

NEWSLETTER

International Regulatory Developments

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AECC Video on Swift Adoption of Euro 7

On 23 January 2023, AECC launched a short video calling for swift adoption of Euro 7 emission standards. The video explains that AECC has shown it is technically feasible to achieve zero impact emissions from light- and heavy-duty vehicles with affordable emissions control technology.



The video can be found on LinkedIn at [linkedin.com/feed/update/urn:li:activity:7023723918054060033](https://www.linkedin.com/feed/update/urn:li:activity:7023723918054060033), and in AECC's YouTube channel at [youtube.com/watch?v=G3J4LcNjST8](https://www.youtube.com/watch?v=G3J4LcNjST8).

EUROPE

Special Address by President von der Leyen at World Economic Forum

On 17 January 2023, European Commission President von der Leyen gave a special address at the World Economic Forum in Davos, Switzerland.

This included an announcement of a Green Deal Industrial Plan to "make Europe the home of clean tech and industrial innovation on the road to net zero." The four pillars of the plan will cover the regulatory environment, financing, skills and trade.

Ms von der Leyen said that the EU needs to create a regulatory environment that allows the Union to scale up fast and to create conducive conditions for sectors crucial to reaching net zero. To help make this happen, the Commission will put forward a new Net-Zero Industry Act, which will identify clear goals for European clean tech by

2030. The aim will be to focus investment on strategic projects along the entire supply chain. The Net-Zero Industry Act will go hand in hand with the Critical Raw Materials Act, with the aim of improving the refining, processing and recycling of raw materials in Europe.

The full speech is available to read at ec.europa.eu/commission/presscorner/detail/en/speech_23_232.

Swedish EU Presidency Programme

The Swedish Presidency programme sets out the priorities and main direction for the Swedish Presidency of the Council of the European Union from 1 January until 30 June 2023.

In the field of transport, the programme states that putting in place the regulatory framework required to achieve the EU climate targets and reduce EU greenhouse gas emissions by at least 55% by 2030 is a priority. The Presidency therefore intends to focus on dialogues on transport legislation within the 'Fit for 55' package.

Regarding its environmental priorities, the programme says environment and climate issues are high on the EU agenda, and a large number of proposals are already on the table or will be presented by the Commission in the near future. The 'Fit for 55' proposals presented in July 2021 lay the foundations for the way in which the EU will achieve its climate targets.

It goes on to say that the pricing of carbon dioxide emissions is crucial, and emissions trading is a mainstay of the EU's climate framework. Certification of carbon sequestration and carbon capture is expected to be important in the future, not least for the development of biogenic carbon capture. The rate of transition and electrification in the EU's world-leading automotive industry is an excellent example of the significance of the green transition in driving innovation.

The EU's actions for the climate transition within the Union affect the whole world's prospects of achieving the commitments in the Paris Agreement. For this reason, the Swedish Presidency will prioritise moving the negotiations on any remaining parts of the 'Fit for 55' package forward with a high level of ambition in the Environment Council.

A review of the CO₂ emissions standards for new heavy-duty vehicles will provide an important framework for accelerating the transition of the transport sector.

Within the internal market and industry goals, the Swedish Presidency will prioritise the Euro 7 emissions standards for combustion engine vehicles and intends to initiate negotiations in the Council.

The Swedish Presidency programme can be found at swedish-presidency.consilium.europa.eu/en/programme-of-the-presidency.

ENVI Committee Exchange of Views on Euro 7 Proposal

On 24 January 2023, the Environment (ENVI) Committee of the European Parliament held an exchange of views with the European Commission's DG-GROW on the new proposal on Euro 7 cars.

Ms Maive Rute (DG-GROW) presented the Euro 7 proposal. She emphasised the need to act, saying it is important because of the 70 000 premature deaths due to road transport emissions. She noted that internal combustion engine (ICE) vehicles will stay in the market for a long time, and it is therefore important that they should comply throughout their lifetime. Euro 7 will cover the short trips in the city and the new proposal will increase the requirements for durability of these vehicles from five to ten years. Euro 7 also includes provisions for brakes and tyres. Ms Rute noted the reasonable costs to implement Euro 7 compared to the benefits that will be seen. She added that Euro 7 is a future-proof regulation and that swift adoption is crucial in order to allow improvements in air quality as soon as possible.

Rapporteur MEP Alexandr Vondra (ECR, CZ) agreed that this file is environmentally significant, and that the EP needs to prepare well and to give certainty to the industry, particularly in view of the electric transition. He said the EC claims it does not want to slow down electrification, but questioned what benefit the EC expects, given that this proposal will need significant investment in ICE development. Mr Vondra's view is that compliance for cars and LCV seems highly ambitious and has failed to identify the needs for these sectors. He asked if the Commission could confirm that the Euro 7 technology update implementation is feasible. As new measures and conditions will be found out at a later stage through comitology, he also asked the EC to explain why the compliance dates are not linked to adoption of secondary regulation and how it thinks the implementation can be done on a single date. Finally, MEP Vondra highlighted the 'cubanisation' of the fleet, whereby vehicles can prevent fleet renewal as a result of being too expensive.

Other MEPs covered a range of issues and concerns raised by the Euro 7 proposal. MEP Jens Gieseke (EPP, DE) asked about the costs and benefits of the tyre and brake requirements for heavy-duty vehicles and wondered who would be investing in ICE in future. MEP Christel Schaldemose (S&D, DK) said it is very important to have stringent rules but was disappointed as EC has not introduced stricter limits for diesel and gasoline cars. She stressed the importance of finishing with this dossier before the end of the existing Parliament's mandate in 2024. MEP Susana Solís Pérez (Renew, ES) noted that Europe has shown that it can go further, as it did on CO₂, and said the initial proposal is a good start, with reasonable limits. In her view the EP's timing is not ambitious enough, as deciding in 2024 and implementing in 2025 is not realistic for the industry. MEP Eickhout (Greens, NL) said the Greens are not

happy with the proposal and the Commission has not even considered the limits in the middle scenario of its impact assessment. He noted that the standards need to be strengthened to comply with air quality standards. Regarding fairness, he said the durability requirements are low, stating that these vehicles will end up in the eastern part of Europe which will then suffer with air quality problems. Mr Eickhout said standards in USA and China are more ambitious than the Euro 7 proposal. MEP Sylvia Limmer (ID, DE) questioned why technology that will be prohibited in future should be incentivised.

Ms Rute, Mr Mark Nicklas and Dr Panagiota Dilara from DG-GROW responded to the MEPs' comments. Ms Rute stressed that the proposal tries to have a balanced approach, acknowledging the importance of improved air quality but also for the proposal to be able to be implemented. Mr Nicklas said the Commission had found the right balance between achieving air quality requirements, but with those parts that will have the best cost-benefit. He added that the industry will need to focus its investment in decarbonisation and this is why the requirements can improve air quality with available technologies without making vehicles more expensive. Mr Nicklas said it was important to look at the whole package. For heavy-duty he agreed that the application date is ambitious but stated it is necessary to enable industry to have certainty for return on its investment. Dr Dilara said DG-GROW is working hard on the implementing regulations, which will ideally be ready and published by mid-2024. This will complete the package at the same time as the co-decision process is expected to be finished. Regarding the comparison with US and Chinese limits, she said the methodology is also very important and she reminded the MEPs that US vehicle tests are carried out in the laboratory. On the subject of durability, Dr Dilara pointed out that the proposal requires sensors in the vehicle to continue to work and to make sure that if a vehicle exceeds the limits they need to be stopped.

Finally, the Commission mentioned its current work on the Euro 7 Implementing Regulations, which would be published ideally around mid-2024.

A video of the session (09.04-09.55) can be viewed at multimedia.europarl.europa.eu/en/webstreaming/committees_20230124-0900-COMMITTEE-ENVI.

Swedish Presidency Presentation to ENVI Committee

On 23 January 2023, Ms Pourmokhtari, Swedish Minister for Climate and Environment, presented the Swedish Presidency programme to the European Parliament's Environment (ENVI) Committee. She said Sweden intends to make Europe greener, safer and freer, and that the shift from fossil fuel is vital for our security and a priority for the Swedish Presidency. She added that the 'Fit for 55' package is fundamental to boost the economy and further work on

energy and transport will be prioritised. Work will continue on the remaining climate files, and there is a Council mandate to commence negotiations on CO₂ emission standards for heavy duty vehicles. Pollution is one of the most prominent problems in everyday life, so the Presidency intends to make as much progress as possible on the Ambient Air Quality Directive.

The group coordinators then commented and raised questions MEP Liese (EPP, DE) mentioned 'Fit for 55' and the international agenda, saying more ambitious coalitions are needed. MEP Wolkien (S&D, DE) pointed out that Swedish MEPs had voted against the Climate Law and other 'Fit for 55' files and the Swedish government is dismantling climate measures, MEP Torvalds (Renew, FI) said the Renewable Energy Directive (RED) dossier being discussed now has a completely different context with the war, and asked how the Presidency intends to deal with the issue of damaging subsidies as these are promoting uneconomical use of forests. MEP Paulus (Greens, DE) said that in relation to the industrial Emissions Directive, we need to consider not only the cost for industry but also the cost for society. MEP Modig (GUE, FI) asked whether the Presidency's priority would be energy or climate.

Ms Pourmokhtari said work in the Council will not be blocked by Swedish democrats. The day to day work in Council is something the Government is responsible for and the Swedish democrats are not part of that. This was a precondition to her party (Liberals) joining the coalition.

During further questions from MEPs, MEP Lopez (S&D, ES) said that Sweden is stopping all subsidies. He noted air quality and asked for the Council to work for a mandate on the Air Quality Directive in the first semester. MEP Vondra (ECR, CZ) asked if the Presidency will overburden EU companies with a lot administrative requirements through the regulations now being concluded. He asked for elaboration on the Member States' position on Euro 7 and a likely timeline in the Council.

Ms Pourmokhtari replied that air quality needs to be improved and that we need to see how the green transition can lead to better standards. On the revision of the Air Quality Directive, this means stronger rules and the EC impact assessment shows the proposal makes a contribution towards improving air quality. Sweden will make this a priority. The Presidency wants to see ambition and we would like to see a good discussion on this topic and to be in a good position for the Spanish Presidency afterwards. She said as much progress as possible will try to be completed on RED. Finally, she said Euro 7 is still on the early days of the negotiations, but it is being given high priority and Sweden will be looking for a high level of ambition.

A video of the meeting can be viewed at multimedia.europarl.europa.eu/en/webstreaming/committees_20230123-1500-COMMITTEE-ENVJ.

EC Response to Parliamentary Question on ICE Phase-Out in Denmark

On 12 January 2023, European Commission Executive Vice-President Timmermans provided a response to a written question from Danish MEP Ms Kira Marie Peter-Hansen (Greens/EFA). She asked if it will be possible for Denmark to phase out petrol and diesel cars as early as 2025.

In his reply, Mr Timmermans said that in the context of the provisional agreement reached between the European Parliament and the Council on the revision of the regulation setting CO₂ emission standards for passenger cars and light commercial vehicles, which includes a zero-emission target for the fleet of new vehicles registered from 2035 onwards, actions taken by Member States to incentivise the deployment of zero-emission vehicles in the EU market are welcome.

He went on to say that this could be achieved for example by purchase incentives for zero-emission vehicles or through fiscal measures based on a vehicle's CO₂ emissions, such as tax exemptions for zero-emission vehicles, and targeted registration or circulation taxes or tolls.

Mr Timmermans added that all such national actions will have to be in line with the EU's internal market rules. Measures that may be considered as technical regulations within the meaning of Directive (EU) 2015/1535 must be notified to the Commission for determining whether they constitute a barrier to trade, and this will be assessed on a case-by-case basis.

The question from Ms Peter-Hansen can be found at europarl.europa.eu/doceo/document/P-9-2022-003657_EN.html with the response from Mr Timmermans at europarl.europa.eu/doceo/document/P-9-2022-003657-ASW_EN.html.

Publication of UN Regulation No. 49 in Official Journal

On 16 January 2023, UN Regulation No. 49 07 series of amendments, regarding uniform provisions concerning the measures to be taken against the emission of gaseous and particulate pollutants from compression-ignition engines and positive ignition engines for use in vehicles was published in the Official Journal of the European Union.

The Regulation applies to motor vehicles of categories M1, M2, N1 and N2 with a reference mass exceeding 2 610 kg and to all motor vehicles of categories M3 and N3.

At the request of the manufacturer, the type approval of a completed vehicle given under this Regulation shall be extended to its incomplete vehicle with a reference mass below 2 610 kg. Type approvals shall be extended if the manufacturer can demonstrate that all bodywork combinations expected to be built onto the incomplete vehicle increase the reference mass of the vehicle to above 2 610 kg.

At the request of the manufacturer, the type approval of a vehicle granted under this Regulation shall be extended to its variants and versions with a reference mass above 2 380 kg provided that it also meets the requirements relating to the measurement of greenhouse gas emissions and fuel consumption in accordance with paragraph 4.2. of the Regulation.

Vehicles of up to 2 840 kg reference mass to which an approval to UN Regulation No. 83 or UN Regulation No. 154 has been granted as an extension, do not need to be approved according to this Regulation.

The full Regulation can be found at eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_2023.014.01.0001.01.

EPRS Report on Impact of Increasing Fuel Prices on Transport

On 12 January 2023, the European Parliamentary Research Service (Think Tank) published the seventh edition of its annual publication aimed at identifying and framing some of the key issues and policy areas that have the potential to feature prominently in public debate and on the policy agenda of the European Union over the coming year.

One of the topics is the impact of increasing fuel prices on transport. The report says that a rise in fossil fuel prices impacts several dimensions of the transport system, including structural impacts on usage levels, modal shifts, new network configurations and supply chains.

The report considers whether the increase in prices will have a favourable impact on the speed of transition towards greener transport modes or the use of more renewable energy, and if it will lead to a reduction in greenhouse gas (GHG) emissions. As the majority of GHG emissions from transport are CO₂ emissions from the combustion of petroleum-based fuels, reduced consumption of fossil fuels as a result of increasing prices could lead to lower GHG emissions. This could have the result that emissions targets can be reached more quickly. Emissions can also be reduced through the use of higher shares of advanced biofuels and a more ambitious quota for renewable fuels of non-biological origin such as hydrogen. The report says this is encouraged at EU level in the proposed revision of the Renewable Energy Directive and REPowerEU plan, aiming for a higher renewable energy target.

The report goes on to say that the use of fuels produced using renewable energy and the use of biofuels is less costly and leads to lower emissions. Nevertheless, it says this can be a solution only in the long or medium term, as it requires technical adaptation or even the construction of new types of engines. Recent research also shows that the use of e-fuels costs 47% more than battery electric vehicles. In the long run however, technological developments will make it

possible to reverse this tendency and to advance on the road to greener transport.

The Think Tank report can be found at epthinktank.eu/2023/01/12/how-will-increasing-fuel-prices-impact-transport-ten-issues-to-watch-in-2023/.

Non-Paper by Four EU Member States on Transition to Zero-Emission HDVs

On 20 January 2023, four EU Member States (Netherlands, Belgium, Denmark and Luxembourg) published a non-paper on the transition to zero-emission heavy-duty vehicles (HDVs).

The group says it welcomes the Commission's intention to revise the CO₂ standards for HDVs and adds that an ambitious revision is much needed to contribute to a reduction of the emissions of road transport in line with the Paris Agreement, the European Climate Law and Member States targets under the Effort Sharing Regulation (ESR). It goes on to say that currently, emissions from road transport are clearly not on a Paris aligned trajectory. At the same time, there are vast opportunities to abate the emissions of the sector given the increasingly growing availability of cost-effective solutions. An increasing number of European manufacturers (OEMs) in the heavy-duty segment have already made public commitments to increase the roll-out of zero-emission vehicles (ZEVs) in the near future, which gives confidence that total cost of ownership (TCO) parity of long-haul zero-emission HDVs will be reached within the foreseeable future.

The document states that the Commission proposal should contain three core elements. The first of these is a 100% zero emission target for new HDVs in the EU, in line with the EU objective of climate neutrality by 2050. The group also calls for a strengthened 2030 target, building on the ambitions expressed by frontrunning OEMs and fleet owners, as well as application of the CO₂ standards to more vehicle categories than covered under the current scope. It explains that the current CO₂ reduction targets are only applicable to a small share of freight vehicles on the road, leaving almost 35% of emissions out of scope.

The four Member States say that in reaching these targets a technology-neutral approach in setting the new standards for tail pipe emissions continues to be appropriate, and calls on the Commission to publish the proposal to revise the CO₂ standards for HDVs as soon as possible.

The non-paper is available at permanentrepresentations.nl/pr-eu/documents/publications/2023/01/20/joint-non-paper-co2-hdv.

European Infringement Decisions on Air Quality and Emissions

On 26 January 2023, the European Commission published its regular package of infringement decisions.

In the area of clean air, the Commission calls on 14 Member States to reduce emissions of several air pollutants, as required by Directive 2016/2284 on the reduction of national emissions of certain atmospheric pollutants (the 'National Emission Ceilings' or 'NEC Directive'). The 14 Member States mentioned above have failed to meet their commitments for one or several pollutants targeted by the NEC Directive. Moreover, since the measures set out in the NAPCP of most of these Member States have not ensured reaching the emission reduction commitment for one or several pollutants, these measures are not sufficient to limit the annual human-caused emissions as required by the Directive. Ammonia (stemming from the agricultural sector) is the pollutant for which most of these Member States do not comply with their obligations.

The infringement announcement can be read in full at ec.europa.eu/commission/presscorner/detail/en/inf_23_142.

NORTH AMERICA

US National Blueprint for Transportation Decarbonisation

On 10 January 2023, the US Administration released the U.S. National Blueprint for Transportation Decarbonization. Developed by the departments of Energy, Transportation, Housing and Urban Development, and the EPA, the Blueprint offers a whole-of-government approach to addressing the climate crisis and meeting President Biden's goals of a 100% clean electrical grid by 2035 and net-zero carbon emissions by 2050.

The press release says that the transportation sector – which includes all modes of travel through land, air, and sea to move people and goods – accounts for a third of all domestic greenhouse gas emissions, negatively affecting the health and wellbeing of millions of Americans, particularly those in disadvantaged communities. Transportation costs are the second largest annual household expense in our country and for the poorest Americans, the financial burden of transportation is disproportionately and unsustainably high.

It goes on to say that a well-planned transition to a decarbonised transportation system can address these and other inequities and provide equitable, affordable, and accessible options for moving people and goods. Further developing and deploying clean-energy technologies such as electric vehicles and hydrogen and sustainable fuels, while also building out the supporting infrastructure for clean transportation will create good-paying jobs across all segments of the transportation sector and strengthening America's energy independence.

The Blueprint lays out three key strategies to achieve decarbonisation. It aims to increase convenience by supporting community design and land-use planning at the local and regional levels that ensure that job centres, shopping, schools, entertainment, and essential services are strategically located near where people live to reduce commute burdens, improve walkability and bikeability, and improve quality of life. Second, the Blueprint looks to improve efficiency by expanding affordable, accessible, efficient, and reliable options like public transportation and rail, and improving the efficiency of all vehicles.



Finally, it will aid a transition to clean options by deploying zero-emission vehicles and fuels for cars, commercial trucks, transit, boats, airplanes, and more. This is expected to drive the majority of emissions reductions. A successful transition will require various vehicle and fuel solutions and must consider full life-cycle emissions. This Blueprint focuses on each major transportation mode and identifies specific decarbonisation opportunities and challenges, highlighting the role of various clean technologies for various applications.

Technology solutions for travel modes to reach a net-zero economy in 2050			
	BATTERY/ELECTRIC	HYDROGEN	SUSTAINABLE LIQUID FUELS
Light Duty Vehicles (49%)*	3 icons	—	TBD
Medium, Short-Haul Heavy Trucks & Buses (~14%)	2 icons	1 icon	1 icon
Long-Haul Heavy Trucks (~7%)	1 icon	3 icons	2 icons
Off-road (10%)	2 icons	1 icon	1 icon
Rail (2%)	2 icons	2 icons	1 icon
Maritime (3%)	1 icon	2 icons	2 icons
Aviation (11%)	1 icon	1 icon	2 icons
Pipelines (4%)	2 icons	TBD	TBD
Additional Opportunities	<ul style="list-style-type: none"> Stationary battery use Grid support (managed EV charging) 	<ul style="list-style-type: none"> Heavy industries Grid support Feedstock for chemicals and fuels 	<ul style="list-style-type: none"> Decarbonize plastics/chemicals Bio-products
RD&D Priorities	<ul style="list-style-type: none"> National battery strategy Charging infrastructure Grid integration Battery recycling 	<ul style="list-style-type: none"> Electrolyzer costs Fuel cell durability and cost Clean hydrogen infrastructure 	<ul style="list-style-type: none"> Multiple cost-effective drop-in sustainable fuels Reduce ethanol carbon intensity Bioenergy scale-up

* All emissions shares are for 2019. † Includes hydrogen for ammonia and methanol.

The Blueprint and Fact Sheet can be downloaded from energy.gov/eere/us-national-blueprint-transportation-decarbonization-joint-strategy-transform-transportation.

US EPA Proposal to Strengthen Air Quality Standards for PM_{2.5}

On 6 January 2023, the US EPA announced a proposal to strengthen a key national ambient air quality standard (NAAQS) for fine particle pollution, also known as PM_{2.5}, to better protect communities, including those most overburdened by pollution.

EPA’s proposal will specifically take comment on strengthening the primary (health based) annual PM_{2.5} standard from a level of 12 micrograms per cubic meter to a level between 9 and 10 micrograms per cubic meter, reflecting the latest health data and scientific evidence; the Agency is also taking comment on the full range (between 8 and 11 micrograms per cubic meter) included in the Clean Air Scientific Advisory Committee’s (CASAC) latest report.

Since EPA completed its last review of the PM NAAQS in 2012, thousands of new scientific studies have demonstrated the dangers of soot exposure. Strengthening the primary annual PM_{2.5} standard is expected to address disparities and would result in significant public health benefits. EPA estimates that if finalised, a strengthened primary annual PM_{2.5} standard at a level of 9 micrograms per cubic meter, the lower end of the proposed range, would prevent up to 4 200 premature deaths per year, 270 000 lost workdays per year, and would result in as much as \$43 (€39.9) billion in net health benefits in 2032.

EPA will accept public comment for 60 days after the proposal is published in the Federal Register.

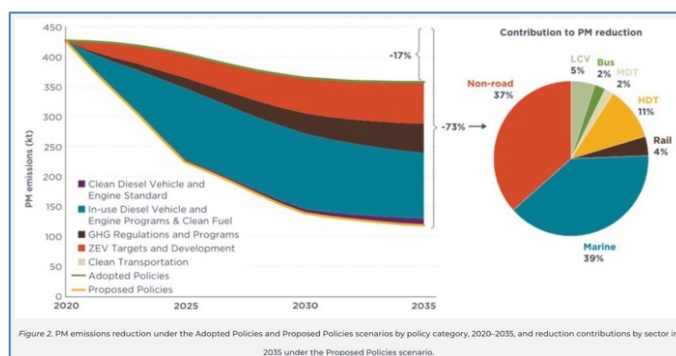
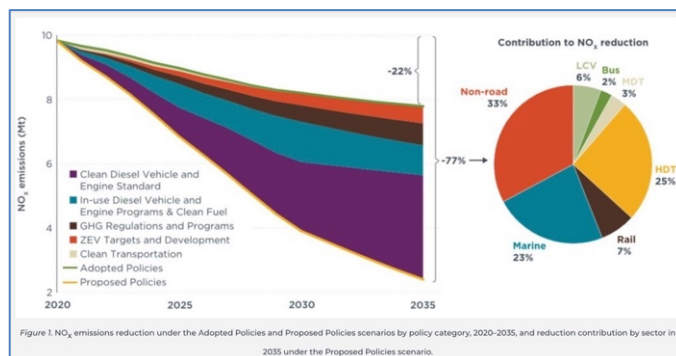
Further details can be found at [epa.gov/newsreleases/epa-proposes-strengthen-air-quality-standards-protect-public-harmful-effects-soot](https://www.epa.gov/newsreleases/epa-proposes-strengthen-air-quality-standards-protect-public-harmful-effects-soot).

ASIA-PACIFIC

ICCT Benchmarking of China’s Clean Diesel Programme

On 10 January 2023, the International Council on Clean Transportation (ICCT) published a research report assessing potential diesel emissions reductions from four transportation sectors – on-road vehicles, non-road machinery, rail engines, and marine vessels – and from strategies that China could consider adopting by 2035. The study models both an Adopted Policies scenario that represents policy measures and associated clean technologies adopted as of October 2022 and a Proposed Policies scenario that is a set of world-class policy measures and clean technology requirements taken from international best practices, especially California.

Results show that the Proposed Policies scenario brings significantly higher emissions reduction benefits than the Adopted Policies scenario. As shown in the figures below, emissions of nitrogen oxides (NOx) and particulate matter (PM) from the diesel transportation sector are estimated to be reduced by 77% and 73%, respectively, in 2035 compared with the 2020 baseline in the Proposed Policies scenario.



Meanwhile, the Adopted Policies scenario is estimated to only achieve 21% and 17% reductions, respectively.

ICCT adds that while this study mostly focused on criteria air pollutants, many of the policies considered are also projected to deliver significant reductions in climate pollutants. Key policies include strengthened greenhouse gas (GHG) emission standards for on-road vehicles, progressive vehicle and engine electrification targets, and modal shift from truck to rail. Under the Proposed Policies scenario, TTW CO_{2eq} emissions are estimated to be reduced by 36% in 2035 compared to the 2020 baseline, and under the Adopted Policies scenario, the TTW CO_{2eq} emissions are expected to be 12% higher in 2035.

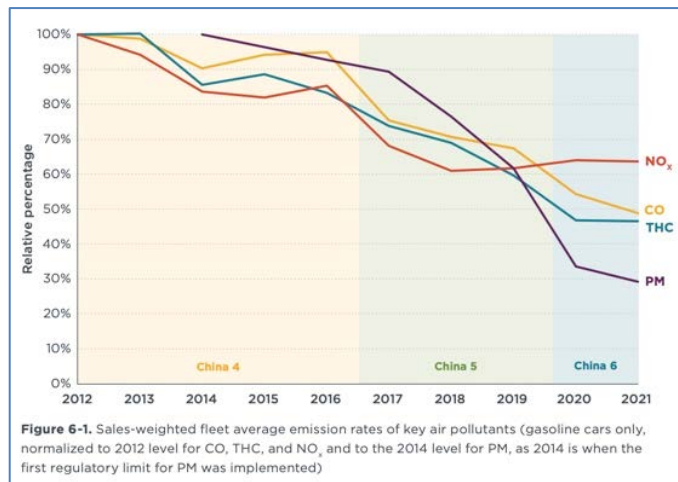
The study can be downloaded from theicct.org/publication/china-clean-diesel-hii-jan23/.

ICCT Report on Passenger Car Trends in China

On 17 January 2023, the International Council on Clean Transportation (ICCT) published a report on trends of new passenger cars in China from 2012 to 2021, with particular focus on air pollutant and CO₂ emissions and technologies. ICCT collaborated with the Vehicle Emissions Control Centre (VECC) in collecting, compiling, cleaning, and validating some of the data used, and the report also assesses how previous policies impacted emissions trends.

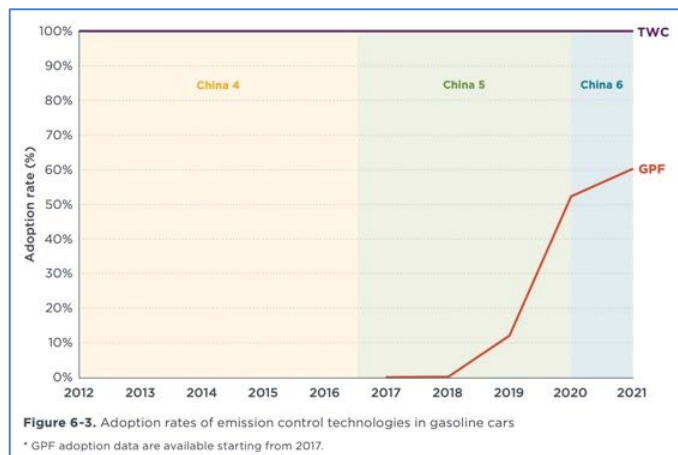
ICCT says the certified CO₂ emission rate of the entire new passenger car fleet, normalised to the New European Driving Cycle (NEDC), decreased by 18% from 2012 to 2021, to 129 g/km, and there was an average annual reduction of 2.2%.

The most rapid single-year reduction, 9%, was from 2020 to 2021 as a result of the dramatic increase in the share of new energy vehicles. When solely looking at internal combustion engine vehicles, ICCT says the reduction in CO₂ emission intensity is less remarkable.

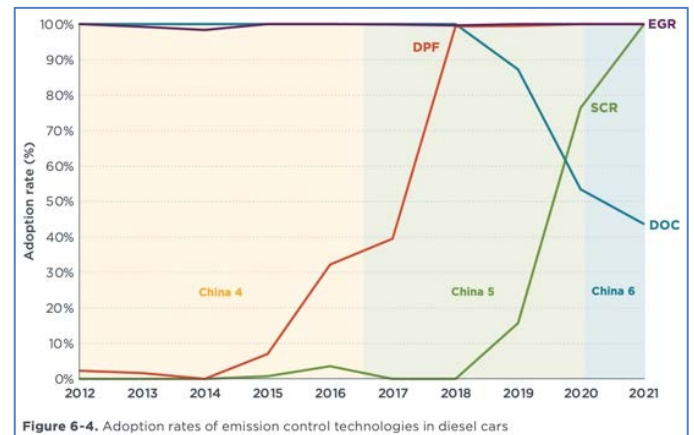


The report says there has been significant progress in controlling air pollutant emissions in the past decade and it is due to the constantly evolving regulatory standards and the penetration of advanced emission control technologies. The laboratory emission intensities of nitrogen oxides (NO_x) declined by over 30% and particulate matter declined by over 70% in the past decade. The average on-road NO_x emission level of passenger cars certified to the China 6 standard is currently in compliance with both China 6a and 6b regulatory requirements.

Regarding emission control technologies, the report says while three-way catalyst (TWC) is a fully fledged technology and has long been used in the gasoline car fleet, the gasoline particulate filter (GPF) is an emergent technology that has increased its presence in a remarkable way, from zero in 2017 to 60% in 2021; this was driven by the China 6 emissions requirements.



For diesel cars, exhaust gas recirculation (EGR) is mostly universally present. Diesel particulate filters (DPFs) and selective catalytic reduction (SCR) started to gain massive popularity in 2014 and 2018, respectively, and quickly became 100% adopted fleet-wide in 3–4 years. On the contrary, a formerly fully present technology, the diesel oxidation catalyst (DOC), has been seen less since 2018. As of 2021, less than 50% of diesel PCs used a DOC.



The report is available to read at theicct.org/wp-content/uploads/2023/01/China-PV-trends_final.pdf.

UNITED NATIONS

Carbon Life Cycle Assessment

Since October 2022, the new Informal Working Group on Carbon Life Cycle Assessment (LCA IWG) has held three meetings, following a workshop on Carbon LCA held on 31 May 2022 prior to the June session of the Working Party on Pollution and Energy (GRPE) (See AECC Newsletter from June 2022). The outcome of the work is to develop a UN Resolution on LCA, with a target date for adoption by GRPE of June 2025.

The objective of the IWG is to develop an internationally harmonised procedure to determine the carbon footprint of different technologies, also considering energy use, for energy pathways and automotive types from production to use and disposal.

In parallel with this work, other organisations (commercial and NGOs) are developing their own LCA tools. One example of this is Green NCAP, an independent initiative which ‘promotes the development of cars which are clean, energy efficient and cause as little harm to the environment as possible’. The consortium comprises European governments, motoring clubs, consumer groups and universities. In December it launched an LCA interactive tool that allows comparisons of vehicle data drawn from a database that, amongst others, contains vehicles tested by Green NCAP and by the Ecotest programme. This tool offers full transparency on assumptions and statistics (e.g., the electric energy mixes), and the tool is able to compare up to

three vehicles and two countries. Finally, this tool considers all relevant greenhouse gases (GHGs) – methane, nitrous oxide and carbon dioxide – as well as primary energy demand.

Concawe, the scientific arm of the European fuel industry, has also developed a tool for considering LCA of vehicles. As powertrains diversify in their electrification levels and fuel production pathways, the carbon footprint over their life cycle heavily depends on their use cases (e.g., driving profile) and context of use (e.g., carbon intensity of electricity). The tool covers Hybrids (HEV), Plug-in Hybrids (PHEV) and Battery Electric Vehicles (BEV) and a variety of fossil and renewable fuel production routes. This interactive tool allows for the design of several scenarios combining these parameters and also comparison of their environmental performance.

It is expected that LCA will in future determine the total GHG emissions from vehicles. Back in October 2022, the European Council and the European Parliament reached a provisional political agreement on stricter CO₂ emission performance standards for new cars and vans. The agreement reinforces other provisions in the regulations and includes a mandate to the Commission to develop a common EU methodology, by 2025, for assessing the full life cycle of CO₂ emissions of cars and vans placed on the EU market, as well as for the fuels and energy consumed by these vehicles. Based on this methodology, manufacturers may, on a voluntary basis, report to the Commission on the life cycle emissions of the new vehicles they place on the market.

Further details on the IWG LCA can be found at unece.org/sustainable-development/news/unece-starts-regulatory-work-automotive-life-cycle-assessment

Further information on various LCA tools can be found at greenncap.com/lca-explained/.
carsco2comparator.eu/life-cycle/.

The press release on the interinstitutional agreement for CO₂ emissions for new cars and vans is available at consilium.europa.eu/en/press/2022/10/27/first-fit-for-55-proposal-eu-strengthens-targets-for-co2-emissions-for-new-cars-and-vans/.

GENERAL

ICCT Analysis of European Commission Euro 7 Proposal

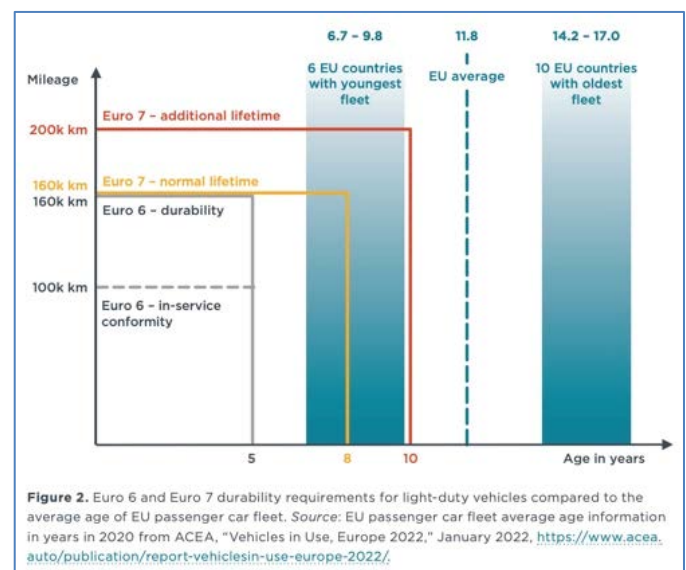
On 20 January 2023, the International Council on Clean Transportation (ICCT) published a report analysing the regulatory changes included in the European Commission's Euro 7 proposal, discussing the proposal's shortcomings, and recommending improvements to the regulation.

ICCT says the proposed Euro 7 regulation lacks ambition, especially for light-duty vehicles. For cars and vans, it says the proposal does not significantly increase the stringency of pollutant emission limits compared to Euro 6, nor does it widen the normal RDE boundary conditions. The proposal also fails to adjust the durability requirements to values

representative of the useful life of vehicles in the European Union. To further strengthen the Euro 7 regulation and to bring it closer to the European Commission's own impact assessment and its longer-term policy targets, ICCT calls on the European Parliament and the Council of the European Union to consider certain 'improvements'.

Regarding light-duty emission limits, ICCT wants to see them adjusted to 30 mg/km for nitrogen oxides (NO_x), 2 mg/km for particle mass, 400 mg/km for carbon monoxide (CO), 45 mg/km for non-methane organic gases (NMOG), and to 1.0e11 #/km for particle number. A combined methane (CH₄) + nitrous oxides (N₂O) limit of 45 mg/km and a formaldehyde (HCHO) limit of 5 mg/km is also proposed. Boundary RDE testing conditions for light-duty vehicles should be adjusted to -7 to 35 °C and 0 to 1 600 m, according to the NGO.

For the voluntary Euro 7+ level, ICCT says the limits should be at least 33% below the Euro 7 emission limits, with the normal lifetime of vehicles increased to at least 200 000 km or 10 years and the extended lifetime to 240 000 km or 15 years.



For electrified vehicles, ICCT's proposal is to increase the battery durability lifetime to 10 years or 240 000 km and raise the performance retention requirement from 70% to 80% from 2030 onwards.

For heavy trucks and buses, ICCT wants to see the lifetime increased to 1.3 million km and to 560 000 km for medium trucks and buses.

For on-board emissions monitoring, ICCT wants pollutants to be measured by the on-board emissions monitoring system based on sensor availability and define the pollutants that should be included in the monitoring as soon as sensors become available. It also wants the on-board emission monitor to be used as an indicator for in-service conformity testing eligibility.

The report can be downloaded from theicct.org/publication/euro7-analysis-recommendations-jan23/.

DUH Real-World Measurements of Euro V and VI Truck Emissions

On 5 January 2022, Deutsche Umwelthilfe (DUH) published a press release claiming that emissions measurements on 235 trucks on the road show indications of illegal defeat devices by truck operators.

DUH carried out measurements in real operation on 235 truck models of the Euro V and VI emission standards and found that the limit values were exceeded in almost half. More than three years ago, the DUH says it had already proven that limit values were exceeded, in some cases massively, and made the results available to the Federal Ministry of Transport and the Federal Office for Goods Transport. It adds that it is now "clear that the responsible authorities did not implement the emission controls and sanctions required at the time".

The reason for the new measurements was, among other things, the increased AdBlue price and the resulting assumption of the increasing use of illegal AdBlue emulators. By installing an emulator, the function of the catalytic converter is reduced by reducing or completely stopping the supply of the necessary urea AdBlue. Operators can gain an economic advantage in this way – however, reducing the urea supply causes increases in nitrogen oxide emissions.

The current series of measurements consists of around 90% Euro VI trucks, as the number of Euro V trucks is falling. The measured Euro VI trucks emit an average of 708 mg NO_x/kWh. The range goes as high as 10 141 mg NO_x/kWh. While the current legal nitrogen oxide limit for Euro VI trucks is still 460 mg/kWh, the EU Commission's draft provides for a value of 90 mg/kWh for Euro VII trucks.

According to DUH, the outliers are mainly found among the Euro VI models: almost 14% of the Euro VI trucks are responsible for half of the total NO_x emissions of the Euro VI fleet. DUH says the reasons for this are a lack of inspections and maintenance of exhaust gas cleaning, the installation of AdBlue emulators and a lack of controls and penalties.

The DUH press release can be found at duh.de/presse/pressemitteilung/alarmierende-abgasmessungen-der-duh-fast-jeder-zweite-lkw-zeigt-ueberhoehnte-stickox/.

State of Global Air EU Regional Air Quality Snapshot

On 18 January 2023, the State of Global Air (SoGA) released a new European Union Regional Air Quality Snapshot that finds air pollution is a significant environmental health threat, and that air quality remains a concern in cities across the EU. This new data comes at a time when proposals to align the EU Air Quality Limit Values more closely to the 2021 World Health Organization Air Quality Guidelines are in discussion.

Using 2019 data, only 120 EU cities (22%) meet the new proposed 10 µg/m³ limit value for PM_{2.5}, while 454 cities (84%) meet the proposed 20 µg/m³ target for NO₂. Hot spots for poor air quality can be seen in cities across Central and Eastern Europe. There are also important regional differences in relative contribution of fossil fuels to outdoor fine particulate matter (PM_{2.5}) levels. For example, coal combustion is the primary contributor in Eastern and Central Europe, while oil and gas combustion are larger contributors in Western Europe.

Across the EU, average PM_{2.5} exposure was 13.5 µg/m³, nearly 35% higher than the newly proposed EU air quality limit value of 10 µg/m³. On the other hand, the average exposure for NO₂ was 16.8 µg/m³ — 16% lower than the newly proposed EU air quality limit value of 20 µg/m³. Notably, 15 out of the top 20 cities with the highest PM_{2.5} exposures in the EU were in Poland. Although exposures to PM_{2.5} tend to be higher in cities in Central and Eastern Europe, exposure to NO₂ is high across the most populated cities. Combustion of fossil fuels in vehicles, energy production, and industries is the leading source of NO₂.

Half of urban residents are exposed to NO₂ levels above the EU proposed target of 20 µg/m³, while eight out of ten are exposed to PM_{2.5} levels above the EU proposed target of 10 µg/m³.

The magnitude of health impacts varies across the EU with the highest impacts in Central and Eastern Europe. Cities including Katowice and Warsaw (Poland), Plovdiv (Bulgaria), Bucharest and Călăraşi (Romania), and Budapest (Hungary) experience death rates nearly 4–6 times higher than cities in Western Europe.

The document concludes that cities are not only at the front line for air pollution impacts, but also for progress and interventions. 93% of the cities in the EU saw reductions in NO₂ exposures between 2000 and 2019 as new vehicles entered the market, and tighter regulations for power plants, vehicle emissions, and industrial boilers were established. More than 300 cities have created low-emission zones for vehicles, generating declines in traffic air pollution. Other cities are establishing or expanding strict clean air policies that target vehicle fuel efficiency and decreased emissions from coal-fired power plants.

The SoGA Regional Air Quality Snapshot is at stateofglobalair.org/sites/default/files/documents/2023-01/soga-european-union-snapshot_1.pdf.

RESEARCH SUMMARY

Effects of Emissions and Pollution

Long-term exposure to traffic-related air pollution and temperature increases gynecological cancers, Hongsen Liao, et al.; *Building and Environment* (February 2023), Vol. 230, 109989, [doi: 10.1016/j.buildenv.2023.109989](https://doi.org/10.1016/j.buildenv.2023.109989).

Are air quality perception and PM_{2.5} exposure differently associated with cardiovascular and respiratory disease mortality in Brussels? Findings from a census-based study, Terhi Kangas, et al.; *Environmental Research* (February 2023), Vol. 219, 115180, [doi: 10.1016/j.envres.2022.115180](https://doi.org/10.1016/j.envres.2022.115180).

Interaction of high temperature and NO₂ exposure on asthma risk: In vivo experimental evidence of inflammation and oxidative stress, Chan Lu, et al.; *Science of The Total Environment* (April 2023), Vol. 869, 161760, [doi: 10.1016/j.scitotenv.2023.161760](https://doi.org/10.1016/j.scitotenv.2023.161760).

Air Quality, Sources and Exposure

Factors affecting in-vehicle exposure to traffic-related air pollutants: A review, Davide Campagnolo, et al.; *Atmospheric Environment* (February 2023), Vol. 295, 119560, [doi: 10.1016/j.atmosenv.2022.119560](https://doi.org/10.1016/j.atmosenv.2022.119560).

Roadside NO₂/NO_x and primary NO₂ from individual vehicles, Peter Brimblecombe, et al.; *Atmospheric Environment* (February 2023), Vol. 295, 119562, [doi: 10.1016/j.atmosenv.2022.119562](https://doi.org/10.1016/j.atmosenv.2022.119562).

Evolution and mitigation of vehicular emissions due to India's Bharat stage emission standards – A case study from Delhi, Madhur Gajbhiye, et al.; *Environmental Development* (in press), [doi: 10.1016/j.envdev.2023.100803](https://doi.org/10.1016/j.envdev.2023.100803).

Why did air quality experience little improvement during the COVID-19 lockdown in megacities, northeast China? Donglei Fu, et al.; *Environmental Research* (in press), [doi: 10.1016/j.envres.2023.115282](https://doi.org/10.1016/j.envres.2023.115282).

Role of vehicular emissions in urban air quality: The COVID-19 lockdown experiment, Maider Llaguno-Munitxa and Elie Bou-Zeid; *Transportation Research Part D: Transport and Environment* (February 2023), Vol. 115, 103580, [doi: 10.1016/j.trd.2022.103580](https://doi.org/10.1016/j.trd.2022.103580).

Phenomenology of ultrafine particle concentrations and size distribution across urban Europe, Pedro Trechera, et al.; *Environment International* (February 2023), Vol. 172, 107744, [doi: 10.1016/j.envint.2023.107744](https://doi.org/10.1016/j.envint.2023.107744).

High-Resolution Modeling for Criteria Air Pollutants and the Associated Air Quality Index in a Metropolitan City, Yiyi Wang, et al.; *Environment International* (in press), [doi: 10.1016/j.envint.2023.107752](https://doi.org/10.1016/j.envint.2023.107752).

Effectiveness of India's Bharat Stage mitigation measures in reducing vehicular emissions, Madhur Gajbhiye, et al.; *Transportation Research Part D: Transport and Environment* (February 2023), Vol. 115, 103603, [doi: 10.1016/j.trd.2022.103603](https://doi.org/10.1016/j.trd.2022.103603).

Emissions Measurements and Modelling

Quantifying start emissions and impact of reducing cold and warm starts for gasoline and hybrid vehicles, Zhiqiang Zhai, et al.; *Atmospheric Pollution Research* (January 2023), Vol. 14, 101646, [doi: 10.1016/j.apr.2022.101646](https://doi.org/10.1016/j.apr.2022.101646).

Assessment of a Euro VI Step E Heavy-Duty Vehicle's Aftertreatment System, Barouch Giechaskiel, et al.; *Catalysts* (2022), Vol. 12(10), 1230, [doi: 10.3390/catal12101230](https://doi.org/10.3390/catal12101230).

Assessment of On-Board and Laboratory Gas Measurement Systems for Future Heavy-Duty Emissions Regulations, Barouch Giechaskiel, et al.; *Int. J. Environ. Res. Public Health* (2022), Vol. 19(10), 6199, [doi: 10.3390/ijerph19106199](https://doi.org/10.3390/ijerph19106199).

NO_x emissions from diesel cars increase with altitude, Yuche Chen, et al.; *Transportation Research Part D: Transport and Environment* (February 2023), Vol. 115, 103573, [doi: 10.1016/j.trd.2022.103573](https://doi.org/10.1016/j.trd.2022.103573).

Mobile measurements of black carbon: Comparison of normal traffic with reduced traffic conditions during COVID-19 lock-down, Martine Van

Poppel, et al.; *Atmospheric Environment* (March 2023), Vol. 297, 119594, [doi: 10.1016/j.atmosenv.2023.119594](https://doi.org/10.1016/j.atmosenv.2023.119594).

Emissions Control, Catalysis, Filtration

Engineering excellent Pd/CeO₂-ZrO₂-Al₂O₃ catalyst with abundant oxygen vacancies by Pr surface modification for eliminating NO and C₃H₈, Yi Zhao, et al.; *Journal of Alloys and Compounds* (March 2023), Vol. 938, 168585, [doi: 10.1016/j.jallcom.2022.168585](https://doi.org/10.1016/j.jallcom.2022.168585).

Formation of nitrous oxide over Pt-Pd oxidation catalysts: Secondary emissions by interaction of hydrocarbons and nitric oxide, Patrick Lott, et al.; *Applied Catalysis A: General* (February 2023), Vol. 651, 119028, [doi: 10.1016/j.apcata.2023.119028](https://doi.org/10.1016/j.apcata.2023.119028).

Excellent hydrocarbon tolerance of CeO₂-WO₃-SnO₂ oxide catalyst for the NH₃-SCR of NO_x, Jingjing Liu, et al.; *Applied Catalysis B: Environmental* (May 2023), Vol. 324, 122283, [doi: 10.1016/j.apcatb.2022.122283](https://doi.org/10.1016/j.apcatb.2022.122283).

Evaluation of Advanced Diesel Particulate Filter Concepts for Post Euro VI Heavy-Duty Diesel Applications, Athanasios Mamakos, et al.; *Atmosphere* (2022), Vol. 13(10), 1682, [doi: 10.3390/atmos13101682](https://doi.org/10.3390/atmos13101682).

Experimental study on pollutant emission characteristics of diesel urea-based selective catalytic reduction system based on corrugated substrate, Qiaonan Zhao, et al.; *Energy* (March 2023), Vol. 267, 126475, [doi: 10.1016/j.energy.2022.126475](https://doi.org/10.1016/j.energy.2022.126475).

Experimental investigation on particulate filters for heavy-duty natural gas engines: Potentialities toward EURO VII regulation, Pierpaolo Napolitano, et al.; *Journal of Environmental Management* (April 2023), Vol. 331, 117204, [doi: 10.1016/j.jenvman.2022.117204](https://doi.org/10.1016/j.jenvman.2022.117204).

Exhaust emission control of SI engines using ZSM-5 zeolite supported bimetal as a catalyst synthesized from coal fly ash, P. Rajakrishnamoorthy, et al.; *Fuel* (May 2023), Vol. 340, 127380, [doi: 10.1016/j.fuel.2022.127380](https://doi.org/10.1016/j.fuel.2022.127380).

Transport, Climate Change & Emissions

Review of Well-to-Wheel lifecycle emissions of liquefied natural gas heavy goods vehicles, Marc Stettler, et al.; *Applied Energy* (March 2023), Vol. 333, 120511, [doi: 10.1016/j.apenergy.2022.120511](https://doi.org/10.1016/j.apenergy.2022.120511).

Can promoting ethanol gasoline usage improve air quality? Evidence from Tianjin, China, Lujiang Miao, et al.; *Chinese Journal of Population, Resources and Environment* (December 2022), Vol. 20, pp. 341-356, [doi: 10.1016/j.cjpre.2022.11.005](https://doi.org/10.1016/j.cjpre.2022.11.005).

Lifecycle carbon footprint comparison between internal combustion engine versus electric transit vehicle: A case study in the U.S., Farhad Farzaneh and Sungmoon Jung; *Journal of Cleaner Production* (March 2023), Vol. 390, 136111, [doi: 10.1016/j.jclepro.2023.136111](https://doi.org/10.1016/j.jclepro.2023.136111).

Environmental assessment of road transport fueled by ammonia from a life cycle perspective, Andrea Boero, et al.; *Journal of Cleaner Production* (March 2023), Vol. 390, 136150, [doi: 10.1016/j.jclepro.2023.136150](https://doi.org/10.1016/j.jclepro.2023.136150).

Cradle-to-grave mercury emissions of light-duty gasoline and electric vehicles in China, Yu Gan, et al.; *Resources, Conservation and Recycling* (March 2023), Vol. 190, 106736, [doi: 10.1016/j.resconrec.2022.106736](https://doi.org/10.1016/j.resconrec.2022.106736).

Is it the end of combustion and engine combustion research? Should it be? Gautam Kalghatgi, et al.; *Transportation Engineering* (December 2022), Vol. 10, 100142, [doi: 10.1016/j.treng.2022.100142](https://doi.org/10.1016/j.treng.2022.100142).

FORTHCOMING CONFERENCES

SAE On-Board Diagnostics Symposium

14-16 March 2023, Prague, Czech Republic

sae.org/attend/obd-europe

13th VERT Forum

21 March 2023, Switzerland

vert-dpf.eu/j3/index.php?view=article&id=66:vert-r-13th-vert-forum-march-21th-2022-conference&catid=8

WCX SAE World Congress Experience

18-20 April 2023, Detroit, USA

sae.org/highlights/wcx

44th International Vienna Motor Symposium

26-28 April 2023, Vienna, Austria

wiener-motorensymposium.at/fileadmin/Media

SAE Heavy-Duty Diesel Sustainable Transport Symposium

3-4 May 2023, Gothenburg, Sweden

sae.org/attend/heavy-duty-diesel-sustainable-transport-symposium

AECC will have a presentation.

Fuel Science – From Production to Propulsion

23-25 May 2023, Aachen, Germany

fuelcenter.rwth-aachen.de/cms/Fuelcenter/Austausch/~smxp/Int-Konferenz

AVL Vehicle & Environment Conference

25-26 May 2023, Graz, Austria

avl.com/-/vehicle-environment?j=3464186&sfmc_sub

SIA Powertrain 2023

14-15 June 2023, Paris, France

sia.fr/evenements/302-sia-powertrain-2023

ETH Conference on Combustion-Generated Nanoparticles

20-22 June 2023, Zurich, Switzerland

nanoparticles.ch/

Stuttgart International Symposium

4-5 July 2023, Stuttgart, Germany

fkfs-veranstaltungen.de/en/events/stuttgart-symposium

Deadline for abstracts 20 January 2023

Cenex-LCV

6-7 September 2023, Millbrook, United Kingdom

cenex-lcv.co.uk

International Conference on Engines and Vehicles

10-14 September 2023

FISITA World Congress 2023

12-15 September 2023, Barcelona, Spain

fisita.com/diary/fisita-world-congress-2023

Deadline for abstracts February 2023

International Transport and Air Pollution Conference

25-26 September 2023, Gothenburg, Sweden

ivl.se/tapase

Deadline for abstracts 15 February 2023

Aachen Colloquium Sustainable Mobility

9-11 October 2023, Aachen, Germany

aachener-kolloquium.de/en/attend/speaker/call-for-papers.html

Deadline for abstracts 15 February 2023

Powertrain Systems for a Sustainable Future

29-30 November 2023, London, United Kingdom

events.imeche.org/ViewEvent?code=CON7568#msdyntrid=P31DYp9_uO9BcgMpB1eDYE_yyLahi1N1sHvWz0Zd1JU

Deadline for abstracts 10 February 2023