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EUROPE

Consultation on Amendment to Euro 6 including RDE4 and EU-WLTP2

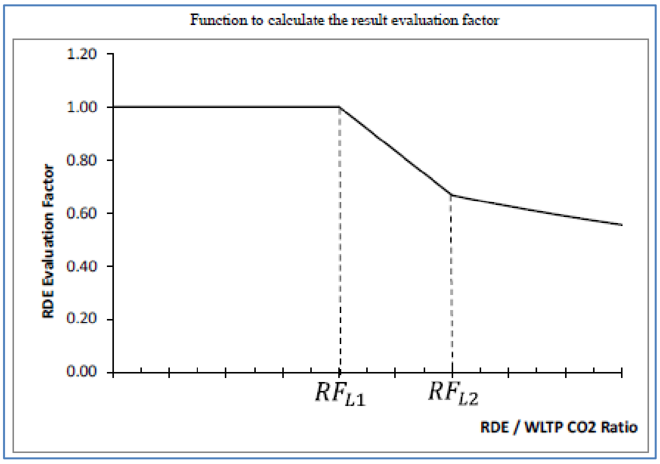
On 8 March 2018, the European Commission launched a public consultation on a draft amendment to the Euro 6 implementing Regulation (EU) 2017/1151 which combines updates to the World harmonized Light-vehicle Test Procedure (WLTP), the 4th package of Real-Driving Emissions (RDE4), and provisions also for monitoring on-board fuel and/or electric energy consumption.

On RDE, the error margin for the NOx measurement with Portable Emissions Measurement System (PEMS) is proposed to change from 0.5 to 0.43; this is in line with the JRC assessment on PEMS recently published (*see item below*). The NOx Conformity Factor (CF) for Euro 6d from 1 January 2020 then becomes 1+0.43.

The review of the methodologies for the evaluation of the pollutant emissions of a valid RDE trip showed that the results of the two methods (Moving Average Method EMROAD and power-binning method CLEAR) were not consistent. A new simple and transparent methodology is therefore laid down.

The trip 'normality' is checked by comparing the moving average windows of CO_2 distance-specific emissions with the WLTP CO_2 reference curve. A band around the WLTP is set between -25% for all phases (except PHEVs for which zero tailpipe emission in urban is allowed) and +45% for urban / +40% for rural and motorway driving. The test is valid when it comprises at least 50% of the urban, rural and motorway windows within the specified tolerance band.

The CLEAR methodology is deleted and Appendix 6 of Annex IIIA now describes the new data processing methodology. As described in the chart below, for RDE/WLTP CO_2 ratios up to RF_{L1}, the raw PEMS data is used, for higher ratios, mathematical formulas are established.



The thresholds are set to RF_{L1}=1.3 and RF_{L2}=1.5 (derogation possible until 1 January 2020 to have RF_{L1}=1.2 and RF_{L2}=1.25). Special provisions are included for PHEVs which reflect the respective usage of the internal combustion engine during the RDE trip and on the WLTP test in charge sustaining mode.

These evaluation factors shall be subject to an annual review by the Commission and shall be revised as a result of technical progress.

A new In-Service Conformity (ISC) methodology is inserted in Annex II Part B with requirements for checking compliance against the emission limits for tailpipe emissions (including low temperature) and evaporative emissions throughout the normal life of the vehicle up to five years or 100 000 km, whichever is sooner. Provisions on compliance assessment and remedial measures are included.

ISC checks currently cover only pollutant emissions measured through the Type 1 test. The ISC checks are extended to low temperature tailpipe emissions (Type 6) and evaporative emissions (Type 4) tests. Due to the cost and complexity of such tests, they remain optional though.

Every year, the granting Type-Approval Authority shall make freely available on a publicly accessible website, a report with the results of all the finalised ISC investigations of the previous year.

A new emission stage 'Euro 6d-TEMP-ISC' is introduced with RDE testing against temporary conformity factors, full Euro 6 tailpipe emission requirements (including PN RDE) and the new ISC procedure. The new ISC procedure is also included for the Euro 6d-TEMP-EVAP and Euro 6d stages.

The draft text also lays down a common format for the extended documentation package to be provided by the OEM on Auxiliary Emission Strategies (AES) and a common methodology for their assessment by the Type-Approval Authorities.

Elements related to the EU-WLTP include a method to normalize the impact of specific test tolerances on CO_2 emissions and fuel consumption test results but also alignment with amendments to the GTR No 15, including alternative ways to measure the road load parameters of a vehicle, more clear provisions for bi-fuel vehicles, improvements of the CO_2 interpolation method, and updates related to dual-axis dynamometer requirements and tyre rolling resistances.

The draft text also updates the evaporative emissions tests to reflect the changes at UNECE level, including new provisions for sealed tanks.

The new legislation would apply from 1 January 2019.

This consultation aims at improving transparency in the EU regulatory process for adoption of implementing legislations. Once complete, Member States are expected to vote the text at the Technical Committee Motor Vehicle (TCMV) on 3 May 2018.

The consultation is open until 5 April 2018 and is at http://ec.europa.eu/info/law/better-regulation/initiatives/ares-2018-1297632_en.

JRC Assessment of PEMS Error Margin

On 2 March 2018, the European Commission's Joint Research Centre (JRC) published its 2017 assessment of the uncertainty of Portable Emissions Measurement Systems (PEMS) used for Real-Driving Emissions (RDE) measurement.

The first RDE Regulation (EU) 2016/427 introduced on-road testing with PEMS to complement the laboratory Type I test for the type-approval of light-duty vehicles in the EU. A NOx conformity factor of 1.5 will apply from January 2020/2021. This conformity factor includes an error margin of 0.5 to account for the additional measurement uncertainty of PEMS relative to standard laboratory equipment. That error margin (and also the PN error margin, initially set at 0.5 by Regulation (EU) 2017/1154 (the 3rd RDE package), has to be reviewed annually.

This JRC report summarizes the first review of the NOx margin and lays out the framework for future margin reviews. Based on experimental data received by the stakeholders, technical improvements of PEMS and assumptions of possible zero drift during the tests, a NOx margin of 0.24 to 0.43 was calculated.

Since the PN margin was first set in 2017, it was not included in the 2017 review exercise.

The JRC report is at http://publications.jrc.ec.europa.eu/repository/bitstream/JRC109841/kjna29138enn.pdf.

Commission Proposal to amend Motorcycle Euro 5 Regulation

On 19 March 2018, the Commission adopted a proposal to amend Regulation (EU) No 168/2013 on the Euro 5 step to the type-approval of two- or three- wheel vehicles and quadricycles.

The co-decision proposal COM (2018) 137 stems from the recommendations in the Commission report on the comprehensive effect study of the environmental step Euro 5 for L-category vehicles (*see below*).

The Commission proposes to postpone by 2 years the entry into force of Euro 5 requirements for L2e-U (three-wheel utility moped), L3e-AxE (enduro bike), L3e-AxT (trial bike) and L6e-B (light minicars). It would become 1 January 2022 for new types and 1 January 2023 for all vehicles in these sub-categories.

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 an enduro bikes are exempted from OBD II.

The mathematical durability procedure, whereby vehicles are tested after 100 km of use and a fixed Deterioration Factor is used, does not reflect the real degradation of the emissions control system of a vehicle during its lifetime. That method should no longer be used and is therefore phased out by 2025.

For the period until 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 proposal is now sent to the European Parliament and Council for co-decision. It is also open for public consultation until 14 May 2018.

The Commission co-decision proposal is at http://ec.europa.eu/info/law/better-regulation/initiatives/com-2018-137_en.

Commission Report on Effects of Euro 5 Step for L-category Vehicles

On 19 March 2018, the European Commission published its report COM (2018) 136 to the European Parliament and the Council on the effects of the Euro 5 environmental step for L-category vehicles.

The objective of this study, as required in Regulation (EU) 168/2013 setting out the Euro 4 and Euro 5 stages for motorcycles and mopeds, is to evaluate and confirm the feasibility and cost-effectiveness of the Euro 5 emission limits by gathering and analysing the latest available data and research findings.

Based on the findings of the study contracted to a consortium led by TNO (*see AECC Newsletter of September 2017*), the Commission covers in its report the following aspects:

- Analysis of the feasibility and cost-effectiveness of the enforcement dates of the Euro 5 level.

Generally the existing Euro 5 emission limits, dates, requirements and test procedures are both feasible and cost-effective. Regarding mini cars (L6e-B), three wheel mopeds for utility purposes (L2e-U) and enduro and trail motorcycles (L3e-AxE; L3eAxT), the adjustments to the emission control system needed for Euro 5 cannot be introduced by 2020 in a cost-effective way for the engines currently fitted in those vehicles. An extra lead time of two years should allow manufacturers to move away from Euro 4 powertrains and introduce the Euro 5 step in a cost-beneficial way for these vehicle categories.

- Analysis of the adequacy of the Euro 5 OBD requirements.

In Use Performance Ratios (IUPR) should be implemented gradually, allowing for an introductory period to enable that type-approval authorities and manufacturers become familiar with the IUPR functionality.

- A cost-benefit analysis of the foreseen introduction of OBD stage II at the Euro 5 level for (sub) categories L3e, L5e, L6e-A and L7e-A.

For OBD II requirements, there is a need to change the window of misfire detection and to extend the lead time for the introduction of catalyst monitoring to ensure accurate monitoring of the emission control systems.

- A review of the durability mileage and the deterioration factors for Euro 5.

The mathematical durability procedure needs to phase out as it does not reflect properly the actual deterioration of the environmental performance of a vehicle during its lifetime. The method does not guarantee durable environmental performance for the entire life of a vehicle. A complete phasing out of the AMA cycle after 2020 is not necessary, as this is still useful for vehicles with a moderate and low speed profile, for which it provides the same accuracy as the SRC LeCV. Phasing out of AMA is therefore only recommended for larger motorcycles. Finally, there is a need to introduce a bench ageing procedure as an alternative to full and half mileage accumulation durability procedure.

That report was used to develop the proposed co-decision amendment to Regulation (EU) 168/2013 (*see above*).

The contractors study also outlined possible areas for improvements beyond the Euro 5 step, namely off-cycle emissions requirements, in-service conformity testing requirements and particle number emission limit for certain (sub-) categories. Concerning the possible introduction of a PN limit for L-category vehicles, the study concludes that a better understanding would be needed of the emissions performance of such vehicles, when new emissions control technologies become available at the Euro 5 step.

The Commission report is at https://ec.europa.eu/transparency/regdoc/rep/1/2018/EN/COM-2018-136-F1-EN-MAIN-PART-1.PDF.

Draft Amendment to Delegated Act on NRMM Stage V Technical Provisions

On 20 March 2018, the European Commission released a draft delegated act amending Regulation (EU) No 2017/654 on technical and general requirements for type-approval of engines installed in Non-Road Mobile Machinery (NRMM).

In order to enable the use of certain fuels marketed in some Member States, the permitted content of Fatty-Acid Methyl Ester ('FAME') is increased from 7% to 8% v/v.

The base emission control strategy is added to the technical requirements in addition to the auxiliary emission control strategy.

To reduce the likelihood of regeneration during the discrete-mode NRSC emission test, the minimum sample time is reduced to 3 minutes for the demonstration based on random point selection.

Finally, certain changes are made to provisions containing contradictions or redundant information and certain references are corrected.

The consultation is open until 17 April 2018.

The draft amendment is at http://ec.europa.eu/info/law/better-regulation/initiatives/ares-2018-1536211_en.

Consultations on NEDC-WLTP CO_2 Correlation Update

On 14 March 2018, the European Commission launched two public consultation on draft legislative updates on the correlation of CO_2 emissions between NEDC and WLTP; one for cars and one for vans.

Amendments to Implementing Regulation (EU) 2017/1153 (for cars) and Implementing Regulation (EU) 2017/1152 (for vans) include clarifications of the existing method for defining the end-points of the interpolation line used for calculating the NEDC CO_2 emission value of an individual vehicle, based on the WLTP interpolated value measured. Those end-points, which are represented by a test vehicle with the highest CO_2 emission values, and test vehicle with the lowest values, should be defined so that the difference between the two test vehicles high and low is never smaller than 5 g CO_2/km.

Also, in order to ensure a robust correlation output, the number of cylinders is added as an input to the CO_2MPAS correlation tool.

Finally, when road load matrix families are used for the WLTP type-approval test, the calculation of the NEDC CO_2 emission value of an individual vehicle in such a family is simplified by deriving the NEDC road load coefficients from the WLTP road load coefficients of the individual vehicle.

The draft texts are open for comments until 11 April 2018.

The consultation for car CO_2 correlation is at http://ec.europa.eu/info/law/better-regulation/initiatives/ares-2018-1401678_en and the one for vans is at http://ec.europa.eu/info/law/better-regulation/initiatives/ares-2018-1401716_en.

Industry Commissioner discusses Emissions Inquiry in Parliament

On 14 March 2018, Industry Commissioner Elżbieta Bieńkowska (DG-GROW) was invited to the Environment (ENVI) Committee of the European Parliament to exchange views on the follow-up on the recommendations by the EMIS inquiry committee.

The EMIS report consists of 85 conclusions as well as a set of 94 recommendations and was endorsed by the plenary on 4 April 2017. The European Commission (EC) is requested to report on progress within 18 months from the recommendations' adoption.

So far, EC DG-GROW has adopted legislative and non-legislative measures; introduced RDE tests to measure pollutant emissions of all new cars from September 2017 on; the new WLTP was also put forward as well as the EC provided guidance to national type-approval authorities.

Further on, the core aspect of Commissioner Bieńkowska's statement on the EMIS follow-up was the lacking implication and missing engagement of the Member States which is crucial to achieve the implementation of the recommendations. For the moment, there have been recalls of heavily polluting cars but she said "the Commission is not satisfied with the low number of recalls in the Member States". Therefore, there are further and concreter measures foreseen, as it already happened in the case of Italy and Fiat. More precisely, the next step would be a letter of formal notice to the six Member States already warned. Their answers to the first infringements are currently examined.

Regarding the compensation of consumers, she explained that European law would not conceive such measures like in the US; the national governments need to plan concrete infringement procedures. All political groups agreed on the lack of sanctions against Member States. However, she announced close cooperation with Environment Commissioner Vella who would have more authority regarding infringement policy on air pollution. Even if DG-ENVI puts already pressure on the Member States, DG-GROW asked several times for the EP's support in order to put pressure on Member States. Regarding infringements, Ms Bieńkowska suggested to address car producers directly in order to increase the number of recalls. Nevertheless, there is no timetable available from the EC which would plan any concrete further steps to address the national authorities.

The Greens (MEP Bas Eickhout, NL) requested mandatory retrofitting. As answer to that, the EC announced that there will soon be a list of retrofitting possibilities for Euro 5 cars. Additionally, she announced the 3rd mobility package for May this year which will provide necessary technical definitions that will allow a harmonized European type-approval and recall measures. Problems which would occur with the current Euro 6 legislation would be fixed with the new type-approval rules. In a long-term perspective, Commissioner Bieńkowska sees the future of mobility clearly in a European investment in electric vehicles or rather batteries.

MEP Jens Gieseke (EPP, DE) requested more technical neutrality in terms of competition between the different technology providers. To MEP Miriam Dalli's (S&D, MT) question about NOx emission control, the Commissioner answered that she will provide a written document. In general, she announced that DG-GROW will provide written answers to all major topical issues.

The debate can be followed at http://web.ep.streamovations.be/index.php/event/stream/20180314-1400-committee-envi.

Parliament Committee Report on Workers Exposure Protection

On 27 March 2018, the Employment and Social Affairs (EMPL) Committee adopted its report on the proposed amendment to Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work.

MEPs backed the Commission proposal to set exposure limit values (the maximum amount that a substance should be present in workplace air) and/or skin notations (the possibility that a substance could be significantly absorbed through the skin) for harmful carcinogens. Subject to exposure limit values and/or skin notations are trichloroethylene, 4,4-methylenedianiline, epichloro-hydrine, ethylene dibromide, ethylene dichloride and mixtures containing benzo(a)pyrene.

In order to protect the 4 million workers in the EU who are potentially exposed to diesel engine exhaust emissions, MEPs added exposure limit values also for diesel engine exhaust fumes.

Oils that would be covered under the changes include UEOs (Used Engine Oils), substances used in automobile, rail, marine and aero-transport engines and portable machinery, including chain saws and lawn mowers.

Rapporteur Claude Rolin (EPP, BE) was keen to emphasise the practicalities of the revisions, as well as the importance of future progress: "Firms and workers will be made more aware of the substances they have been handling and will be able to reduce exposure to these materials," he said. "Cancer is the main cause of workers' deaths in the EU. I hope that an initiative like this can inspire further improvements to standards."

The draft report was adopted by 41 votes to 0, with 7 abstentions. Trilogue negotiations with the Council will start soon as the Member States have already adopted their negotiating position.

More info is at www.europarl.europa.eu/news/en/press-room/20180327IPR00604/carcinogens-in-the-workplace-eu-protection-regime-to-include-new-substances.

EU Court of Justice Ruling on Trilogue Transparency

On 22 March 2018, the EU Court of Justice ruled that the European Parliament "must in principle" grant access to documents related to the so-called trilogues.

Trilogues are legislative talks between MEPs, member states and the European Commission; they are a decisive step used in 70 to 80% of EU legislative procedure. The Court therefore ruled that citizens "must be in a position to follow in detail the decision-making process" and "have access to all relevant information."

More info at https://curia.europa.eu/jcms/upload/docs/application/pdf/2018-03/cp180035en.pdf.

Report on Tax Revenue Losses due to Incorrect Car CO_2 Values

On 9 March 2018, the Greens/European Free Alliance group of the European Parliament released a report titled "Loss of revenues in passenger car taxation due to incorrect CO_2 values in 11 EU states".

The report, produced by Green Budget Germany and Green Budget Europe, analyses the impact of the gap between type-approval and real-world CO_2 emissions values for passenger cars focussing on its impact on tax revenues in eleven EU member states (Austria, Belgium, Denmark, Finland, France, Germany, Luxembourg, the Netherlands, Spain, Sweden and the UK). These countries account for more than 60% of the total car registrations in the EU.

Results of the research show that in these eleven countries, revenues from car registration and ownership taxes would have been more than €10 billion higher in 2016, if CO_2 emission values had been more realistic. Between 2010 and 2016, the loss was at least €46 billion.

The report is at http://extranet.greens-efa-service.eu/public/media/file/1/5503.

EESC Opinion on Post-2020 CO_2 Standards Proposal for Cars and Vans

On 9 March 2018, the European Economic and Social Committee (EESC) released its opinion on the European Commission's proposals on CO_2 emissions from passenger cars and commercial vehicles.

The Commission proposal on post-2020 CO_2 standards from cars and vans is considered as a balanced compromise between the objectives of climate-neutral mobility, the innovation capacity of the European automotive industry and preserving quality jobs.

However, the EESC draws attention to potential challenges to employment, which depends on the pace of the structural transition in the automotive industry.

The EESC emphasizes that the structural transition towards alternative powertrains, digitalisation and networking, and autonomous driving should be accompanied by industrial policy measures.

The European car industry currently employs around 2.3 million workers directly in vehicle manufacturing and another 10 million indirectly. Initial results of a study by Fraunhofer IAO show that, in the best case scenario, around 10-12% of jobs involving powertrains will be lost by 2030 as part of the technological switchover. That would amount to between 25 000 and 30 000 jobs in Germany alone. The same would be true for an accelerated phasing out of diesel technology, which, due to the greater complexity, particularly of the supplied parts, has a 30-40% greater bearing on employment than petrol engine parts. Risks to employment are also emerging as a result of digitalisation and the increased delocalization of production to other regions of the world.

The EESC believes that it is vital to ensure that the skills and qualifications of car industry workers are improved and updated, since the structural transition could lead to new trends for new qualifications. For instance, the production of electric cars would require employees to gain extensive skills in areas such as electrical engineering, electrochemistry or behaviour of materials.

The EESC considers the planned interim target for 2025 of a 15% CO_2 reduction to be very demanding, especially knowing that the required changes to combustion engines are at the cutting edge of technology. Since alternative fuel vehicles still play a minor role in the EU market, achieving the set goal by 2025 will be especially difficult for light commercial vehicles, which have longer production and development cycles.

The EESC opinion is at www.eesc.europa.eu/en/our-work/opinions-information-reports/opinions/co2-emissions-passenger-cars-and-commercial-vehicles.

Commission urges 10 Member States to transpose Rules on GHG from Fuels

On 8 March 2018, the European Commission issued as part of its March infringement package a reasoned opinion to Austria, Belgium, Cyprus, the Czech Republic, Finland, Greece, Latvia, Romania, Spain, and the UK for failing to transpose the EU rules on petrol and diesel fuel quality into their national law.

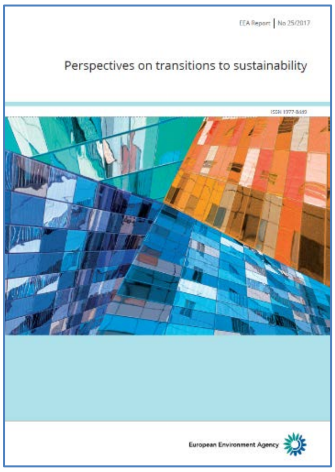
Directive (EU) 2015/652 lays down EU rules to calculate and report the greenhouse gas emissions of fuels and other energy from non-biological sources. The EU aims to yield reporting of sufficient accuracy, so that the Commission can assess the performance of fuel suppliers in meeting their obligations under the Fuel Quality Directive 98/70/EC which aims to achieve at least a 6% reduction of the greenhouse gas intensity of the fuel and energy supplied by the end of 2020.

Member States had to implement EU rules on the calculation and reporting of greenhouse gas emissions of fuels into their national legislation by 21 April 2017. The Commission had already sent a letter of formal notice to these 10 Member States in May 2017.

If the concerned Member States fail to act within two months from the receipt of the reasoned opinion, the case may be referred to the Court of Justice of the EU.

EEA Report on Transitions to Sustainability

On 14 March 2018, the European Environment Agency (EPA) published a report titled "Perspectives on transitions to sustainability".



The report presents a variety of analytical perspectives on systemic change, exploring what insights they collectively offer for policy, governance and knowledge creation. It includes five academic papers drafted by internationally recognised experts in the field of sustainability transitions.

For each of the five perspectives, the papers explore the conceptual background and understanding of how systemic changes occur, presenting their strengths and weaknesses and their implications for governance.

The EEA previously stated that achieving Europe's long-term sustainability goals will require fundamental transitions of the consumption-production systems that drive environmental degradation. As highlighted in the five papers in this new report, these systems are tied in complex ways to jobs and investments, policies and institutions, social norms and traditions. Collectively, these inter-linkages can mean that it is often very hard to achieve the needed changes and reforms through business as usual actions.

While emphasising that governments alone cannot start and steer transitions, the EEA report highlights the essential role of policy and public institutions in supporting local experimentation and learning, upscaling and reconfiguration. Governments also have a key role to play in supporting networking of local initiatives and in creating the shared goals and frameworks that can help coordinate and steer society-wide processes towards long-term sustainability goals.

The EEA report is at www.eea.europa.eu/publications/perspectives-on-transitions-to-sustainability.

Commissioner for Transport comments on the German Air Quality Situation

On 7 March 2018, German newspaper *Mitteldeutsche Zeitung* published an interview with European Commissioner for Transport Ms Violeta Bulc who commented on the situation of worsening air quality caused by transport pollution in Germany.

On the question if the diesel engine would still have a future, the Commissioner answered that the diesel technology itself would not be the problem, but emissions need to get clean. Furthermore, she suggested different steps to the German Government in order to avoid a ban of particular cars. Her recommendation to all Member States in general is to take the European dimension of the issue into account: if a country is willing to counter climate change and air pollution, it can only be effective if faced together. Pollution does not stop at the border. One solution at European level would be an EU-wide electronic tolling system where clean cars would be promoted and every Member State could adapt the toll fees to its needs. That means dynamic tariff in a system possibly standardized across the EU. This possibility would be efficient, although subsidiary and not more expensive. The European Commission would not impose measures to the Member States but national governments need to take action.

Certainly, cities need to invest financially first. However, the environment, citizens' health and financial and social sustainability will benefit. Commissioner Bulc suggested different possibilities for further investment by cities: extension of public transport systems including accessibility and development of new systems such as car sharing would be quite efficient. In addition to that, renewable energies should not be ignored; European manufacturing of renewable batteries is one important option. In the end, it is essential to have the adequate energy supplier for each kind of transport in order to be the most efficient possible.

She regretted the inefficiency in Europe regarding cooperative transport systems. The European Commission hopes therefore that more local entities would benefit from EU-funded subsidies to counter air pollution in a joint initiative. Taking this European perspective into account is also how she expects the so called German Verkehrswende ("the transportation policies transition") is going to be accelerated.

The original interview (in German) is at www.mz-web.de/wirtschaft/eu-kommissarin-bulc--city-maut-systeme-koennen-ein-effizientes-werkzeug-sein--29825456.

German Environment Agency Study on Health Impact of NO_2

On 8 March 2018, the German Environment Agency (UBA) published a comprehensive study on Germany's vulnerability to climate change and in particular the health impact of nitrogen dioxide (NO_2) that is more and more perceptibly noticeable.

By linking relevant statistics on public health and applying the World Health Organization's (WHO) concept to assess the Environmental Burden of Disease, the study made calculations of the statistical incidences of disease and deaths in Germany linked to NO_2. Although epidemiological studies do not allow to draw conclusions about causal relationships, they do deliver consistent results about the statistical correlations between negative health effects and NO_2 exposure.

Statistics for 2014 indicate roughly 6 000 premature deaths due to cardiovascular diseases which are linked to background concentrations of NO_2 in both rural and urban areas. The study also shows that NO_2 pollution is associated with diseases such as diabetes mellitus, hypertension, stroke, chronic obstructive pulmonary disease (COPD) and asthma. According to the study, 8% of the existing cases of diabetes mellitus in Germany in 2014 are linked to NO_2 exposure in outdoor air. That means that about 437 000 people are suffering the disease. For asthma, around 14% of cases can be traced to NO_2 pollution, this is about 439 000 cases.

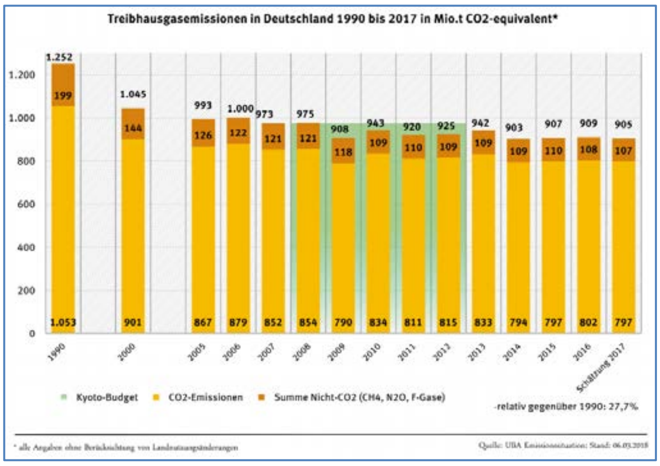
NO_2 pollution has been decreasing for a number of years overall, but current data for 2017 corroborates that many locations still exceed threshold levels. "One significant cause of harmful nitrogen oxides in respiratory air is undoubtedly diesel cars – also on roads with lighter traffic", said UBA President Maria Krautzberger. She stressed the need for an action plan especially in urban areas with heavy traffic.

The UBA study (in German) is at
www.umweltbundesamt.de/sites/default/files/medien/421/publikationen/abschlussbericht_no2_krankheitslast_final_2018_03_05.pdf.

Germany Report on Greenhouse Gas Inventory

On 27 March 2018, the German Environment Agency (UBA) published jointly with the Ministry for Environment a first prognosis about the climate footprint of Germany for 2017.

Greenhouse gas (GHG) emissions in Germany fell slightly last year as emissions decreased in the energy sector but increased in the transport and industry sectors: Germany emitted a total of 904.7 million tonnes of GHG last year, down by 4.7 million tonnes compared to 2016. That means that Germany has so far managed to reduce its emissions by 27.7% compared with 1990 levels – still far below its 2020 reduction target of 40%. The German government has pledged to cut emissions by 55% by 2030.



The report shows a "mixed picture" according to German Environment Minister Svenja Schulze. The major problem remains the transport sector (next to industry) with an increasing number of passenger cars (+1.5%), trucks (+4.1%) and semi-trailer tractors (+4.4%). In 2017, GHG emissions in the transport sector rose by 3.8 million tonnes to 170.6 million tonnes in total (+2.3%). Meanwhile, the growing share of gasoline cars and the shrinking share of diesel cars did not contribute significantly to the growth in emissions. Minister Schulze announced the adoption of a climate protection law next year with the priority goal to overhaul the transport sector.

President of the German Environment Agency Maria Krautzberger mentioned that diesel vehicles would not be the solution to achieve climate goals. She called for more sustainable mobility and less vehicles in general. Krautzberger explained her critical view towards the CO_2 targets for cars and vans for 2025 and 2030 proposed by the European Commission. The European objectives would not be sufficient. Therefore, she requested higher ambitions for the German transport sector in order to fulfil the climate goals for 2030.

More info is at
www.umweltbundesamt.de/sites/default/files/medien/479/dokumente/pm-2018-08_thg-nahzeitprognose_2017.pdf.

UK Vehicle Market Surveillance Programme Results

On 22 March 2018, the UK Driver and Vehicle Standards Agency (DVSA) published the results of its vehicle market surveillance programme in 2017.

For 2017 the UK chose to continue to focus on vehicle emissions testing and selected a programme that included petrol cars, light diesel vans, trucks and buses, to complement the earlier work on diesel cars. The testing programme was designed to check pollutant and CO_2 emissions of the most popular vehicle types used on UK roads. The primary aim was to assess if the vehicles complied with the standards to which they were approved. For the cars and vans the testing was also designed to assess how the real world performance of these vehicles compares against the newly introduced Real Driving

Emissions (RDE) standards. The cars and vans tested in this programme were nevertheless not RDE-compliant as they were type-approved before the RDE entry into force. Vehicles were tested on the New European Driving Cycle (NEDC) cold-start test, in accordance with their original type-approval requirements. The further testing was not legislative and was conducted for information purposes; it included a series of variations of the NEDC test (hot-start, double length, reverse order, and 10% higher speeds). With the Portable Emissions Measurement System (PEMS) fitted, the NEDC was reproduced on a track and RDE trips were driven on the road. Heavy-duty vehicles were tested only with PEMS.

The 15 petrol passenger cars tested in this programme (including both direct and indirect injection engines) all complied with the regulatory limits when tested on the legislative laboratory test. The results from the PEMS track testing showed that NOx emissions were generally higher on the test track than allowed in the laboratory testing. For the majority of cases these remained within the European Commission guideline limits of two to five times the limit. Similar results obtained when the vehicles were tested in real world conditions.

In the case of the Nissan Qashqai, track and real world tests gave results which were more than eight times higher than the regulatory limit. The Ford Fiesta emitted over four times the regulated results. The report provides results of further investigation on these two particular vehicles.

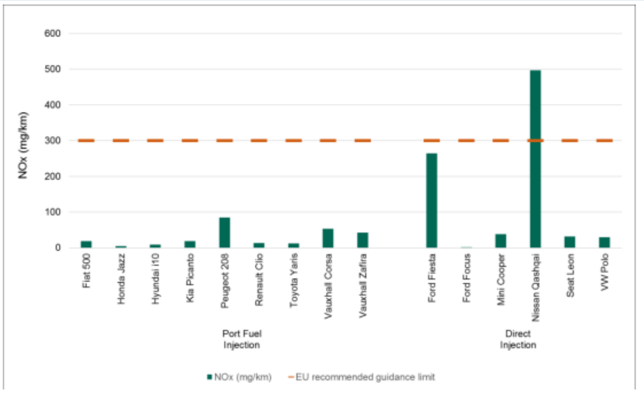


Figure 4-3 Real world results for the petrol cars against EU recommended guidance limits.

The six light diesel vans tested were mainly Euro 5 with one Euro 6. All complied with the regulatory limit on the cold-start NEDC provided they were tested exactly as during the type-approval test, including same gear shifting at high speed and outside of a regeneration event where high NOx and PN emissions could be observed respectively.

Five heavy duty vehicles were tested in line with the Euro VI in-service on road emissions test. Four were compliant with the 1.5 NOx Conformity Factor. The Iveco Eurocargo however had higher NOx levels (2.73 higher than the limit) in a particular combination of circumstances that had not been fully considered during the vehicle development process. IVECO fully cooperated with UK authorities in exploring the issue and worked quickly to develop a software recalibration solution.

3 buses were tested on the road in this programme; all of these were compliant with the legal obligations.

Finally, the report includes results of tests conducted on Mitsubishi ASX and Outlander with regard to CO_2 as well as Euro 5b and Euro 6 diesel Jeep Grand Cherokee with regard to NOx emissions, following allegations against these manufacturers.

The UK DVSA report is at www.gov.uk/government/publications/vehicle-market-surveillance-unit-programme-results-2017.

UK Consultation on Implementation of Stage V Emissions Standard for NRMM

On 20 March 2018, the UK Department for Transport opened a public consultation on the national implementation of the Stage V emissions standard for Non-Road Mobile Machinery (NRMM).

The consultation seeks views on the implementation of EU Regulation (2016/1628) governing the European type-approval rules for gaseous and particulate emissions from engines for NRMM. Many aspects of machinery emissions approval are set down in the Regulation and the UK has no discretion to vary them. However, there are some areas, such as penalties for not complying with the requirements, where domestic discretion exists.

UK government policy is not allowed to impose requirements additional to those in European regulations and directives, but the consultation includes some questions on whether that policy is appropriate in this case. The consultation states: "We are considering creating an offence of placing on the market an engine using a defeat strategy, or other similar functionality, to deliberately circumvent EU Regulation, irrespective of which national authority is used to obtain type-approval. Our intention is to make such an offence potentially applicable to any, and all, elements of the supply chain – the engine or machine manufacturer, importer or dealer/distributor. Comments are requested as to whether this is appropriate."

The consultation is open until 10 April 2018 and is at www.gov.uk/government/consultations/improving-air-quality-reducing-emissions-from-machinery.

Notice on Brexit Impact on Type-Approval of NRMM and Motorcycles

On 28 March 2018, the European Commission issued a notice to stakeholders on the consequences of the withdrawal of the UK from the EU in the field of type-approval of Non-Road Mobile Machinery (NRMM), agricultural and forestry tractors and motorcycles.

Unless a ratified withdrawal agreement establishes another date, all European Union law will cease to apply to the UK from 30 March 2019. The UK will then become a 'third country'. Subject to any transitional arrangement that may be contained in a possible withdrawal agreement, Regulation (EU) No 167/2013 on the approval and market surveillance of agricultural and forestry vehicles, Regulation (EU) No 168/2013 on Euro 4&5 standards for two- or three-wheel vehicles and quadricycles, and Regulation (EU) No 2016/1628 on Stage V requirements for NRMM will no longer apply to the UK from the withdrawal date.

Consequences for the identification of economic operators mean that manufacturers' representatives established in the UK will no longer be considered as established in the EU.

With regard to type-approvals, the UK approval authority will cease to be an EU type-approval authority. As a result, it will no longer be possible for a manufacturer to place on the EU market tractors and motorcycles with a certificate of conformity referring to a type-approval granted by the UK, nor NRMM engines and machinery for which a type-approval was granted by the UK approval authority.

A separate notice for more information on legal consequences of Brexit on the type-approval of light- and heavy-duty vehicles was issued earlier this year (*see AECC Newsletter of February 2018*).

The European Commission notice on Brexit is at http://ec.europa.eu/docsroom/documents/28544.

NORTH-AMERICA

CARB Grant for Ultra-Low NOx HD Truck Demonstration Project

On 6 March 2018, the California Air Resources Board (CARB) announced a $7 million (€5.7 million) grant for a Class 8 truck that will achieve a 90% reduction in NOx, and a 15 to 20% fuel efficiency improvement.

The project is part of CARB's Low Carbon Transportation and Fuels Investments and Air Quality Improvement Program. The project will build and install Achates Power Opposed-Piston Engines into Class 8 demonstration trucks that will operate in fleet service in California in 2020.

California's ultra-low NOx emissions standard is 0.02 g/bhp/hr (27 mg/kWh). This programme will demonstrate the first diesel engine to comply with the state standard. In addition, the engine will emit 10% less CO_2 than the 2027 federal greenhouse gas requirement.

The project team, led by CALSTART, includes a heavy-duty truck manufacturer as well as leading suppliers in the powertrain and emissions industry.

US DOE funds Gas Engine Combustion and Emission Control Projects

On 6 March 2018, the US Department of Energy (DOE) announced $12 million (€9.7 million) in early research for natural gas engines and off-road fluid power systems.

$4 million will fund three new cost-shared research projects focused on medium- and heavy-duty, on-road natural gas engines and $3 million will go to two new cost-shared research projects for advancing fluid power systems for off-road vehicles.

With regard to emission control, recipients of the three new cost-shared projects are:

- Colorado State University (Fort Collins, Colorado) will receive $1.2 million to research ultra-low emissions, high-efficiency heavy-duty natural gas engines with optimized combustion chamber designs.
- University of Houston (Houston, Texas) will receive $2 million to develop a new class of catalysts with low levels of precious metals for natural gas engine emissions control.
- University of Minnesota (Minneapolis, Minnesota) will receive $1.1 million to advance low temperature combustion technologies for higher-efficiency natural gas engines.

In addition, DOE is supporting $3 million in early-stage research among several national laboratories. Pacific Northwest National Laboratory (PNNL) and Oak Ridge National Laboratory (ORNL) are researching active and durable catalysts for low temperature methane oxidation to enable efficient CNG engines. Argonne National Laboratory (ANL), National Renewable Energy Laboratory, ORNL, and Sandia National Laboratories are working collaboratively to research fundamental in-cylinder and emissions-control advancements for higher-efficiency medium-/heavy-duty natural gas engines.

More info is at www.energy.gov/eere/articles/department-energy-announces-12-million-early-stage-research-natural-gas-engines-and.

MIDDLE-EAST

Mandatory DPF Retrofit in Israel

On 12 March 2018, the Knesset – the legislative branch of the Israeli government – passed regulation that will require owners of old, heavy-duty, diesel vehicles to install Diesel Particulate Filters (DPF).

The DPF retrofit will become mandatory on 1 November 2018. Those who are required to install the filters but do not do so will be unable to renew their vehicle's license.

Vehicles defined as "polluting" will be marked with a sticker during their annual vehicular license test, and ultimately, will not be allowed to enter low-emission zones in Israel.

Every vehicle license will include a rating, in accordance with its impact on air pollution. The rating system is as follows: Clean (electric vehicles), Reduced pollution vehicle, Normal, and Polluting vehicle (those that do not meet Euro 4 standards).

Diesel vehicles will receive a "reduced pollution" rating once a DPF has been installed.

Implementation of these regulations is expected to reduce vehicular air pollution in Israel by 30%.

More info at www.sviva.gov.il/English/ResourcesandServices/NewsAndEvents/NewsAndMessageDover/Pages/2018/03-March/Knesset-Approves-Regulations-to-Reduce-Pollution-from-Diesel-Exhaust.aspx.

ASIA PACIFIC

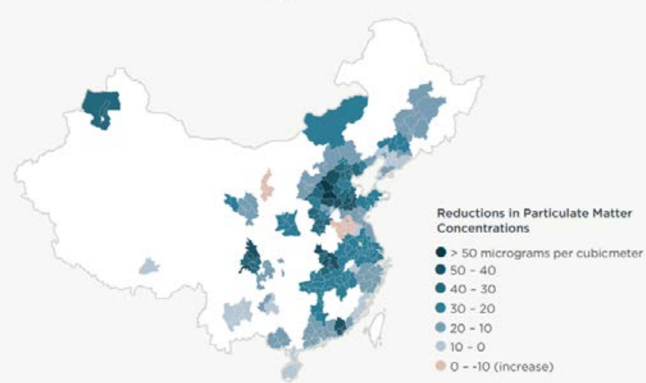
Assessment of Air Quality Improvement in China

On 12 March 2018, the Energy Policy Institute at the University of Chicago (EPIC) published an assessment of air quality improvement in China.

Using daily data from more than 200 monitors across the country from 2013 to 2017, they found that China's most populated areas have experienced remarkable improvements in air quality, ranging from 21 to 42%, with most meeting or exceeding the goals outlined in their National Air Quality Action Plan.

According to the report, if these reductions in pollution are sustained, the average Chinese citizen would see their life expectancy increase by 2.4 years relative to 2013. Although China faces a long road ahead to reach national and international air quality standards, these results suggest the country is winning its war on pollution.

Figure 3 · Reductions in $PM_{2.5}$ Concentrations, 2013 and 2017



The EPIC report is at https://epic.uchicago.edu/sites/default/files/UCH-EPIC-AQLI_Update_8pager_v04_Singles_Hi%20%282%29.pdf.

China IV Non-Road Diesel Engine Standards: Proposal for Revision

In late March 2018, China released a proposal for a revised China IV off-road diesel engine emissions standard which builds on the earlier China IV non-road standard from 2014. The latest China IV non-road diesel proposal includes the same gaseous and PM standards associated with the previously finalized China IV standards (similar to Euro Stage IIIB non-road standards for 37-560 kW engine power ratings), but adds a particle number standard of 5 X 1012 particles/kWh for engine power ratings from 37 kW to 560 kW and specifies that these engines shall be equipped with a wall-flow DPF. These revised China IV non-road diesel standards are proposed to be implemented starting January 1, 2020. The proposal would also allow manufacturers to voluntarily certify their non-road diesel engines to more stringent standards that are equivalent to the Euro Stage V non-road diesel engine standards (includes a particle number standard of 1 X 1012 particles/kWh for 19-560 kW engine power ratings). China will likely finalize mandatory Stage V non-road standards in a future regulatory action that could have an implementation date around 2025.

Additional provisions included in this revised China IV non-road emission standard include an exhaust temperature limit of 550oC if a Vanadia-based SCR catalyst as well as a 25 ppm cap on ammonia emissions if urea-SCR and a not-to-exceed-cap of 2 X standard for gaseous emissions and PM. It contains also a 8000 h emissions durability for engine power ratings of 37 kW or larger (5000 h for 19-37 kW) and a 3000 h for < 19 kW) and specified multiplicative deterioration factors for determining emissions durability using emissions measured after 25% of full useful life (e.g., 2000 h for power ratings of 37 kW or larger). The document also foresees an in-use conformity testing and a production line emissions testing by the manufacturer with regulatory authority random spot emission checks on production engines also allowed.

Indian Stage IV and V Emission Standards for Diesel Non-Road Engines finalized

On 5 March 2018, the Indian Ministry of Transport agreed on regulations covering the next stages of emission standards for diesel non-road engines used in construction and agricultural equipment. India becomes the first country outside of the EU to enact the Euro Stage V non-road standards. The final BS IV non-road diesel engine emission standards are aligned with Euro Stage IV non-road mobile machinery emission standards and begin their implementation in October 2020. The same applies now for the final BS V non-road diesel engine emission standards: they got aligned with the correspondent Euro Stage V. However, implementation for this second one starts later, in 2024. This stage BS V will include a particle filter forcing particle number standard for most engine power categories.

The final India BS IV/V non-road regulations include no BS IV emission standards for diesel engines with rated power < 37 kw or for engines with rated power of 560 kW or greater but BS V standards are included for the smallest and largest power ratings. The regulations also contain an ammonia emission limit of 25 ppm for engine power categories less than or equal to 56 kW, and 10 ppm for engine power categories above 56 kW. After 01 April 2026, an in-service conformity check for all BS V approved engines manufactured is required, as well as a six month grace period for allowing registrations of equipment complying with the previous set of emission standards. Generator sets are not covered by these BS IV/V emission standards and proposals for Stage 3 and Stage 4 emission standards for these gen-sets are under development.

More information is at http://morth.nic.in/showfile.asp?lid=3180.

Audit of Air Pollution Measurement by EPA of Victoria, Australia

On 8 March 2018, the Auditor General of the Victoria State in Australia issued a report on air pollution measurement and monitoring by the Environment Protection Authority (EPA).

The auditor's report indicate that the EPA has failed to properly monitor air quality across the Australian state with many highly-populated centres going unchecked. The EPA was unable to show that its data collection between 2010 and 2016 truly reflected the air quality experienced in most Victorian communities.

The audit's report reflects some long-held concerns about how the EPA monitored and managed air pollution in Victoria. Hence, the information provided by the EPA mentioning that the level of air pollution would be decreasing is not trustworthy anymore.

The audit examined in particular the roles and responsibilities of Victorian agencies in air quality management, monitoring and reporting on air quality and management of point and diffuse source releases. It investigated whether Victoria's air quality meets the standards for ozone and PM. More precisely, the audit's report identified 40 urban centres, using 2016 Australian Bureau of Statistics data that were not covered by the EPA's air monitoring network, including many parts of metropolitan Melbourne. The EPA would have failed in some cases to maintain at least one monitoring station in each urban centre with a population of at least 25 000 people which is usually required.

The authority accepted and already started to put into place all of the recommendations given by the audit. The recommendations include expanding the air monitoring network; improving the quality of reporting; working with councils to tackle air quality issues at the Brooklyn industrial precinct in Melbourne's west and updating the knowledge on air quality. Improvement is happening within the EPA; also according to the audit.

The audit report is at www.audit.vic.gov.au/report/improving-victorias-air-quality?section=32713.

GENERAL

PSA discloses Vehicle Emissions in Real Driving Conditions

On 6 March 2018, Groupe PSA released the first results of the NOx and particles measurement protocol developed with the NGOs Transport & Environment and France Nature Environnement.

Five Peugeot, Citroën and DS vehicles that comply with the Euro 6d-TEMP standard have been evaluated on the road. They show excellent results for both NOx and particle number emissions. The three diesel models emitted between 30 and 52 mg/km NOx on the road test.

Estimated average real-world emissions for a vehicle with low mileage (1)

Euro 6 RDE compliant models	NOx (mg/km)		Particulate number (PN) (10^{11} # /km)		Fuel Economy
	Protocol results	2020 limit	Protocol results	2020 limit	Protocol results
Peugeot 208 1.2L PureTech 82 MT5	28	WLTP: 60 RDE: 90*	5.5	No legal limit	6.3
Peugeot 308 1.2L PureTech 130 MT6	13		3.5	WLTP: 6.0 RDE: 9.0	6.8
Peugeot 308 SW 1.5L BlueHDi 130 MT6	52	WLTP: 80 RDE: 120*	2.0		5.7
Citroën C3 1.5L BlueHDi 110 MT6	40		0.8		5.0
DS 7 CROSSBACK BlueHDi 180 Automatique	30		3.1		7.1

* Based on current CF 1.5 tbc by E. C.

PSA said that these good results confirm the performance of the selected technologies and PSA's undertaking to meet the targets set by the EU emissions standards three years ahead of schedule.

Emissions testing will be available for 80% of Euro 6d-TEMP compliant vehicles sold in Europe, by the end of 2018 in the case of passenger cars and by the end of 2019 for light commercial vehicles. The test protocol will also be extended to PSA hybrid vehicles in 2019.

ART Fuels Forum Position on Post-2020 CO_2 Standards for Cars and Vans

On 8 March 2018, the Alternative and Renewable Transport (ART) Fuels Forum representing the value chain for alternative and renewable transportation fuels and funded by the European Commission, published a position paper on the proposal for post-2020 light vehicle CO_2 regulation.

The ART Fuels Forum supports the objective of progressively reducing GHG emissions from transport through the adoption of a holistic approach which includes fuels, vehicles, control and management of traffic, improved infrastructures and drivers' training and education.

Over the long term, transport policy for fuels and vehicles should be:

- cost-effective and cross-sectorial, as this approach is more effective than sectorial ones, and thus deliver higher value for the planet at the lowest cost for citizens
- technology neutral
- predictable to ensure safeguarding of the internal market
- fair, taking into account overall GHG emissions when making policy proposals on bio/renewable fuels.

The regulatory transition to the cross sectorial approach in the short-mid-term should be based on:

- a continuation of the growing trend for vehicle efficiency, with realistic and achievable targets by different technologies
- the recognition of the fact that blending sustainable biofuels/renewable fuels results in a substantial reduction of CO_2 emissions.

The combination of liquid/gaseous carbon neutral fuels produced by sustainable clean sources (biofuels, recycled carbon fuels, synthetic fuels, Power-to-X fuels) in the most efficient ICE and hybrid vehicles could offer an effective means to lower GHG emissions by passenger cars, while leveraging further improvements in other sectors (most notably in the heavy-duty vehicles sector, but also in the maritime and aviation sectors) and taking advantage of existing infrastructures.

The ART Fuels position paper is at http://artfuelsforum.eu/wp-content/uploads/2018/03/ART-Fuels-Forum_Passenger-Cars_Position-paper_Mar_2018.pdf.

Audi tests New Synthetic Gasoline Fuel

On 9 March 2018, Audi issued a press release on recent achievements in the development of synthetic gasoline fuel.

Together with Global Bioenergies in Leuna (Saxony-Anhalt), 60 litres of e-gasoline have been produced, the largest batch ever. Audi "e-benzin" (e-gasoline) is essentially a liquid isooctane. It is currently produced from biomass in a two-step process. In the first step, Global Bioenergies produces gaseous isobutene (C_4H_8) in a demonstration plant. In the second step, the Fraunhofer Center for Chemical Biotechnological Processes (CBP) in Leuna uses additional hydrogen to transform it into isooctane (C_8H_{18}). The fuel is free of sulfur and benzene and is therefore especially low in pollutants when it burns.

Audi engineers are now examining the combustion and emission behaviour of the renewable fuel in a test engine. As a high-purity synthetic fuel with very good anti-knock properties, Audi "e-benzin" offers the possibility to further increase engine compression and thus boost efficiency. Over the medium term, the project partners aim to modify the production process so that it will not require biomass but CO_2 and hydrogen produced from renewable sources.

Audi's alternative fuels already offer great potential for sustainable mobility and are helping reduce CO_2 emissions from combustion engines – by up to 80% in g-tron models, for example.

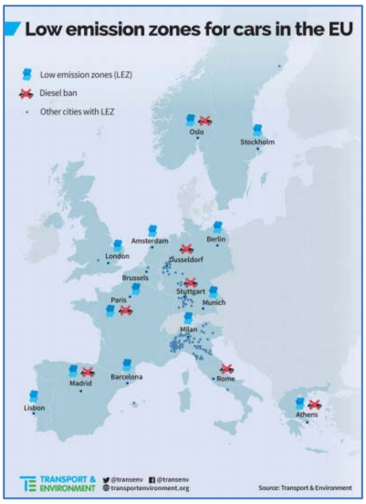
Audi e-diesel is also part of the Audi e-fuels portfolio. In Dresden, Audi's cooperation partner Sunfire operated a pilot plant for this purpose from late 2014 to October 2016. Green electricity supplied the energy, and water and CO_2 were used as raw materials. The end product was called Blue Crude, which was refined into Audi e-diesel. Audi is currently planning production capacity in Laufenburg in the Swiss canton of Aargau. Together with partners Ineratec and Energiedienst, a new pilot plant will produce around 400 000 litres of Audi e-diesel per year. Hydroelectric power is the sole energy supply required for this.

More info is at www.audi-mediacenter.com/en/press-releases/audi-advances-e-fuels-technology-new-e-benzin-fuel-being-tested-9912.

T&E Summary of Diesel Restriction Measures in European Cities

On 14 March 2018, Transport & Environment (T&E) released an analysis of diesel restriction measures in European cities to date.

The paper analyses low emission zones (LEZ) and congestion charges in 11 European cities: Amsterdam, Athens, Berlin, Brussels, Lisbon, London, Madrid, Milan, Oslo, Paris and Stockholm. There are large differences in the environmental zones implemented so far. Some policies permanently exclude polluting vehicles and are intended to drive modal shift to cleaner transportation options. Others are of temporary nature in response to hazardous air pollution episodes.



According to T&E, one of the key weaknesses of measures introduced to date is the blanket exemption for Euro 6 vehicles. Less than 10% of new Euro 6 diesels on sale today meet the EU emission limits on the road.

In order to ensure LEZ and diesel bans are fully effective cities should:

- Avoid blanket exemptions of Euro 6 diesels and instead only allow vehicles that are clean in real-world driving, including those fixed. The inclusion/exclusion criteria should be based on vehicles' real-world emissions (RDE) that are now widely available.
- Use remote sensing linked to number plate recognition to police compliance, and identify individual grossly polluting models and ensure these are repaired or cannot enter the city.
- Provide high quality public transport as well as infrastructure for active, shared and zero emission transport modes.

The T&E briefing is at www.transportenvironment.org/sites/te/files/publications/T%26E%20Air%20Quality%20Report_FINAL_12032018.pdf.

JATO Study on CO_2 Emissions of New Cars registered in the EU

On 6 March 2018, consulting company JATO released a new study on average CO_2 emissions generated by new cars in Europe in 2017.

Across the 23 European markets covered by the study, average CO_2 emissions from new cars increased by 0.3 g/km in 2017, finishing at 118.1 g/km. This is the first rise in Europe in 10 years.

This rise in average CO_2 emissions correlates with a decrease in demand for diesel cars, which produce lower CO_2 emissions than petrol cars, and the rising popularity of SUVs, which emit higher average CO_2 emissions.

Data for 2017 shows that diesel cars registered in the EU had average CO_2 emissions of 117.9 g/km, compared to petrol cars which emitted an average of 123.4 g/km – a difference of 5.5 g/km. Likewise, the average power output of a diesel engine registered in the EU was found to be 142 hp. The average power output of petrol cars was found to be 123 hp showing that diesels are chosen by customers who prioritise power output and torque.

With increased negative public perception towards diesels, combined with increased government regulation and scrutiny of the fuel type, the volume of diesel cars registered fell by 7.9% to 6.77 million units in 2017. In turn, diesel cars accounted for just 43.8% of total registrations in 2017, which is 11.1 percentage points lower than their peak, seen in 2011, and the fuel type's lowest market share since 2003, when diesels accounted for 43.4% of total registrations.

Whilst demand for diesel cars declined in 2017, registrations of petrol cars increased by 10.9% – the highest level since 2003. This meant the market share of petrol vehicles grew by 3 percentage points from 47% to 50% between 2016 and 2017.

Alongside the decline of diesel, significant volume growth for the SUV segment also contributed to the rise in average CO_2 emissions, with the segment recording average CO_2 emissions of 133.0 g/km in 2017.

Alternative-Fuelled-Vehicles only experienced a small increase in volume. They increased their market share from 3% in 2016 to 5% in 2017. Battery-Electric-Vehicles (BEVs) experienced meagre growth too. This could be due to consumer scepticism when it comes to the battery ranges of BEVs and the number of charging points available on the road network at present. In comparison, the market share of hybrid vehicles increased by one percentage point.

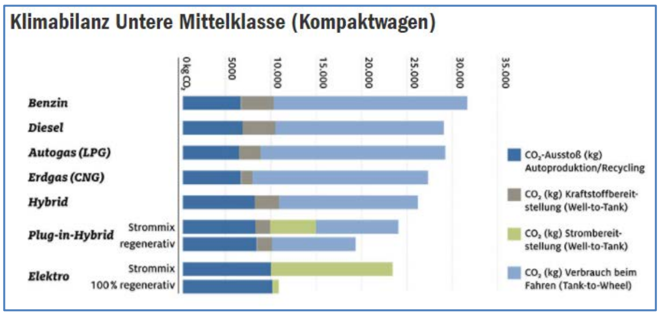
The JATO study is at www.jato.com/co2-emissions-rise-first-time-decade-europe-market-turns-back-disel-vehicles-suv-registrations-rise.

ADAC Life Cycle Analysis of Powertrains

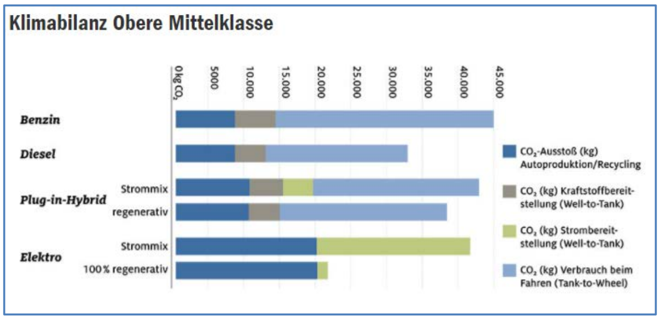
On 20 March 2018, the German Automobile Club ADAC published a new report analysing the environmental footprint of different powertrains over their entire life cycle.

The study was performed by the Institut für Energie- und Umweltforschung (IFEU). A lifecycle mileage of 150 000 km and the German electricity mix in 2013 were used for the calculations.

Small cars, compact cars and upper middle class cars were evaluated. The tailpipe CO_2 emissions from vehicle use (Tank-to-Wheel) were based on the ADAC EcoTest, which explains the choice of vehicles for the different drive types.



Assuming a mileage of 150 000 km, in the compact class, the electric car has the lowest CO_2 output even with the use of the German power mix with 150 g CO_2/km, just ahead of the plug-in hybrid and hybrid. Natural gas (174 g/km), diesel (186 g/km) and LPG (188 g/km) follow. The petrol engine has the highest CO_2 output (201 g/km) of all common types of engines that can be bought in this vehicle class.



For large cars, the diesel with 33 000 kg CO_2 after 150 000 km (219 g/km) has the best CO_2 output. The electric car (277 g/km) performs worse due to the large battery (more CO_2 during production) and the high power consumption. Only with the use of 100% renewable electricity would the EV output be better.

The report finally compares when electric cars are more environmentally friendly – on a LCA CO_2 basis – for upper middle class, compact, and small cars. The comparison is drawn for the current electricity mix and using a 100% renewable electricity scenario.

When will electric cars be more climate friendly?

upper middle class	Electric (power mix)	Electric (100% regerative)
Compared to gasoline	from 116,000 km	from 50,000 km
In comparison to the diesel	from 580,000 km	from 70,000 km
Compared to the plug-in hybrid (power mix)	from 130,000 km	from 46,000 km
Compared to the plug-in hybrid (100% regenerative)	-	from 54,000 km

compact class	Electric (power mix)	Electric (100% regenerative)
Compared to gasoline	from 45,000 km	from 21,000 km
Compared to LPG	from 55,000 km	from 23,000 km
In comparison to the diesel	from 57,000 km	from 23,000 km
Compared to the hybrid	from 60,000 km	from 16,000 km
Compared to natural gas (CNG)	from 71,000 km	from 26,000 km
Compared to the plug-in hybrid (power mix)	from 106,000 km	from 16,000 km
Compared to the plug-in hybrid (100% regenerative)	-	from 24,000 km

small car	Electric (power mix)	Electric (100% regenerative)
Compared to gasoline	from 80,000 km	from 24,000 km
In comparison to the diesel	from 111,000 km	from 25,000 km
Compared to the hybrid	from 58,000 km	from 14,000 km

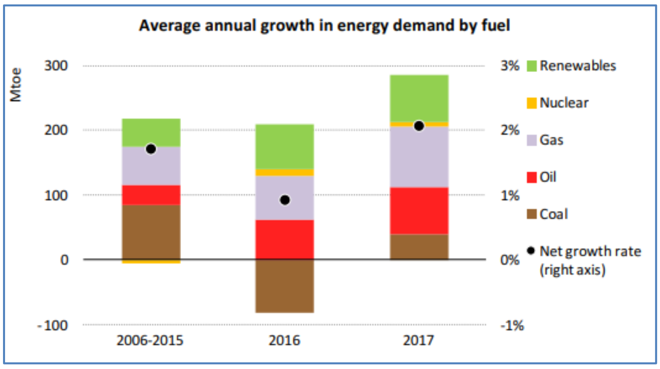
The ADAC LCA report is at www.adac.de/der-adac/motorwelt/reportagen-berichte/auto-innovation/studie-oekobilanz-pkw-antriebe-2018.

IEA Global Energy and CO_2 Status Report 2017

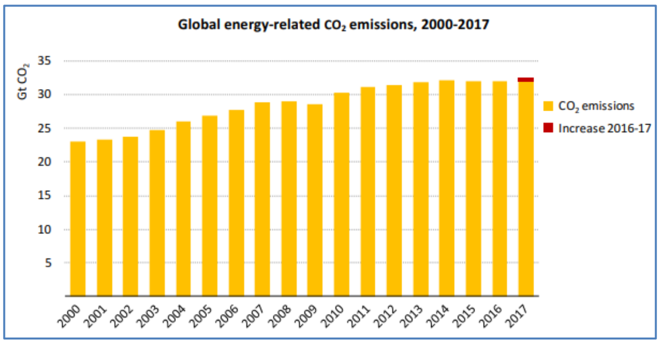
On 23 March 2018, the International Energy Agency (IEA) published its Global Energy and CO_2 Status Report 2017.

The global energy demand rose by 2.1% in 2017, more than twice the previous year's rate, boosted by strong global economic growth, with oil, gas and coal meeting most of the increase in demand for energy, and renewables seeing impressive gains.

Over 70% of global energy demand growth was met by oil, natural gas and coal, while renewables accounted for almost all of the rest. Improvements in energy efficiency slowed down last year. As a result of these trends, global energy-related CO_2 emissions increased by 1.4% in 2017, after three years of remaining flat.



But CO_2 emissions, which reached a historical high of 32.5 gigatonnes in 2017, did not rise everywhere. While most major economies saw a rise, the USA, the UK, Mexico and Japan experienced declines. The biggest drop in emissions came from the USA, driven by higher renewables deployment.



Oil demand grew by 1.6%, more than twice the average annual rate seen over the past decade, driven by the transport sector (in particular a growing share of SUVs and trucks in major economies) as well as rising petrochemical demand.

Natural gas consumption grew 3%, the most of all fossil fuels, with China alone accounting for nearly a third of this growth, and the buildings and industry sectors contributing to 80% of the increase in global demand.

Coal demand rose about 1%, reversing declines over the previous two years, driven by an increase in coal-fired electricity generation mostly in Asia.

Renewables had the highest growth rate of any fuel, meeting a quarter of world energy demand growth, as renewables-based electricity generation rose 6.3%, driven by expansion of wind, solar and hydropower.

Electricity generation increased by 3.1%, significantly faster than overall energy demand, and India and China together accounting for 70% of the global increase.

Energy efficiency improvements slowed significantly, with global energy intensity improving by only 1.7% in 2017 compared with 2.3% on average over the last three years, caused by an apparent slowdown in efficiency policy coverage and stringency and lower energy prices.

Fossil fuels accounted for 81% of total energy demand in 2017, a level that has remained stable for more than three decades.

The IEA report is at www.iea.org/geco.

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FORTHCOMING CONFERENCES

WCX18: SAE World Congress Experience

10-12 April 2018, Detroit, USA

www.wcx18.org

8th AVL Large Engines TechDays

11-12 April 2018, Graz, Austria

www.avl.com/-/8th-avl-large-engines-techdays

Electrification, New Fuels and Power Sources: Boom or Doom for Large Engines?

TRA 2018 – A Digital Era for Transport

16-19 April 2018, Vienna, Austria

www.traconference.eu

Key focus areas of TRA 2018 will be how digitalisation is transforming transport & mobility systems; decarbonisation & future growth – how to change our mobility system & remain competitive; and shaping the new mobility landscape – a vision for transport & mobility for Europe.

7th Annual Platts Geneva Biofuels Conference

26 April 2018, Geneva, Switzerland

www.platts.com/events/emea/EU-Biofuels/index

Key topics will include policy updates (RED II and updates on NER300 and H2020), feedstock markets for first and advanced generation biofuels, pricing and trading techniques, international outlook with a focus on production and trade flow due to the duties updates.

39th International Vienna Motor Symposium

26-27 April 2018, Vienna, Austria

https://wiener-motorensymposium.at

Outstanding lecturers from all over the world will present the latest findings in engine development and, amongst other topics, will report on new engines, fuel cells, hybrid technology, exhaust gas treatment and real driving emissions (RDE).

7th Freiburg Workshop 'Luftreinhaltung und Modelle'

15-16 May 2018, Freiburg, Germany

www.ivu-umwelt.de/front_content.php?idcat=3

SIA Powertrain 2018: the New Compression Engine for Passenger Cars & Commercial Vehicles

16-17 May 2018, Rouen, France

www.sia.fr/evenements/93-sia-powertrain-rouen-2018

The conference will support the automotive community in providing an overall picture of state-of-the-art technologies and by anticipating future development challenges. Reflecting the ongoing focus shift in transportation decarbonisation to a well-to-wheel basis, new topics will be introduced on alternative powertrain energy types (sustainable liquid and gaseous fuels) and fuel cells.

European Commission Green Week "Green Cities for a Greener Future"

22-24 May 2018, Brussels, Belgium

www.eugreenweek.eu

EU Green Week 2018 will explore ways in which the EU is helping cities to become better places to live and work. Showcasing policy developments on air quality, noise, nature and biodiversity, waste and water management, it will promote participatory approaches to urban development, networking schemes, and tools for sharing best practices, engaging local authorities and citizens, and encouraging them to share their vision of a sustainable future.

Integer Emissions Summit & AdBlue® Forum China 2018

5-7 June 2018, Beijing, China

www.integer-research.com/conferences/ies-china-2018

Connectivity – Key to future emission and consumption reduction in vehicle and powertrain?

7-8 June 2018, Graz, Austria

www.avl.com/-/30th-international-avl-conference-engine-environment-2018

On the one hand, connectivity enables predictive and adaptive management of energy and emissions with advantages regarding energy consumption, emissions, wear and durability thanks to the online monitoring of all relevant system parameters. On the other hand, the subject "Online Vehicle" necessitates stricter requirements being placed on data security and also causes a paradigm shift in the development and validation of vehicles. The questions "what does networking make possible, what is meaningful, and how do we control the corresponding risks" pose quite possibly the most intriguing range of topics in automotive development today.

6th International Exhaust Emissions Symposium

14-15 June 2018, Bielsko-Biała, Poland

www.bosmal.com.pl/693-symposium_2018

The main topics of the symposium are emissions legislation - for all jurisdictions; WLTP- and RDE-focused R&D test methods; fuel economy in light of Euro 6d, WLTP and RDE; new methods of PM testing; compounds which are potential candidates for emissions regulation; emissions test equipment (including PEMS); emissions reduction technology; aftertreatment systems, technologies and strategies; emissions simulation; powertrain development and electrification; IC Engine test method development; vehicular fuel development; alternative fuels, fuel additives and fuel blends; gaseous fuels CNG & LPG; engine oil development; commercial vehicles, discussion of other automotive sectors: synergies and shared challenges/solutions.

Cambridge Particle Meeting 2018

15 June 2018, Cambridge, UK

www.cambridgeparticlemeeting.org/2018

22nd ETH- Conference on Combustion Generated Nanoparticles

18-21 June 2018, Zurich, Switzerland

www.nanoparticles.ethz.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.

7th International MinNOx Conference

19-20 June 2018, Berlin, Germany

www.iav.com/MinNOx

Topics of the conference include: exhaust emission legislation, MinNOx systems in diesel, gasoline and hybrid powertrains from passenger car to heavy-duty as well as off-highway applications; global optimization of engine and MinNOx systems to reduce both NOx and CO_2 emissions; innovative ideas and methods for the development, modelling or control of component and overall systems; emission control technologies; boundary conditions for operating MinNOx systems monitoring and diagnostics of MinNOx systems; and potential for cost reduction of future concepts.

The Future of Transportation World Conference

19-20 June 2018, Cologne, Germany

www.thefutureoftransportconference.com

Conference streams include urban mobility & smart cities; mobility as a service; quantum shifts; sustainability in transportation; changing landscape for automotive industry; etc.

Integer Emissions Summit & AdBlue® Forum Europe 2018

26-28 June 2018, Brussels, Belgium

www.integer-research.com/conferences/integer-emissions-summit-adblue-forum-europe-2018

The summit will cover emissions control for heavy-duty commercial vehicles, non-road mobile machinery, light-duty vehicles and passenger cars, and the European AdBlue® market.

AECC will give a presentation on the evolution of advanced emissions control system to meet NOx and particulates regulations.

FEV Conference Diesel Powertrain 3.0

3-4 July 2018, Coventry, UK

www.fev.com/events/fev-conferences/fev-conference-diesel-powertrains-30/introduction.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.

Powertrain Modelling and Control Conference 2018

10-11 September 2018, Leicester, UK

www.pmc-conf.com

Topics of interest include electric drivetrains; hybrid powertrains; system identification; powertrain optimization; emission legislation; powertrain / engine testing; fuel cell; noise, vibration and harshness; combustion engine modelling; performance /drivability; ECU development; drive cycles; mapping and calibration; Hardware-in-Loop (HIL) testing; driveline and transmission; and tribology and friction

SAE International Powertrains, Fuels & Lubricants Meeting

17-19 September 2018, Heidelberg, Germany

www.pfl18.org

Topics of interest include general powertrain development; engine combustion; exhaust, aftertreatment & emissions; fuels and lubricants; new engines, components, actuators & sensors; hybrid & electric powertrains; and transmission and driveline technology.

37th FISITA World Automotive Congress: Disruptive Technologies for Affordable and Sustainable Mobility

2-5 October 2018, Chennai, India

www.fisita-congress.com

The congress topics include powertrain & emissions, fuels & lubricants, noise & vibration, vehicle dynamics, active and passive safety, electric & hybrid vehicles, autonomous & connected vehicles, manufacturing & materials, vehicle concepts, and sustainability.

2018 Aachen Colloquium Automobile and Engine Technology

8-10 October 2018, Aachen, Germany

www.aachener-kolloquium.de

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

6th International Conference Real-Driving Emissions

15-17 October 2018, Berlin, Germany

Information will be at https://real-driving-emissions.iqpc.de

SAE Heavy Duty Diesel Emissions Control Symposium

16-17 October 2018, Gothenburg, Sweden

https://hddec18.org

At the bi-annual symposium, the very latest trends in global emissions control legislation and the implications of these regulations on engine and after treatment technology will be discussed.

Integer Emissions Summit & AdBlue® Forum India 2018

17-18 October 2018, New Delhi, India

www.integer-research.com/conferences/ies-india-2018/

11th International Congress on Catalysis and Automotive Pollution Control CAPoC11

29-31 October 2018, Brussels, Belgium

http://capoc.ulb.ac.be

The International Congress on Catalysis and Automotive Pollution Control will discuss applications and requirements of catalysis in automotive emission control such as catalyst and sorption technologies; particulate emission control for both diesel and gasoline engines; aftertreatment for gaseous HC, H_2 and renewable or reformulated fuel mixtures; emission control for natural-gas and dual-fuel engines; emission control for hybrid vehicles; off-cycles emissions and unregulated pollutants (e.g. greenhouse gases); materials for catalysts, washcoat and fuel-borne catalysts; modelling of aftertreatment systems and catalyst characterization; integrated emission control systems, on-board diagnostics; sustainable fuel technologies; and innovative technologies (new materials, recovery of precious metals).

WHO 1st Global Conference on Air Pollution and Health

30 October - 1 November 2018, Geneva, Switzerland

www.who.int/airpollution/events/conference/en

The conference will bring together global, national and local partners to share knowledge and mobilize action for cleaner air and better health globally. The conference will update the evidence on the health impacts of air pollution; methods of monitoring pollution and health exposures; and tools for assessing and implementing effective interventions. It will support strong health sector leadership for change, in partnership with other sectors. Cities and countries will be invited to join the BreatheLife campaign and commit to reducing air pollution by 2030 in line with WHO Air Quality Guidelines.

Integer Emissions Summit USA 2018

6-7 November 2018, Indianapolis, USA

www.integer-research.com/conferences/ies-usa-2018/

2nd International FEV Conference Zero CO_2 Mobility

13-14 November 2018, Aachen, Germany

www.fev.com/events/fev-conferences/fev-conference-zero-co2-mobility/introduction.html

The conference will offer a platform for strategic discussion on the potential and performance of various forms of energy storage – from battery technologies to eco- and e-fuels.

10th Better Air Quality Conference

14-16 November 2018, Kuching, Malaysia

www.baq2018.org

The 10th Better Air Quality (BAQ) is themed, Regional Action, Global Impact. It is organized by Clean Air Asia, the Clean Air Forum Society of Malaysia (MyCAS), Malaysia's Ministry of Natural Resources and Environment, and the Natural Resources and Environment Board of Sarawak.

2018 Polis Conference on "Transport innovation for sustainable cities and regions"

22-23 November 2018, Manchester, UK

www.polisnetwork.eu/2018conference

40th International Vienna Motor Symposium

16-17 May 2019, Vienna, Austria

Info will be at https://wiener-motorensymposium.at