MAY 2017

NEWSLETTER

International Regulatory Developments

TABLE OF CONTENTS

AECC AISBL | bd. Auguste Reyers, 80 | B-1030 Brussels | Belgium | Tel: +32 2 7068160 | info@aecc.eu | www.aecc.eu

EUROPE

NRMM Stage V enters Force

On 3 May 2017 the new Stage V standard for Non-Road Mobile Machinery (NRMM) entered force, following publication in the Official Journal of the delegated and implementing acts (*see AECC Newsletter of April 2017*).

Stage V notably introduces a Particle Number limit of $1x10^{12}$/kWh for engines of the main category (NRE) between 19 and 560 kW, for inland waterway (IWP and IWA) engines >300 kW, and railcar (RLR) engines.

For most engine categories, Stage V will become mandatory as of 1 January 2018 for type-approval of engines and 1 January 2019 for placing on the market of engines. One year additional leadtime is provided for NRE engines between 56 and 130 kW, and for inland waterway vessels engines (both IWP and IWA) above 300 kW (1 January 2019/2020), and two additional years for rail engines (both RLL and RLR categories), i.e. 1 January 2020/2021.

Member States adopt CO_2 Certification Procedure for Heavy-Duty Vehicles

On 11 May 2017 EU Member States adopted a new certification procedure for CO_2 emissions and fuel consumption of heavy-duty vehicles, based on the simulation tool VECTO.

The approved system will see industry supply information on several key vehicle parameters, including weight, aerodynamics performance and engine efficiency. Based on this data, the simulator will build reference CO_2 emission values that customers will find in labels on the vehicles.

These fuel figures could also be the basis for the CO_2 standards for heavy-duty vehicles that the European Commission is expected to propose in the future.

The requirements will be phased-in over the period from January 2019 through July 2020, depending on the type of truck and its registration and production date. This Regulation will apply to N2 vehicles with a reference mass over 7 500 kg and to all N3 vehicles.

More information on the VECTO tool is available from the Commission's Joint Research Centre (JRC) report at https://ec.europa.eu/jrc/en/publication/report-vecto-technology-simulation-capabilities-and-future-outlook.

'Europe on the Move' Package includes HDV CO_2 Monitoring Proposal

On 31 May 2017 the European Commission adopted a range of initiatives to modernise European mobility and transport, called 'Europe on the Move'.

The aim is to help the sector to stay competitive in a socially fair transition towards clean energy and digitalisation. 'Europe on the Move' is a wide-ranging set of initiatives that will make traffic safer; encourage smart road charging; reduce CO_2 emissions, air pollution and congestion; cut red-tape for businesses; fight illicit employment; and ensure proper conditions and rest times for workers.

It is accompanied by a first series of 8 legislative initiatives specifically targeting road transport. The proposals will improve the functioning of the road haulage market and help improve workers' social and employment conditions. This first batch of proposals will be complemented over the next 12 months by other proposals, including post-2020 CO_2 emissions standards for cars and vans as well as the first-ever CO_2 emissions standards for Heavy-Duty Vehicles (HDVs). These proposals will further drive innovation; improve competitiveness, reduce CO_2 emissions, improve air quality and public health and increase the safety of transport.

Policy and legislative documents adopted include in particular:

- an evaluation report of the Fuel Quality Directive,
- a Commission Recommendation to Member States on the use of the World harmonised Light Vehicles Test Procedure (WLTP) for car labelling and information to consumers, and
- a proposal for CO_2 emissions monitoring and reporting for HDVs.

Regarding the Fuel Quality Directive evaluation, the report says that available evidence shows that there is currently no case for legislative amendments to the Directive.

The Fuel Quality Directive evaluation is at https://ec.europa.eu/transport/sites/transport/files/com20170284-evaluationreportfuelqualitydirective.pdf.

The Commission recommends for Member States to ensure that the NEDC values of new cars are used until 31 December 2018 for communication of the official fuel consumption and CO_2 emissions to consumer, as defined in the car labelling Directive 1999/94/EC. From 1 January 2019, Member States should ensure that only WLTP fuel consumption and CO_2 emission values are used for consumer information. At least the "combined" values measured in accordance with the relevant test procedure need to be communicated.

The Commission also recommends that Member States consider including the maximum value for real-driving air pollutants declared on each vehicle's certificate of conformity on the new passenger car label at the point of sale.

The Commission Recommendation was published in the Official Journal on 2 June 2017. It is available at http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017H0948&from=EN.

The proposed Regulation on HDV CO_2 monitoring and reporting applies to HDVs of categories M1, M2, N1 and N2 with above 2 610 kg not falling within the scope of the

Euro 5 & 6 Regulation (EC) 715/2007, to all M3 and N3 vehicles, as well as O3 and O4 vehicles.

The Regulation would require Member States to annually collect data (specified in Annex I) on new HDVs registered during the preceding year, and communicate that data to the Commission. Member States would have to start monitoring the data from 1 January 2019 onwards when manufacturers would have to record the data and submit it via electronic transfer to the European Environment Agency (EEA). The Commission would have to keep a publicly available central register for the reported data, to be managed by the EEA. Certain data would however not be made available due to privacy and competitiveness reasons.

The Commission would then have to present an analysis of the data annually, starting in 2020. The analysis would include the average CO_2 emission and fuel consumption of the EU HDV fleet as well as that of each manufacturer. It would also have to take into account the uptake of new and advanced CO_2 reducing technologies, where available.

The proposal has been sent to the European Parliament and the Council which will examine it under codecision.

The Commission also launched a public consultation on the text of the proposal under the Commission's Better Regulation Agenda, Stakeholders have until 26 July 2017 to submit comments.

The HDV CO_2 monitoring Regulation proposal is at https://ec.europa.eu/info/law/better-regulation/initiatives/com-2017-279_en.

Corrigendum to RDE Package 1 published

On 20 May 2017 a small corrigendum to the first package of Real-Driving Emissions, Commission Regulation (EU) 2016/427, was published in the Official Journal of the EU.

This is correcting a typo in a sentence of Appendix 7 (Selection of vehicles for PEMS testing at initial type-approval) of Annex IIIA (RDE) of the Euro 6 implementing Regulation (EC) No 692/2008. It clarifies that vehicles selected for the validation of a PEMS test family have to be driven by the Technical Services themselves.

The correction only applies to the English version of the first RDE package originally published on 31 March 2016.

The corrigendum is at http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0427R(03)&from=EN.

Commission's Infringement Procedure against Italy on Fiat Type-Approval

On 17 May 2017 the European Commission launched an infringement procedure against Italy for failure to fulfil its obligations under EU vehicle type-approval legislation with regards to Fiat Chrysler Automobiles (FCA).

The Commission sent a letter of formal notice asking Italy to respond to concerns about insufficient action taken regarding the emission control strategies employed by FCA.

The case relates to the request from the German Transport Ministry in September 2016 to mediate between the German and Italian authorities on a dissent on NOx emissions concerning vehicles type-approved by Italy. Germany raised concerns about a time-window of emissions control that is just about the duration of a type-approval emissions test cycle. The Commission carefully assessed the NOx emissions test results provided by the German type-approval authority (KBA), as well as the technical information provided by Italy on the emission control strategies employed by FCA in the car type in question.

The Commission is now formally asking Italy to respond to its concerns that the manufacturer has not sufficiently justified the technical necessity – and thus the legality – of the defeat device used, and to clarify whether Italy has failed to meet its obligation to adopt corrective measures regarding the FCA type in question and to impose penalties on the car manufacturer.

A letter of formal notice is a first step in an infringement procedure and forms part of the Commission's dialogue with Italy to clarify facts and to find a solution to the concerns identified by the Commission. Italy now has two months to respond to the arguments put forward by the Commission; otherwise, the Commission may decide to send a reasoned opinion.

More info is at http://europa.eu/rapid/press-release_IP-17-1288_en.htm.

Competitiveness Council adopts Position on Type-Approval Reform

On 29 May 2017 EU Ministers agreed on a general approach to reform the system of type-approval and market surveillance for motor vehicles at a meeting of the Competitiveness Council.

The 28 Member States agreed to improve the harmonised implementation of the rules across the EU so as to reduce the possible differences in interpretation and application by national type-approval authorities and technical services. They also agreed that more effective market surveillance rules should apply to better detect non-compliance at an early stage.

The new market surveillance obligations agreed by the Council would require every country to conduct a minimum number of checks on cars each year (at least 1 in every 50 000 new vehicles registered in that country the previous year). The checks will include verification of emissions under real driving conditions.

The European Commission will be empowered to carry out tests and inspections of vehicles to verify compliance and react to irregularities immediately. This will increase the independence and quality of the EU type-approval system. The Commission could also impose fines for infringements

on manufacturers and importers of up to €30 000 per non-compliant vehicle.

Type-Approval Authorities (TAA) would be peer-reviewed by two TAAs of other Member States at least once every five years. The Commission will be able to participate in peer evaluation teams and should draw up a summary of the outcomes of peer evaluations and make them public. Type-approval authorities however would not be subject to peer evaluation when they designate all their technical services on the basis of accreditation of internationally recognised standards.

Furthermore, an Advisory Forum for exchange of information on enforcement measures would be established with the purpose to harmonise different interpretations and practises among the Member States. In addition, the national authorities will have to submit each year to the Forum a comprehensive overview of their planned market surveillance checks.

The Council general approach will now have to be negotiated with the European Parliament, who adopted its position on 4 April 2017, during the so-called trilogue.

The Council compromise text adopted is at http://data.consilium.europa.eu/doc/document/ST-9272-2017-INIT/en/pdf.

Parliament adopts Resolution on Road Transport in the EU

On 18 May 2017 the European Parliament adopted at its plenary session a resolution on road transport in the EU.

The resolution, drafted by MEP Karima Delli (Greens, France), chair of the Transport Committee, asks the Commission to look into the introduction in several Member States of low-emission zones, and to examine the possibility of setting common criteria and rules for the introduction and functioning of these zones.

The non-legislative document suggests measures to be included in the road transport policy package the Commission was due to publish on 31 May 2017 (*see earlier article in this Newsletter*). According to MEPs, the legislative overhaul should set ambitious CO_2 standards for heavy-duty vehicles and include a new road-charging system that addresses pollution and congestion.

The Parliament's position also urges the Commission to legislate to bring down the number of heavy-goods vehicles travelling without any cargo, estimated by Eurostat to represent almost a quarter of all journeys (23.2% of vehicle-km of all heavy goods vehicles). The EU 'cabotage' rules that restrict how often foreign companies can transport freight within a country are promoting this environmentally inefficient practice, MEPs said.

Finally, the request for an EU type-approval and market surveillance agency was not adopted in the final Parliamentary resolution. The idea had support amongst the Socialist & Democrats (S&D) and the Greens, but was opposed by the European People's Party (EPP) and the European Conservatives and Reformists (ECR) groups.

The Parliamentary resolution is at www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+TA+P8-TA-2017-0228+0+DOC+PDF+V0//EN.

Commission urges Eight Member States to transpose Alternative Fuels Directive

On 17 May 2017 the European Commission asked eight Member States to fully transpose EU rules on the deployment of alternative fuels infrastructure (Directive 2014/94/EU).

The main purpose of the Directive is to establish a common framework for the large-scale roll-out of alternative fuels infrastructure in Europe to reduce transport oil-dependence, mitigate its environmental impact, and deliver on the Strategy for Low-Emission Mobility. Directive 2014/94/EU sets out minimum requirements for the building-up of alternative fuels infrastructure, including recharging points for electric vehicles and refuelling points for natural gas and hydrogen.

Cyprus, Finland, Hungary, Ireland, Latvia, the Netherlands, Portugal and Slovenia have not yet notified the Commission of measures transposing the Directive into national law despite the deadline of 18 November 2016.

The eight Member States now have two months to notify the Commission of such measures; otherwise, the Commission may decide to refer the case to the Court of Justice of the EU.

EEA publishes 2016 CO_2 Emissions from new Vans

On 18 May 2017 the European Environment Agency (EEA) published preliminary data on average carbon dioxide (CO_2) emissions of new vans registered in the EU in 2016.

The average van registered in the EU in 2016 emitted 163.8 g CO_2/km, which is 4.5 g/km less than in 2015.

This reduction brings the EU average emissions 6.4% below the 2017 target of 175 g CO_2/km; a target which was already met in 2013. Further efficiency improvements are however still needed to reach the EU target of 147 g CO_2/km set for 2020.

In 2016, almost 1.6 million new vans were registered in the EU, an increase of 9% compared to the 2015. More new vans were sold in most Member States. However, three countries reported lower sales: Latvia (-25%), Czech Republic (-19%) and France (-8.2%). Two third of new vans registered in the EU were sold in just four Member States: the UK (22%), France (18%), Germany (15%) and Italy (11%).

The average fuel-efficiency of new vans varied widely across Member States due to the different models and sizes of vehicles sold in each country. Average emissions were lowest in Portugal (140.5 g CO_2/km), Bulgaria

(141.5 g CO_2/km) and Cyprus (143.7 g CO_2/km) and highest in Slovakia (185.6 g CO_2/km), the Czech Republic (183.8 g CO_2/km), and Germany (178.8 g CO_2/km).

Only 10 177 electric and plug-in hybrid vans were sold in 2016, representing 0.6 % of the total EU van sales. This is significantly lower than the 157 096 electric and plug-in hybrid passenger cars sold the same year.

Diesel vehicles continue to make up the vast majority of the new van fleet, constituting 96% of sales in the EU.

Consultation on Draft UK Air Quality Plan for tackling NO_2

On 5 May 2017 the UK Department for Environment, Food, and Rural Affairs (DEFRA) launched a public consultation on "Improving air quality: national plan for tackling nitrogen dioxide in our towns and cities".

The most immediate air quality challenge the UK is facing is tackling the problem of nitrogen dioxide (NO_2) concentrations around roads - the only statutory air quality obligation that the UK is currently failing to meet. DEFRA published a draft UK air quality plan for tackling NO_2, accompanied by a Technical Report. Road transport is by far the largest contributor to NO_2 pollution in the local areas where the UK is exceeding limit values. Addressing road transport emissions therefore presents the most significant opportunity to tackle the problem. Solutions involve reducing NOx emissions from the current road vehicle fleet in problem locations now and accelerate fleet turnover to cleaner vehicles to ensure that the problem remains addressed and does not move to other locations.

The public consultation asks whether the draft plan appears satisfactory. Questions include what is considered the most appropriate way for local authorities to determine the arrangements for a Clean Air Zone, and the measures that should apply within it; what factors local authorities should consider when assessing impacts on businesses; how the Government can best target any funding to support local communities to cut air pollution; what options and criteria the Government should consider further.

On vehicles specifically, the questionnaire asks which vehicles should be prioritised for government-funded retrofit schemes. Views are welcomed as to how a future scheme could support new technologies and innovative solutions for other vehicle types. It is currently anticipated that funding could support modifications to buses, coaches, Heavy-Goods Vehicles, vans and black cabs. Respondents are also asked about the type of environmental and other information that should be made available to help consumers choose which cars to buy. Finally views are sought on how the Government could further support innovative technological solutions and localised measures to improve air quality.

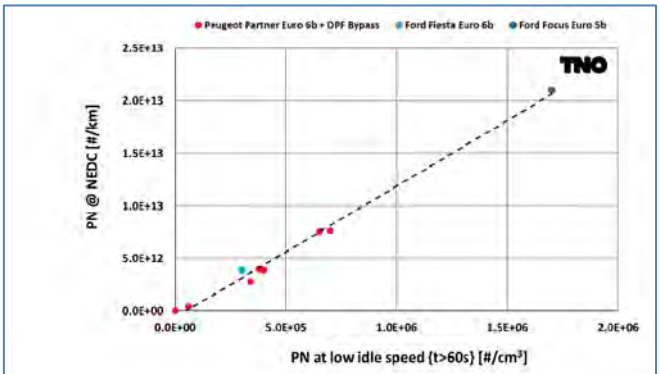
The consultation is open until 15 June 2017 and is, together with the draft UK air quality plan, at https://consult.defra.gov.uk/airquality/air-quality-plan-for-tackling-nitrogen-dioxide.

Dutch Report on Periodic Technical Inspection of DPF-equipped Cars

On 1 May 2017 the Dutch institute TNO published a new report they prepared for the Dutch Ministry of Infrastructure and the Environment, titled 'Investigation into a Periodic Technical Inspection (PTI) test method to check for presence and proper functioning of Diesel Particulate Filters (DPF) in light-duty diesel vehicles'.

TNO has assessed the current PTI smoke emission test procedure. This smoke test yields rather poor test results, mainly due to the fact that the test equipment is insensitive and its signals are filtered. As a consequence, the test results do not correlate well with the real-world Particulate Matter (PM) mass or Particle Number (PN) emissions.

Within this project 14 light-duty vehicles were tested by TNO using different test procedures. The vehicles were certified to Euro 3, 4, 5, and 6. The test results were used to design and propose a new roadworthiness emission test procedure able to identify vehicles with a malfunctioning or removed DPF.



Figuur 2: PN emissions at low idle speed and NEDC tests of 3 different diesel vehicles with (cracked) DPF or variable bypass.

A new simple PTI test procedure was developed by TNO, based on a PN measurement at low idle speed. Launching this new test procedure is likely to be possible after the development of a dedicated, low-cost PTI PN tester and implementation of the procedure in vehicle regulations.

Due to the restricted measuring range of this new PN-tester, TNO nevertheless recommends to stick to the current free acceleration test with opacimeter for vehicles without DPF.

The TNO report is at www.tno.nl/en/focus-areas/urbanisation/mobility-logistics/clean-mobility/emissions-of-particulate-matter-from-diesel-cars.

Final Report on Diesel Emissions Investigations in France

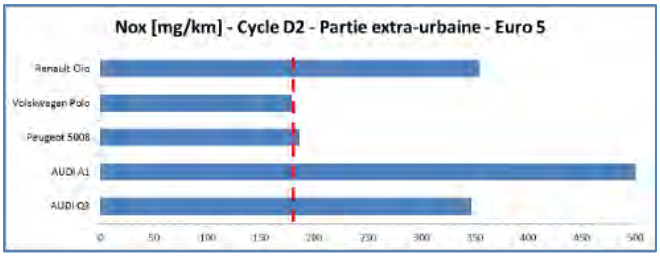
On 5 May 2017 the French Ministry for Environment published the final report of the investigations conducted by the "Royal Commission" on emissions from diesel vehicles.

A first report was published in the summer 2016 on results from investigations conducted at UTAC on pollutant and CO_2 emissions measured on 86 vehicles (*see AECC Newsletter of July-August 2016*). The Ministry then decided to complement its investigations with further emissions tests of five EGR-only Euro 5 and five Euro 6 diesel cars evaluated by IFPEN.

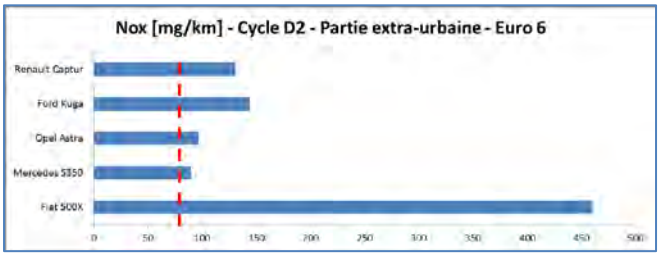
Marque	Modèle	Cylindrée	Puissance (CV)	Boîte de vitesse	Dépollution	Norme Euro
Audi	Q3	2.0L	140	BVM6	EGR	Euro 5
Audi	A1	1.6L	90	BVA	EGR	Euro 5
Fiat	500X	2.0L	140	BVA	EGR - NOxTrap	Euro 6
Ford	Kuga	2.0L	120	BVM6	EGR - NOxTrap	Euro 6
Mercedes	S350	3.0	260	BVA	EGR + SCR	Euro 6
Opel	Astra	1.6	110	BVM6	EGR + NOxTrap	Euro 6
Peugeot	5008	1.6L	115	BVM6	EGR	Euro 5
Renault	Captur	1.5L	110	BVM6	EGR (HP & BP)+ NOxTrap	Euro 6
Renault	Clio	1.5L	90	BVM5	EGR (HP & BP)	Euro 5
Volkswagen	Polo	1.2L	75	BVM5	EGR	Euro 5

Emissions tests conducted with these vehicles were identical to those performed by UTAC (a slightly modified NEDC – D1, and a hot-start modified NEDC without the first urban ECE section – D2, but no on-road tests) and with additional instrumentation (oxygen sensor for NOx traps, urea injection sensor for SCR systems, thermocouples, and OBD signals).

All Euro 5 vehicles meet their NOx limit on the D1 tests but all have much higher extra-urban emissions on the hot-start D2 test. When tested again according to the D2 procedure, but with a cold-start, NOx emissions of the Peugeot 5008 came back to a value below the Euro 5 limit. This was not the case for the VW Polo and the Audi A1 which still had higher NOx emissions. The Renault Clio and the Audi Q3 were not tested under cold-start D2.



Amongst the Euro 6 diesel cars, only the Opel Astra met the regulatory NOx limit on the D1 test. The high increase of NOx emissions on the D1 cycle compared to NEDC observed on 3 out of 4 vehicles equipped with a NOx trap show the high sensitivity to history of the technology usage, i.e. initial NOx trap loading resulting from preconditioning, the report says.



Much higher NOx emissions are observed on the D2 cycle for the Fiat 500X. For the other Euro 6 vehicles, the increase is not that large than for Euro 5 vehicles.

The final investigations report (in French) is at www.developpement-durable.gouv.fr/sites/default/files/Rapport%20final%20-%20Mission%20d%27expertise%20IFPEN.pdf.

French Agency Report on Air Quality Standards

On 23 May 2017 the French Agency for Food, Environmental and Occupational Health & Safety (ANSES) published a report on ambient air quality standards.

The report was prepared for the Directorate General for Health and the Directorate General for Energy and Climate of the French administration who asked for an expert appraisal of the ambient air quality standards for fine particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and ozone (O_3), to ensure that these standards meet the needs for protection of public health.

In the report, ANSES insists on the importance of pursuing efforts to implement long-term public policies in favour of improving air quality, which remains a major public health challenge.

It also issues a series of recommendations regarding the potential change in standards for each of the pollutants targeted by its expert appraisal:

- Any reduction of PM_{10} and $PM_{2.5}$ concentration levels will lead to health benefits. This should be considered by the European Commission.
- A short-term exposure limit on $PM_{2.5}$ is recommended. An average daily limit value of 50 µg/m³ is proposed for PM_{10} and such a standard should be set for $PM_{2.5}$ on which there is now a great deal of new knowledge on health effects. In 2005, the World Health Organization (WHO) suggested a $PM_{2.5}$ average daily value of 25 µg/m³.
- Information and alert thresholds should be maintained given the short-term health effects for NO_2, SO_2, O_3, and PM_{10}.
- Simplifying French regulations related to air quality standards should be considered to improve public understanding of air quality objectives currently in force by making for instance reference in the long-term to the WHO guideline values; also ozone alert thresholds at

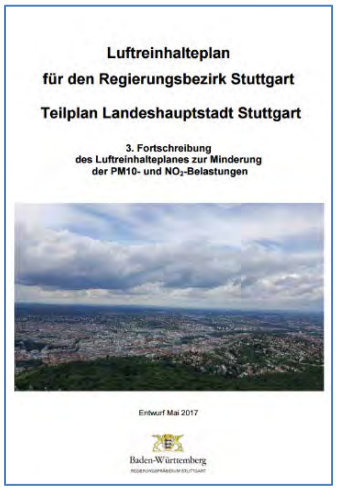
300 and 360 µg/m³ could be abolished, only retaining the 240 µg/m³ threshold.

- Carrying out further work to assess the effectiveness of public action in air pollution mitigation and to identify mechanisms which would mobilise policymakers and the public.
- Investigating a new means of daily communication, able to inform the public about air quality in relation to the health issues.

The ANSES report (in French) is at www.anses.fr/en/system/files/AIR2016SA0092Ra.pdf.

Stuttgart presents its Draft Plan for Better Air

On 6 May 2017 the Regierungspräsidium Stuttgart (RP), the Ministry of Transport of Baden-Württemberg and the City of Stuttgart jointly presented the first draft of the third update of Stuttgart's air pollution plan.



The draft plan includes 20 measures which are intended to ensure compliance with the air pollution limit values in Stuttgart. It also includes traffic restriction measures, including for diesel cars older than Euro 6, which are to apply in Stuttgart from 1 January 2018 during peak pollution days.

The Minister of Transport of Baden-Württemberg, Mr Winfried Hermann, explained that traffic restrictions are the alternative to a possible blue label that the German Federal Government keeps postponing.

The draft plan is open for comments until 23 June 2017.

More information (in German) is at https://rp.baden-wuerttemberg.de/rps/Seiten/aktuellemeldung.aspx?rid=133.

Denmark fines Two Shipowners over High Sulfur Fuels

On 18 May 2017 the Danish Environmental Protection Agency (EPA) announced that it has imposed fines on two shipping companies who used high-sulfur fuel causing illegal air pollution.

Since 1 January 2015, ships sailing in the Baltic Sea, the North Sea or in waters around North America have had to use fuel containing a maximum of 0.1% sulfur.

A foreign shipping company has been fined DKK 375 000 (€50 400) for sailing with fuel containing too much sulfur. The fine was issued by the police in northern Denmark following a report from the Danish EPA. The report arose from sulfur monitoring by the Danish EPA, and this is one of the first fines, and so far the largest fine in Denmark for this type of case.

In addition, a fine of DKK 30 000 (€4000) has been issued to another foreign shipping company for a less serious violation of the sulfur regulations.

Denmark regularly monitors the sulfur content of ship fuel by taking samples from ships in Danish ports. Furthermore, sulfur emissions by shipping are monitored from the air using a 'sniffer' installed underneath the Great Belt Bridge between the Danish islands of Zealand and Funen. The 'sniffer' can detect if too much sulfur is being emitted by a ship, and the Danish EPA will then receive an alarm and can ask the Danish Maritime Authority to take a sample when the ship reaches a port.

In order to strengthen supervision, the Danish EPA is also about to start mobile monitoring of ships' sulfur emissions in Danish waters.

NORTH-AMERICA

US EPA and CARB approve Technical Fix of VW 2.0L Generation 2 Diesels

On 19 May 2017 the US Environmental protection Agency (EPA) and the California Air Resources Board (CARB) announced they have approved modification for the so-called 'Gen 2' automatic 2-litre diesel engine found in Passat of model years 2012-2014.

The approved modification involves a software change. VW will remove the defeat device software that reduced emission control effectiveness outside of emissions testing circumstances, and replace it with software that directs the emission controls to function effectively in all typical vehicle operations.

With the approval, VW will offer owners of these vehicles the choice to keep and fix their car, or to have it bought back. The approval does not cover manual transmission Passat diesel Gen 2 2-litre models.

The Gen 2 automatic cars now join the Gen 3 ones which were approved for modification on 6 January 2017.

According to CARB, modifications for the 49 000 Gen 1 cars, the earliest models from model years 2009-2014, are still being evaluated. Engineering is also underway for possible modification of the 17 000, 2009-2016, 3- litre diesel vehicles which have defeat devices. Modifications have not yet been approved for those vehicles.

More information at www.epa.gov/sites/production/files/2017-05/documents/vw-gen2-auto-dsl-eng_apvl-ltr-2017-05-19.pdf.

US Federal Court Settlement on Volkswagen 3.0L Case

On 17 May 2017 agreements between Volkswagen, the California Air Resources Board (CARB), the US Environmental Protection Agency (US EPA), and the US

Department of Justice were signed by a US District Court Judge.

One decree is a national agreement; the second is California-specific. According to the partial consent decrees, VW will pay $225 million (€204 million), including $66 million (€60 million) to California, for harm resulting from the sale of its 3.0-litre diesel passenger cars that included emissions control "defeat devices". This is a separate partial consent decree from the one approved earlier on VW's 2.0-litre diesel cars with a similar defeat device.

CARB announced that the $41 million received from the national mitigation trust for the environmental damage caused by VW's deception will be spent on projects to reduce smog-producing pollution, such as incentivizing clean, heavy-duty vehicles and equipment in disadvantaged communities. The additional $25 million dollars of the California-specific agreement will be invested to advance availability of cleaner vehicles in California's disadvantaged communities.

VW also agreed to place a second Green City project in California. This could include such features as zero-emission vehicle (ZEV) ridesharing projects or ZEV transit and freight applications. The selected city must have a population of about 500 000 and consist primarily of disadvantaged communities. A first Green City was called out in the Consent Decree for the 2.0-litre vehicles. No city has yet been named.

In addition, VW will contribute to California's ZEV market by introducing two new ZEV models, plus the electric e-Golf, or its replacement, by 2019. One of those new vehicles must be an electric SUV. The company will also introduce a second SUV by 2020. It must collectively sell at least 35 000 of these various ZEV models between 2019 and 2025.

US files Complaint against Fiat Chrysler for Alleged Clean Air Act Violation

On 23 May 2017 the US Department for Justice, on behalf of the US Environmental Protection Agency (EPA), filed a civil complaint in federal court in Detroit, Michigan, against Fiat Chrysler Automobiles (FCA).

The complaint alleges that FCA equipped nearly 104 000 Ram 1500 and Jeep Grand Cherokee vehicles (MY 2014-2016) containing the 3.0 litre EcoDiesel engine with at least eight software-based features that were not disclosed in FCA's applications for certificates of conformity and that affect the vehicles' emission control systems. The undisclosed software features lessen the effectiveness of the vehicles' emissions control systems during certain normal driving situations. This results in cars that meet emission standards in the laboratory and during standard EPA testing, but during certain normal on-road driving emit NOx that are much higher than the EPA-compliant level. These allegations are consistent with those set forth in notice of violation that EPA issued to FCA in January 2017.

More info is at www.justice.gov/opa/pr/united-states-files-complaint-against-fiat-chrysler-automobiles-alleged-clean-air-act.

In a statement released on the same day, FCA reminded that it has developed updated emissions software calibrations that should address the concerns of EPA and CARB, and has now formally filed for diesel vehicle emissions certification with the regulators for its 2017 MY Jeep Grand Cherokee and Ram 1500 diesel vehicles.

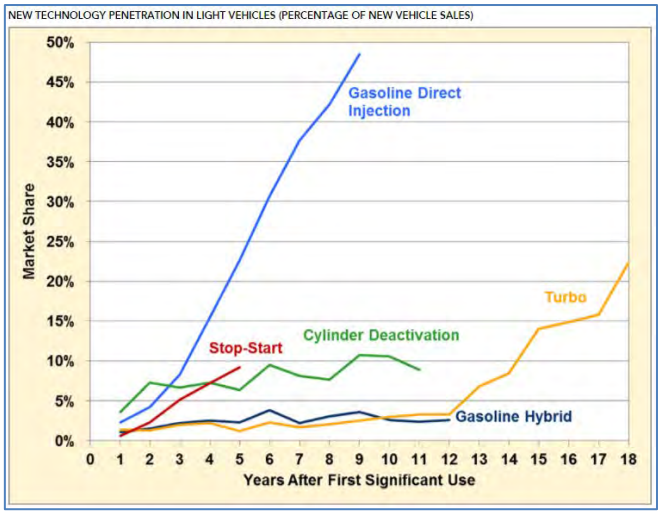
FCA expects that the installation of the updated software calibrations will improve the 2014-2016 MY vehicles' emissions performance and does not anticipate any impact on performance or fuel efficiency.

Oak Ridge National Laboratory Report on US Vehicle Technologies Market

On 25 May 2017 Oak Ridge National Laboratory published a report on the US Vehicle Technologies Market in 2016.

The report details the major trends in US light-duty vehicle and medium/heavy truck markets. This report is supported by the US Department of Energy's Vehicle Technologies Office, and, in accord with its mission, pays special attention to the progress of high-efficiency and alternative-fuel technologies.

From that report the US Department of Energy's Office of Energy Efficiency & Renewable Energy has published a fact sheet on market penetration of Gasoline Direct Injection (GDI) which has seen rapid adoption.



Many auto manufacturers have used the combined benefits of GDI and turbocharging for increasing power output from downsized engines. This is evident in the rapid rise of turbo-charged engines in the last five years. Cylinder deactivation, which is seen mostly in 6- and 8-cylinder applications, has about 10% market share over the past five years. Stop-start technology in non-hybrid vehicles is relatively new in the US market and has only been around for five years since its first significant use. However, in just five years, stop-start has reached over 9% market share while gasoline hybrids have only grown to 4% market share in the past 12 years.

The Oak Ridge National Laboratory report is at http://cta.ornl.gov/vtmarketreport/pdf/2016_vtmarketreport_full_doc.pdf.

US EPA settles with Three Trucking Companies over California Diesel Rule

On 4 May 2017 the US Environment Protection Agency (EPA) announced recent settlements with three companies for violating the California's Truck and Bus Regulation.

The California Truck and Bus Regulation was adopted into federal Clean Air Act plan requirements in 2012 and applies to diesel trucks and buses operating in California. The rule requires trucking companies to upgrade vehicles they own to meet specific NOx and PM performance standards and also requires trucking companies to verify compliance of vehicles they hire or dispatch. Heavy-duty diesel trucks in California must meet 2010 engine emissions levels or use Diesel Particulate Filters (DPFs) that can reduce the emissions of particulates by 85% or more.

C.R. England, Inc. operated 34 heavy-duty diesel trucks in California from 2013 to 2014 without the required DPF. The company is required to pay a $64 000 (€58 600) penalty and is currently in compliance.

Knight Transportation Inc. failed to verify that the carriers it hired to transport goods in California from 2012 to 2014 complied with the Truck and Bus rule. Knight is required to pay a $72 000 (€66 000) penalty; the company agreed to register all of its hired contractors on the State database (TRUCRS) and to provide verification of state compliance.

Werner Enterprises, Inc. operated five heavy-duty diesel trucks in California from 2012 to 2014 without the required DPF. Werner also failed to verify that the carriers it hired to transport goods in California complied with the Truck and Bus rule. The company is required to pay a $65 000 (€59 500) penalty.

ASIA PACIFIC

India proposes Emissions Standards for Diesel Locomotives

The Indian Central Pollution Control Board (CPCB) has submitted proposed emission standards for diesel locomotive to the Indian Ministry of Environment and Forests (MoEF) for approval.

The CPCB's interim report titled "Exhaust Emission Benchmarks for Diesel Locomotives on Indian Railways" aims to fix standards and protocols for the sector to achieve the targets submitted by India under the Paris climate change agreement. According to the report, the contribution of the transport sector to CO_2 emissions has risen by 3.5 times since 1990 to stand at 250 million tonnes CO_2, or 13.5% of the total emissions in 2013. The railways contributed 9.7% of this figure (24.7 million tonnes). Globally, however, only 3.5% of the emissions from the transport sector are attributed to the rail sector, the CPCB's report said.

While the Indian Railways has been making consistent efforts in improving energy efficiency of indigenously manufactured Diesel locomotives and a substantial improvement in fuel consumption has already been achieved, the need for reducing pollutant emissions is still needed.

Based on the analysis of limited emissions data available with Indian Railways, considering emissions at the time of manufacture of the locomotives and the subsequent emissions deterioration towards the end of their useful life, interim standards for exhaust emissions from the two family of locomotives i.e. High Horse Power (HHP) EMD and ALCO type diesel locomotives are proposed as:

Type of locomotives	Carbon monoxide (CO) (g/bhp-hr)	Oxides of Nitrogen (NO_x) (g/bhp-hr)	Hydrocarbon (HC) (g/bhp-hr)	Particulate matter (PM) (g/bhp-hr)
ALCo type	3.0	17.0	1.00	0.45
EMD (HHP Locos)	1.4	9.0	1.00	0.35

NOx limits roughly compare to US EPA Tier 0 standards, while PM limits are similar to the US Tier 1-2 standards.

The CPCB's report is at http://cpcb.nic.in/Draft_Interim_Rly_Diesel_Emission_Stds_01.05.2017.pdf.

Euro 5 Emissions Standard in Thailand

On 18 May 2017 the *Bangkok Post* reported on new steps in fuel quality and emissions standards for cars in Thailand.

New passenger cars have been required to meet Euro 4 emission standards in Thailand since 2012.

According to the news article the Thailand's Pollution Control Department has reached preliminary agreements with Thailand's auto and oil industries to introduce Euro 5 fuel requirements (10 ppm maximum fuel sulfur levels for both gasoline and diesel fuel) by 2023 and Euro 5 emission standards for passenger cars by 2024.

GENERAL

ICCT Paper on Motor Vehicle Emissions Standards and Competitiveness

On 23 May 2017 the International Council on Clean Transportation (ICCT) published a paper reviewing the political science, regulatory, and economics literature to illuminate the international competitiveness impacts of motor vehicle emissions standards.

The primary question the authors consider is whether motor vehicle emissions standards adopted in one market will create a future competitive advantage for domestic manufacturers when policy diffusion leads other markets to adopt similar emission standards at a later date.

The ICCT paper includes a reference to "Regulatory emission limits for mobile sources and the Porter hypothesis: a survey of the literature" that Laurent Franckx of the Flemish Institute for Technological Research (VITO) conducted for AECC in 2014.

The paper notes that generally strict, well-designed environmental regulations spur innovation; domestic firms achieve a first-mover advantage through "learning by doing" and economies of scale; policy diffusion of emission standards leads other markets to adopt similar standards and associated technologies after a brief lag time; domestic manufacturers (automakers and suppliers) are able to comply with standards adopted in other markets at lower cost than their competitors; global automakers exporting to markets with stringent emission standards tend to encourage their home governments to raise their standards to gain a competitive advantage over other, non-global domestic manufacturers; and research and development, assembly plants, and component supplier production facilities tend to be located in those markets with advanced emissions standards.

The ICCT paper is at http://theicct.org/sites/default/files/publications/Auto-Industry-Intl-Competitiveness_ICCT_Briefing_23052017_vF.pdf.

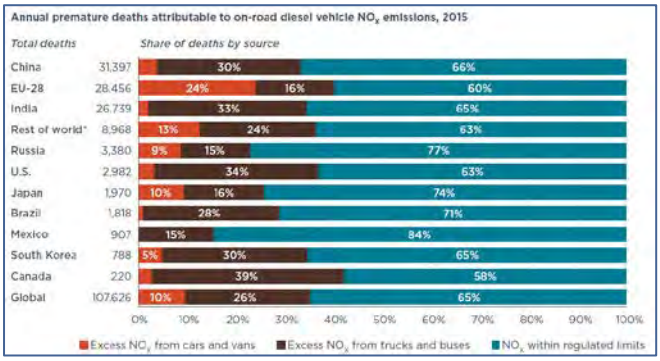
Publication on Global Diesel NOx Health Burden

On 15 May 2017 a new study was published in Nature that offers a quantitative analysis of the global impacts of real-world on-road diesel NOx emissions on public health and the environment. Authors of the paper include the International Council on Clean Transportation (ICCT), Environmental Health Analytics, the University of Colorado Boulder, the University of York, and the International Institute for Applied Systems Analysis (IIASA).

The 11 regions examined for the study (Australia, Brazil, Canada, China, the EU, India, Japan, Mexico, Russia, South Korea, and the US) account for more than 80% of new diesel vehicle sales in 2015, and about 59% of worldwide diesel NOx emissions. Of those diesel NOx emissions, about a third were "excess", i.e. above regulatory limits.

According to the study, Heavy-Duty Vehicles (HDVs) account for 76% of all excess diesel NOx in the 11 regions studied. China, India, the EU, Brazil, and the US together contribute 90% of excess NOx from HDVs.

Light-duty vehicles (LDVs) account for 24% of excess diesel NOx. Nevertheless, Europe alone contributes 68% of excess NOx emissions from LDVs in the 11 regions studied.



The study estimates that 107 600 premature deaths in 2015 were associated with diesel NOx emitted in the 11 regions studied. That total will rise to 183 600 in 2040 unless more effective action is taken to control diesel NOx emissions. Excess NOx emissions, above regulatory values, specifically were linked to about 38 000 premature deaths worldwide in 2015.

China suffers the largest health burden from total diesel NOx emissions (31 397 premature deaths in 2015). The number of premature deaths from excess diesel NOx emissions specifically is highest in Europe (11 400 in 2015).

More info is at www.theicct.org/news/nature-impacts-diesel-nox-may2017.

Baumot/Twintec BNOx System for Passenger Car Retrofit

Twintec of the Baumot group has published a case study demonstrating that their BNOx system offers a retrofit solution that lowers NOx of diesel passenger cars by more than 90% under real-world conditions.

Euro 2 to Euro 5 diesel vehicles can be retrofitted to meet the Euro 6 requirements under the RDE procedure, the company claims. In collaboration with global OEM customers, the BNOx system was developed for series production and expanded under strict quality standards into a dependable, compact exhaust purification system for original equipment and retrofit applications.

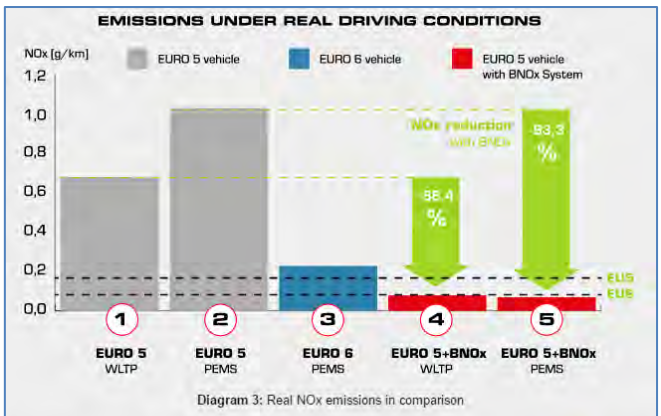


Diagram 3: Real NOx emissions in comparison

	Emission standard	Emission limit NOx [g/km]	Test cycle	NOx emissions [g/km]	NOx emissions w/o BNOx [g/km]	NOx reduction with BNOx
1	EURO 5	0,18	WLTP[1]	0,68	-	-
2	EURO 5	0,18	PEMS[3]	1,03	-	-
3	EURO 6	0,08	PEMS[3]	0,228	-	-
4	EURO 5	0,18	WLTP[1] with BNOx	0,079	0,68	-88,4 %
5	EURO 5	0,18	PEMS[3] with BNOx	0,069	1,03	-93,3 %

The retrofit cost is approximately €2000 for passenger cars. It is estimated to be amortized after 8 years if applied to the 1.37 million Euro 5 cars that are driven in Germany.

More info is at http://baumot.twintecbaumot.de/en/products/bnox-scr-system.

ICCT Report on Market Penetration of Heavy-Duty Technologies

On 5 May 2017 the International Council on Clean Transportation (ICCT) released a report investigating the market adoption trends of 27 heavy-duty vehicle technologies in the EU, the US, and China.

The study presents 20 years of technology market penetration data obtained from Knibb, Gormezano & Partners (KGP), supplemented with data from other sources, and analyses the trends in selected technology adoption on tractor-trailers and rigid trucks in the world's three largest automotive markets.

Of the technologies considered (engine, transmission, road load reduction, auxiliary loads, aftertreatment systems, and energy management), the highest market penetration rates were found for those related to pollutant emissions control regulation, including Selective Catalytic Reduction (SCR) systems, Diesel Particulate Filters (DPF), common rail injection, and advanced turbocharging.

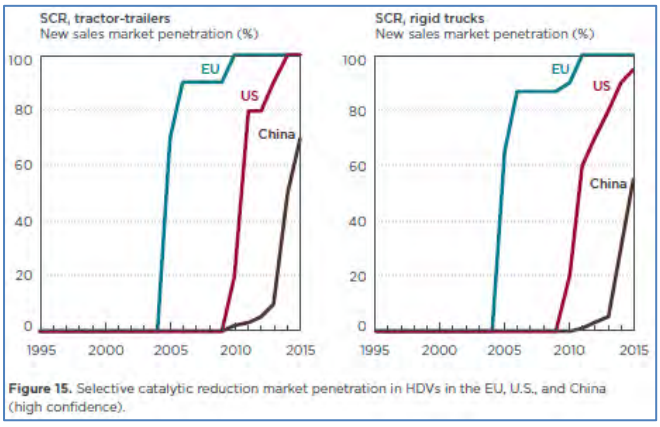


Figure 15. Selective catalytic reduction market penetration in HDVs in the EU, U.S., and China (high confidence).

The large-scale adoption of SCR for Heavy-Duty applications first took place in the EU with the implementation of the Euro IV emissions standard. In 2005, the market penetration rose to approximately 70% and full market penetration was reached in 2010 after Euro V came into force for all new vehicle sales. The market incursion of SCR systems occurred 5 years later in the US, as the NOx limit phase-in period of the US 2007 standard ended in 2009. SCR is expected to have reached full adoption in the US for new diesel-powered vehicles by 2016. In China, SCR systems entered the market in 2010 for tractor-trailers and 2011 for rigid trucks, and have recently increased their market penetration rate to 55% and 70% for rigid trucks and tractor-trailers, respectively, as the China IV regulation has come into force. SCR adoption is expected to increase with the implementation of China V in 2017.

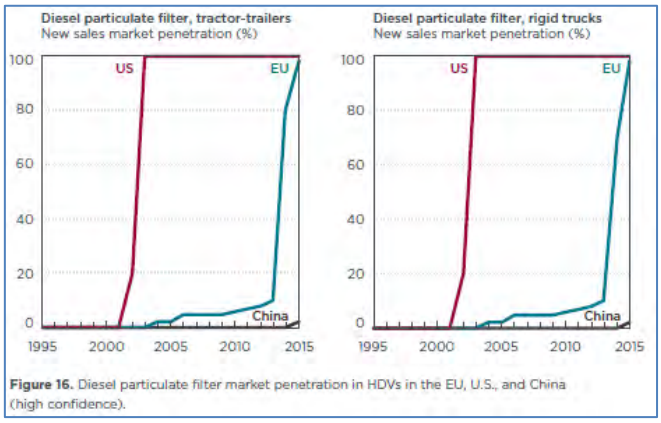


Figure 16. Diesel particulate filter market penetration in HDVs in the EU, U.S., and China (high confidence).

DPFs have been included on 100% of diesel tractor-trailers and rigid trucks sold in the US since 2003. The market penetration of DPF was below 10% in the EU for tractor-trailers and rigid trucks until 2013, when the implementation of the Euro VI standard drove the market penetration to over 98% in diesel HDVs. The remaining 2% corresponds to special vehicles from low volume manufacturers. Currently, DPFs have low market penetration in China and the adoption is not expected to increase much in the near future because the PM limits were not tightened between China IV and China V standards, and the technology pathway for compliance is based on SCR systems with low or no EGR. Currently, the China VI emission standards, which would limit NOx, PM and Particle Number (PN) to the same levels as Euro VI, are expected to be implemented in 2020.

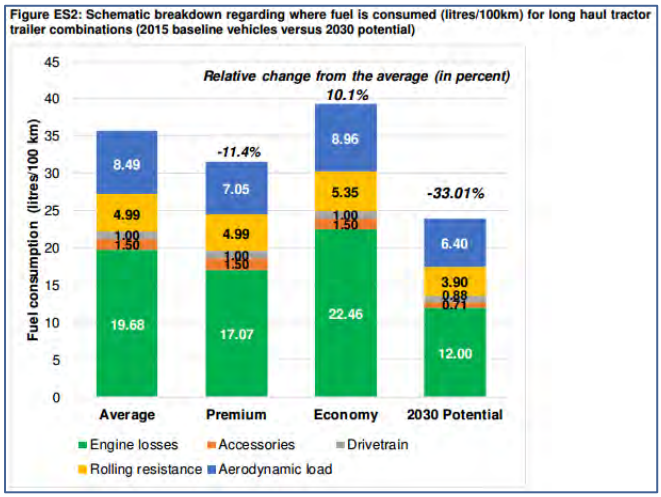
The ICCT report is at http://theicct.org/market-penetration-HDV-fuel-efficiency-technologies.

Ricardo Report on HDV Technology Potential and Cost Study

On 26 May 2017 the International Council on Clean Transportation (ICCT) published a new report prepared by Ricardo on Heavy-Duty Vehicles (HDV) technology potential and cost study.

The study is aimed at informing stakeholders on the technological potential and associated cost for improving the fuel efficiency of new heavy-duty freight hauling vehicles in the EU in the 2020-2030 timeframe. It analyses a wealth of information regarding heavy-duty technology potential and cost available from the US Phase 2 HDV Greenhouse Gas (GHG) regulation, promulgated in 2016, and translated the findings to the EU market in terms of feasibility, effectiveness, and cost.

The analysis found that nearly all of the technologies that the US included in the Phase 2 HDV GHG regulatory impact analysis could be applied to European baseline trucks and that the resulting fuel consumption reduction potential that they bring is substantial. The maximum cost-effective reduction potential for EU panel vans, rigid trucks and tractor trailers was estimated in 43.6%, 31.5%, and 33% respectively.



The Ricardo-ICCT report is at www.theicct.org/sites/default/files/publications/HDV-Technology-Potential-and-Cost-Study_Ricardo_Consultant-Report_26052017_vF.pdf.

Emissions Analytics extends EQUA® Index to Vans

On 26 May 2017 Emissions Analytics announced it has extended its EQUA® Index reflecting on-road fuel economy and emissions performance to light commercial vehicles.

Tested on the same EQUA® route as passenger cars, vans additionally run parts of it ballasted to 50% of their maximum payload. All vans tested give fewer miles per gallon (mpg) than advertised. The average is 17.1% below with a range from -5.3% to -38.8%. The fuel economy gap is smaller than for passenger cars which was 29% in 2016. The effect of load on fuel economy is an average of -11.2% for a fully loaded van.

Make	Model	Regulatory stage	Variance to official MPG	EQUA Aq rating
FIAT	Doblo	Euro 6	-24.8%	H
FORD	Ranger	Euro 5	-13.2%	F
FORD	Transit	Euro 5	-14.4%	H
FORD	Transit Connect	Euro 5	-16.7%	E
FORD	Transit Custom	Euro 5	-22.7%	H
FORD	Transit Custom	Euro 6	-16.1%	C
ISUZU	D-Max	Euro 5	-10.0%	F
MITSUBISHI	L200	Euro 5	-20.8%	H
OPEL/VAUXHALL	Combo	Euro 6	-7.9%	H
TOYOTA	Proace	Euro 6	-28.2%	H
VOLKSWAGEN	Amarok	Euro 5	-15.0%	H
VOLKSWAGEN	Caddy	Euro 5	-5.4%	D
VOLKSWAGEN	Caddy	Euro 6	-38.8%	A*
VOLKSWAGEN	California	Euro 5	-5.3%	H
VOLKSWAGEN	Crafter	Euro 5	-8.5%	H
VOLKSWAGEN	Transporter	Euro 5	-9.6%	H
VOLKSWAGEN	Transporter	Euro 6	-33.2%	B

* gasoline

As far as NOx emissions are concerned, the best performing diesel van is the Euro 6 VW Transporter, scoring a B-rating on the EQUA® Aq Index, meaning it is just 1.5 times the legal limit. This is mirrored in the passenger cars tested, where only 15 of the 131 Euro 6 diesel cars tested meet the standard, of which 10 are from the VW group. Seven Euro 5 and three Euro 6 vans have been rated 'H' on the EQUA® Aq Index, meaning they emit 12 times or more NOx than the Euro 6 limit.

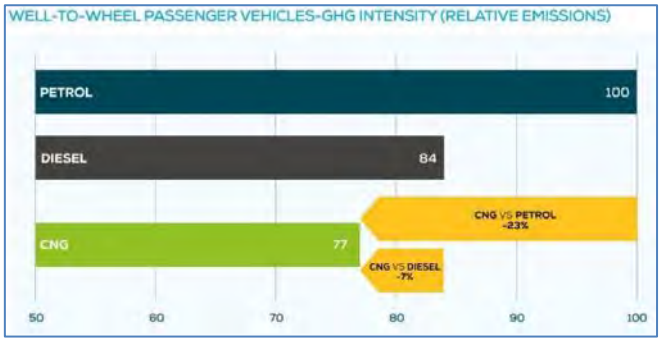
More info is at http://equaindex.com/vans-weigh-in-on-the-equa-index.

Report on Natural Gas Vehicles for Transport Decarbonisation

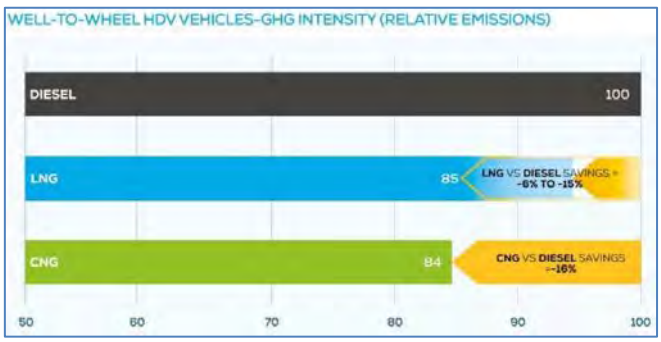
On 31 May 2017 NGVA Europe, the European Natural & bio Gas Vehicle Association, published a new study promoting natural gas as key solution for transport decarbonisation.

The study has been commissioned to 'Thinkstep', a leading global consultant and software company in the Life-Cycle Analysis (LCA) domain, to perform an industry-wide assessment of the supply of natural gas to Europe and its use in the EU, mainly in the transportation sector. More than 50 companies from across the gas value chain took part in providing data.

The study "Greenhouse gas (GHG) intensity of natural gas" shows that natural gas reduces GHG emissions from passenger cars on a Well-to-Wheel (WtW) basis by 23% compared with petrol and by 7% compared with diesel.



On the heavy-duty application, benefits compared to diesel are of 16% for CNG and up to 15% for LNG. Also in the maritime sector, overall WtW benefits are up to 21% compared to conventional HFO (Heavy-Fuel-Oil) fuels.



The report says that the use of renewable gas provides additional benefits towards carbon-neutral mobility: by blending natural gas with just 20% renewable gas, GHG emissions are reduced by 40% compared with oil-derived fuels.

The report is intended to represent the new reference in the domain, providing a deep analysis of the GHG emission sources from the entire natural gas chain. According to NGVA Europe, this is fundamental in a transportation scenario asked to move from a long stand system, mostly based on oil-derived fuels, towards low carbon and clean solutions. Different technologies will have to be compared according to a technology neutral approach, needed for a fair market development that will be guaranteed only through Well-to -Wheel (WtW) methodology.

The NGVA Europe report can be requested at http://ngvemissionsstudy.eu.

BEUC Position on Post-2020 CO_2 Target for Cars

On 3 May 2017 the European Consumer Organisation (BEUC) released a position paper on the European approach to reducing car CO_2 emissions between 2020 and 2030.

BEUC believes that the EU must adopt fuel saving, CO_2 reducing targets for new cars of 75 g/km or lower for 2025 and 50 g/km or lower for 2030 with targets rigorously assessed on WLTP and real-world on-road tests.

According to BEUC, the EU must collectively ensure the deployment of charging points for alternatively powered cars between 2020 and 2030; EU car labelling rules must be reformed to better inform consumers; purchase and in-use incentives should reward sustainable consumption; and only genuinely sustainable biofuels should be supported.

The BEUC position is at www.beuc.eu/publications/beuc-x-2017-041_cca_european_approach_reducing_car_emissions_between_2020_2030.pdf.

Concawe Report on 2008-'12 Market Fuel Surveys

On 9 May 2017 the European refiners association Concawe released a report compiling their market fuel surveys for the period 2008-'12.

Concawe conducted three market surveys in the years 2008, 2010, and 2012; each survey had a different focus reflecting the quality events or issues that were being observed at the time. In 2008, the focus was on metals analysis for both gasoline and diesel, in addition gasoline oxygenates were measured in 2010 whilst in both 2010 and 2012, diesel oxygenates and stability was a focus. Samples were taken from 18 EU countries.

The main conclusion from these surveys is that fuels in Europe appear to be meeting the fuel standards and their quality appears to be on the whole consistently good.

Specific observations were made. Comparison of the metal content in gasoline fuels is difficult due to the different test methods used in different years and also different countries were tested in 2008 and 2010. Overall, metals levels in gasoline in 2008 were low at less than 25 ppb on average apart from the Zn which was thought to be due to contamination from some containers. ETBE (Ethyl tertiary butyl ether) was the most commonly used oxygenate followed by ethanol in 2010. Average high boiling fractions in gasoline are below 1% for all countries tested, with an average FAME contamination by country below 0.05%.

For diesel fuel, there appeared to be an increase in the average metals content reported between 2008 and 2010 although there were only six countries whose fuels were tested in both 2008 and 2010 and overall levels were low (generally under 50 ppb). The average FAME (Fatty acid methyl ester) content was 4.4% in 2010 and 5.1% in 2012.

Concawe report no. 5/17 is at www.concawe.eu/wp-content/uploads/2017/05/Rpt_17-5.pdf.

Report on Biofuels Impact towards 2030 CO_2 Reduction in Road Transport

On 3 May 2017 the Non-Governmental Organization Ecological Council together with the Danish Foundation EnergiFonden organized an event in Brussels to present a new report prepared by 'Ea Energy Analyses' on decarbonizing road transport in the EU and the role of biofuels towards 2030.

Two scenarios were compared, a Business As Usual (BAU) scenario and a 30% CO_2 reduction scenario. The BAU scenario assumes that the 2020-'21 targets for cars and vans are met but that more stringent targets are not put in place after. The 30% CO_2 reduction scenario is based on an accelerated phasing in of electric vehicles, increased blending percentages in biofuels for all road vehicles, and introduction of biogas primarily for heavy-duty vehicles.

The analyses indicate that the BAU scenario entails a 15% CO_2 reduction by 2030 compared to 2005, and thus a 15% gap to the EU objective of -30%. By 2030 there is an annual net benefit from pursuing a 30% CO_2 emissions reduction. The cost of reducing 1 tonne of CO_2 in the 30% scenario relative to the BAU scenario falls from over €230/tonne in 2016 to slightly less than zero in 2030.

Electrification makes up the main contribution to the CO_2 emissions reduction in the 30% scenario and impacts the socioeconomics positively in the later years of the analysis period. The total amount of biofuels is doubled by 2030 compared to today with a significant increase in the usage of advanced 2nd generation biodiesel and bioethanol.

The report on the role of biofuels for decarbonizing road transport is at http://biorefiningalliance.com/wp-content/uploads/2017/05/Analysis-for-print_FINAL_FINAL.pdf.

RESEARCH SUMMARY

Effects of Emissions and Pollution

Effects of fine air particulates on gene expression in non-small-cell lung cancer, Biao Yang, et al.; *Advances in Medical Sciences* (September 2017), Vol. 62 (2), pp. 295-301, doi: 10.1016/j.advms.2016.12.003.

Resveratrol inhibits urban particulate matter-induced COX-2/PGE_2 release in human fibroblast-like synoviocytes via the inhibition of activation of NADPH oxidase/ROS/NF-κB, Ming-Horng Tsai, et al.; *Biochemistry & Cell Biology* (July 2017), Vol. 88, pp. 113-123, doi: 10.1016/j.biocel.2017.05.015.

Gene expression profiles and bioinformatics analysis of human umbilical vein endothelial cells exposed to $PM_{2.5}$, Hejing Hu, et al.; *Chemosphere* (September 2017), Vol. 183, pp. 589–598, doi: 10.1016/j.chemosphere.2017.05.153.

Effect of exposure to polycyclic aromatic hydrocarbons on basal ganglia and attention-deficit hyperactivity disorder symptoms in primary school children, Marion Mortamais, et al.; *Environment International* (August 2017), Vol. 105, pp. 12-19, doi: 10.1016/j.envint.2017.04.011.

Long-term exposure to residential ambient fine and coarse particulate matter and incident hypertension in post-menopausal women, Trenton Honda, et al.; *Environment International* (August 2017), Vol. 105, pp. 79-85, doi: 10.1016/j.envint.2017.05.009.

Temporal trends of PM_{10} and its impact on mortality in Lombardy, Italy, Michele Carugno, et al.; *Environmental Pollution* (August 2017), Vol. 227, pp. 280-286, doi: 10.1016/j.envpol.2017.04.077.

Airborne particulate matter ($PM_{2.5}$) triggers autophagy in human corneal epithelial cell line, Qiuli Fu, et al.; *Environmental Pollution* (August 2017), Vol. 227, pp. 314-322, doi: 10.1016/j.envpol.2017.04.078.

The influence of polycyclic aromatic hydrocarbons on lung function in a representative sample of the Canadian population, Sabit Cakmak, et al.; *Environmental Pollution* (September 2017), Vol. 228, pp. 1-7, doi: 10.1016/j.envpol.2017.05.013.

Inhalation of concentrated $PM_{2.5}$ from Mexico City acts as an adjuvant in a guinea pig model of allergic asthma, Carlos Falcon-Rodriguez, et al.; *Environmental Pollution* (September 2017), Vol. 228, pp. 474-483, doi: 10.1016/j.envpol.2017.05.050.

Prenatal ambient air pollution exposure, infant growth and placental mitochondrial DNA content in the INMA birth cohort, Diana Clemente, et al.; *Environmental Research* (August 2017), Vol. 157, pp. 96-102, doi: 10.1016/j.envres.2017.05.018.

The role of traffic noise on the association between air pollution and children's lung function, Meredith Franklin and Scott Fruin; *Environmental Research* (August 2017), Vol. 157, pp. 153-159, doi: 10.1016/j.envres.2017.05.024.

The effects of autophagy on vascular endothelial cells induced by airborne $PM_{2.5}$, Zhixiang Zhou, et al.; *Environmental Sciences* (in press), doi: 10.1016/j.jes.2017.05.019.

Impacts and mitigation of excess diesel-related NOx emissions in 11 major vehicle markets, Susan Anenberg, et al.; *Nature* (in press), doi: 10.1038/nature22086.

Inhaled ambient-level traffic-derived particulates decrease cardiac vagal influence and baroreflexes and increase arrhythmia in a rat model of metabolic syndrome, Alex Carll, et al.; *Particle and Fibre Toxicology* (May 2017), 14:16, doi: 10.1186/s12989-017-0196-2.

Framework for assessing causality of air pollution-related health effects for reviews of the National Ambient Air Quality Standards, Elizabeth Owens, et al.; *Regulatory Toxicology and Pharmacology* (in press), doi: 10.1016/j.yrtph.2017.05.014.

Does breathing polluted air increase the risk of upper gastrointestinal bleeding from peptic ulcer disease?, Gilaad G Kaplan; *The Lancet Planetary Health* (May 2017), Vol. 1 (2), pp. e54-e55, doi: 10.1016/S2542-5196(17)30030-X.

Association between air pollution and ventricular arrhythmias in high-risk patients (ARIA study): a multicentre longitudinal study, Franco Folino, et al.; *The Lancet Planetary Health* (May 2017), Vol. 1 (2), pp. e58-e64, doi: 10.1016/S2542-5196(17)30020-7.

Association between emergency admission for peptic ulcer bleeding and air pollution: a case-crossover analysis in Hong Kong's elderly population, Linwei Tian, et al.; *The Lancet Planetary Health* (May 2017), Vol. 1 (2), pp. e74-e81, doi: 10.1016/S2542-5196(17)30021-9.

Early life allergen and air pollutant exposures alter longitudinal blood immune profiles in infant rhesus monkeys, Candace Crowley, et al.; *Toxicology and Applied Pharmacology* (August 2017), Vol. 328, pp. 60-69, doi: 10.1016/j.taap.2017.05.006.

Air Quality, Sources and Exposure

Decomposition of Low emission zone strategies into mechanisms and methodology for assessing their impacts on air pollution, Anaïs Pasquier and Michel André; *Earth Sciences and Geotechnical Engineering* (2017), Vol. 7 (1), pp. 241-261, ISSN: 1792-9660.

Temporal and seasonal variations of black carbon in a highly polluted European city: Apportionment of potential sources and the effect of meteorological conditions, Marek Kucbel, et al.; *Environmental Management* (in press), doi: 10.1016/j.jenvman.2017.05.038.

Air pollution in China: Status and spatiotemporal variations, Congbo Song, et al.; *Environmental Pollution* (August 2017), Vol. 227, pp. 334-347, doi: 10.1016/j.envpol.2017.04.075.

A comparison of individual exposure, perception, and acceptable levels of $PM_{2.5}$ with air pollution policy objectives in China, Lei Huang, et al.; *Environmental Research* (August 2017), Vol. 157, pp. 78-86, doi: 10.1016/j.envres.2017.05.012.

Exposure to ultrafine particles in different transport modes in the city of Rome, Mario Grana, et al.; *Environmental Pollution* (September 2017), Vol. 228, pp. 201-210, doi: 10.1016/j.envpol.2017.05.032.

A Global Land Use Regression Model for Nitrogen Dioxide Air Pollution, Andrew Larkin, et al.; *Environ. Sci. Technol.* (in press), doi: 10.1021/acs.est.7b01148.

Diesel engine exhaust exposures in two underground mines, Maximilien Debia, et al.; *Mining Science and Technology* (in press), doi: 10.1016/j.ijmst.2017.05.011.

Urban eddy covariance measurements reveal significant missing NOx emissions in Central Europe, T. Karl, et al.; *Nature Scientific Reports* (2017), Vol. 7, 2536, doi: 10.1038/s41598-017-02699-9.

Substantial air quality and climate co-benefits achievable now with sectoral mitigation strategies in China, Wei Peng, et al.; *Science of The Total Environment* (November 2017), Vol. 598, pp. 1076-1084, doi: 10.1016/j.scitotenv.2017.03.287.

The impact of coordinated policies on air pollution emissions from road transportation in China, Paul Kishimoto, et al.; *Transportation Research Part D: Transport and Environment* (July 2017), Vol. 54, pp. 30-49, doi: 10.1016/j.trd.2017.02.012.

Emissions Measurements and Modelling

Effect of turbulence intensity on PM emission of heavy duty diesel trucks – Wind tunnel studies, D. Littera, et al.; *Atmospheric Environment* (August 2017), Vol. 162, pp. 31-44, doi: 10.1016/j.atmosenv.2017.05.013.

Influence of on-board produced hydrogen and three way catalyst on soot nanostructure in Gasoline Direct Injection engines, M. Bogarra, et al.; *Carbon* (in press), doi: 10.1016/j.carbon.2017.05.049.

Variations of Real World NOx Emissions of Diesel Euro 5 and 6 Light-duty Vehicles, Gerrit Kadijk, et al.; *Earth Sciences and Geotechnical Engineering* (2017), Vol. 7 (1), pp. 11-32, ISSN: 1792-9660.

A New Approach for Systematic use of PEMS Data in Emission Simulation, C. Matzer, et al.; *Earth Sciences and Geotechnical Engineering* (2017), Vol. 7 (1), pp. 33-50, ISSN: 1792-9660.

In Service CO_2 and NOx Emissions of Euro 6/VI Cars, Light- and Heavy-duty goods Vehicles in Real London driving: Taking the Road into the Laboratory, A. Moody, et al.; *Earth Sciences and Geotechnical Engineering* (2017), Vol. 7 (1), pp. 51-62, ISSN: 1792-9660.

Measurement of Exhaust Emissions in Real driving Conditions as a Determinant for Sustainable Transport System Development, Jerzy Merkisz, et al.; *Earth Sciences and Geotechnical Engineering* (2017) Vol. 7(1), pp. 63-82, ISSN: 1792-9660.

Evaluation of the real-time de-NOx performance characteristics of a LNT-equipped Euro-6 diesel passenger car with various vehicle emissions certification cycles, Cha-Lee Myung, et al.; *Energy* (in press), doi: 10.1016/j.energy.2017.05.089.

Total Particle Number Emissions from Modern Diesel, Natural Gas, and Hybrid Heavy-Duty Vehicles during On-Road Operation, Tianyang Wang, et al.; *Environ. Sci. Technol. (in press),* doi: 10.1021/acs.est.6b06464.

Experimental study of the effect of heavy aromatics on the characteristics of combustion and ultrafine particle in DISI engine, Chunde Yao, et al.; *Fuel* (1 September 2017), Vol. 203, pp. 290-297, doi: 10.1016/j.fuel.2017.04.080.

Intercomparison of ethanol, formaldehyde and acetaldehyde measurements from a flex-fuel vehicle exhaust during the WLTC, Ricardo Suarez-Bertoa, et al.; *Fuel* (1 September 2017), Vol. 203, pp. 330-340, doi: 10.1016/j.fuel.2017.04.131.

Combustion and emission characteristics of DI diesel engine fuelled by ethanol injected into the exhaust manifold, Mohamed Nour, et al.; *Fuel Processing Technology* (September 2017), Vol. 164, pp. 33-50, doi: 10.1016/j.fuproc.2017.04.018.

A comprehensive review on performance, combustion and emission characteristics of biodiesel fuelled diesel engines, P. Tamilselvan, et al.; *Renewable and Sustainable Energy Reviews* (November 2017), Vol. 79, pp. 1134-1159, doi: 10.1016/j.rser.2017.05.176.

Fine particle emission characteristics of a light-duty diesel vehicle according to vehicle acceleration and road grade, Won-Geun Kim, et al.; *Transportation Research Part D: Transport and Environment* (June 2017), Vol. 53, pp. 428-439, doi: 10.1016/j.trd.2017.04.041.

Is in-cabin exposure to carbon monoxide and fine particulate matter amplified by the vehicle's self-pollution potential? Quantifying the rate of exhaust intrusion, G. Harik, et al.; *Transportation Research Part D: Transport and Environment* (July 2017), Vol. 54, pp. 225-238, doi: 10.1016/j.trd.2017.05.009.

Emissions Control, Catalysis, Filtration

Simultaneous NOx and Particulate Matter Removal from Diesel Exhaust by Hierarchical Fe-Doped Ce-Zr Oxide, Ying Cheng, et al.; *ACS catal* (2017), Vol. 7, pp. 3883-3892, doi: 10.1021/acscatal.6b03387.

Enhanced catalytic activity of Ni on η-Al_2O_3 and ZSM-5 on addition of ceria zirconia for the partial oxidation of methane, Ahmed Osman, et al.; *Applied Catalysis B: Environmental* (5 September 2017), Vol. 212, pp. 68-79, doi: 10.1016/j.apcatb.2016.12.058.

Activation of Pd/SSZ-13 catalyst by hydrothermal aging treatment in passive NO adsorption performance at low temperature for cold start application, YoungSeok Ryou, et al.; *Applied Catalysis B: Environmental* (5 September 2017), Vol. 212, pp. 140-149, doi: 10.1016/j.apcatb.2017.04.077.

Gypsum-Reinforced Zeolite Composite for Particulate Matter Reduction from Vehicular Emissions, Melissa Muñoz-Boado, et al.; *Environmental Chemical Engineering* (in press), doi: 10.1016/j.jece.2017.05.003.

Active Tetrahedral Iron Sites of γ-Fe_2O_3 Catalyzing NO Reduction by NH_3, Weiye Qu, et al.; *Environ. Sci. Technol. Lett. (in press),* doi: 10.1021/acs.estlett.7b00124.

Mesoporous metallic rhodium nanoparticles, Bo Jiang, et al.; Nature Communications (May 2017), Vol. 8, 15581, doi: 10.1038/ncomms15581.

Transport, Climate Change & Emissions

A simulation-based methodology for quantifying European passenger car fleet CO_2 emissions, Stefanos Tsiakmakis, et al.; *Applied Energy* (1 August 2017), Vol. 199, pp. 447-465, doi: 10.1016/j.apenergy.2017.04.045.

A climate policy pathway for near- and long-term benefits, D. Shindell, et al.; *Science* (5 May 2017), Vol. 356, pp. 493-494, doi: 10.1126/science.aak9521.

Using a Simplified Willans Line Approach as a Means to evaluate the Savings Potential of CO_2 Reduction Measures in Heavy-duty Transport, Stephan Van Zyl, et al.; *Earth Sciences and Geotechnical Engineering* (2017), Vol. 7 (1), pp. 99-117, ISSN: 1792-9660.

Quantification of the effect of WLTP introduction on passenger cars CO_2 emissions, Dimitris Tsokolis, et al.; *Earth Sciences and Geotechnical Engineering* (2017), Vol. 7 (1), pp. 191-214, ISSN: 1792-9660.

Evaluating plug-in electric vehicle policies in the context of long-term greenhouse gas reduction goals: Comparing 10 Canadian provinces using the "PEV policy report card", Noel Melton, et al.; *Energy Policy* (August 2017), Vol. 107, pp. 381-393, doi: 10.1016/j.enpol.2017.04.052.

A review of Battery Electric Vehicle technology and readiness levels, Amin Andwari, et al.; *Renewable and Sustainable Energy Reviews* (October 2017), Vol. 78, pp. 414-430, doi: 10.1016/j.rser.2017.03.138.

FORTHCOMING CONFERENCES

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.

NGV Corridors – Towards Sustainable Mobility

14 June 2017, Barcelona, Spain

www.ngv-events.eu/conference

NGVA Europe 2017 annual event will be an opportunity to report back on the outcomes from the LNG Blue Corridor Project, as well as to identify the best common solutions for reducing emissions from transport.

21st ETH-Conference on Combustion Generated Nanoparticles

19-22 June 2017, Zürich, Switzerland

www.nanoparticles.ch

The conference will discuss all aspects of nanoparticles, freshly emitted from various sources, aged in ambient air, technical mitigation aspects, impact of particles on health, environment and climate and particle legislation.

Ricardo will present "PN Measurements above & below 23 nm" from the AECC GDI test programme.

Engine Emissions Measurement

19-23 June 2017, Leeds, UK
https://engineering.leeds.ac.uk/short-course/22
This course is directed at both emissions legislation compliance, and at engine and catalyst development for low emissions.

Cambridge Particle Meeting 2017

23 June 2017, Cambridge, UK
www.cambridgeparticlemeeting.org/2017
Topics of interest include combustion aerosols and their effects, aerosol-based nanotechnology, and new instrumentation.

13th Integer Emissions Summit & AdBlue® Forum Europe 2017

27-29 June 2017, Dresden, Germany
www.integer-research.com/conferences/ies-europe-2017
The conference will discuss the most challenging issues facing the industry, including how commercial vehicle and engine manufacturers will further reduce CO_2 emissions and improve fuel efficiency beyond Euro VI, Euro 6c for light-duty vehicles and passenger cars – what will be the likely scenario for the European car industry when RDE regulation and WLTP procedures are adopted in September 2017?, which technologies will prove to be best-suited to meeting Stage V regulations for the NRMM sector?, and what are the strategies for meeting upcoming legislation in the marine sector
AECC will give a presentation on "Real-driving emissions experience with a plug-in hybrid electric vehicle (PHEV)".

Cities in Motion: Tackling the Climate and Pollution Challenge

27 June 2017, London, UK
https://connectpa.co.uk/events/lowcvp-annual-conference-2017-in-association-with-mayor-london
Key themes of the LowCVP annual conference, supported by the Mayor of London, will include tackling the twin challenges of air quality and climate change in cities; maximising 'electric miles' and how the electric revolution provides the UK with industrial opportunity; changing technologies: cleaner, low carbon urban vehicles & fuels: buses, taxis and commercial fleets; changing practices; efficiencies and innovation – urban mobility of the future; and how the LowCVP is helping to accelerate the mobility revolution in cities.

VII International Congress on Combustion Engines

27-29 June 2017, Poznan, Poland
www.congress.ptnss.pl/
The congress is organized by the Polish Scientific Society of Combustion Engines (PTNSS). The main topics of the congress include fuel injection systems and mixture formation; combustion processes control in SI and CI engines; emissions measurements and aftertreatment; engine testing, durability, reliability and diagnostics; and global trends in engine technology.

4th International Conference: Sensors for Exhaust gas Aftertreatment and CO_2 Reduction

27-29 June 2017, Augsburg, Germany
www.sv-veranstaltungen.de/fachbereiche/conference-sensors-for-exhaust-gas/?lang=en
Top issues to be discussed include state-of-the-art sensor technology for pressure & temperature, radio-frequency-sensors, nitrogen oxide & ammonia, multi-gas sensing, soot & soot loading, and implementation of sensors in ECUs & OBD.

CLEPA Innovation Awards 2017

29 June 2017, Rome, Italy
http://clepa.eu/events/201706-clepa-innovation-awards
Automotive suppliers, irrespective of size, are eligible for innovations in the fields of connectivity and automation, cooperation, environment and safety.

13th International CTI Conference: SCR Systems/Off-Highway Applications

5-7 July 2017, Stuttgart, Germany
http://cti.euroforum.de/en/events/scr_systems_2017
The conference will discuss international emissions legislation; real-driving emissions legislation and experience; global SCR trends and product line evolution to support changing market needs; development of innovative SCR components; new sensor developments; retrofitting; and off-highway technology trends.

Diesel Powertrains 3.0

11-12 July 2017, Ludwigsburg, Germany
www.fev.com/events/fev-conferences/fev-conference-diesel-powertrains-30.html
The international conference will highlight current developments in the Light-Duty Diesel Powertrain segment with a widespread list of topics, offering multiple interesting paths for best compliance with upcoming demands.

13th International Conference on Engines & Vehicles (ICE2017)

10-14 September 2017, Capri, Italy
www.sae-na.it/index.php/en/2016-03-19-14-13-16/2016-03-19-14-14-16/welcome
Topics to be addressed include engine modelling and diagnostics; engine combustion; new engines, components, actuators & sensors; hybrid and electric powertrains; fuels and lubricants; and exhaust aftertreatment and emissions.

Emissions 2017

12-13 September 2017, Frankfurt, Germany
https://gamcinc.com/conferences/emissions/?id=1
The forum will address advances in emission technology and management systems related to OEMs, suppliers (all tiers), component manufacturers, governmental and non-governmental agencies.

10th Integer DEF Forum USA 2017

26-28 September 2017, San Antonio, USA
www.integer-research.com/conferences/def-forum-usa-2017

2017 Aachen Colloquium Automobile and Engine Technology

9-11 October 2017, Aachen, Germany
www.aachener-kolloquium.de
The congress provides a wide range of technical presentations addressing current challenges of the vehicle and engine industry.

7th Integer Emissions Summit & AdBlue® Forum India 2017

11-12 October 2017, New Delhi, India
www.integer-research.com/conferences/ies-india-2017
The conference will examine the progress made towards Bharat VI a year on from the government's announcement regarding plans to implement the stringent emissions standards by 2020.

GreenPort Congress 2017

11-13 October 2017, Amsterdam, Netherlands
www.greenport.com/congress
The Congress aims to highlight innovations in equipment and technology to allow port users to adhere to policy, whilst illustrating practical solutions through case studies from the global logistics chain.

SAE 2017 International Powertrains, Fuels and Lubricants Meeting

16-19 October 2017, Beijing, China
www.sae.org/events/pfl

G.STIC 2017 – Global Science, Technology & Innovation Conference

23-25 October 2017, Brussels, Belgium
www.gstic.org
The objective of this conference is to underpin the technological discussions in the UN and other international forums as they relate to the Sustainable Development Goals, the climate goals and Means of Implementation.

10th Integer Emissions Summit USA 2017

7-8 November 2017, Pittsburgh, USA
www.integer-research.com/conferences/ies-usa-2017

15th FAD-Conference

8-9 November 2017, Dresden, Germany
www.fad-diesel.de/conference-2017
The FAD conference will focus on drive technologies and environmental impact; Real-Driving Emissions – milestones of implementation; exhaust aftertreatment for on-road applications; contributions of science and research; emission concepts for non-road diesel engines; exhaust aftertreatment for gas engines; special requirement of exhaust aftertreatment for hybrid drives; emission strategies and solutions for large engines; new exhaust aftertretment concepts; service time and aging of exhaust aftertreatment systems; and future fuels and exhaust aftertreatment.

22nd International Transport and Air Pollution Conference (TAP 2017)

15-16 November 2017, Zürich, Switzerland
http://tapconference.org
The conference topics include exhaust and non-exhaust emissions from transport modes (measurements and modelling); urban and suburban air quality; energy demand and greenhouse gas emissions from transport modes; and transport policies and mobility challenges of the future.

Heavy-Duty, On- and Off-Highway Engines 2017

28-29 November 2017, Augsburg, Germany
www.atzlive.de/en/events/heavy-duty-on-and-off-highway-engines
Main subject areas of the conference include new diesel, gas, and dual-fuel engines, electrification, and reducing pollution.

10th International AVL Exhaust Gas and Particulate Emissions Forum

20-21 February 2018, Ludwigsburg, Germany
www.avl.com/web/guest/-/10th-avl-international-exhaust-gas-and-particulate-emissions-forum

8th AVL Large Engines TechDays

11-12 April 2018, Graz, Austria
www.avl.com/-/8th-avl-large-engines-techdays

39th International Vienna Motor Symposium

27-28 April 2018, Vienna, Austria
https://wiener-motorensymposium.at

40th International Vienna Motor Symposium

16-17 May 2019, Vienna, Austria
https://wiener-motorensymposium.at