. 361-374, doi: 10.1016/j.atmosenv.2016.07.002.

Role of the boundary layer dynamics effects on an extreme air pollution event in Paris, J.-C. Dupont, M. Haeffelin, J. Badosa, et al.; *Atmospheric Environment* (September 2016), Vol. 141, pp. 571-579, doi: 10.1016/j.atmosenv.2016.06.061.

Association between neighbourhood air pollution concentrations and dispensed medication for psychiatric disorders in a large longitudinal cohort of Swedish children and adolescents, Anna Oudin, Lennart Bråbäck, Daniel Oudin Åström, et al.; *BMJ Open* (2016), Vol. 6 (6), doi: 10.1136/bmjopen-2015-010004.

Impacts of air pollution on cultural heritage corrosion at European level: What has been achieved and what are the future scenarios, Francesca Di Turo, Chiara Proietti, Augusto Screpanti, et al.; *Environmental Pollution* (in press), doi: 10.1016/j.envpol.2016.07.042.

Association between vehicular emissions and cardiorespiratory disease risk in Brazil and its variation by spatial clustering of socio-economic factors, Weeberb Requia, Petros Koutrakis, Henrique Roig, et al.; *Environmental Research* (October 2016), Vol. 150, pp. 452-460, doi: 10.1016/j.envres.2016.06.027.

Effects of long-range transported air pollution from vegetation fires on daily mortality and hospital admissions in the Helsinki metropolitan area, Finland, Virpi Kollanus, Pekka Tiittanen, Jarkko Niemi, et al.; *Environmental Research* (November 2016), Vol. 151, pp. 351-358, doi: 10.1016/j.envres.2016.08.003.

Maternal exposure to diluted diesel engine exhaust alters placental function and induces intergenerational effects in rabbits, Sarah Valentino, Anne Tarrade, Josiane Aioun, et al.; *Particle and Fibre Toxicology* (2016), Vol. 13 (39), doi: 10.1186/s12989-016-0151-7.

Metabolic Profiling as Well as Stable Isotope Assisted Metabolic and Proteomic Analysis of RAW 264.7 Macrophages Exposed to Ship Engine Aerosol Emissions: Different Effects of Heavy Fuel Oil and Refined Diesel Fuel, Sean Sapcariu, Tamara Kanashova, Marco Dilger, et al.; *PLoS ONE* (2016), Vol. 11 (6), doi: 10.1371/journal.pone.0157964.

The mortality impacts of fine particles in France, Mathilde Pascal, Perrine de Crouy Chanel, Vérène Wagner, et al.; *Science of The Total Environment* (in press), doi: 10.1016/j.scitotenv.2016.06.213.

Air pollution affects lung cancer survival, Sandrah Eckel, Myles Cockburn, Yu-Hsiang Shu, et al.; *Thorax* (in press), doi: 10.1136/thoraxjnl-2015-207927.

Air Quality, Sources and Exposure

Traffic contribution to air pollution in urban street canyons: Integrated application of the OSPM, moss biomonitoring and spectral analysis, Lazar Lazić, Mira Aničić Urošević, Zoran Mijić, et al.; *Atmospheric Environment* (September 2016), Vol.141, pp. 347-360, doi: 10.1016/j.atmosenv.2016.07.008.

Investigating near-road particle number concentrations along a busy urban corridor with varying built environment characteristics, Junshi Xu, An Wang, Marianne Hatzopoulou; *Atmospheric Environment* (October 2016), Vol. 142, pp. 171-180, doi: 10.1016/j.atmosenv.2016.07.041.

Ozone concentrations and damage for realistic future European climate and air quality scenarios, Carlijn Hendriks, Nicklas Forsell, Gregor Kiesewetter, et al.; *Atmospheric Environment* (in press), doi: 10.1016/j.atmosenv.2016.08.026.

Did policies to abate atmospheric emissions from traffic have a positive effect in London?, Anna Font, Gary Fuller; *Environmental Pollution* (in press), doi: 10.1016/j.envpol.2016.07.026.

Increase in ozone due to the use of biodiesel fuel rather than diesel fuel, Phan Quang Thang, Yusuke Muto, Yasuaki Maeda, et al.; *Environmental Pollution* (in press), doi: 10.1016/j.envpol.2016.04.102.

Concentration dynamics of coarse and fine particulate matter at and around signalised traffic intersections, Prashant Kumar, Anju Goel; *Environ. Sci.: Processes Impacts* (in press), doi: 10.1039/C6EM00215C.

Emissions Measurements and Modelling

Comparative profile of pollutants generated by a stationary engine fueled with diesel, biodiesel, and ethanol, Beatriz Silva Amaral, Fábio Júnior Moreira Novaes, Maria da Conceição Klaus Ramos, et al.; *Aerosol Science* (October 2016), Vol. 100, pp. 155-163, doi: 10.1016/j.jaerosci.2016.07.009.

Effect of measurement protocol on organic aerosol measurements of exhaust emissions from gasoline and diesel vehicles, Youngseob Kim, Karine Sartelet, Christian Seigneur, et al.; *Atmospheric Environment* (September 2016), Vol. 140, pp. 176-187, doi: 10.1016/j.atmosenv.2016.05.045.

Real-world automotive particulate matter and PAH emission factors and profile concentrations: Results from an urban tunnel experiment in Naples, Italy, A. Riccio, E. Chianese, D. Monaco, et al.; *Atmospheric Environment* (September 2016) Vol. 141, pp. 379-387, doi: 10.1016/j.atmosenv.2016.06.070.

Joint measurements of black carbon and particle mass for heavy-duty diesel vehicles using a portable emission measurement system, Xuan Zheng, Ye Wu, Shaojun Zhang, et al.; *Atmospheric Environment* (September 2016), Vol. 141, pp. 435-442, doi: 10.1016/j.atmosenv.2016.07.013.

Implications of diesel emissions control failures to emission factors and road transport NOx evolution, L. Ntziachristos, G. Papadimitriou, N. Ligterink, et al.; *Atmospheric Environment* (September 2016), Vol. 141, pp. 542-551, doi: 10.1016/j.atmosenv.2016.07.036.

Characterizing near-road air pollution using local-scale emission and dispersion models and validation against in-situ measurements, A. Wang, M. Fallah-Shorshani, J. Xu, et al.; *Atmospheric Environment* (October 2016), Vol. 142, pp. 452-464, doi: 10.1016/j.atmosenv.2016.08.020.

Type approval and real-world CO_2 and NOx emissions from EU light commercial vehicles, Nikiforos Zacharof, Uwe Tietge, Vicente Franco, et al.; *Energy Policy* (October 2016), Vol. 97, pp. 540-548, doi: 10.1016/j.enpol.2016.08.002.

Evaluating real-world CO_2 and NOx emissions for public transit buses using a remote wireless on-board diagnostic (OBD) approach, Liuhanzi Yang, Shaojun Zhang, Ye Wu, et al.; *Environmental Pollution* (in press), doi: 10.1016/j.envpol.2016.07.025.

Characterization of particulate matter from diesel passenger cars tested on chassis dynamometers, Sungwoon Jung, Jaehyun Lim, Sangil Kwon, et al.; *Environmental Sciences* (in press), doi: 10.1016/j.jes.2016.01.035.

Real-World Emissions from Modern Heavy-Duty Diesel, Natural Gas, and Hybrid Diesel Trucks Operating Along Major California Freight Corridors, David Quiros, Arvind Thiruvengadam, Saroj Pradhan, et al.; *Emiss. Control Sci. Technol.* (July 2016), Vol. 2 (3), pp. 156-172, doi: 10.1007/s40825-016-0044-0.

Performance and pollutant emissions from transient operation of a common rail diesel engine fueled with different biodiesel fuels, María Cárdenas, Octavio Armas, Carmen Mata, et al.; *Fuel* (1 December 2016), Vol. 185, pp. 743-762, doi: 10.1016/j.fuel.2016.08.002.

Polycyclic aromatic hydrocarbons in diesel emission, diesel fuel and lubricant oil, Carolina Vieira de Souza, Sergio Machado Corrêa; *Fuel* (1 December 2016), Vol. 185, pp. 925-931, doi: 10.1016/j.fuel.2016.08.054.

Impact of aromaticity and cetane number on the soot-NOx trade-off in conventional and low temperature combustion, Jos Reijnders, Michael Boot, Philip de Goey; *Fuel* (15 December 2016), Vol. 186, pp. 24-34, doi: 10.1016/j.fuel.2016.08.009.

Evolution and current understanding of physicochemical characterization of particulate matter from reactivity controlled compression ignition combustion on a multicylinder light-duty engine, John Storey, Scott Curran, Samuel Lewis, et al.; *International Journal of Engine Research* (in press), doi: 10.1177/1468087416661637.

Impacts of advanced diesel combustion operation on soot nanostructure and reactivity, Kuen Yehliu, Gregory Lilik, Randy Vander Wal, et al.; *International Journal of Engine Research* (in press), doi: 10.1177/1468087416659947.

Emission factors of air pollutants from CNG-gasoline bi-fuel vehicles: Part I. Black carbon, Yang Wang, Zhenyu Xing, Hui Xu, et al.; *Science of The Total Environment* (in press), doi: 10.1016/j.scitotenv.2016.08.027.

Estimation of the Effects of New Emission Standards on Motorcycle Emissions by Means of Modeling, Conrad Piasecki; *Transportation Research Procedia* (2016), Vol. 14, pp. 3089-3098, doi: 10.1016/j.trpro.2016.05.455.

Emissions Control, Catalysis, Filtration

Synergic effect of Cu/$Ce_{0.5}Pr_{0.5}O_{2-\delta}$ and $Ce_{0.5}Pr_{0.5}O_{2-\delta}$ in soot combustion, Verónica Rico-Pérez, Eleonora Aneggi, Agustín Bueno-López, et al.; *Applied Catalysis B: Environmental* (15 November 2016), Vol. 197, pp. 95-104, doi: 10.1016/j.apcatb.2016.02.051.

CO and soot oxidation activity of doped ceria: Influence of dopants, Deboshree Mukherjee, Bolla Govinda Rao, Benjaram M. Reddy; *Applied Catalysis B: Environmental* (15 November 2016), Vol. 197, pp. 105-115, doi: 10.1016/j.apcatb.2016.03.042.

Catalytic diesel particulate filters with highly dispersed ceria: Effect of the soot-catalyst contact on the regeneration performance, Valeria Di Sarli, Gianluca Landi, Luciana Lisi, et al.; *Applied Catalysis B: Environmental* (15 November 2016), Vol. 197, pp. 116-124, doi: 10.1016/j.apcatb.2016.01.073.

Nanostructured ceria-praseodymia catalysts for diesel soot combustion, Tahrizi Andana, Marco Piumetti, Samir Bensaid, et al.; *Applied Catalysis B: Environmental* (15 November 2016), Vol. 197, pp. 125-137, doi: 10.1016/j.apcatb.2015.12.030.

Hydrogen production from hydrocarbons over Rh supported on Ce-based oxides for automotive applications, S. Rijo Gomes, N. Bion, D. Duprez, F. Epron; *Applied Catalysis B: Environmental* (15 November 2016), Vol. 197, pp. 138-145, doi: 10.1016/j.apcatb.2016.01.022.

Structure-reactivity relationships in $VO_x/Ce_xZr_{1-x}O_2$ catalysts used for low-temperature NH_3-SCR of NO, Thanh Huyen Vuong, Jörg Radnik, Evgenii Kondratenko; *Applied Catalysis B: Environmental* (15 November 2016), Vol. 197, pp. 159-167, doi: 10.1016/j.apcatb.2016.03.063.

The role of Copper–Ceria interactions in catalysis science: Recent theoretical and experimental advances (review article), M. Konsolakis; *Applied Catalysis B: Environmental* (5 December 2016), Vol. 198, pp. 49-66, doi: 10.1016/j.apcatb.2016.05.037.

NOx storage and reduction over copper-based catalysts. Part 1: BaO + CeO_2 supports, Agustin Bueno-López, Dolores Lozano-Castelló, James Anderson; *Applied Catalysis B: Environmental* (5 December 2016), Vol. 198, pp. 189-199, doi: 10.1016/j.apcatb.2016.05.067.

NOx storage and reduction over copper-based catalysts. Part 2: $Ce_{0.8}M_{0.2}O_5$ supports (M = Zr, La, Ce, Pr or Nd), Agustin Bueno-López, Dolores Lozano-Castelló, James Anderson; *Applied Catalysis B: Environmental* (5 December 2016), Vol. 198, pp. 234-242, doi: 10.1016/j.apcatb.2016.05.066.

NOx storage and reduction over copper-based catalysts. Part 3: Simultaneous NOx and soot removal, Agustin Bueno-López, Dolores Lozano-Castelló, Alan McCue, James Anderson; *Applied Catalysis B: Environmental* (5 December 2016), Vol. 198, pp. 266-275, doi: 10.1016/j.apcatb.2016.05.068.

NO_2 adsorption mechanism on TiO_2: An *in-situ* transmission infrared spectroscopy study, L. Sivachandiran, F. Thevenet, A. Rousseau, et al.; *Applied Catalysis B: Environmental* (5 December 2016), Vol. 198, pp. 411-419, doi: 10.1016/j.apcatb.2016.05.065.

Hybrid catalysts for the selective catalytic reduction (SCR) of NO by NH_3. On the role of fast SCR in the reaction network, Mariam Salazar, Stefanie Hoffmann, Vera Singer, et al.; *Applied Catalysis B: Environmental* (15 December 2016), Vol. 199, pp. 433-438, doi: 10.1016/j.apcatb.2016.06.043.

Study of particulate matter and gaseous emissions in gasoline direct injection engine using on-board exhaust gas fuel reforming, M. Bogarra, J.M. Herreros, A. Tsolakis, et al.; *Applied Energy* (15 October 2016), Vol. 180, pp. 245-255, doi: 10.1016/j.apenergy.2016.07.100.

CFD Evaluation of In Situ Probe Techniques for Catalytic Honeycomb Monoliths, Matthias Hettel, Claudia Antinori, Olaf Deutschmann; *Emiss. Control Sci. Technol.* (in press), doi: 10.1007/s40825-016-0043-1.

HC-Induced Deactivation in CO Conversion at Diesel Oxidation Catalysts, M. Herrmann, S. Malmberg, A. Drochner, et al.; *Emiss. Control Sci. Technol.* (in press), doi: 10.1007/s40825-016-0045-z.

Investigation of the Poisoning Mechanism of Lead on the CeO_2-WO_3 Catalyst for the NH_3-SCR Reaction via in Situ IR and Raman Spectroscopy Measurement, Yue Peng, Wenzhe Si, Xiang Li, et al.; *Environ. Sci. Technol.* (2016), Vol. 50 (17), pp. 9576-9582, doi: 10.1021/acs.est.6b02307.

Impact of Aftertreatment Device and Driving Conditions on Black Carbon, Ultrafine Particle and NOx Emissions for Euro 5 Diesel and Gasoline Vehicles, Louis Cédric, Mathieu Goriaux, Patrick Tassel, et al.; *Transportation Research Procedia* (2016), Vol. 14, pp. 3079-3088, doi: 10.1016/j.trpro.2016.05.454.

Transport, Climate Change & Emissions

CO_2 emissions and energy demands of vehicles tested under the NEDC and the new WLTP type approval test procedures, Jelica Pavlovic, Alessandro Marotta, Biagio Ciuffo; *Applied Energy* (1 September 2016), Vol. 177, pp. 661-670, doi: 10.1016/j.apenergy.2016.05.110.

Beyond 'Dieselgate': Implications of unaccounted and future air pollutant emissions and energy use for cars in the United Kingdom, Christian Brand; *Energy Policy* (October 2016), Vol. 97, pp. 1-12, doi: 10.1016/j.enpol.2016.06.036.

Assessing the Climate Trade-Offs of Gasoline Direct Injection Engines, Naomi Zimmerman, Jonathan Wang, Cheol-Heon Jeong, et al.; *Environ. Sci. Technol.* (2016), Vol. 50 (15), pp. 8385-8392, doi: 10.1021/acs.est.6b01800.

Climate change mitigation and deployment of electric vehicles in urban areas, Evanthia Nanaki, Christopher Koroneos; *Renewable Energy* (December 2016), Vol. 99, pp. 1153-1160, doi: 10.1016/j.renene.2016.08.006.

FORTHCOMING CONFERENCES

SAE 2016 Heavy-Duty Diesel Emissions Control Symposium

20-21 September 2016, Gothenburg, Sweden

www.sae.org/events/hddec

The programme will focus on regulatory facts and trends, technical information and the latest strategies regarding Heavy-duty diesel emissions control technologies.

20th International Forum on Advanced Microsystems for Automotive Applications (AMAA 2016)

22-23 September 2016, Brussels, Belgium

www.amaa.de

The conference theme will be "Smart systems for the automobile of the future". Topics include some discussion on how to minimize CO_2 and pollutant emissions.

FISITA 2016 World Automotive Congress

26-30 September 2016, Busan, South Korea

www.fisita2016.com

FISITA 2016 will focus on energy-efficiency, safety, eco-friendly technology, and connectivity.

VPC – Simulation und Test 2016

27-28 September 2016, Hanau, Germany

www.atzlive.de/VPC-Simulation-und-Test-201618--MTZ-Fachtagung/konferenzen/761.html

The conference will discuss the challenges of Real-Driving Emissions (RDE).

Air Quality: a European Challenge

4 October 2016, Strasbourg, France

www.strasbourg.eu/colloqueair

The aim of this gathering is to involve both national and European policymakers and to invite them to exchange good practices.

25th Aachen Colloquium

10-12 October 2016, Aachen, Germany

www.aachener-kolloquium.de

The Aachen colloquium on automobile and engine technology provides a wide range of technical presentations addressing current challenges of the vehicle and engine industry.

GreenPort Congress 2016

11-14 October 2016, Venice, Italy

www.greenport.com/congress

The congress will discuss alternative fuels for port infrastructure and maritime transport; reducing the carbon footprint of the logistics chain; port reception facilities/dust/noise/air emissions; circular economy; and industrial symbiosis.

4th International Conference Real Driving Emissions

25-27 October 2016, Berlin, Germany

www.real-driving-emissions.eu

Topics include latest developments on Real Driving Emissions regulation, results of test runs and round robins, insight into RDE data evaluation models, current PEMS technology, application and improvements, simulation models for cost effective RDE strategies, and engine design strategies and exhaust aftertreatment in regard to RDE compliance.

9th Integer Emissions Summit & DEF Forum USA 2016

25-27 October 2016, Chicago, USA

www.integer-research.com/conferences/ies-usa-2016

The conference will host dedicated streams examining the regulatory and emissions reduction challenges for Heavy-duty commercial vehicles, off-highway vehicles, Light-duty vehicles and passenger cars, marine vessels, and DEF Forum.

14th FAD-Conference

3-4 November 2016, Dresden, Germany

www.fad-diesel.de/news/14th_FAD_Conference

The conference will discuss state of the art, new technologies as well as innovative ideas in the field of exhaust aftertreatment.

Ricardo Motorcycle Conference 3.0 – Riding Future Technologies

7 November 2016, Milan, Italy

www.motorcycleconference.com

The conference will explore the current trends and needs of the motorcycle world, including the challenges relating to future emissions legislation, latest developments of rider assistance systems and urban mobility.

Advanced Fuels for Sustainable Mobility

9-10 November 2016, Aachen, Germany

www.fev.com/fev-conferences/fev-conference-advanced-fuels-for-sustainable-mobility.html

The FEV conference will discuss future-oriented developments in engine technology, fuels and fuel system components.

10th Conference Diesel and Gasoline Direct Injection

24-25 November 2016, Berlin, Germany

www.hdt.de/dub2016

The purpose of this conference is to discuss fuel injection, fuel preparation and mixture formation in the combustion chamber of an ICE.

SAE 2017 Light Duty Emissions Control Symposium

23-24 January 2017, Washington DC, USA

www.sae.org/events/lde

Topics include discussion of and industry reaction to CARB and EC emission regulations as well as CAFE standards and the latest EPA Tier 3 emissions and fuel regulations, mandated from 2017. The symposium will focus on how mandated vehicle emissions are being reduced via vehicle design, powertrain design, aftertreatment, and fuel content and development.

NGV Global 2017 Conference

20-23 March 2017, Rotterdam, Netherlands

www.ngv2017.com

SAE 2017 World Congress

4-6 April 2017, Detroit, USA

www.sae.org/congress

38th International Vienna Motor Symposium

27-28 April 2017, Vienna, Austria

https://wiener-motorensymposium.at/en/home/

Topics for the symposium include latest findings in engine development, on new engines, fuel cells, hybrid technology, exhaust gas treatment and real driving emissions (RDE).

Deadline for abstracts: 30 September 2016

29th International AVL Conference "Engine & Environment"

1-2 June 2017, Graz, Austria

www.avl.com/engine-environment-2017

Competition of powertrain systems to reduce CO_2 and emissions 2020/2025.

International Conference SIA Powertrain

7-8 June 2017, Versailles, France

www.sia.fr/evenements/66-sia-powertrain-versailles-2017

The conference will focus on the low CO_2 spark ignition engine of the future and its hybridization.

Emissions 2017

12-13 September 2017, Frankfurt, Germany

https://gamcinc.com/conferences/emissions/?id=1

The forum will address key topics and issues on advances in emission technology and management systems related to OEMs, suppliers (all tiers), component manufacturers, governmental and non-governmental agencies.

Deadline for abstracts: 10 November 2016

Aachen Colloquium 2017

9-11 October 2017, Aachen, Germany

Info will be at www.aachener-kolloquium.de