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NEWSLETTER

International Regulatory Developments

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

AECC celebrates 40 Years of Working in Partnership for Cleaner Air

On 8 November 2018, the Association for Emissions Control by Catalyst (AECC) celebrated its 40th anniversary in Brussels.

A distinguished audience heard from AECC's Executive Director, Dirk Bosteels, and AECC President, Chris Bennett, as well as from deputy head of unit in the European Commission's DG Growth, Mehdi Hocine, UNECE GRPE Chairman, André Rijnders, and the Secretary General of ACEA, Erik Jonnaert.

Drawing from its achievements over the years, AECC remains committed to further reducing harmful emissions from internal combustion engines on mobile sources. AECC will continue to actively contribute to the next emissions legislation development.

More info at www.aecc.eu/event/40-years-of-aecc.

EUROPE

Real-Driving Emissions (RDE) Package 4 published

On 27 November 2018, the 4th package of Real-Driving Emissions (RDE) legislation was published in the Official Journal as part of Regulation (EU) 2018/1832.

A comprehensive review of the uncertainty margins when measuring emissions with Portable Emissions Measurement System (PEMS) led to a decrease of the NOx margin from 0.50 to 0.43 at the Euro 6d step in 2020. For particle Number (PN), the PEMS error margin is unchanged.

The two different evaluation methods (i.e. Moving average windows (EMROAD) and power binning (CLEAR)) that were allowed under RDE package 3 were proven to lead to diverging results. Therefore, one simple evaluation method is now implemented. This methodology uses the raw emissions for a good percentage of RDE trips, while it balances the raw emissions against CO_2 for the more demanding trips (compared to WLTP). A specific evaluation factor is used in the case of plug-in hybrid vehicles; it compares CO_2 emissions during the RDE test and CO_2 emitted over the WLTP test in Charge Sustaining mode. The evaluation methodology will be reviewed against technological progress.

A new methodology for checking In-Service Conformity (ISC) is introduced. Testing compliance will now be made by both the manufacturer and the granting type-approval authority (GTAA), while other entities can make use of an accredited laboratory or a technical service to make tests that are taken fully into account in assessment of compliance. Starting in 2020, GTAA are required to test at least 5% of their approvals per year and per manufacturer. The new ISC also foresees the possibility to perform evaporative and cold temperature tests.

New statistics are implemented to ensure that testing is representative and balanced. The new rules also lead directly to further investigation when vehicles emit amounts significantly over the limit.

Rules were developed for multi-stage vehicles that may now be tested for compliance. Clear rules and a template for the selection of the vehicles to be tested are set.

Finally, all data will be publicly available in order to allow testing and the GTAAs need to report yearly on the ISC performed the previous year in order to improve transparency of the system.

In order to ensure that an emission character can be easily associated to a clear set of requirements and that manufacturers who have already type-approved vehicles under Euro 6d can be easily identified, the tables with the emission type-approval characters is restructured and new characters are introduced.

Character	Emissions stage	OBD stage	Required from		Ends	Notes
			New Types	All Registrations		Dates shown for M1 and N1 Class I only
BA	Euro 6b	Euro 6-1			31/8/2018	
AA	Euro 6c	Euro 6-1	-	-	31/8/2018	
AD	Euro 6c	Euro 6-2	-	1/9/2018	31/8/2019	PN RDE CF of 1.5
AG	Euro 6d-TEMP	Euro 6-2	1/9/2017 (*)	-	31/08/2019	NOx RDE CF of 2.1
BG	Euro 6d-TEMP-EVAP	Euro 6-2	-	-	31/08/2019	
CG	Euro 6d-TEMP-ISC	Euro 6-2	1/1/2019	-	31/08/2019	RDE#4 ISC
DG	Euro 6d-TEMP-EVAP-ISC	Euro 6-2	1/9/2019	1/9/2019	31/12/2020	
AJ	Euro 6d	Euro 6-2	-	-	31/08/2019	NOx RDE CF of 1.43
AM	Euro 6d-ISC	Euro 6-2	-	-	31/12/2020	
AP	Euro 6d-ISC-FCM	Euro 6-2	1/1/2020	1/1/2021	-	

(*) This date does not apply if a vehicle was type-approved to (EC) 715/2007 prior to 1/9/2017 (transitional provisions).
For vehicles of categories N1 Class II and III, and N2, dates are one year later.

Regulation (EU) 2018/1832 also includes the 2nd act on the World harmonized Light vehicle Test Procedure (WLTP) which aligns EU requirements with the 4th amendment to the Global Technical Regulation (GTR) No. 15.

This includes a substantial upgrade of almost all annexes and appendices of GTR No. 15: e.g. a new gear shift calculation tool, an improved procedure for the determination of the vehicle's road load (with coast down but also with wind tunnel), the correction of several inconsistencies in the previous versions, and improved calculation of the test results.

The new amendment also brings new EU specific elements, such as the correction of the CO_2 test results based on the difference between the actual speed profile and distance versus the set points, the revised Ambient Temperature Correction Test (ATCT) procedure at 14°C, the revised inducement procedure for urea Selective Catalytic Reduction (SCR) systems and the revised provisions for CO_2 calculation in the cases of multi-stage and individual type-approvals.

The 2nd WLTP act also introduces the new evaporative emissions procedure from GTR No. 19.

Finally, Regulation (EU) 2018/1832 introduces requirements to install standardised and accessible On-Board Fuel and energy Consumption Monitors (OBFCM) on all new vehicle types from 2020 and on all new vehicles from 2021. This obligation applies only to vehicles running with liquid fuels (petrol, diesel and biofuels). The accuracy of the OBFCM is checked at type-approval on the basis of the WLTP tests.

Regulation (EU) 2018/1832 is at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.301.01.0001.01.ENG&toc=OJ:L:2018:301:TOC.

EU Diesel Summit

On 6 November 2018, non-governmental organizations Transport & Environment (T&E), Eurocities and the European Public Health Alliance jointly organized the EU Diesel Summit in Brussels.

NGOs urged the European Commission and national governments to make tackling air pollution from dirty diesel vehicles a political priority for Europe.

They highlighted solutions to put the dangerous legacy of the 'Dieselgate' scandal to an end. Cities have led the way, through measures such as low emission zones, to protect people's health and the environment. However, city-level action alone is not enough to ensure clean air for all citizens. Too little has been done at national and European level to tackle the fleet of more than 43 million grossly-polluting diesel cars and vans currently on Europe's roads.

A declaration supported by the three organisations and presented to Commissioner for Internal Market, Industry, Entrepreneurship and SMEs, Elżbieta Bieńkowska, urged Member States and the EU to take five specific actions without delay:

- Clean up the 43 million existing dirty diesel vehicles across all member states as a political priority for Europe and support cleaner new vehicles.
- Coordinate the recall and fixing of vehicles at the European level; prevent the sale and use of polluting cars that have not been fixed and that are exported from west to east.
- Ensure all fixed vehicles undergo independent real-world testing to verify emissions performance.
- Create an 'EU Clean Air Fund' and ensure that industry contributes significantly.
- Strengthen European level legislation on vehicle emissions and testing frameworks; incentivise the modal shift and invest in infrastructure at national level.

The joint declaration is at http://nws.eurocities.eu/MediaShell/media/European_Diesel_Summit_Programme_Declaration.pdf.

In her speech, Commissioner Bieńkowska regretted that 'dieselgate' is not over however, she listed areas where real progress has been made such as new emission testing rules, new type-approval framework and improved market surveillance. Also she noted that in Member States there is more and more enforcement action. Germany for instance has recently addressed the problem forcefully with fines for Volkswagen and Audi. However, only 8 other Member States (Denmark, France, Finland, Germany, Netherlands, Portugal, Austria, Slovenia) have issued mandatory recalls of non-compliant cars; but this is not enough. Commissioner Bieńkowska also expressed concern at a growing number of underperforming diesel vehicles sold into eastern Europe, a phenomenon reinforced by diesel bans in some western cities.

MEP Kathleen Van Brempt (S&D, BE), former chair of the Emission Measurements in the Automotive Sector (EMIS) inquiry committee of the Parliament, called for an EU label to distinguish dirty diesels from those that have been retrofitted.

Commissioner Bienkowska's speech is at https://ec.europa.eu/commission/commissioners/2014-2019/bienkowska/announcements/diesel-some-light-end-tunnel_en.

Status of Negotiations on Post-2020 CO_2 Standards for Cars and Vans

On 20 November 2018, the European Parliamentary Research Service released an updated briefing on the post-2020 CO_2 standards for cars and vans to reflect the current status of negotiations.

The European Parliament voted on its report during the first October 2018 plenary session. The adopted amendments would set a 40% target for reducing EU fleet-wide emissions for new cars by 2030 (compared to 2021 levels), with an intermediate target of 20% by 2025. Similar targets are set for new vans. Manufacturers whose average CO_2 emissions exceed these targets would pay a fine to the EU budget, to be used for qualification and reallocation of workers affected by changes in the automotive sector.

Carmakers would also have to ensure that zero- and low-emission vehicles have a 35% market share of sales of new cars and vans by 2030, and 20% by 2025. Parliament calls on the Commission to table, within two years, plans for a real-world CO_2 emissions test to be introduced by 2023, using portable equipment, like that recently introduced for NOx. Until then, CO_2 emissions would be calculated based on data from the cars' fuel consumption meters. By the end of 2019, the Commission would have to propose legislation to provide consumers with accurate and comparable information on the fuel consumption, CO_2 and pollutant emissions of new cars. As of 2025, carmakers would have to report the lifecycle CO_2 emissions of new cars put on the market, using a common methodology.

In 2023, the Commission would have to review the effectiveness of the regulation. The adopted text calls on the EU, Member States and regions to promote skills development and reallocation of workers in the automotive sector, in order to achieve a socially acceptable and just transition towards zero-emission mobility, particularly in regions and communities most affected by the required changes throughout the value chain. It also calls for support for developing infrastructure, including recharging and refuelling, and European battery manufacturing.

The Council, on the other hand, adopted its general approach on 9 October 2018. Under the Council position, average CO_2 emissions of new passenger cars registered in the EU would have to be 35% lower in 2030 than in 2021. The intermediate target for 2025 would be 15%, as in the Commission proposal. For vans, the Council maintains the targets as proposed by the European Commission: 15% in 2025 and 30% in 2030. The target for the market share of zero- and low-emission passenger cars in 2030 would be raised to 35%. Newly registered zero or low-emission passenger cars would be weighted more favourably in Member States where the share of such vehicles is below 60% of the EU average, in order to incentivise sales in these markets. Car manufacturers would be obliged to report measured, instead of declared, values concerning the emissions of cars and vans, in order to ensure more robust and more representative data. The calculation of targets would thus be based on measured WLTP values. The derogation for niche manufacturers making up to 300 000 cars would be extended beyond 2025. In 2023, the Commission would have to review the effectiveness of the regulation, including the functioning of the incentive mechanism for zero- and low-emission vehicles.

Trilogue negotiations between the co-legislators started on 10 October 2018.

The EP briefing on cars and vans' CO_2 is at www.europarl.europa.eu/RegData/etudes/BRIE/2018/614689/EPRS_BRI(2018)614689_EN.pdf.

Parliament backs CO_2 Performance Standards for Heavy-duty Vehicles

On 14 November 2018, the European Parliament adopted at its plenary session, its position on future CO_2 standards for Heavy-duty vehicles.

MEPs voted for a 35% CO_2 reduction target for new lorries in 2030 compared to 2019 and an intermediate target of 20% by 2025; these are higher than the targets the European Commission originally proposed (30% in 2030 and 15% in 2025).

Manufacturers will also have to ensure that zero- and low-emission vehicles (which emit below 50% of the reference CO_2 emissions for each sub-group – see table below) represent a 20% market share of the sales of new ones by 2030, and 5% by 2025. No mandate for zero-emission urban buses was adopted though.

Table 1 – Vehicle sub-groups (sg)

Heavy-duty vehicles	Cab type	Engine power	Vehicle sub-group (sg)
Rigid lorries with axle configuration 4x2 and technically permissible maximum laden mass > 16 tons	All	<170 kW	4-UD
	Day cab	≥170 kW	4-RD
	Sleeper cab	≥170 kW and <265 kW	
	Sleeper cab	≥265 kW	4-LH
Rigid lorries with axle configuration 6x2	Day cab	All	9-RD
	Sleeper cab		9-LH
Tractors with axle configuration 4x2 and technically permissible maximum laden mass >16 tons	Day cab	All	5-RD
	Sleeper cab	< 265 kW	
	Sleeper cab	≥ 265 kW	5-LH
Tractors with axle configuration 6x2	Day cab	All	10-RD
	Sleeper cab		10-LH

Before 2020, delegated acts should be adopted to introduce an on-road in-service conformity test which ensures that on-road CO_2 emissions and fuel consumption of heavy-duty vehicles do not exceed the monitoring data reported by more than 10%. The Commission shall take any deviation exceeding that threshold into account for the purpose of calculating the average specific CO_2 emissions of a manufacturer, and adapting, where appropriate, the 2019 reference CO_2 emissions. The Commission shall also ensure that the public is informed of how the real-world representativeness evolves over time.

Also, a specific methodology shall be developed by the Commission by the end of 2020 to include for Compressed Natural gas (CNG) and Liquefied Natural Gas (LNG) applications the effect of use of advanced and renewable gaseous transport fuels compliant with the sustainable criteria defined under the Renewable Energy Directive (RED II) to the computation of the average fleet emissions.

In its 2022 report which will amongst others review the 2030 CO_2 target, the European Commission should consider assessing CO_2 emissions produced by heavy-duty vehicles during their full life-cycle, and propose, if necessary, reporting obligations for manufacturers.

The low-emission mobility strategy adopted by the European Commission in September 2017 stressed the importance of ensuring that electric vehicles are powered by electricity from sustainable energy sources and that an initiative on long-term next-generation batteries is launched at EU level as soon as possible. In order to meet those objectives, it will be necessary to step up funding for technological research into the production, management and disposal of electric motor batteries, making them increasingly environmentally sustainable, MEPs agreed.

MEPs acknowledged that a socially acceptable and balanced transition to zero-emission mobility requires changes throughout the automotive value chain, with a possible negative social impact. The EU should therefore assist workers in the sector learning new skills and reallocating, particularly in regions and communities most affected by the transition.

The text was adopted with 373 votes in favour, 285 against and 16 abstentions. Trilogue negotiations with the Council of Ministers will now start.

The EP text adopted is at
www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+TA+P8-TA-2018-0455+0+DOC+PDF+V0//EN.

EESC Position on CO_2 Standards for Heavy-Duty Vehicles

On 17 October 2018, the European Economic and Social Committee (EESC) adopted its position on the legislative proposal to set CO_2 standards for heavy-duty vehicles (HDVs).

The EESC welcomes the proposal for a regulation setting CO_2 emission standards for new HDVs as a balanced approach to addressing the need to reduce CO_2 emissions from HDVs as a contribution to the implementation of the undertakings made under the Paris Agreement.

Still, the EESC regrets the complexity of the proposal which makes it difficult to access. For instance, a common terminology and common criteria are not used for what the Regulation proposal calls zero and low emission vehicles, as different designations are used in other proposals in the mobility package. Common terminology and, where possible, common criteria, would have made the texts clearer.

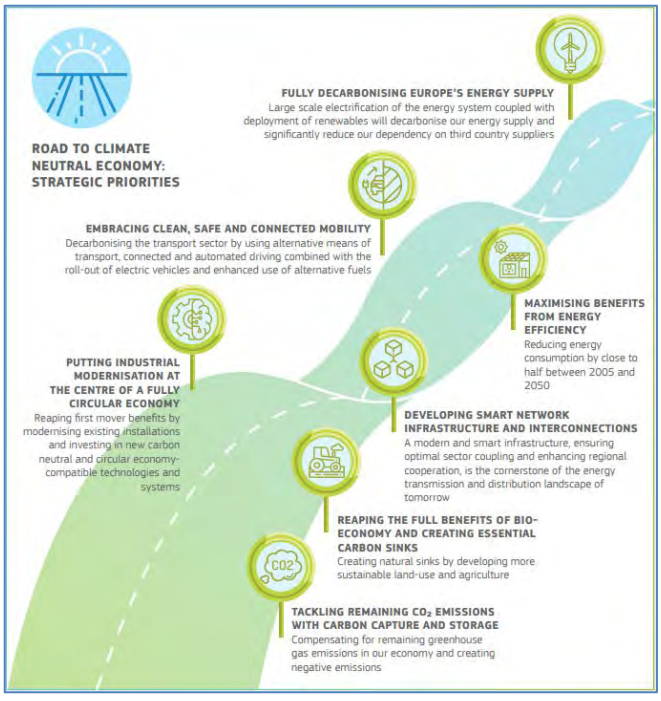
The 15% CO_2 emissions reduction targets set by the Commission proposal is challenging but in line with the commitment of the EU; the EESC would nevertheless wish to see more precise targets for the CO_2 trajectory after 2030.

The EESC position is at www.eesc.europa.eu/en/our-work/opinions-information-reports/opinions/co2-standards-lorries-weights-and-dimensions-road-vehicles.

Commission adopts 2050 Long-Term Climate Strategy

On 28 November 2018, the European Commission adopted a strategic long-term vision for a prosperous, modern, competitive and climate neutral economy by 2050 – A Clean Planet for all.

Following the invitation by the European Council in March 2018, the Commission's vision for a climate-neutral future covers nearly all EU policies and is in line with the Paris Agreement objective to keep temperature increase to well below 2°C, and pursue efforts to keep it to 1.5°C. For the EU to lead the world towards climate neutrality means achieving it by 2050.



The purpose of this long-term strategy is not to set targets, but to create a vision and sense of direction, plan for it, and inspire as well as enable stakeholders, researchers, entrepreneurs and citizens alike to develop new and innovative industries, businesses and associated jobs.

Today the major part of the energy system is based on fossil fuels. All scenarios assessed by the Commission imply that by mid-century this will change radically with the large-scale electrification of the energy system driven by the deployment of renewables, be it at the level of end-users or to produce carbon-free fuels and feedstock for the industry.

The competitive deployment of renewable electricity also provides a major opportunity for the decarbonisation of other sectors such as heating, transport and industry, either through direct use of electricity or indirectly through the production of e-fuels through electrolysis (e.g. e-hydrogen). The potential advantage of power-to-X is that synthetic fuels can be stored and used in multiple ways across different economic sectors, where it is otherwise hard to decarbonise (e.g. industry and transport). In niche applications and with a fully decarbonised electricity system, these technologies could use CO_2 as a feedstock captured from industrial processes. If captured from sustainable bio-energy or even directly from the air (recognising, however, that these technologies are yet untested at scale), they have the capacity to deliver on zero emissions fuels, the Commission said.

Just as for renewable energy in the previous decade, the automotive industry already today heavily invests in the emergence of zero and low emission vehicle technologies, such as electric vehicles. Based on today's knowledge and technologies, electrification using renewables alone will not be the single silver bullet for all transport modes. Batteries have so far a low energy density, and for now their high weight makes the technology ill-suited for aviation and long distance shipping. Also, for long-haul trucks and coaches it is currently unclear whether batteries will reach the required cost and performance level. Until we see emerge new technologies that will allow to electrify more modes than today, alternative fuels will be important. In addition, hydrogen-based technologies (such as electric vehicles and vessels based on fuel cells) may become competitive in the medium to long-term. Liquefied natural gas with high blends of bio-methane could also be a short-term alternative for long-distance haul.

In long distance shipping and heavy-duty vehicles, not only bio-fuels and bio-gas but also e-fuels can have a role provided that they are carbon-free throughout their production chain. E-fuels can be used in conventional vehicle engines, relying on the existing refuelling infrastructure. Further significant steps in research and development are needed in production of decarbonised fuels as well as the vehicle technologies such as batteries, fuel cells and hydrogen gas engines.

The Commission 2050 long-term climate strategy is at https://ec.europa.eu/clima/policies/strategies/2050_en.

Interinstitutional Agreement on Motorcycle Euro 5 Type-Approval

On 14 November 2018, the Council of the EU announced that agreement has been struck with the European Parliament on amendments to Regulation (EU) No 168/2013 on the Euro 5 type-approval rules for two- and three-wheelers and quadricyles.

According to the agreement, the date of application of the Euro 5 emission limits for microcars (L6e-B), three-wheel mopeds designed for utility purposes (L2e-U), trial motorcycles (L3e-AxT) and enduro motorcycles (L3e-AxE) is postponed from 1 January 2020 to 1 January 2024 to increase the cost-benefit ratio as the Commission feasibility study concluded (however the Commission had proposed postponing the date to 1 January 2022). For all other L-categories, the Euro 5 step is introduced on 1 January 2020 for new types and 1 January 2021 for all new vehicles, unchanged from original Regulation (EU) No 168/2013.

The mathematical durability procedure, whereby vehicles are tested after 100 km of use and a fixed Deterioration Factor is applied, does not reflect the real degradation of the emissions control system of a vehicle during its lifetime. That method will therefore be phased out by 2025. During the transition, between 2021 and 2025, the required accumulated distance travelled by the vehicle before it is tested is raised to ensure that the test results are reliable. It is increased to 2500 km for a vehicle with a maximum speed of <130 km/h and 3500 km for a vehicle with a maximum speed ≥130 km/h.

The requirement to install an on-board diagnostic system (OBD) of stage II, which ensures the monitoring and reporting on the emission control system failures and degradation, is postponed to 2024 for L3e (motorcycles), L4e (motorcycles with side car), L5e-A (tricycles) and L7e-A (heavy-on-road quads) category vehicles. Other L sub-category vehicles (trial and enduro bikes) are exempted from OBD II requirements.

The agreement also extends the power granted to the Commission to adopt delegated acts by an additional five years.

The agreement was formally approved by the European Parliament during the plenary session on 29 November 2018. MEPs adopted the text of the interinstitutional agreement with 512 votes in favour, 73 votes against and 4 abstentions.

It has now to be formally approved by the Council before publication in the Official Journal.

The text of the agreement is at http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+TA+P8-TA-2018-0466+0+DOC+PDF+V0//EN.

Parliament Committee adopts Motion for a Resolution on Clean Air for All

On 27 November 2018, MEPs on the Environment (ENVI) Committee of the European Parliament adopted a motion for a resolution in response to the 'clean air for all' communication adopted by the European Commission in May 2018, outlining measures to support Member States to tackle air pollution.

In the motion for a resolution, MEPs underlined that tackling air pollution requires a holistic approach and action at all levels of governance. They also recalled that cutting air pollution and reducing CO_2 emissions from the transport sector are twin challenges in urban areas. In addition, they stressed the important role played by the agricultural sector in relation to ammonia emissions and methane.

MEPs called on the Commission to continue reducing NOx emissions of the car fleet by reviewing annually the conformity factor in line with technological developments, so as to bring it down to 1 as soon as possible, and by 2021 at the latest.

They also called on the Commission to act without delay on $PM_{2.5}$ by proposing the introduction of more stringent compliance values as recommended by the World Health Organization (WHO) into EU air quality legislation. An ambitious update of the Ambient Quality Directive is expected to ensure that the latest WHO limit and target values for PM, SO_2 and O_3 correspond to EU requirements.

The resolution also called on the Commission to define harmonised testing standards to measure indoor pollution, and to encourage governments to draw up urban mobility plans to reduce access to personal cars.

The ENVI committee's motion will now go before a full plenary session of the Parliament.

The final text of the motion for a resolution has not yet been published.

JRC Report on Calibration of PN-PEMS

The Joint Research Centre (JRC) of the European Commission has published a new report on the calibration of Particle Number Portable Emissions Measurement System (PN-PEMS).

This report summarizes the calibration requirements of PN-PEMS. Although the principles are described in the regulation, in practice some difficulties can be encountered during the application of the procedures. Examples of experimental setups are given in this report and possible combinations of calibration ways are discussed.

The JRC concludes that the efficiency requirements have to be checked with monodisperse aerosol. This can be done for the complete PN-PEMS or its parts separately. In the second case efficiencies have to be multiplied to each other.

The linearity requirements can be checked with monodisperse or polydisperse aerosol. In practice polydisperse aerosol is used to achieve a high concentration range. Typically, the whole PN-PEMS is checked for linearity. Alternatively, the particle detector can be checked separately.

The results of these checks need to be within the technical requirement specifications. There is no need to adjust the PN-PEMS or its parts; nevertheless, it is permissible. With any adjustment, both linearity and efficiency still need to be within the limits.

The effect of multiply-charged particles can be significant and should be taken into account. The effect can be minimized by choosing the right size distribution and reference instrument for each case.

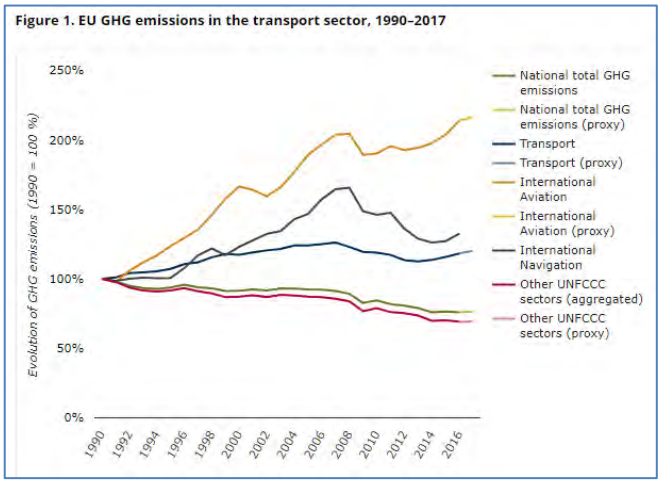
The JRC report is at
http://publications.jrc.ec.europa.eu/repository/bitstream/JRC110424/kjna29036enn.pdf.

EEA Briefing on Environment and Climate Impacts of Transport

On 22 November 2018, the European Environment Agency (EEA) published a briefing on progress of the EU transport sector towards its environment and climate objectives, based on its Transport and Environment Reporting Mechanism (TERM) indicators.

Greenhouse Gas (GHG) emissions from transport have been increasing since 2014. By 2016, transport emissions were 26.1% higher relative to 1990. Preliminary estimates from EU Member States show that GHG emissions from transport were 28% above 1990 levels in 2017.

Figure 1. EU GHG emissions in the transport sector, 1990–2017



The average CO_2 emissions of new passenger cars slightly increased for the first time since data monitoring started. Meanwhile average CO_2 emissions of new vans continue to fall, with the largest annual reduction occurring in 2017. However, considerable reductions still need to take place in the coming years to meet the EU's 2020/2021 targets.

The use of diesel remains dominant in Europe, representing 67% of total fuel sold for road transport use in 2016. However, more petrol passenger cars than diesel

cars were sold in 2017 (for the first time since CO_2 monitoring for passenger cars started).

The EU's share of renewable energy in transport rose slightly from 7.1% in 2016 to 7.2% in 2017. It remains well below the 10% target set for 2020 under the EU's Renewable Energy Directive (RED). Just two Member States (Austria and Sweden) have already reached the 10% goal.

Electric cars are slowly penetrating the EU market. Despite significant increases in sales in 2017, battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV) represent only 0.6% and 0.8%, respectively of new passenger car registrations in the EU.

Transport continues to be a significant source of air pollution, especially of PM and NO_2, although these emissions have been reduced in the last decade due to the introduction of fuel quality standards, the Euro vehicle emission standards and the use of cleaner technologies.

The EEA briefing on transport's environment and climate impacts is at www.eea.europa.eu/themes/transport/term/term-briefing-2018.

EEA Report on Life Cycle of Electric Vehicles

On 22 November 2018, the European Environment Agency (EEA) released a new report titled "Electric vehicles from life cycle and circular economy perspectives".

According to EEA, electric vehicles are anticipated to be a key future component of Europe's mobility system, helping reduce impacts on climate change and air quality. Battery Electric Vehicles (BEVs) comprised around 0.6% of all new car registrations in the EU in 2017. By 2030, BEVs could be between 3.9% and 13% of new car registrations, depending on the EU-wide fleet average CO_2 target levels set for passenger cars in the future.

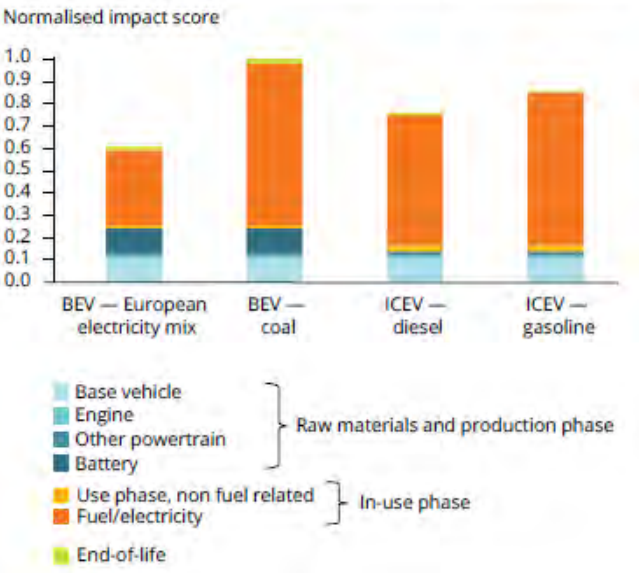
There is, therefore, an increasing need to understand BEVs from a systems perspective. This involves an in-depth consideration of the environmental impact of the product using Life Cycle Assessment (LCA) as well as taking a broader 'circular economy' approach. The aims of this report are to bring together existing evidence on the environmental impact of BEVs across the stages of their life cycle, undertaking where possible comparison with internal combustion engine vehicles (ICEVs) and consider how a move to a circular economy could reduce these impacts.

For the purposes of this report, environmental impacts are grouped under the following themes: climate change, health impacts and ecosystem impacts.

Overall, across its life cycle, a typical BEV in Europe offers a reduction in greenhouse gas (GHG) emissions compared with its ICEV equivalent. The extent of the difference can depend on a number of factors, including the size of vehicle considered, the electricity mix and whether the BEV is compared with a petrol or diesel conventional vehicle.

Life-cycle GHG emissions from BEVs charged using the average European electricity mix are estimated as 17-21% and 26-30% lower than similar diesel and petrol vehicles, respectively. GHG emissions from raw material and production LCA phases are typically higher for a BEV than for its ICEV equivalent. This is related to the energy requirements for raw material extraction and processing as well as producing the batteries. For the end-of-life stage GHG emissions from both BEVs and ICEVs are low in terms of the overall life cycle; however, there is much uncertainty around the data. The potential for reuse and recycling of vehicle components is a key area of further research and development.

Figure 6.1 Climate change impacts: example comparison of BEVs with ICEVs



The largest potential reduction in GHG emissions between a BEV and an ICEV occurs in the in-use phase, which can more than offset the higher impact of the raw materials extraction and production phases. However, the extent to which the GHG emissions advantage is realised during the in-use stage of BEVs depends strongly on the electricity mix. BEVs charged with electricity generated from coal currently have higher life-cycle emissions than ICEVs, whereas the life-cycle emissions of a BEV could be almost 90% lower than an equivalent ICEV using electricity generated from wind power. In the future, with greater use of lower carbon electricity in the European mix the typical GHG emissions saving of BEVs relative to ICEVs will increase, the EEA said.

BEVs can offer local air quality benefits due to zero exhaust emissions, e.g. NOx and particulate matter (PM). However, BEVs still emit PM locally from road, tyre and brake wear, as all motor vehicles do. For local PM emissions, there is a great deal of uncertainty and variation in the results, depending on the assumptions made around ICEV emissions and on the different estimation methods for non-exhaust emissions. In addition, electricity generation

also produces emissions. Here, the spatial location of emissions is important. Where power stations are located away from population centres, replacing ICEVs with BEVs is likely to lead to an improvement in urban air quality, even in contexts in which the total emissions of the latter may be greater.

The literature on human toxicity impacts is limited in comparison to that on climate change impacts. However, it suggests that BEV impacts could be higher overall than their ICEV equivalents. Existing research suggest that the larger impact of BEVs results from additional copper (and, where relevant, nickel) requirements.

The ecosystem impacts of BEVs can be higher or lower than ICEVs, depending on the individual impact. The effects of BEVs on freshwater ecotoxicity an eutrophication can be higher than for ICEVs because of the impacts associated with mining and processing metals and mining and burning coal to produce electricity.

The environmental impacts of BEVs, and their advantages or disadvantages relative to ICEVs, are influenced by a range of key variables associated with vehicle design, vehicle choice and use patterns, reuse and recycling and the electricity generation mix. Promoting a circular economy approach presents opportunities to influence the future trajectories of these key variables by offering incentives for improvement, which will increase the benefits and reduce the negative impacts of BEVs.

The EEA report on LCA of EVs is at www.eea.europa.eu/publications/electric-vehicles-from-life-cycle.

EEA Environmental Indicator Report 2018

On 29 November 2018, the European Environment Agency (EEA) published its Environmental Indicator report 2018.

The annual report provides an updated scoreboard that monitors progress in 29 selected environmental objectives that are relevant to achieving the three key priority objectives under the 7th Environment Action Programme (EAP) that address: natural capital (including biodiversity); sustainable, resource efficient, low-carbon economy; and people's health and well-being.

The report indicates that the EU's natural capital is not yet being protected, maintained and enhanced in line with the ambitions of the 7th EAP. The 2020 outlook remains bleak overall for the selected set of objectives related to this priority objective.

The 2020 outlook shows that the EU is on track to meet its climate and renewable energy related targets, although it is uncertain whether it will meet its energy efficiency target. There have been resource efficiency improvements. However, waste generation increased recently and a reduction in the environmental impact of production and consumption is uncertain for the housing sector and unlikely for the food and mobility sectors.

Finally, there have been substantial reductions in emissions of air and water pollutants in recent decades. However, there are still key concerns over air quality and noise pollution in urban areas, and chronic exposure of the population to mixtures of chemicals.

Table S.1 Indicator scoreboard by 7th Environment Action Programme thematic priority objective

Indicator	EU indicator past trend (*)	Outlook for meeting the selected objective by 2020
Priority objective 1: 'to protect, conserve and enhance the Union's natural capital'		
(!) Exposure of terrestrial ecosystems to eutrophication due to air pollution (*)	▲	●
Gross nutrient balance in agricultural land: nitrogen	▲	●
(!) Land take (*)	▲	●
(!) Forest: growing stock, increment and fellings	▲	●
Status of marine fish and shellfish in European seas	▲	●
Abundance and distribution of selected species (common birds (*) and grassland butterflies)	▲	●
(!) Species of European interest	▲	●
(!) Habitats of European interest	▲	●
Status of surface waters	▲	●
Priority objective 2: 'to turn the Union into a resource-efficient, green, and competitive low-carbon economy'		
Resource productivity	▲	●
Waste generation in Europe (excluding major mineral wastes) — absolute and per capita	▲	●
Recycling of municipal waste (*)	▲	●
Use of freshwater resources	▲	●
Total greenhouse gas emission trends and projections	▲	●
Share of renewable energy in gross final energy consumption	▲	●
Progress on energy efficiency in Europe	▲	●
Energy consumption by households	▲	●
Greenhouse gas emissions from transport	▲	●
(!) Animal product consumption (animal protein)	▲	●
Share of environmental and labour taxes in total tax revenues	▲	●
Employment and value added in the environmental goods and services sector (EGSS) compared with the whole economy	▲	●
Environmental protection expenditure in Europe (deflated absolute value)	▲	●
Priority objective 3: 'to safeguard the Union's citizens from environment-related pressures and risks to health and well-being'		
Exceedance of air quality standards in urban areas (nitrogen dioxide: NO_2; dust particles: PM_{10}; fine particulate matter: $PM_{2.5}$; ozone: O_3)	▲ NO_2, PM_{10}, $PM_{2.5}$, O_3	●
Emissions of the main air pollutants in Europe (sulphur oxides: SO_x; nitrogen oxides: NO_x; fine particulate matter: $PM_{2.5}$; non-methane volatile organic compounds: NMVOCs; ammonia: NH_3) (*)	▲ SO_x, NO_x, $PM_{2.5}$, NMVOCs, NH_3	● SO_x, NO_x, $PM_{2.5}$, NMVOCs, NH_3
Bathing water quality	▲	●
Number of countries that have adopted a climate change adaptation strategy and/or plan	N.A.	●
Exposure to environmental noise	▲	●
Consumption of chemicals, by hazard class	▲	●
Total sales of pesticides	▲	●

EU indicator past trend		Outlook for meeting the selected objective by 2020	
▲	Improving trend	●	It is likely that the EU will meet the objective by 2020
▲	Stable or unclear trend	●	It is uncertain whether or not the EU will meet the objective by 2020
▲	Deteriorating trend	●	It is unlikely that the objective will be met by 2020

The EEA Environmental Indicator Report 2018 is at www.eea.europa.eu/publications/environmental-indicator-report-2018.

European Parliament Note on Climate Change

On 16 November 2018, the European Parliamentary Research Service issued a briefing titled 'what Think Tanks are Thinking' on climate change.

Ahead of the COP24 summit on tackling climate change in Katowice, Poland, in December 2018, this note brings together commentaries, analyses and studies by major international think tanks and research institutes on climate talks and wider issues relating to climate change.

The EP note on climate change is at www.europarl.europa.eu/RegData/etudes/BRIE/2018/630281/EPRS_BRI(2018)630281_EN.pdf.

VW and Daimler agree with Retrofit of Euro 5 Diesel Cars in Germany

On 8 November 2018, Germany's Transport Minister Andreas Scheuer announced that Volkswagen and Daimler agreed to spend up to €3000 per Euro 5 car for upgrading their NOx emissions, including possible hardware retrofit. BMW did not support hardware retrofit.

Technical solutions for hardware retrofit of passenger cars will nevertheless not be available on the market at short notice. Some time for development and approval will be needed. In addition, the German Transport Minister stressed that hardware retrofit cost for diesel cars was still unknown.

The announcement came on the day when a court ruled that two more German cities, Cologne and Bonn, must impose bans on older diesel vehicles.

More info (in German) is at www.bmvi.de/SharedDocs/DE/SocialMedia/Youtube/public/2018/11/Gesamte-Pressekonferenz-zur-Verhandlung-mit-Dieselherstellern-08112018_-DILWwJKW2w.html.

Germany notifies Commission on Plans to avoid Disproportionate Diesel Bans

On 12 November 2018, the German Ministry of Economy notified the European Commission of plans to amend the Federal Pollution Control Act to avoid disproportionate diesel bans in cities facing air quality issues.

According to the draft, in areas where the average annual ambient air concentration of NO_2 does not exceed 50 µg/m³, existing measures are expected to make air quality in line with the EU Directive setting a limit of 40 µg/m³.

In areas where NO_2 average concentration exceeds 50 µg/m³ though, diesel vehicle traffic prohibitions can be considered. Nevertheless, the following vehicles must be excluded from any traffic ban:

- Euro 6 cars and vans and Euro VI buses and trucks;
- Euro 4 and 5 cars and vans (possibly retrofitted) when their real-world NOx emissions are less than 270 mg/km when measured according to Annex IIIA of Regulation (EC) 692/2008 as last amended in July 2017 (i.e. RDE 3 package);
- Retrofitted buses, heavy-duty, and light commercial vehicles fitted with a NOx abatement system of higher conversion efficiency.

The notification is at http://ec.europa.eu/growth/tools-databases/tris/en/index.cfm/search/?trisaction=search.detail&year=2018&num=558&mLang=EN.

Denmark calls for EU Action on Truck NOx Tampering

On 13 November 2018, the Transport Ministry of Denmark called on the European Commission to develop common rules to prevent emission tampering on heavy-duty vehicles.

This follows investigations by Denmark showing that trucks equipped with tampering devices have up to 45 times higher NOx emissions than trucks with a well-functioning emission control system. The illegal truck manipulation is typically done to save money for the operation and maintenance of the truck's NOx control system, the Ministry said.

The Danish Transport Ministry therefore calls on the EU to prohibit the sale of NOx tampering devices in combination with roadside inspection of trucks.

In Denmark, since 1 January 2018, the fines for tampering with truck emission control systems have been raised from 1000 krone (€130) to 15 000 krone (€2000) for the owner of the truck for the first infringement. If the truck is tampered with repeatedly, the fine will be increased to the owner by 20 000 krone (€2700) for each violation.

Enhanced UK Vehicle Periodic Technical Inspection increases Emission Failures

On 20 November 2018, the UK government issued a press release on the results from a more demanding periodic technical inspection test (MOT).

Since 20 May 2018, a vehicle gets a 'major fault' if the MOT tester can see smoke of any colour coming from the exhaust or finds evidence that the Diesel Particulate Filter (DPF) has been tampered. A 'major fault' means the car needs to immediate repair and then to pass an MOT retest.

In the first 6 months of the new MOT, almost 16 million vehicles have taken the test. A total of 238 971 diesel cars and 505 721 petrol cars have failed the new emissions test. This compares to 58 004 diesel cars and 292 468 petrol cars during the same period in 2017 and represents increases of 312% for diesel cars and 73% for petrol cars.

The new test has also seen a 448% increase in the number of diesel vans failing. These have increased from 3585 in 2017 to 19 648 over the same period in 2018.

More info is at www.gov.uk/government/news/new-mot-standards-improving-our-air-quality.

Belgium must comply with EU Legislation on Air Quality

On 8 November 2018, the European Commission sent a letter of formal notice to Belgium over poor air quality.

Belgium has persistently failed to meet binding limit values for NO_2 in the Brussels region since they came into force in 2010. The Antwerp agglomeration is also exceeding permitted values, despite a later 2015 deadline for entering into force.

Although some measures, such as low emission zones, are in place to combat air pollution, the Commission is concerned that the current measures are not sufficient to achieve compliance as soon as possible. The Commission is also questioning the way air quality is monitored in Belgium, including the location of measuring points for NO_2 in Brussels.

Belgium has two months to reply to the additional letter of formal notice; otherwise, the Commission may decide to send a reasoned opinion.

Bulgaria urged to comply with the Ruling on Air Quality

On 8 November 2018, the European Commission urged Bulgaria to fully implement the ruling delivered by the Court of Justice of the EU on 5 April 2017 (C-488/15).

The Court found that Bulgaria had breached its obligations under the Air Quality Directive (2008/50/EC) by failing to comply with the limit values for concentration of PM_{10} in the ambient air and to keep the period of exceedance as short as possible.

While acknowledging that some progress has been made, the Commission is concerned by the slow pace of change and the lack of a coordinated approach between the environmental authorities and the other authorities concerned at national and local levels.

In May 2018, the Commission set out the wide range of policy efforts that are ongoing to support Member States in their efforts to meet EU air quality targets; the enforcement actions that are being taken to help ensure clean air for all Europeans are part of this wider policy approach. Bulgaria has not yet adopted all the measures required to remedy the situation.

The country adopted measures related to road traffic, namely amendment to the road traffic legislation, including controls on end-of-life vehicles waste and technical inspections. While this goes into the right direction, other measures, likely to help improve air quality, such as new requirements for sulfur and ash in coal and briquettes used for domestic heating, are still at the planning stage.

If Bulgaria fails to act and the case is referred back to Court, financial sanctions could be imposed. Bulgaria has two months to reply.

Bulgaria and Czech Republic reminded of EU Air Quality Requirements

On 8 November 2018, the European Commission called on Bulgaria and the Czech Republic to bring their Air Quality legislation into line with European rules (Directive 2008/50/EC).

Bulgaria and the Czech Republic have shortcomings with the enactment of several provisions of this Directive into domestic legislation, with certain important provisions of principle not correctly reflected in national law. Under EU law, Member States are obliged to take appropriate measures to keep periods of exceedance of permitted values as short as possible. The Commission is concerned by the formulation in the legislation of Bulgaria, which falls short of this requirement.

The Czech Republic has not effectively enacted provisions relating to limit values and some definitions, e.g. the definition of Volatile Organic Compounds (VOC) do not follow the Air Quality Directive definition.

Letters of formal notice were therefore sent, giving Bulgaria and the Czech Republic two months to reply; otherwise, the Commission may decide to send a reasoned opinion.

TNO Report on In-Use NOx Emissions from Petrol Vehicles

On 8 October 2018, the Netherlands' organisation for applied scientific research TNO published a new report on "Emissions of twelve petrol vehicles with high mileages".

On behalf of the Ministry of Infrastructure and Water Management, TNO measured the tailpipe emissions of twelve older petrol vehicles, model year after 1998, with three-way catalysts (1xEuro 2, 3xEuro 3, 7x Euro 4 and 1x Euro 5; odometer readings were between 155 000 and 254 000 km). Tests have been conducted on the chassis dynamometer over the Artemis driving cycle (CADC), with representative road loads, between autumn 2017 and summer 2018.

The report states that petrol vehicles represent more than 70% of all urban traffic and they have an average lifespan over 200 000 km. These vehicles had to satisfy the NEDC requirements, which did ensure proper emission performance of new vehicles. However, emission control technology has no durability requirements above 160 000 km. The report stipulates that it extends the emission testing to the full lifespan of the vehicles, beyond these limits.

The results of the chassis dynamometer tests show a large spread in the emission behaviour of these twelve vehicles. Measured average NOx emissions vary between 17 and 1234 mg/km. Particulates emissions of these vehicles vary as well, but these emission levels are low, except for one vehicle. All vehicles perform well on THC (total hydrocarbons) emission, ranging from 8 to 138 mg/km.

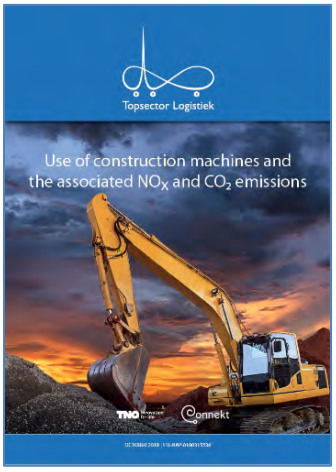
The high emissions over a real-world test show little correlation with NOx emissions in simple tests like stationary operation, or at constant speed. Hence, with such tests the problem cannot be established. Moreover, also Periodic Technical Inspection (PTI) tests and proper maintenance do not indicate the emission problems with these vehicles.

The high emissions are not correlated with a particular brand or model, nor with the emission class. Since the problems also occurred with a Euro 5 vehicle, it is expected that this problem may affect air quality until 2030, since Euro 5 vehicles are likely to be present on Dutch road until then. There are indications, from the two vehicles, that drift in the lambda sensor, controlling the operation of the three-way catalyst, is the main culprit of very high NOx emissions. However, other possible causes, and combinations thereof, are also possible.

The TNO report on NOx emissions of petrol cars is at:
http://publications.tno.nl/publication/34627191/HOH1aG/TNO-2018-R11114.pdf

TNO Report on In-Use NOx and CO_2 Emissions from Construction Machines

On 30 October 2018, the Netherlands' organisation for applied scientific research TNO published a new report on "Use of construction machines and the associated NOx and CO_2 emissions".



This project, funded by the Top Sector Logistics and the Netherlands Pollutant Release and Transfer Register, monitored the use and emissions of four common, modern construction machines during normal operation. This monitoring was performed using the Smart Emission Measurement System (SEMS), a sensor-based system developed by TNO. Selected machines consisted of two excavators, a loading shovel and a tractor. Two construction machines fall under the Stage IIIB legislation (introduced from 2011) for Non-Road Mobile machinery (NRMM), while the other two are subject to the newer Stage IV legislation (introduced from 2014). None of these machines has to comply with in-use requirements which were introduced as In-Service Monitoring provisions with Stage V.

The table below provides an overview of the results for the four machines monitored. NOx emissions in practice were around 20% to 350% higher than the limit for the laboratory test.

Overview of the use and emissions of the four machines monitored.

Machine Type	1 Excavator	2 Loading shovel	3 Excavator	4 Tractor
Stage with which engine complies	IV	III B	III B	IV
Idling time [min/hr]	21	34	11	15
Average CO_2 emissions [kg/hr]	42	18	53	30
Average NO_x emissions [g/hr]	34	141	149	70
Average NO_x emissions when idling [g/hr]	49	106	91	64
Average NO_x emissions [g/kWh]	0.5	4.9	2.8	1.8
NO_x limit (lab) [g/kWh]	0.4	3.3	2.0	0.4

On the basis of these measurements and experiences in the area of road transport in general, the current emission factors for NOx, based on the legislation and short tests, appear to be too low. Higher emission values have been observed for every construction machine, train and ship measured to date, in particular when the engine load is low. TNO recommends provisionally adjusting the emission factors upwards.

It is also important to develop an In-Service Conformity (ISC) procedure for NRMM and to add this to the type-approval test, as is customary for road transport. The current In-Service Monitoring (ISM) procedure would provide a logical basis for this, although the existing measurements reveal that the ISM procedure needs some improvement. In particular, the coverage of low engine load operation.

Also, during the test period the four machines measured were idling for between 18% and 57% of the time. The fuel consumption and CO_2 emissions during idling account for a relevant share of the total. Furthermore, idling is responsible for up to half of the total NOx emissions.

In the case of the more modern machines measured (Stage IV), the share during idling was greater than had previously been the case (Stage III B). Additional attention should therefore be paid to ensuring that machines are used efficiently (with short waiting times and a uniformly high engine load) and that instructions are given regarding switching-off the machine.

The TNO report on construction machines' emissions is at www.tno.nl/nl/over-tno/nieuws/2018/10/emissie-mobiele-werktuigen-in-praktijk-hoger-dan-limietwaarde-wettelijke-laboratorium-test/.

TNO Report on In-Use NOx Emissions from Euro VI Buses

On 15 November 2018, the Netherlands' organisation for applied scientific research TNO published a new report on "Tailpipe NOx emissions of Euro VI buses in daily operation in the Netherlands".

For the Ministry of Infrastructure and Water Management, emissions of five Euro VI public transport buses were measured during real-world operation during everyday use with a Smart Emissions Measurement System (SEMS). In addition, NOx emissions of two Euro VI buses were measured with a Portable Emissions Measurement System (PEMS).

Results show that average NOx emissions varied during normal operation between 0.3 g/km and 2.9 g/km with SEMS and from 0.2 to 1.9 g/kWh with PEMS. For three tests, the average NOx emissions were higher than the regulatory on-road Euro VI limit value. TNO noted that the limit value is applicable to test conditions that are prescribed in the formal European on-road bus test with PEMS.

The high average real-world NOx emissions of some of the buses and the chance of temporarily high emissions show that there is still a difference between real-world and regulatory test conditions. The Euro VI standard does not ensure NOx emissions sustainably below the Euro VI emissions level under all conditions, TNO concluded.

The TNO report on buses' NOx emissions is at http://publications.tno.nl/publication/34627250/9C8rot/TNO-2018-R11328.pdf

TNO Report on PEMS Test for Heavy-Duty Vehicles

On 15 November 2018, the Netherlands' organisation for applied scientific research TNO published a new report on the evaluation of the EU real-world PEMS test for heavy-duty vehicles.

The TNO report says that real-world emissions test within the EU certification process is meant to control NOx emissions under 'normal conditions of use' but has boundary conditions outside which NOx emissions are not tested. Therefore, these conditions may not be controlled. A risk assessment was performed to determine what situations, that typically occur in the Netherlands, are not controlled by the on-road emissions test for heavy-duty vehicles and which may potentially lead to high NOx emissions.

The TNO report lists driving conditions which are considered as normal conditions of use in the Netherlands, but which are not covered by Euro VI-C. It is acknowledged that Euro VI-D will cover a larger range of engine power operation. However, some vehicles, such as refuse trucks, often operate at lower power levels than 10%, which will not yet be covered.

TNO concludes that a risk assessment of the whole regulation on NOx tailpipe emissions of HDV would give a better view of what conditions are covered and which are not. Together with an assessment of the real-world emissions trends of generations of HDVs, it would reveal whether the current Euro VI legislation is effective in lowering NOx emissions under all normal conditions of use in the Netherlands. It is unclear how much the heavier trucks drive at low engine load conditions. Additional testing of this vehicles in real operation will provide some insight into their contribution to total and local NOx emissions.

Finally, the TNO report also looks at developments outside of the EU, saying that the CARB-SwRI pilot programme seems to indicate that, with an advanced NOx abatement system, wider boundaries for the PEMS test are feasible. In this way, more representative driving conditions would be covered, leading to a decrease of real-world tailpipe NOx emissions.

The TNO report on Heavy-duty PEMS tests is at http://publications.tno.nl/publication/34627251/L35lf6/TNO-2018-R10550.pdf

NORTH-AMERICA

US EPA Cleaner Trucks Initiative

On 13 November 2018, the US Environmental Protection Agency (EPA) launched the Cleaner Trucks Initiative to further decrease NOx emissions from on-highway heavy-duty trucks and engines.

From 2007 to 2017, US NOx emissions dropped by more than 40%, but it is estimated that heavy-duty trucks will still be responsible for one-third of NOx emissions from the transportation sector in 2025. EPA therefore expects that any update to the current standards established in 2001 will result in significant mobile source NOx reductions and will aid in the attainment of ozone and particulate matter air quality standards.

The Cleaner Trucks Initiative (CTI) will include a future rulemaking that will update the existing NOx standard while also streamlining compliance and certification requirements. It will cut unnecessary red tape while simplifying certification of compliance requirements for heavy-duty trucks and engines. Areas of deregulatory focus will include onboard diagnostic (OBD) requirements, cost-effective means of reassuring real-world compliance by using modern and advanced technologies, the deterioration factor testing process, and concerns regarding annual recertification of engine families.

The US EPA intends to publish a proposed rule in early 2020.

REAL: California New On-Board Emissions Monitoring Programme

On 15 November 2018, the California Air Resources Board (CARB) adopted a new emissions tracking programme that will help regulators identify vehicles with excess smog-related and greenhouse gas emissions.

Real Emissions Assessment Logging (REAL) is part of the amendments to the OBD (On-board Diagnostic) Regulations approved by the Board. When the OBD system detects a malfunction, it alerts the driver by illuminating an indicator light on the instrument panel, and stores information that helps identify the faulty equipment, enabling technicians to quickly fix the problem. While the OBD system currently notifies drivers when emissions components are malfunctioning, the REAL program would require the OBD system to do more than that. It would require OBD systems to collect and store emissions data from NOx on medium- and heavy-duty diesel vehicles in-use starting in the 2022 model year. It would also require OBD systems to collect and store fuel consumption data that would be used to characterize CO_2 emissions on all heavy-duty vehicles in-use.

Storage of similar data for greenhouse gas emissions is already required on light-duty and medium-duty vehicles starting in model year 2019. The REAL data will be retrieved from the vehicle by plugging a scan tool or data reader into the vehicle.

The REAL programme will not require new technology since it will take advantage of existing sensors. Older vehicles will not be part of the REAL programme and will not require any new equipment.

More info on REAL is at www.arb.ca.gov/board/books/2018/111518/18-9-4pres.pdf.

US Settlements to resolve Violations of California's Truck and Bus Regulation

On 1 November 2018, the US Environmental Protection Agency (EPA) announced settlements with two interstate trucking companies to resolve violations of California's Truck and Bus Regulation.

Schneider National Inc. operated 150 heavy-duty diesel trucks in California from 2013 to 2016 without the required Diesel Particulate Filters (DPFs). In addition, the company failed to verify that nearly 1200 of the carriers it hired in California complied with the Truck and Bus rule. The company, headquartered in Green Bay, WI, will pay a $125 000 (€110 000) penalty and spend $350 000 (€310 000) on air filtration projects at schools located near freeways in the Los Angeles area.

Old Dominion Freight Line Inc. operated 117 heavy-duty diesel trucks in California from 2013 to 2016 without the required DPFs. The company did not verify that 64 of the carriers it hired in California complied with the Truck and Bus rule. The company, headquartered in Thomasville, NC, will pay a $100 000 (€90 000) penalty and spend $225 000 (€200 000) on air filtration projects at schools in the Rialto area.

More info is at www.epa.gov/newsreleases/us-epa-requires-trucking-companies-reduce-air-pollution-near-los-angeles-schools.

EPA fines Aftermarket Part Suppliers for Clean Air Act Violations

On 14 November 2018, the US Environmental Protection Agency (EPA) announced that Arizona-based Vivid Distributing will pay a $200 000 (€178 000) penalty for violating the Clean Air Act.

EPA alleges the company installed, manufactured, and sold illegal defeat devices that bypass or render inoperative required emissions control systems. Between 2014 and 2016, Vivid Distributing sold 443 aftermarket products designed to defeat the emissions control systems of cars and trucks.

More info is at www.epa.gov/newsreleases/us-epa-settles-arizona-auto-parts-manufacturer-selling-pollution-control-bypass.

On 14 November 2018, the US EPA also announced it has reached similar agreements with three Southern California companies for selling pollution control bypass equipment; the three firms will pay a total of $322 000 (€286 000) in penalties.

Yoshimura Research and Development of America manufactured and sold 46 502 aftermarket exhaust systems for motorcycles from 2008-2010 that required the removal of catalytic converters. The company paid a reduced penalty of $225 000 (€200 000) due to financial hardship.

Modbargins.com sold 16 aftermarket exhaust systems for motor vehicles from 2015-2016 that required the removal of catalytic converters. The company paid a $7000 (€6200) penalty.

Two Brothers Racing manufactured and sold 13 597 various exhaust systems for motorcycles from 2013-2016 that required the removal of catalytic converters. The company will pay a reduced penalty of $90 000 (€80 000) penalty due to financial hardship.

More info is at www.epa.gov/newsreleases/us-epa-settles-three-southern-california-companies-selling-pollution-control-bypass.

Hyundai fined $1.95 Million by the US for importing Non-Compliant Diesel Engines

On 14 November 2018, the US Department of Justice announced that Hyundai Construction Equipment Americas Inc., then a subsidiary of Hyundai Heavy Industries Co. Ltd, pleaded guilty and was sentenced to pay a $1.95 million (€1.73 million) criminal fine.

The charges relate to construction equipment Hyundai imported from South-Korea for sale into the US with diesel engines that did not comply with air emissions standards under the Clean Air Act.

During a phase-in period for new air emissions standards, Hyundai opted to participate in a transition programme that allowed it to import limited numbers of engines not in compliance with the new standards. However, Hyundai submitted a report to US authorities that intentionally understated the number of non-compliant engines it had imported from South-Korea.

More info is at www.justice.gov/opa/pr/hyundai-construction-equipment-americas-inc-sentenced-19-million-criminal-fine-violating.

SOUTH AMERICA

Brazil strengthens Light-Duty and Heavy-Duty Emission Standards

In late October 2018, Brazil's National Environment Council (CONAMA) published a series of resolutions aimed at increasing the stringency of Brazil's emission standards for motor vehicles.

One of the resolutions establishes that a new stage of requirements for new heavy vehicles is included in Brazil's Air Pollution Control Program for Motor Vehicles (Proconve). The CONAMA resolution requires all heavy-duty vehicles starting in 2023 to comply with a P8 phase, equivalent to Euro VI emission standards for heavy-duty vehicles. In addition, the P8 heavy-duty standards include mandatory verification of compliance with emission limits under real-world driving conditions using Portable Emissions Measurement System (PEMS) equipment.

The complete series of resolutions covering the next set of emission standards for both new heavy-duty and light-duty vehicles sold in Brazil were finalized in late November 2018.

For light-duty vehicles more stringent exhaust and evaporative emission limits associated with a P7 phase begin in 2022, with additional tightening of exhaust standards associated with a P8 phase starting in 2025. The P8 standards include a corporate fleet average emission limit on non-methane organic gases (NMOG)+NOx that decreases every two years starting in 2025 through 2031. In addition to a more stringent P7 (and P8) diurnal evaporative emission limit of 0.5 g/test over a 48-hour diurnal test, on-board refuelling vapor recovery (ORVR) limits are phased in starting in 2023, with all light-duty gasoline (or flex-fuel) vehicles required to meet ORVR requirements in 2025.

More details on the light-duty Proconve P7 and P8 standards are found in the resolution (in Portuguese) at www2.mma.gov.br/port/conama/processos/F36AB2B0/PropResol_PROCONVE_L71.pdf.

UNITED NATIONS

UNEP Emissions Gap Report 2018

On 27 November 2018, the United Nations Environment Programme (UNEP) released the 2018 issue of its annual Emissions Gap Report.

The report presents an assessment of current national climate mitigation efforts and the ambitions countries have presented in their Nationally Determined Contributions (NDC), which form the foundation of the Paris Agreement.

Current commitments expressed in the NDCs are inadequate to bridge the emissions gap in 2030. Technically, it is still possible to bridge the gap to ensure global warming stays well below 2°C and 1.5°C, but if NDC ambitions are not increased before 2030, exceeding the 1.5°C goal can no longer be avoided. Now more than ever, unprecedented and urgent action is required by all nations. The assessment of actions by the G20 countries indicates that this is yet to happen.

Global greenhouse gas (GHG) emissions show no signs of peaking. Global CO_2 emissions from energy and industry increased in 2017, following a three-year period of stabilization. Total annual GHG emissions, including from land-use change, reached a record high of 53.5 Gt CO_2eq in 2017, an increase of 0.7 Gt CO_2eq compared with 2016. In contrast, global GHG emissions in 2030 need to be approximately 25% and 55% lower than in 2017 to put the world on a least-cost pathway to limiting global warming to 2°C and 1.5°C respectively.

The gap in 2030 between emission levels under full implementation of conditional NDCs and those consistent with least-cost pathways to the 2°C target is 13 Gt CO_2eq. If only the unconditional NDCs are implemented, the gap increases to 15 Gt CO_2eq. The gap in the case of the 1.5°C target is 29 Gt CO_2eq and 32 Gt CO_2eq respectively. This gap has increased compared with 2017 as a result of the expanded and more diverse literature on 1.5°C and 2°C pathways prepared for the IPCC Special Report.

Fiscal policy reform can play a key role in creating strong incentives for low-carbon investments and reducing GHG emissions. Revenues from carbon pricing can be used for reducing other taxes, increase spending on social issues and/or compensating low-income households. Well-designed fiscal reform packages can reduce the costs of mitigating emissions, thereby making these fiscal reforms more socially acceptable. The use of carbon pricing to reduce GHG emissions is still only emerging in many countries and generally not applied at a sufficient level to facilitate a real shift towards low-carbon societies.

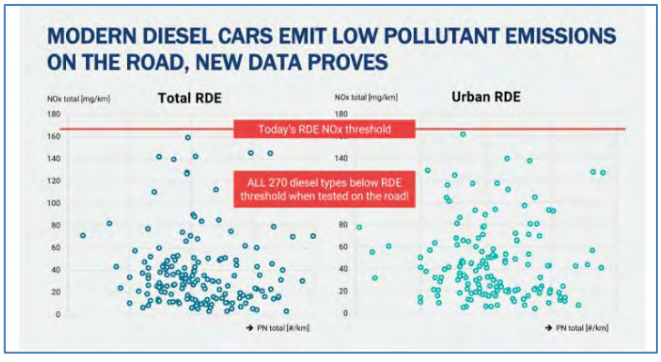
Accelerating innovation is a key component of any attempt to bridge the emissions gap, but it will not happen by itself. Combining innovation in the use of existing technologies and in behaviour with the promotion of investment in new technologies and market creation has the potential to radically transform societies and reduce their GHG emissions.

The UNEP Emissions Gap Report 2018 is at www.unenvironment.org/resources/emissions-gap-report-2018.

GENERAL

Euro 6d-temp Type-Approval Data of Diesel Cars confirm Low NOx Emission

On 5 November 2018, the European Automobile Manufacturers' Association (ACEA) issued a press release emphasizing the low on-road NOx emission of recent diesel vehicles certified to the Euro 6d-temp standard.



ACEA said that some 270 new types of diesel cars type-approved against the latest Euro 6d-temp standard were introduced on the European market over the past year. The new data shows that all of these diesel cars performed well below the NOx threshold of the Real Driving Emissions (RDE) test, which applies to all new car types

since September 2017. What is more, already today most of these vehicles show results that are below the stricter NOx threshold that will be mandatory from January 2020.

These findings are supported by third parties. The German motor club ADAC recently performed independent on-road testing of RDE-compliant diesel vehicles and found that modern diesels emit 85% less NOx on average than Euro 5 cars, concluding that the latest diesels are "very clean". Their additional testing demonstrated that the best-performing RDE-compliant Euro 6 diesels emit as much as 95-99% less NOx than Euro 5 vehicles.

The ACEA statement is at www.acea.be/press-releases/article/diesel-new-data-proves-that-modern-diesel-cars-emit-low-pollutant-emissions.

Polis City Network Conference on Transport Innovations

On 22 and 23 November 2018, the Polis city network held its annual conference on Innovation in Transport for Sustainable Cities and Regions in Manchester, UK.

AECC spoke about "modern, Real-Driving Emissions (RDE)-compliant cars: key to improving urban air quality" in the conference session dedicated to "Measuring vehicle emissions and improving air quality". It was shown to city authorities that today, the Euro 6d-temp (and Euro 6d in 2020) certification level limiting real-world driving emissions allows to identify modern, cleaner vehicles based on their performance. Such modern, combustion engine-powered vehicles will play a key role in improving air quality in cities.

Other speakers in that session included representatives from Barcelona, Baden-Württenberg and Transport for London, who all explained their regional activities aiming to tackle persisting air quality issue. It was indicated that no ban of Euro 6 diesel vehicles is planned in any of these areas. The Barcelona remote sensing project actually showed that Euro 6 diesel cars are performing well enough in terms of NOx emission for the city's air quality needs.

The FIA Foundation also presented the TRUE initiative and indicated that a new report focused on the remote sensing campaign run in London would be published by the end of the year. The lack (or very low number) of low emission diesel cars already driving on roads was brought forward.

The AECC presentation is at www.aecc.eu/wp-content/uploads/2018/11/181122-AECC-presentation-Polis-conference.pdf.

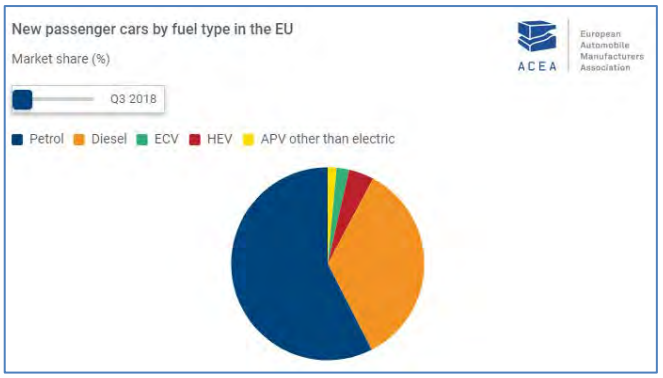
Fuel Types of New Cars in 3rd Quarter of 2018

On 8 November 2018, the European Automobile Manufacturers' Association (ACEA) published data on fuel types of new cars registered in the EU in the third quarter of 2018.

Petrol vehicles' market share increased by almost 7 percentage points compared to the third quarter of 2017, now accounting for almost 58% of the market. Demand for petrol cars increased in all the EU member states, except Sweden, growing by 15.2%.

At the same time, diesel car sales declined in most of the EU countries except Denmark, Romania, Bulgaria and Poland. As a result, the share of diesel cars fell from 43.1% to 34.7% of the market compared to the same quarter one year ago.

In the third quarter of 2018, demand for alternatively-powered cars continued to post strong growth (+29.7%), mostly driven by battery (+37.4%), hybrid (+37.1%) and plug-in hybrid electric vehicles (+24.5%). Demand for Liquefied Petroleum Gas (LPG) and Natural Gas Vehicles (NGV) also increased – up 11.8%.



More info is at www.acea.be/press-releases/article/fuel-types-of-new-cars-diesel-18.2-petrol-15.2-electric-30.0-in-third-quart.

ACEA Vehicles in Use Report

On 13 November 2018, the European Automobile Manufacturers' Association (ACEA) released the 2018 version of their report on vehicles in use in Europe which provides an extensive overview of the European motor vehicle fleet.

The report shows, per EU Member State, the number of vehicles in use for each segment – covering passenger cars, light commercial vehicles, medium and heavy commercial vehicles, as well as buses – and how those numbers have developed over recent years.

The EU passenger car fleet grew by 5.7% over the last five years; the number of vehicles on the road went from 243 to 257 million. The EU counts 511 cars per 1000 inhabitants. The highest number of cars per inhabitant can be found in Luxembourg, while Romania has the lowest car density in the EU. In Hungary nearly half of all households (48.3%) do not have a car and in Denmark almost 40%. By contrast, more than 30% of French families have two cars. Cars are on average 10.5 years old in the EU. Lithuania and Romania have the oldest fleets, with vehicles older than 16 years, while the youngest cars can be found in Luxembourg (6.3 years) and the UK (7.8 years). Despite an increase in registrations in recent years, alternatively-powered passenger cars make up only 3.4% of the EU car fleet.

31.5 million vans are in circulation throughout the EU. Counting more than 6 million vehicles, France has the largest van fleet, followed by Spain, the UK and Italy. The average age of vans in the EU is 10.5 years. Among the EU's five big automobile markets, Spain has the oldest light commercial vehicle fleet, followed closely by Italy. Diesel-powered light commercial vehicles are dominant in all EU countries except for Greece: almost 90% of the EU van fleet runs on diesel.

There are 6.3 million trucks on the EU's roads. With more than 1 million trucks, Poland has the largest truck fleet in the EU, followed closely by Germany and Italy. Trucks are on average 11.7 years old in EU. Greek trucks are the oldest ones, with an average age of almost 21 years. Nearly all trucks in the European Union run on diesel (96.1%), petrol fuels only 1%.

745 000 buses are in operation throughout the EU.

There are 77 commercial vehicles per 1000 inhabitants in the EU, Portugal has the highest number per inhabitant: 119.

The ACEA Vehicles in Use report is at www.acea.be/statistics/article/report-vehicles-in-use-europe-2018.

IEA World Energy Outlook 2018

On 13 November2018, the International Energy Agency (IEA) released it World Energy Outlook 2018 report.

The annual World Energy Outlook (WEO) publication details global energy trends and what possible impact they will have on supply and demand, carbon emissions, air pollution, and energy access. The WEO's scenario-based analysis outlines different possible futures for the energy system across all fuels and technologies.

While the geography of energy consumption continues its historic shift to Asia, IEA finds mixed signals on the pace and direction of change. Oil markets, for instance, are entering a period of renewed uncertainty and volatility, including a possible supply gap in the early 2020s. Demand for natural gas is on the rise, erasing talk of an excess as China emerges as a giant consumer. Solar PV is charging ahead, but other low-carbon technologies and especially efficiency policies still require a big push.

In all cases, governments will have a critical influence in the direction of the future energy system. Under current and planned policies, modelled in the New Policies Scenario, energy demand is set to grow by more than 25% to 2040, requiring more than $2 trillion a year of investment in new energy supply.

The analysis shows oil consumption growing in coming decades, due to rising petrochemicals, trucking and aviation demand. But meeting this growth in the near-term means that approvals of conventional oil projects need to double from their current low levels. Without such a pick-up in investment, US shale production, which has already been expanding at record pace, would have to add more than 10 million barrels a day from today to 2025, the equivalent of adding another Russia to global supply in seven years.

In power markets, renewables have become the technology of choice, making up almost two-thirds of global capacity additions to 2040, thanks to falling costs and supportive government policies. This is transforming the global power mix, with the share of renewables in generation rising to over 40% by 2040, from 25% today, even though coal remains the largest source and gas remains the second-largest.

This year's WEO includes a special focus on electricity markets which are also undergoing a unique transformation with higher demand brought by the digital economy, electric vehicles and other technological change. WEO 2018 examines what impact of higher electrification in transportation, buildings and industry. The analysis finds that higher electrification would lead to a peak in oil demand by 2030 and reduce harmful local air pollutant. But it would have a negligible impact on CO_2 emissions without stronger efforts to increase the share of renewables and low-carbon sources of power.

The World Energy Outlook 2018 and an Executive Summary are at www.iea.org/weo2018.

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FORTHCOMING CONFERENCES

Integer Emissions Summit & ARLA 32 Forum Brazil

12-13 February 2019, Sao Paulo, Brazil

www.integer-research.com/conferences/ies-brazil-2019/

10th VERT Forum

14 March 2019, Dübendorf, Switzerland

Info will be at www.vert-dpf.eu/j3/index.php/start-page/events

This 10th Forum is organized again in cooperation with EMPA and the VERT association and will focus on SCRT retrofit solutions for HDV and LDV. Best practices of emission reduction methodology are shared as they are available from VERT member companies.

3rd Annual Real Driving Emissions Forum

19-20 March 2019, Berlin, Germany

www.rde-realdrivingemissions.com

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

10th CLEPA Aftermarket Conference

27-28 March 2019, Brussels, Belgium

https://clepa.eu/events/10th-clepa-aftermarket-conference/

The conference will discuss the future challenges in an increasing digitalized automotive aftermarket

Future Diesel Engine Summit China 2019

27-28 March 2019, Shanghai, China

www.fiveoit.com/desc/#/desc/home

Integer Emissions Summit & AdBlue® Forum China

7-9 May 2019, Shanghai, China

www.integer-research.com/conferences/ies-china-2019/

International VDI Conference: Electrified Off-Highway Machines

14-15 May 2019, Düsseldorf, Germany

www.vdi-wissensforum.de/en/event/electrified-off-highway-machines/

The conference will focus on developments on electrified powertrains and battery technology specifically used in off-highway machines, and their implications on safety, standardization, maintenance and life cycle cost.

EU Green Week High-Level Summit

15-17 May 2019, Brussels, Belgium

https://ec.europa.eu/info/events/eu-green-week-2019_en

The 2019 EU Green Week will be focusing on the implementation of EU environmental legislation, highlighting the benefit of EU environmental policies and showing their benefits for citizens.

23rd International Transport and Air Pollution (TAP) Conference

15-17 May 2019, Thessaloniki, Greece

www.tapconference.org

The theme of TAP2019 is 2020-2030: Transport in critical transition. Indeed, this decade will determine whether transport systems will succeed in moving ahead, fulfilling their sustainability targets.

40th International Vienna Motor Symposium

16-17 May 2019, Vienna, Austria

https://wiener-motorensymposium.at

International Conference on Calibration Methods and Automotive Data Analytics

21-22 May 2019, Berlin, Germany

www.iav.com/termine/tagungen/international-calibration-conference

Deadline for abstract: 7 December 2018

Integer Emissions Summit & AdBlue® Forum Asia Pacific

5-6 June 2019, Tokyo, Japan

www.integer-research.com/conferences/ies-apac-2019

SIA Paris 2019 Power Train & Electronics

12-13 June 2018, Port-Marly, France

www.sia.fr/evenements/136-sia-power-train-electronics-2019

To support the automotive industry in the transition towards ever more environmentally friendly mobility, a new automotive event in France named SIA power train & Electronics broadens the scope of the Powertrain Conference to include electric traction technologies, along with internal combustion engines (ICE), low carbon fuels, and transmissions.

ETH Conference on Combustion Generated Nanoparticles

18-20 June 2019, Zurich, Switzerland

www.nanoparticles.ch

The conference serves as an interdisciplinary platform for expert discussions on all aspects of nanoparticles, freshly emitted from various sources, aged in ambient air, technical mitigation aspects, impact of particles on health, environment and climate and particle legislation.

Deadline for abstract: April 2019

Integer Emissions Summit & AdBlue® Forum Europe

25-27 June 2019, Munich, Germany

www.integer-research.com/conferences/ies-europe-2019

India & ASEAN Diesel Powertrain Summit

26-27 June 2019, Singapore

www.fiveoit.com/iadp/

India & ASEAN Diesel Powertrain Summit 2019 is dedicated to providing the next 5-10 years of policy direction and supporting technological innovations as well as exploiting the market opportunities in India and ASEAN countries.

28th Aachen Colloquium Automobile and Engine Technology

7-9 October 2019, Aachen, Germany

www.aachener-kolloquium.de

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

European Transport Conference

9-11 October 2019, Dublin, Ireland

www.aetransport.org

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