

NEWSLETTER

International Regulatory Developments

TABLE OF CONTENTS

EUROPE	2
European Parliament votes to adopt ENVI Committee RDE Report.....	2
Meeting of the Advisory Group on Vehicle Emission Standards.....	2
Specific Measures on L-Category End-of-Series Vehicles	2
Vice-President Speech on European Green Deal as a Growth Strategy	3
Commission President von der Leyen's State of the Union Speech.....	3
European Union 2030 Climate Target Plan.....	3
EP Environment Committee Vote on European Climate Law.....	4
ENVI Exchange of Views on EU Climate Ambition.....	4
JEC Well-to-Wheels Report version 5.....	4
EEA Preliminary Report on EU Greenhouse Gas Emissions	4
European Environment Agency to hold Online Debates.....	5
Updated EU Critical Raw Materials List.....	5
EC launches European Raw Materials Alliance	5
Transport White Paper Public Consultation.....	6
Public Consultation on Roadmap for Sustainable Products Initiative	6
Assessment of Roadworthiness Package Implementation	6
France unveils Hydrogen Strategy	6
NORTH AMERICA	6
CARB Advanced Clean Cars Workshop	6
California Mandate for Zero Emission Cars and Passenger Trucks from 2035	7
SOUTH & CENTRAL AMERICA	7
Heavy-Duty Emissions Regulations Delay in Mexico	7
UNITED NATIONS	8
First International Day of Clean Air for Blue Skies.....	8
GENERAL	8
Publication of Article on Contribution of Modern Diesels to Local Air Quality	8
AECC Presentation to SAE Powertrains, Fuels and Lubricants Summit	9
ICCT Report on Real-world Usage of Plug-in Hybrid Vehicles	9
T&E Online Tax Tool Update	10
Global Energy Outlook.....	10
RESEARCH SUMMARY	11
FORTHCOMING CONFERENCES	13

EUROPE

European Parliament votes to adopt ENVI Committee RDE Report

On 16 September 2020, the plenary of the European Parliament voted to adopt the final Environment Committee (ENVI) report on Real Driving Emissions (RDE).

There were some last-minute amendments proposed, including Amendment 35, where around 70 MEPs tabled an amendment on a final Conformity Factor (CF). This proposed revising the CF downwards at least annually on the basis of regular assessment of the Joint Research Centre (JRC). MEPs argued that there is no scientific evidence to support claims that the margin can be phased out by a certain point in time as was requested by other amendments. It should be up to the JRC to scientifically review the progress in Portable Emissions Measurement Systems (PEMS) design and measurement accuracy before considering if it is technically justified for the margin to be further reduced. This amendment was not adopted.

Amendments that were adopted included Amendment 15, which states that "In order to encourage the producers to have a proactive, pro-environmental attitude, the new technological innovations meant to absorb NOx should be tested, quantified and considered in the subsequent revision of Euro standards." Amendment 24 modifies the initial text proposed by the European Commission, including the margin on the CF (i.e. CF=1.43). It modifies this to CF = 1 + margin (margin=0.32) and also adds the note "By 30 September 2022 the margin shall be zero, and the conformity factor shall cease to apply."

The ENVI report was adopted by the European Parliament Plenary and Parliament is now ready to begin trilogue negotiations to agree on the final legislative text with the European Council and European Commission.

A European Parliament press release is available at www.europarl.europa.eu/news/en/20200910/meps-want-new-cars-to-respect-emission-limits-under-real-driving-conditions.

Meeting of the Advisory Group on Vehicle Emission Standards

On 10 September 2020, the European Commission's Advisory Group on Vehicle Emission Standards (AGVES) held its fifth meeting. The AGVES meeting was conducted in a virtual setup and was chaired by EU Commission DG Growth's Dr Penny Dilara. Several presentations by stakeholders were discussed.

Concawe presented the outcome of an air quality modelling study done by AERIS that was published in April 2018. The study investigated two scenarios: one with the entire diesel fleet replaced by Euro 6d vehicles and another one with all new diesel cars are replaced by zero emission vehicles. The study shows that Euro 6d diesel vehicles are as effective as electric vehicles in helping cities being compliant with air quality standards.

ACEA presented the preliminary results from an air quality modelling study done by AERIS. The model uses the Sybil database for the fleet composition and COPERT 5 for emission factors. Both datasets were corrected by ACEA based on their own market data in some areas. The study investigates different Euro 7/VII scenarios. ACEA concludes that the results do not support any need for further tightening of NOx and PM limits.

Last but not least, the CLOVE consortium presented initial findings from the database of emission results they are putting together for both light- and heavy-duty vehicles, based on the latest available Euro 6d(temp) and Euro VI vehicles. CLOVE also explained its intended approach to propose Euro 7/VII options as input to the impact assessment analysis based on the measurement database. CLOVE will select Best Available Technologies (BAT) as benchmark for the future emissions standards and analyse the emissions reduction potential of new emission control technologies on BAT.

The next AGVES meeting will be held on 27 October 2020.

Specific Measures on L-Category End-of-Series Vehicles

On 28 September 2020, the European Commission presented the Amending Regulation (EU) No 168/2013 as regards specific measures on L-category end-of-series vehicles in response to the COVID-19 outbreak. The COVID-19 pandemic is causing major disruption, which is impacting the motorcycle industry in the form of multiple shocks with disruption of production sites and international value chains as well as a sizeable drop in demand and increase of vehicles in stock.

This has affected manufacturers' ability to meet some of the deadlines imposed by Regulation (EU) No 168/2013 of the European Parliament and of the Council of 15 January 2013. According to that Regulation, the pollutant emissions Euro 5 step will apply from 1 January 2021, which means that as of that date only vehicles meeting the Euro 5 requirements can be placed on the Union market.

A new article (Art 44 bis) allows special end-of-series rules. The number of vehicles that can benefit is limited to the vehicles in stock on 15 March 2020. Those vehicles can be sold for a period of one year only (instead of two years for "normal end-of-series"). National authorities have one month to decide on manufacturers' requests.

The proposal will not postpone the entry into force of the Euro 5 on 1 January 2021 and does not incentivise manufacturers to continue the production of Euro 4 vehicles.

A short presentation on the amendments is at www.europarl.europa.eu/cmsdata/211782/pt%208a%20PPT-L-cat%20EoS%20prop_IMCO%2028-9.pdf.

Vice-President Speech on European Green Deal as a Growth Strategy

On 1 September 2020, European Commission Vice-President Frans Timmermans spoke at the Bruegel Annual Meetings on the European Green Deal as “Europe’s new growth strategy”.

Mr Timmermans said that the Green Deal was launched as a growth strategy and is now also Europe’s roadmap out of the coronavirus crisis. The Commission is therefore “doubling down” on the package as “the cost of climate action may seem high, but it is dwarfed by the cost of inaction”.

Vice-President Timmermans went on to emphasise that the EU Taxonomy will provide clear criteria to determine which economic activities help to achieve Europe’s climate goals. Speaking about the 2030 greenhouse gas emission reduction target, he said that “an increased target in the range of 50-55% is doable”.

The full speech is available to read at ec.europa.eu/commission/presscorner/detail/en/SPEECH_20_1551.

Commission President von der Leyen’s State of the Union Speech

On 16 September 2020, European Commission President Ursula von der Leyen addressed the European Parliament Plenary to deliver her State of the Union (SOTEU) Speech.

Amongst many other topics, she referred to the European Green Deal mission for the EU to become the first climate-neutral continent by 2050. The European Commission is proposing to increase the 2030 target for emission reduction to at least 55% from 1990 levels, which will increase from the current 40%. Even though this is a big increase, Ms von der Leyen mentioned that the impact assessment clearly shows that European economy and industry can manage this. She also referred to a letter signed recently by 170 business leaders and investors - from SMEs to some of the world’s biggest companies - calling on Europe to set a target of at least 55%. She affirmed that the 2030 target is ambitious, achievable, and beneficial for Europe. Meeting this new target will reduce the EU’s energy import dependency, create millions of extra jobs and more than halve air pollution.

Some associations reacted to the ambitious target. ACEA’s Director General, Mr Huitema, stated “... policy makers need to put in place not only targets but also the required supportive policies for all vehicle types, without which these targets will simply not be achievable.” CLEPA Secretary General, Ms de Vries responded that “The existing CO₂ targets for vehicles have only been adopted in 2019 after a long and substantial debate. Planning and investment decisions have been taken with confidence in the reliability of the regulatory framework. An increased level of ambition for 2030, if coupled with stricter tailpipe targets for vehicles or possibly a ban on technologies, hampers industry competitiveness, requires massive public investment in infrastructure and makes mobility more expensive for citizens.”

FuelsEurope issued a press release stating that, although the EC proposes using renewable and low-carbon fuels in aviation and maritime applications, it overlooks the potential for them to decarbonise all modes of transport. Director General, Mr Cooper said that “we call for the importance of low carbon liquid and gaseous fuels to be recognised and supported for all transport sectors, in the next development of regulations”.

The State of the Union also highlighted what has been achieved in the first year of the new Commission, relevant points for the automotive industry included:

- 11 December 2019 the European Green Deal was launched, setting out a roadmap for how to make Europe the first climate-neutral continent by 2050;
- 4 March 2020, the Commission proposed a European climate law, to transform political promises into legal obligations;
- 10 March 2020, a new industrial strategy was announced to prepare the green and digital transformations of European industry;
- 11 March 2020, the European Commission adopted a new circular economy action plan;
- 29 April 2020, a Package to support the transport sector was announced and
- 8 July 2020, the Commission adopted the EU’s strategies for energy system integration and hydrogen.

The State of the Union speech can be found at ec.europa.eu/commission/presscorner/detail/en/speech_20_1655.

European Union 2030 Climate Target Plan

On 17 September 2020, EU Commissioners of Climate and Energy Timmermans and Simson presented the EU 2030 Climate Target Plan, proposing to reduce net greenhouse gas emissions by at least 55% by 2030 to make Europe climate-neutral by 2050.

The main components of the 2030 Climate target plan that will impact the industry are that by June 2021 the Commission will present proposals to amend Emissions Trading System, Effort Sharing Regulation, the Renewable Energy Directive and the CO₂ Emissions Performance Standards for Cars and Vans Regulation.

The plan confirms that the assessment projects reduction levels corresponding to a decrease of around 50% of the CO₂ per kilometre for passenger cars in 2030 as compared to the 2021 targets. It also that “The production and sales of electric vehicles are already taking off, and hydrogen promises new ways of propulsion, particularly for heavy-duty trucks, indicating that this is a realistic scenario”. The plan also mentioned that emissions trading has the advantage of capturing fleet emissions under a cap and incentivising behavioural change with lasting effects on mobility solutions through the price signal.

The document indicates that the definition of a comprehensive terminology for all renewable and low carbon fuels and a European system of certification of such fuels based on full life cycle

greenhouse gas emissions savings and sustainability criteria, and existing provisions for instance in the Renewable Energy Directive (RED), would support the further development of renewables. It also mentions the need for infrastructure and that an increased renewables target will provide the necessary predictability and investment certainty for further renewable energy deployment across all sectors.

Finally, the plan confirms that the Commission will revisit and strengthen the CO₂ standards for cars and vans for 2030 by June 2021. Furthermore, it also points out that to achieve the overall neutrality target for 2050, nearly all cars on the road must be zero emissions by that time and states "...The Commission will also assess in the coming months what would be required in practice for this sector to contribute to achieving climate neutrality by 2050 and at what point in time internal combustion engines in cars should stop coming to the market."

The documents relevant to the Climate Target Plan 2030 can be found at ec.europa.eu/commission/presscorner/detail/en/ip_20_1599.

EP Environment Committee Vote on European Climate Law

On 10-11 September 2020, the Environment (ENVI) Committee of the European Parliament voted for a new EU carbon emissions reduction target of 60% by 2030. The committee adopted its report on the EU Climate Law with 46 votes for, 18 against and 17 abstentions.

ENVI also wants an interim target for 2040 to be proposed by the Commission following an impact assessment, to ensure the EU is on track to reach its 2050 climate neutrality target. The MEPs request that the Commission assesses and proposes amendments to all relevant EU legislation that contributes to reducing greenhouse gas emissions. They also want the Commission to issue a report every two years on the progress made by EU and Member States towards achieving the climate targets. The committee has furthermore said that an independent scientific body should be created to monitor progress.

The text of the vote will go to the full plenary of Parliament from 5-8 October, although it is still subject to negotiation with the European Commission and Member States.

The ENVI Committee press release can be found at www.europarl.europa.eu/news/en/press-room/20200907IPR86512/eu-climate-law-meps.

ENVI Exchange of Views on EU Climate Ambition

On 28 September 2020, the Environment (ENVI) Committee of the European Parliament held a debate with Mr Frans Timmermans, Executive Vice-President of the Commission, on stepping up Europe's 2030 climate ambition.

Mr Timmermans presented the Commission's plan to reduce EU greenhouse gas emissions by at least 55 % by 2030 compared to 1990 levels, as announced on 16 September in the State of the Union speech by the Commission President Ursula von der Leyen.

Currently, emissions are not going down fast enough, Mr Timmermans said, but he underlined that becoming carbon neutral is both feasible and beneficial for the EU. He invited Parliament to confirm the proposed 55% 2030 target as the EU's new Nationally Determined Contribution under the Paris Agreement. The ENVI Chair Pascal Canfin (Renew, FR) reminded MEPs that the next Plenary would vote on a report by the Environment Committee on the EU Climate Law, which calls for 60% emission reductions in 2030.

Several MEPs expressed concern that the new 2030 target proposed by the Commission is a net target, making it less ambitious. Mr Timmermans defended a net target, saying that carbon sinks are needed to achieve carbon neutrality and are fully in line with international commitments.

Mr Timmermans finally informed MEPs that the Commission would come up with proposals by June 2021 to revise key EU legislation such as the EU Emissions Trading System, energy efficiency and renewable energy policies and strengthening CO₂ standards for road vehicles to enable the EU to reach a more ambitious target.

The ENVI press release is at www.europarl.europa.eu/news/en/20200925IPR87925/increasing-the-eu-s-2030-emissions-reduction-target.

JEC Well-to-Wheels Report version 5

On 25 September 2020, JRC (the Joint Research Centre of the European Commission), EUCAR and Concawe (together known as JEC) published their updated joint report of the Well-to-Wheels (WTW) energy use and greenhouse gas (GHG) emissions for a wide range of potential future fuel and powertrain options. This was first published in December 2003.

As an update of the previous version, the objectives of JEC WTW v5 are to establish, in a transparent and objective manner, a consensual Well-to-Wheels energy use and GHG emissions assessment of a wide range of automotive fuels and powertrains relevant to Europe in 2025 and beyond.

This version updates the technologies investigated and applies a common methodology and dataset to estimate WTW emissions. This WTW version 5 concentrates on the evaluation of energy and GHG balances for the different combinations of fuel and powertrains, in road transport. The current version 5 investigates, for the first time, the heavy-duty segment, thus expanding the scope of the previous versions of the study.

The study can be found at ec.europa.eu/jrc/en/jec/publications/reports-version-5-2020.

EEA Preliminary Report on EU Greenhouse Gas Emissions

On 17 September 2020, the European Environment Agency (EEA) published a press release regarding preliminary data on the EU's greenhouse gas emissions in 2019. This shows a nearly 4% decrease compared with 2018 and puts the EU emissions

approximately 24% below 1990 levels (26% if the United Kingdom is included). EU emissions have remained consistently below the 20% reduction target for 2020 since 2014.

The EEA says that this downward trend reflects the strong and steady growth of renewable energy in Europe and the shift away from coal, triggered particularly by increased carbon emission prices. Moreover, the 2019 drop took place in a period of economic growth, highlighting the results of effective climate policies implemented across the EU. It says that this shows that it is clearly possible to achieve more ambitious reduction targets by 2030, paving the way for a climate neutral EU by 2050.

The press release can be found at www.eea.europa.eu/highlights/sharpest-decrease-of-the-decade?utm_source=EEASubscriptions&utm_medium=RSSFeeds&utm_campaign=Generic.

European Environment Agency to hold Online Debates

On 9 September 2020, the European Environment Agency (EEA) announced that it will be holding a series of high-level panel debates focusing on the impacts of COVID-19 and the challenges the pandemic poses in meeting long-term climate and environment goals.

The aim of the debates is to contribute to policymaking by bringing the latest knowledge, research and issues to the attention of key stakeholders, including policymakers and influencers that are shaping the future in these uncertain times. In addition to the debate series, the EEA has put online a database of a number of studies, reports and other research from across Europe, looking at the impact of COVID-19 on the climate and environment.

The debates will address topics such as sustainable recovery and the European Green Deal – the EU perspective, the scientific perspective, nature – planetary boundaries, air quality/transport, environmental health, climate change, and strategic reflections on Europe’s environment in a post-COVID world.

More details on the debates can be found at www.eea.europa.eu/highlights/new-debate-series-by-eea?utm_medium=RSSFeeds&utm_campaign=Generic.

Updated EU Critical Raw Materials List

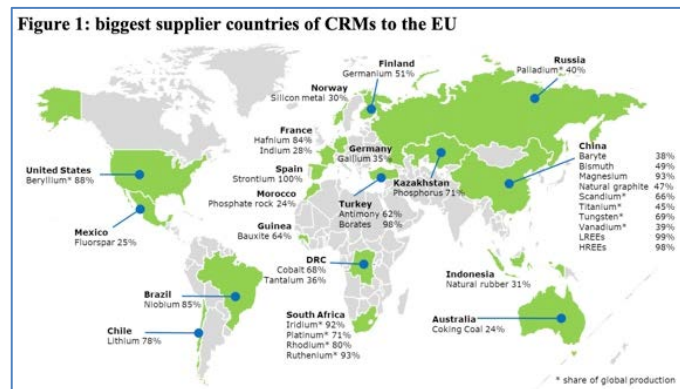
On 3 September 2020, the European Commission published a communication on Critical Raw Materials Resilience, updating its list of critical raw materials.

The Commission reviews the list of critical raw materials for the EU every three years. It published the first list in 2011, updating it in 2014 and 2017. The assessment is based on data from the recent past and shows how criticality has evolved since the first list was published.

The 2020 assessment screened 83 materials (five more than in 2017) and, where possible, looked more closely than previous assessments at where criticality appears in the value chain: extraction and/or processing. Economic importance and supply

risk are the two main parameters used to determine criticality for the EU.

Bauxite, lithium, titanium and strontium have been added to the list, which already contains platinum group metals.



The report says that this knowledge base should enable strategic planning and foresight, reflecting the EU’s objective of a digital and climate-neutral economy by 2050.

It concludes by saying that the EU’s success in transforming and modernising its economy depends on securing in a sustainable way the primary and secondary raw materials needed to scale up clean and digital technologies in all of the EU’s industrial ecosystems. The EU must act to become more resilient in coping with possible future shocks and in leading the twin green and digital transformations.

The report is available to read at s3.eu-central-1.amazonaws.com/euobs-media/e7cce2f04107a82cacc263dfd3fbbd66.pdf.

EC launches European Raw Materials Alliance

On 29 September 2020, the European Commission launched the European Raw Materials Alliance (ERMA), aimed at strengthening the EU’s “strategic autonomy” on raw materials like rare earths, which are considered key for its green and digital transitions.

The ERMA aims to make Europe economically more resilient by diversifying its supply chains, creating jobs, attracting investments to the raw materials value chain, fostering innovation, training young talents and contributing to the best enabling framework for raw materials and the Circular Economy worldwide.

The Alliance addresses the challenge of securing access to sustainable raw materials, advanced materials, and industrial processing know-how. By 2030, a stated aim of the ERMA is that its activities will increase the production of raw and advanced materials and address the Circular Economy by boosting the recovery and recycling of Critical Raw Materials. More specifically, the Alliance will: bolster the creation of environmentally sustainable and socially equitable innovations and infrastructure; implement a Circular Economy of complex products like electric vehicles, clean tech, and hydrogen equipment; support Europe’s raw materials industry capability, to extract, design, manufacture

and recycle materials; promote innovation, strategic investment, and industrial production across specific value chains.

ERMA says that it is an open and inclusive alliance that provides an open and independent forum for discussion and analysis, as well as a mechanism for translating potential projects into actual activities and infrastructures that will contribute to creating long-lasting added value and jobs for Europe.

The EC communication announcing the Alliance is at eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0474 and more information on the ERMA can be found at erma.eu.

Transport White Paper Public Consultation

On 23 September 2020, the European Commission's public consultation on the evaluation of the 2011 Transport White Paper closed. The survey sought to gather the views of citizens and stakeholders on the objectives of the upcoming Strategy for Sustainable and Smart Mobility and looks into how the current framework set out in 2011 Transport White Paper has delivered up to now.

A Commission Staff Working Document is expected to be published in late 2020. This would report on the progress of the implementation of the White Paper on Transport, which set out a list of policies the Commission envisaged to enact during the current decade in order to make improvements to the EU's transport system by 2050.

In particular, the evaluation will aim at identifying the needs for transport policy, the objectives and goals set, the proposed action points, the outcomes achieved and where applicable their preliminary impacts, as well as the overall political impact of the strategy since it was adopted in 2011 until the end of 2018. The evaluation will focus on the relevance, effectiveness, efficiency, coherence and EU value-added of the Regulation and cover all provisions of the Regulation.

More information can be found at ec.europa.eu/info/law/have-your-say/initiatives/12438-Sustainable-and-Smart-Mobility-Strategy/public-consultation.

Public Consultation on Roadmap for Sustainable Products Initiative

On 14 September 2020, the European Commission launched the roadmap for its Sustainable Products Initiative. Stakeholders can provide feedback on the roadmap until 2 November 2020.

The initiative aims to broaden the scope of the EU's Ecodesign Directive, which focused mainly on the energy performance of a range of appliances. Now the EU Commission wants to extend the Ecodesign Directive to the "broadest possible range of products".

Other goals include "reducing the overall life-cycle climate and environmental footprint of the products placed on the EU market, achieving longer product lifetimes for example through more durable and repairable products, increasing circular material use rate, reducing waste and achieving higher recycling rates".

The initiative will also address the presence of harmful chemicals in products such as electronics, computers and phones, textiles, furniture, steel, cement and chemicals.

The consultation can be accessed at ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12567-Sustainable-Products-Initiative.

Assessment of Roadworthiness Package Implementation

On 10 September 2020, the European Parliamentary Research Service published an assessment of the implementation of the roadworthiness package adopted in 2014.

As one of the objectives of the package is to reduce emissions in road transport caused by poor maintenance of vehicles, emissions testing in Member States was assessed.

Few issues were identified. In the Czech Republic, no inspection tasks related to vehicle emission measurements are carried out on L-category (motorbikes) vehicles. In Latvia and The Netherlands, the assessment found that some emissions data were not recorded.

The full assessment report can be found at [www.europarl.europa.eu/RegData/etudes/STUD/2020/654175/EPRS_STU\(20\)654175_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2020/654175/EPRS_STU(20)654175_EN.pdf).

France unveils Hydrogen Strategy

On 10 September 2020, the French Economy and Finance Minister, Mr Bruno Le Maire, announced details of France's hydrogen strategy.

A €7 billion package over the next ten years is intended to ensure that France has its own supply chain and production. More than half of this will be spent on decarbonising industry, and France has set a goal of installing 6.5 gigawatts of electrolysis capacity by 2030 to make emissions-free hydrogen.

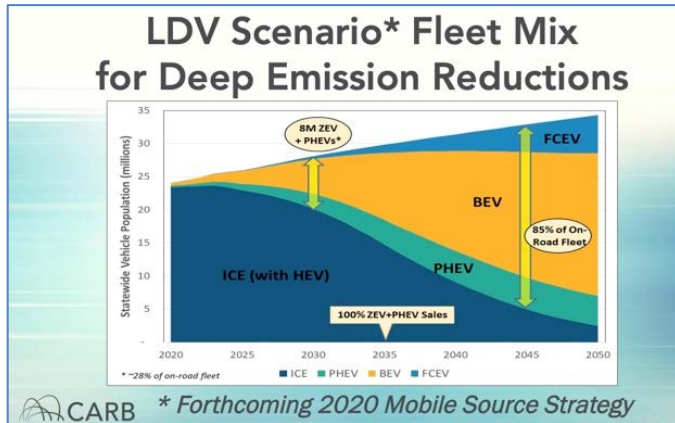
A video of Mr Le Maire's speech (in French) is at www.youtube.com/watch?v=J9LLS00s_oo&feature=youtu.be&utm_source=POLITICO.EU&utm_campaign.

NORTH AMERICA

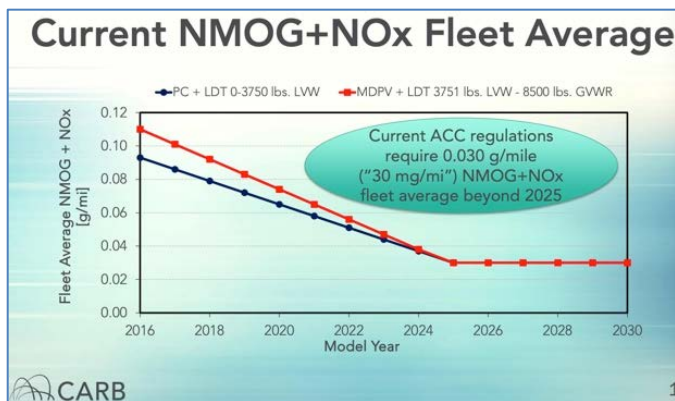
CARB Advanced Clean Cars Workshop

On 16 September 2020, the California Air Resources Board (CARB) held its first Advanced Clean Cars (ACC2.0) public workshop on the development of post-2025 light-duty low emission vehicle (LEV) emissions limits, greenhouse gas (GHG) and zero-emission vehicle (ZEV) requirements.

California's climate and air quality challenges still require significant reductions from light-duty vehicles, which represent 13% and 28% of the state's nitrogen oxides (NOx) and GHG inventories respectively. CARB's forthcoming 2020 Mobile Source Strategy (MSS) will identify aggressive new ZEV/PHEV (plug-in hybrid electric vehicle) sales requirements of 100% by 2035 and continued emissions reductions from combustion vehicles.



The current fleet average emissions methodology includes ZEV provisions. As ZEV sales requirements continue to increase after 2025, this will allow ICE powered vehicles to emit at higher levels. CARB is considering whether it should tighten the non-methane organic gas (NMOG) + NOx fleet average after 2025. This would allow manufacturers to demonstrate compliance by increasing ZEV sales and/or continue ICE emission reductions. An alternative strategy could be to transition to a non-ZEV fleet average from 2025 to 2027 through incremental adjustments of the NMOG+NOx 30 mg/mile limit.



For medium-duty vehicles (MDV), CARB is proposing to align chassis certification emissions limits with the recently approved Omnibus rule (see AECC News of 28 August 2020) to better ensure equivalent in-use emission control between the two certification methods. CARB continues to investigate the impact of higher loads and towing on emissions on MDV emissions and is considering “HD-like” in-use standards.

With regards to particulate matter (PM) emissions, CARB reported that currently 86% of vehicles tested were below the 3 mg/mile limit over the US06 test cycle. As a result, CARB is considering requiring all vehicles to meet the 3 mg/mile standard.

CARB is also looking at how to improve real-world emissions. One aspect is a proposal to reduce emissions from intermediate soak cold starts by implementing the cold start FTP limit for periods from 10 minutes to 36 hours. It is considering additional

requirements for intermediate soaks below 90 minutes to ensure fast catalyst light-off and control of engine emissions.

In addition, CARB is seeking better control of engine start emissions. At present, the FTP cycle has a 20 second initial engine idle upon engine start. CARB feels the current focus is clearly on warming up the catalyst. However, in-use data indicates a median value of approximately seven seconds of engine idle after starting. CARB has found that using a five second initial idle upon engine start resulted in a doubling of FTP emissions. CARB is considering revising the initial idle upon engine start from 20 seconds to five seconds because they feel this would put the focus on minimising engine-out emissions while using the initial drive-off to heat up the catalyst.

CARB’s presentation from the workshop is at [ww2.arb.ca.gov/sites/default/files/2020-09/ACC II Sept 2020 Workshop Presentation.pdf](http://ww2.arb.ca.gov/sites/default/files/2020-09/ACC%20II%20Sept%202020%20Workshop%20Presentation.pdf).

California Mandate for Zero Emission Cars and Passenger Trucks from 2035

On 23 September 2020, California Governor Gavin Newsom issued an executive order requiring sales of all new passenger vehicles to be zero-emission by 2035 and additional measures to eliminate harmful emissions from the transportation sector.

Following the order, the California Air Resources Board (CARB) will develop regulations to mandate that 100% of in-state sales of new passenger cars and trucks are zero-emission by 2035 – a target which it estimates will achieve more than a 35% reduction in greenhouse gas emissions and an 80% improvement in oxides of nitrogen emissions from cars state-wide. In addition, the Air Resources Board will develop regulations to mandate that all operations of medium- and heavy-duty vehicles shall be 100% zero emission by 2045 where feasible, with the mandate going into effect by 2035 for drayage trucks. To ensure needed infrastructure to support zero-emission vehicles, the order requires state agencies, in partnership with the private sector, to accelerate deployment of affordable fuelling and charging options. It also requires support of new and used zero-emission vehicle markets to provide broad accessibility to zero-emission vehicles for all Californians.

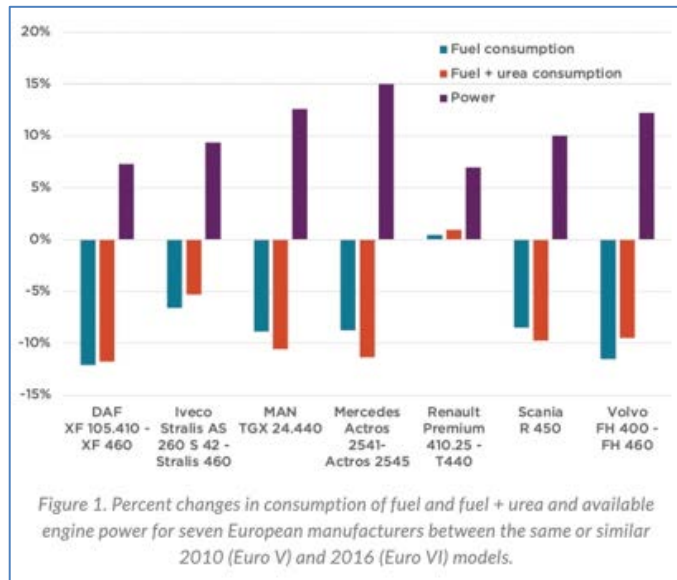
The press release and the Executive Order are at ww2.arb.ca.gov/news/governor-newsom-announces-california-will-phase-out-gasoline-powered-cars-dramatically-reduce.

SOUTH & CENTRAL AMERICA

Heavy-Duty Emissions Regulations Delay in Mexico

On 22 September 2020, the International Council on Clean Transportation (ICCT) published a blog criticising the delay of Mexico’s NOM-044 regulations, equivalent to Euro VI. It says that claims about the technology being too expensive, that the market is not ready and that COVID-19 has made introduction too difficult, do not stand up to scrutiny.

ICCT points to a study showing how increased power in Euro VI vehicles is accompanied by fuel consumption improvements in most cases. Regarding cost, the NGO identifies its own earlier analysis estimating incremental costs of \$2 280 (€1 959) compared with Euro V, suggesting that this should not be prohibitive.



ICCT goes on to make a comparison with the introduction of Euro VI-equivalent legislation in India earlier this year, “in the midst of a global pandemic and with no real delay”.

Its conclusion is that the NOM-044 regulations will save lives and help slow climate change and that “we can’t wait any longer”.

The full blog is available to read at theicct.org/blog/staff/euro-vi-latam-sept2020.

UNITED NATIONS

First International Day of Clean Air for Blue Skies

On 7 September 2020, the United Nations held the first International Day of Clean Air for blue skies.

The day aimed to raise public awareness of the importance of clean air and to demonstrate how air quality is linked to climate change and the global Sustainable Development Goals. It also helped to share knowledge, best practices, innovations and success stories, as well as forming a strategic alliance to “gain momentum for concerted national, regional and international approaches for effective air quality management”.

AECC took the opportunity to launch its new video highlighting its commitment to the European Green Deal. The video considers how the emission control industry can support the European Green Deal, looks at the main options to reduce road transport emissions in Europe and highlights AECC’s views on future transport policy.



The video can be viewed in the AECC YouTube channel www.youtube.com/watch?v=2TT0g0t-B3E and via the AECC website at www.aecc.eu/wp-content/uploads/2020/09/200914-How-can-Emissions-Control-Industry-Support-European-Green-Deal-2.pdf.

The WHO press release and additional material are at www.who.int/news-room/events/detail/2020/09/07/default-calendar/international-day-of-clean-air-for-blue-skies.

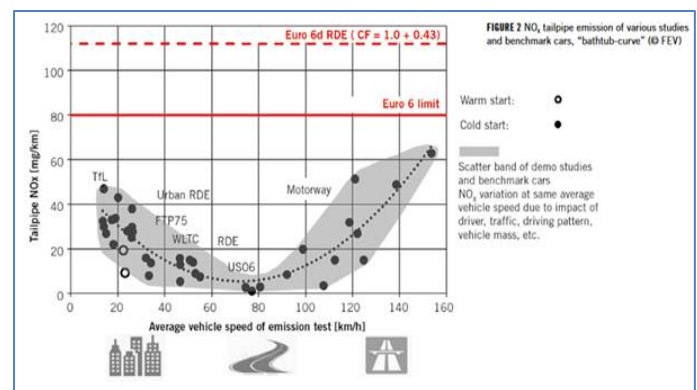
GENERAL

Publication of Article on Contribution of Modern Diesels to Local Air Quality

On 22 September 2020, an article written by AECC, Robert Bosch, Vitesco Technologies, IAV and FEV Europe was published in the industry magazine MTZ.

This paper analyses results of recent developments on demonstrator vehicles to show that a combined reduction in pollutant and CO₂ emissions is possible with the latest diesel technology through an integrated system approach of engine, hybrid and emission control technologies.

It furthermore shows that the existing technologies for achieving low pollutant emissions are compatible with renewable fuels for further reducing greenhouse gas emissions.



The paper concludes that diesel vehicles are part of future mobility. They are a medium-term solution to meet CO₂ reduction targets, while having low pollutant emissions on the road, even

under urban driving conditions. The vision of a diesel powertrain with negligible impact on air quality is becoming a reality.

In the long term, technologies are compatible with renewable fuels to maintain the low pollutant emissions while further reducing the carbon footprint on a well-to-wheel or lifecycle basis.

The paper is available to read at www.aecc.eu/wp-content/uploads/2020/09/200901-modern-diesel-MTZ.pdf.

AECC Presentation to SAE Powertrains, Fuels and Lubricants Summit

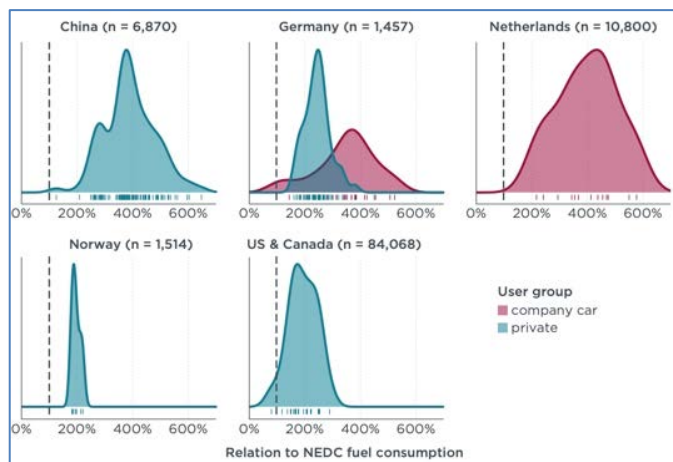
On 22 and 23 September 2020, the SAE and BOSMAL hosted the Powertrains, Fuels and Lubricants Digital Summit. The digital summit featured more than 200 on-demand technical presentations on several relevant topics for the automotive industry.

AECC participated with a presentation on *Ultra-Low Heavy-Duty Diesel NOx Emissions in Real World Conditions*. AECC presented results of real-world emissions of Euro VI-A-C and VI-D type-approved vehicles. The measured emissions resulting from the on-road testing are analysed through the Moving Average Window (MAW) evaluation procedure as prescribed in the EU regulation, where data boundary conditions are also applied, leaving non-negligible emissions data unaccounted for in the determination of the final result, particularly under urban operation of heavy-duty vehicles. AECC also introduced the heavy-duty demonstrator vehicle programme, giving an overview of its objective to show ultra-low diesel NOx and particulate emissions capability across a wide range of real-world operating conditions and, more specifically, address emissions reduction at low average speeds and loads in urban operation.

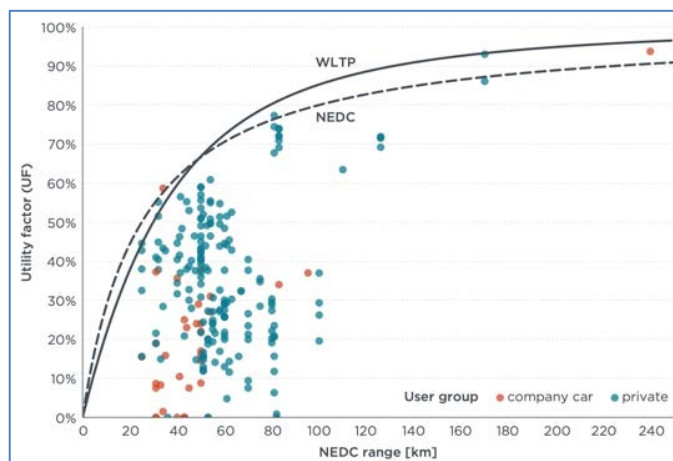
ICCT Report on Real-world Usage of Plug-in Hybrid Vehicles

On 27 September 2020, the International Council on Clean Transportation (ICCT) published a report on real-world usage of plug-in hybrid electric vehicles (PHEVs). This looked at fuel consumption, electric driving and CO₂ emissions, and was carried out in conjunction with the Fraunhofer Institute, analysing around 100 000 PHEVs in China, Europe, and North America.

The report found that PHEV fuel consumption and tail-pipe CO₂ emissions in real-world driving, on average, are approximately two to four times higher than type-approval values. The deviation from New European Drive Cycle (NEDC) type-approval values spans much larger ranges than for conventional vehicles. Real-world values are two to four times higher for private cars and three to four times higher for company cars.



The real-world share of electric driving for PHEVs, on average, is about half the share considered in the type-approval values. For private cars, the average utility factor (UF) - the portion of kilometres driven on electric motor versus kilometres driven on combustion engine - is 69% for NEDC type approval but only around 37% for real-world driving. For company cars, an average UF of 63% for NEDC and approximately 20% for real-world driving was found. There are noteworthy differences between the markets analysed, with the highest real-world UF found for Norway at 53% for private vehicles and the United States at 54% for private vehicles. The lowest UFs were for China at 26% for private vehicles, Germany with 18% for company cars and 43% for private vehicles, and the Netherlands with 24% for company cars.



Most PHEVs have type-approval all-electric ranges of 30–60 km and electrify 5 000–10 000 km a year. PHEVs with high all-electric ranges of 80 km or more achieve 12 000–20 000 km mean annual electric mileages, which is comparable to the annual mileage of the car fleet in Germany and the United States. The high annual electric kilometres reflect high annual mileages of PHEVs despite low UFs. The share of kilometres that PHEVs electrify results in a total of 15%–55% lower tailpipe CO₂ emissions compared to conventional cars. ICCT says that this is much lower than expected from type-approval values.

Decreasing combustion engine power while increasing all-electric range and frequency of charging, improve real-world fuel consumption and CO₂ emissions of PHEVs. Real-world fuel consumption and CO₂ emission levels decrease by 2%–4% with each 10 kW of system power taken out of a PHEV. At the same time, analysis finds that adding 10 km of all-electric range improves real-world values by 8%–14%.

The report goes on to make recommendations for vehicle manufacturers, fleet managers and regulators. It says that vehicle manufacturers should increase the all-electric range of their PHEVs from an average of about 50 km today to a level of about 90 km in future years. This would be sufficient to cover the full daily distance driven electrically on about 85% of driving days or approximately 70% of total distances driven by German private car owners if charged every day.

Fleet managers should carefully assess which of their company car users' driving and usage behaviour is appropriate for PHEVs. They should incentivise frequent charging of PHEVs, for example by allowing unlimited re-charging of electricity while limiting the budget for gasoline or diesel on a fuel card provided by the company.

ICCT says that at the European level, the testing procedures for PHEVs, and in particular the UF assumptions of the WLTP, should be updated to better reflect real driving and usage patterns. A further recommendation is that the threshold for providing Zero- and Low Emission Vehicle (ZLEV) credits should be adapted to real-world data and the current multiplier of 0.7 should be removed to avoid any incentive for PHEVs with a low electric range.

For national governments, the report proposes that fiscal and other incentives should prefer PHEVs with a high all-electric range and a high ratio of electric motor power to combustion engine power. Whenever possible, incentives should be tied to demonstrating proper real-world performance of the vehicles, for example by using UF data collected from on-board fuel consumption meters or during regular technical inspections. This applies to incentives at the time of purchase, such as for private vehicle buyers, as well as tax incentives, such as for company cars.

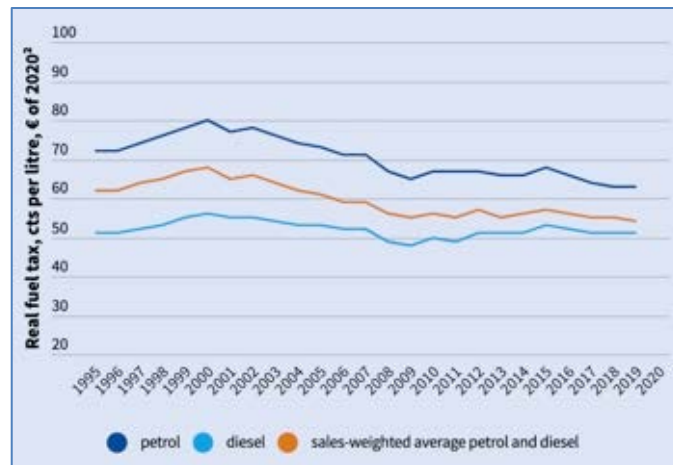
The full report is available to read at theicct.org/sites/default/files/publications/PHEV-white%20paper-sept2020-0.pdf.

T&E Online Tax Tool Update

On 25 September 2020, Transport & Environment (T&E) published an update to its online tax tool, claiming that diesel cars continue to receive favourable tax treatment in Europe compared with petrol.

T&E says that efforts to phase out diesel's tax advantages over petrol stagnated in 2019. In 2015 when the 'Dieselgate' scandal broke, T&E calculated that diesel fuel was taxed, on average, at 14% less per litre than petrol in 2014, which amounted to indirect subsidies totalling almost €27 billion. It now calculates that €24

billion is the amount of lost revenues from failing to tax diesel fuel at the same rate as petrol in the EU in 2019.



It goes on to say that the gap between diesel and petrol taxes is closing very slowly but surely. In 2019, the gap in tax levels for diesel and petrol paid by motorists approaches €0.12 per litre, diesel tax being 27% lower than petrol tax per unit of energy.

T&E's analysis can be found at www.transportenvironment.org/what-we-do/sustainable-finance/fuel-taxes.

Global Energy Outlook

On 14 September 2020, BP launched its 2020 Energy Outlook, which explores the forces shaping the global energy transition out to 2050 and the key uncertainties surrounding that transition. It says that the global energy system is likely to undergo a fundamental restructuring in order to decarbonise. Three main scenarios – Rapid, Net Zero, and Business-as-usual (BAU) – provide a range of possible outcomes.

With regard to transport, the report states that the growth of energy used in transportation slows, with oil peaking in mid- to late-2020s. The demand for passenger and commercial transportation increases strongly over the Outlook, with road and air travel doubling in all three scenarios. The growth in final energy required to fuel this increased travel is offset by significant gains in vehicle efficiency, especially in passenger cars, trucks and aviation.

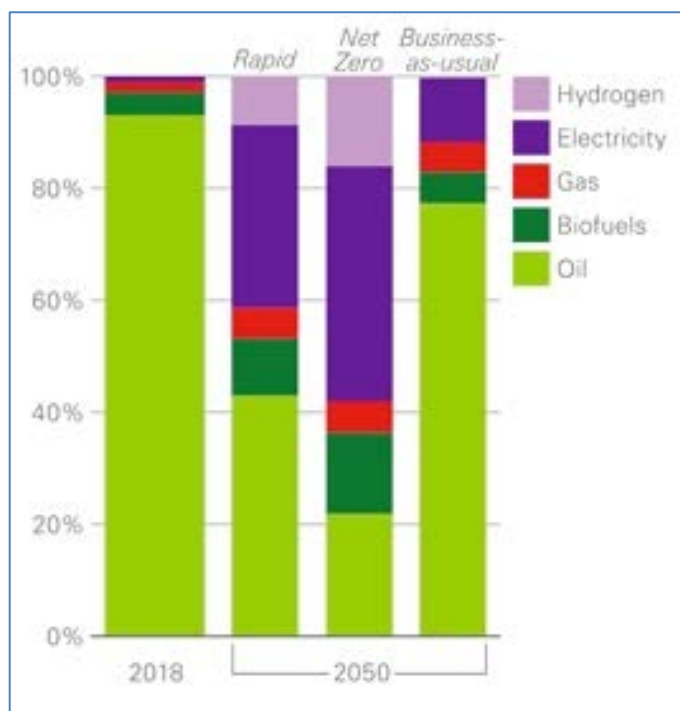
The gains in energy efficiency are partially disguised by a shift away from oil towards the increasing use of electricity and hydrogen in transport. In particular, the conversion process used to produce these energy carriers boosts the total amount of primary energy absorbed by the transport sector. The shift towards electricity and hydrogen is most pronounced in Rapid and Net Zero, where overall primary energy increases by around 25% and 35% respectively by 2050. Primary energy in transport increases by almost 25% in BAU, with slower gains in energy efficiency offset by a smaller shift away from oil.

The growth in primary energy used in transport in all three scenarios stems entirely from the developing world, as increasing prosperity in developing Asia, Africa and Latin America supports

greater demand for passenger and freight transportation. Energy use in transport in the developed world is broadly flat.

The use of oil in transport peaks in the mid-to-late 2020s in all three scenarios: the demand for oil for road transport in emerging markets continues to increase until the early 2030s in Rapid and Net Zero, and the late 2030s in BAU, but this is increasingly offset by falls in the developed world.

The share of oil in total final consumption falls from over 90% of transport demand in 2018 to around 80% by 2050 in BAU, 40% in Rapid and just 20% in Net Zero. The main counterpart is the increasing use of electricity, especially in passenger cars and light and medium-duty trucks, along with hydrogen, biofuels and gas. The share of electricity in end energy use in transport increases to between 30% and 40% by 2050 in Rapid and Net Zero.



The electrification of the vehicle parc is most pronounced in Rapid and Net Zero, concentrated in two and three wheelers, passenger cars and light and medium-duty trucks. Electric vehicles in Rapid and Net Zero account for around 30% of four-wheeled vehicle kilometres (VKM) travelled on roads in 2035 and between 70-80% in 2050, compared with less than 1% in 2018. The corresponding shares in BAU are a little over 10% in 2035 and around 30% in 2050.



Share of car, truck & bus vehicle kilometres electrified

By 2050, electric vehicles account for between 80-85% of the stock of passenger cars in Rapid and Net Zero and 35% in BAU. The corresponding numbers for light and medium-duty trucks are 70-80% and 20%.

The other dominant trend affecting the use of energy in road transport is the increasing levels of vehicle efficiency, especially passenger cars, driven by tightening vehicle emission standards and rising carbon prices. In Rapid, the efficiency of a typical new internal combustion engine (ICE) passenger car increases by around 45% over the next 15 years.

Despite the accelerated electrification of passenger cars, the continuing importance of ICE passenger cars for much of the Outlook means that improvements in their efficiency is the main factor limiting the growth of oil used in passenger cars out to 2050. Vehicle efficiency improvements in Rapid reduce oil use in passenger cars (and hence carbon emissions) by roughly twice as much as electrification in 2050.

The BP Energy Outlook can be found at www.bp.com/en/global/corporate/energy-economics/energy-outlook.html.

RESEARCH SUMMARY

Effects of Emissions and Pollution

Effects of Low Exposure to Traffic Related Air Pollution on Childhood Asthma Onset by Age 10 Years, Nelson Lau, et al.; *Environmental Research* (in press), doi: [10.1016/j.envres.2020.110174](https://doi.org/10.1016/j.envres.2020.110174).

Experimentally determined deposition of ambient urban ultrafine particles in the respiratory tract of children, Lingli Guo, et al.; *Environment International* (December 2020), Vol. 145, 106094, doi: [10.1016/j.envint.2020.106094](https://doi.org/10.1016/j.envint.2020.106094).

Effects of long-term exposure to air pollutants on the spatial spread of COVID-19 in Catalonia, Spain, Marc Saez, et al.; *Environmental Research* (December 2020), Vol. 191, 110177, [doi: 10.1016/j.envres.2020.110177](https://doi.org/10.1016/j.envres.2020.110177).

Quantitative analysis of air pollution and mortality in Portugal: current trends and links following proposed biological pathways, José Brito, et al.; *Science of The Total Environment* (in press), [doi: 10.1016/j.scitotenv.2020.142473](https://doi.org/10.1016/j.scitotenv.2020.142473).

Air Quality, Sources and Exposure

Traffic-Related Air Pollution, Haneen Khreis, et al.; ISBN: 978-0-12-818122-5, [doi: 10.1016/C2018-0-02716-4](https://doi.org/10.1016/C2018-0-02716-4).

The spatio-temporal evolution of black carbon in the North-West European 'air pollution hotspot', K. Wyche, et al.; *Atmospheric Environment* (December 2020), Vol. 243, 117874, [doi: 10.1016/j.atmosenv.2020.117874](https://doi.org/10.1016/j.atmosenv.2020.117874).

From emissions to source allocation: Synergies and trade-offs between top-down and bottom-up information, L. Sartini, et al.; *Atmospheric Environment: X* (October 2020), Vol. 7, 100088, [doi: 10.1016/j.aeaoa.2020.100088](https://doi.org/10.1016/j.aeaoa.2020.100088).

Evaluation of traffic control measures in Oslo region and its effect on current air quality policies in Norway, G. Santos, et al.; *Transport Policy* (in press), [doi: 10.1016/j.tranpol.2020.08.025](https://doi.org/10.1016/j.tranpol.2020.08.025).

Mobile air quality measurements using bicycle to obtain spatial distribution and high temporal resolution in and around the city center of Stuttgart, A. Samad and U. Vogt; *Atmospheric Environment* (January 2021), Vol. 244, 117915, [doi: 10.1016/j.atmosenv.2020.117915](https://doi.org/10.1016/j.atmosenv.2020.117915).

Quantifying road traffic impact on air quality in urban areas: A Covid19-induced lockdown analysis in Italy, Giovanni Gualtieri, et al.; *Environmental Pollution* (December 2020), Vol. 267, 115682, [doi: 10.1016/j.envpol.2020.115682](https://doi.org/10.1016/j.envpol.2020.115682).

Early Observations on the impact of the COVID-19 Lockdown on Air Quality Trends across the UK, Karl Ropkins and James Tate; *Science of The Total Environment* (in press), [doi: 10.1016/j.scitotenv.2020.142374](https://doi.org/10.1016/j.scitotenv.2020.142374).

Assessing the effects of mobility on air quality: The Liverpool Smart Pedestrian project, Nicolas Verstaebel, et al.; *Transportation Research Procedia* (2020), Vol. 48, pp. 2197-2206, [doi: 10.1016/j.trpro.2020.08.276](https://doi.org/10.1016/j.trpro.2020.08.276).

Urban air quality and meteorology on opposite sides of the Alps: The Lyon and Torino case studies, Matteo Bo, et al.; *Urban Climate* (December 2020), Vol. 34, 100698, [doi: 10.1016/j.uclim.2020.100698](https://doi.org/10.1016/j.uclim.2020.100698).

Emissions Measurements and Modelling

Assessment of a complete truck operating under dual-mode dual-fuel combustion in real life applications: Performance and emissions analysis, Antonio García, et al.; *Applied Energy* (December 2020), Vol. 279, 115729, [doi: 10.1016/j.apenergy.2020.115729](https://doi.org/10.1016/j.apenergy.2020.115729).

Characteristics of the real-driving emissions from gasoline passenger vehicles in the Kuala Lumpur urban environment, Nurzawani Sofwan and Mohd Latif; *Atmospheric Pollution Research* (in press), [doi: 10.1016/j.apr.2020.09.004](https://doi.org/10.1016/j.apr.2020.09.004).

The experimental study on transient emissions and engine behaviors of a sporting motorcycle under World Motorcycle Test Cycle, Jianqin Fu, et al.; *Energy* (November 2020), Vol. 211, 118670, [doi: 10.1016/j.energy.2020.118670](https://doi.org/10.1016/j.energy.2020.118670).

Physicochemical and mutagenic analysis of particulate matter emissions from an automotive diesel engine fuelled with fossil and biofuel blends, Federico Millo, et al.; *Fuel* (February 2021), Vol. 285, 119092, [doi: 10.1016/j.fuel.2020.119092](https://doi.org/10.1016/j.fuel.2020.119092).

A novel method for comparing passenger car fleets and identifying high-chance gross emitting vehicles using kerbside remote sensing data, Christopher Rushton, et al.; *Science of The Total Environment* (in press), [doi: 10.1016/j.scitotenv.2020.142088](https://doi.org/10.1016/j.scitotenv.2020.142088).

Generation of spikes in ultrafine particle emissions from a gasoline direct injection vehicle during on-road emission tests, Junshi Xu, et al.; *Environmental Pollution* (in press), [doi: 10.1016/j.envpol.2020.115695](https://doi.org/10.1016/j.envpol.2020.115695).

Palm oil biodiesel: An assessment of PAH emissions, oxidative potential and ecotoxicity of particulate matter, Silvana Arias, et al.; *Journal of Environmental Sciences* (March 2021), Vol. 101, pp. 326-338, [doi: 10.1016/j.jes.2020.08.022](https://doi.org/10.1016/j.jes.2020.08.022).

Evaluation of pure rapeseed oil as a renewable fuel for agricultural machinery based on emission characteristics and long-term operation behaviour of a fleet of 18 tractors, Johannes Ettl, et al.; *SN Applied Sciences* (2020), Vol. 2, 1711, [doi: 10.1007/s42452-020-03490-8](https://doi.org/10.1007/s42452-020-03490-8).

Emissions Control, Catalysis, Filtration

Selective catalytic reduction (SCR) system performance of a diesel passenger car in real-world conditions, Zamir Mera, et al.; *Applied Thermal Engineering* (in press), [doi: 10.1016/j.applthermaleng.2020.115983](https://doi.org/10.1016/j.applthermaleng.2020.115983).

Influence of exhaust gas temperature and air-fuel ratio on NO_x aftertreatment performance of five large passenger cars, Zamir Mera, et al.; *Atmospheric Environment* (in press), [doi: 10.1016/j.atmosenv.2020.117878](https://doi.org/10.1016/j.atmosenv.2020.117878).

Nonuniform Oxidation Behavior of Loaded Gasoline Particulate Filters, Melanie Moses-DeBusk, et al.; *Emission Control Science and Technology* (2020), Vol. 6, pp. 301-314, [doi: 10.1007/s40825-020-00166-y](https://doi.org/10.1007/s40825-020-00166-y).

Catalytic Paper Filters for Diesel Soot Abatement: Studies at Laboratory and Bench Scales, Nicolás Sacco, et al.; *Emission Control Science and Technology* (in press), [doi: 10.1007/s40825-020-00169-9](https://doi.org/10.1007/s40825-020-00169-9).

SCR-Filter Model Order Reduction (2): Proper Orthogonal Decomposition and Artificial Neural Network, Seun Olowojebutu, et al.; *Emission Control Science and Technology* (in press), [doi: 10.1007/s40825-020-00168-w](https://doi.org/10.1007/s40825-020-00168-w).

Turning poison into medicine: NH₃ or urea treatment leads to improved Pd-based three-way catalysts, Han Zhao, et al.; *Chemical Engineering Journal* (February 2021), Vol. 405, 126995, [doi: 10.1016/j.cej.2020.126995](https://doi.org/10.1016/j.cej.2020.126995).

Impact of washcoat distribution on the catalytic performance of gasoline particulate filters as predicted by lattice boltzmann simulations, Igor Belot, et al.; *Chemical Engineering Journal* (in press), [doi: 10.1016/j.cej.2020.127040](https://doi.org/10.1016/j.cej.2020.127040).

Significance of Oxygen Storage Capacity of Catalytic Materials in Emission Control Application, Deboshree Mukherjee and Benjamin Reddy; *Emiss. Control Sci. Technol.* (2020), [doi: 10.1007/s40825-020-00170-2](https://doi.org/10.1007/s40825-020-00170-2).

Leaching of platinum group metals from spent automotive catalysts using organic acids, Jessica de Oliveira Demarco, et al.; *Minerals Engineering* (December 2020), Vol. 159, 106634, [doi: 10.1016/j.mineng.2020.106634](https://doi.org/10.1016/j.mineng.2020.106634).

FORTHCOMING CONFERENCES

Putting the EU auto industry back on track post-COVID

20 October 2020, Online

www.acea.be/news/article/register-now-putting-the-eu-auto-industry-back-on-track-post-covid

ONLINE SIA Powertrain & Energy

3-4 November 2020

www.sia.fr/evenements/193-sia-powertrain-energy-rouen-2020

ONLINE 5th Green & Sustainable Chemistry Conference

8-11 November 2020

www.elsevier.com/events/conferences/green-and-sustainable-chemistry-conference

4th International FEV Conference: Zero CO₂ Mobility

10-11 November 2020, Aachen, Germany

www.fev.com/en/coming-up/fev-conferences/fev-conference-zero-co2-mobility

Hydrogen and P2X European Conference

25-26 November 2020, Copenhagen, Denmark

fortesmedia.com/hydrogen-p2x-2020,4,en,2,1,4.html

ONLINE 2020 Annual POLIS Conference

30 November-3 December 2020

www.polisnetwork.eu/2020-annual-polis-conference

The Polis Annual Conference provides an opportunity for cities and regions to showcase their transport achievement to large audience of mobility experts, practitioners and decision makers.

11th VERT Forum

25 March 2021, Dübendorf, Switzerland (postponed from March 2020)

www.vert-certification.eu

International Transport and Air Pollution Conference

30-31 March 2021, Graz, Austria (postponed from September 2020)

www.tapconference.org

The main topics of the 24th TAP Conference include energy consumption and GHG emissions from vehicles, open issues for pollutant emissions, such as tampering, retrofits of software and hardware and non-regulated pollutants, emissions from non-road mobile machinery and other transport modes and measurements and simulation of traffic related environmental impacts and air quality.

9th AVL Large Engines Techdays

21-22 April 2021, Graz, Austria

www.avl.com/large-engines-techdays

42nd International Vienna Motor Symposium

28-30 April 2021, Vienna, Austria

wiener-motorensymposium.at/en/

8th International MinNOx Conference

16-17 June 2021, Berlin, Germany (postponed from September 2020)

www.iav.com/en/events/minnox

SAE Heavy-Duty Diesel Emissions Control Symposium

5-6 October 2021, Gothenburg, Sweden (postponed from October 2020)

www.sae.org/attend/heavy-duty-diesel-emissions-control-symposium