CLEPA
European Association of Automotive Suppliers

POSITION PAPER

Reduction of urban pollution

Clean technology, retrofitting, traffic management

Content

Background

This paper summarises options to reduce pollutant emissions in urban transport as well as policy measures to facilitate progress.

Key messages

- CLEPA supports an ambitious and effective European policy on air quality. Automotive suppliers embrace the objective of policymakers to reduce pollutant emissions and lead the world in developing innovative technology to achieve it in the context of internal combustion engines (ICE) as well as alternative drivetrains.
- Significant progress has been made in reducing emissions of pollutants in combustion engines in the past years over the various EURO standards. Further optimisation is in the process to cover remaining incremental steps and options are available to address existing vehicles such as retrofitting. Connected and automated driving may help reducing emissions, as well as traffic management measures.
- From the perspective of effectiveness and economy, a balanced mix of technology neutral measures would be preferable over restrictions or bans.

Need to act

- The Clean Air Directive 2008/50/EC sets a number of limits and thresholds concerning hazardous pollutants such as nitrogen oxides and particulate matter in ambient air.
- Infringement proceedings for non-compliance with the PM10 limit values are currently pending against 17 Member States.

Solutions

Advanced engines and effective emissions control technology, fleet renewal

- The market for combustion engines is primarily divided between diesel and petrol engines. Diesel engines are more fuel efficient than petrol, and diesel fuel itself contains about 10% more energy. Per kilometre, the diesel engine consumes about 25% less fuel. Therefore, the diesel engine emits approximately 15% less carbon dioxide per kilometre, however, produces considerably more nitrogen oxides (NO_x). The one causes the other: Higher pressure and temperature in modern diesel combustion allows better fuel efficiency and reduces CO_2 at the cost of increased NO_x and particle emissions.
- In state-of-the-art diesel engines, this trade-off is addressed via active exhaust treatment systems, i.e. catalytic converters, SCR technology and particulate filters. Thus, the most recent EURO 6 standards can be met with available technology. Recent examples have shown further potential to reduce pollutant emissions of Diesel engines, achieving NO_x emission levels 10 times lower than the limits set to be applicable as of 2020.[1]
- Automotive suppliers contribute to meeting and exceeding emission standards by developing innovative technologies and advanced engine systems such as improved combustion chamber configuration, variable injection timing, turbocharging, advanced air and temperature management as well as highly efficient emission cleaning technology in the exhaust system.
- Diesel offers high potential in lowering CO_2 emissions in combination with electrification of other parts of the drivetrain, without being impacted by issues concerning charging times and the supporting infrastructure.
- Upgrading the fleet with state-of-the-art technology will significantly reduce overall NO_x emissions.
- However, under normal conditions, fleet renewal replacing older vehicles with models fulfilling or exceeding EURO 6 standard will take more than 10 years. The actual fleet counts 19 times the number of annual sales figures.
- An accelerated fleet renewal may be supported by incentives schemes and public procurement rules as available in some Member States and public procurement rules, as discussed currently in the Clean Vehicles Directive.[2]

[1] Robert Bosch GmbH reportedly measured 13 (!) mg NO_x per kilometre under real driving conditions. Since 2017, European legislation has required that new passenger car models tested according to an RDE-compliant mix of urban, extra-urban, and freeway cycles emit no more than 168 milligrams of NO_x per kilometre. As of 2020, this limit will be cut to 120 milligrams
[2] COM (2017) 653

Solutions

Retrofit

- Retrofitting of older diesel engines can support meeting the targets of the Clean Air Directive as well. Retrofitting means adding components or accessories not fitted during original vehicle production.
- Technology includes filters, catalytic converters and ammonia exhaust treatment, targeting various pollutants in the exhaust gas, including carbon monoxide, hydrocarbons, particulate matter (PM_x), nitrogen oxides (NO_x), leaving only carbon-dioxide, nitrogen and water which are constituent parts of the atmosphere.
- Practical applications show that retrofitting can reduce NO_x emissions by up to 85% for EURO 5 diesel passenger cars, depending on the technology and the characteristics of the vehicle or equipment.
- Specifically, public transport vehicle fleets would benefit from retrofitting given their high mileage in urban areas, specifically inner cities. Thus, retrofitting this vehicle group constitutes a high potential for reducing pollution in urban areas quickly and cost-effectively.
- Moreover, efficient and immediate improvements can be realised by retrofitting buses as well as light commercial and heavy-duty vehicles, given their size, which provides for adequate space on the vehicle to add retrofitting devices, as well as the good to very good cost-benefit ratio.
- Passenger cars, given low average mileage per vehicle in urban traffic, high volumes, registration obstacles result in a less favourable cost-benefit ratio for retrofit.
- CLEPA supports guidelines for retrofit as a supportive framework, drawn up and published by the European Commission based on detailed cost-benefit analysis. The investment into retrofitting must be accompanied with a guarantee, that such vehicles will not be affected by measures limiting the use of certain vehicles, e.g. bans in certain urban areas.

Solutions

Electrification and hybridisation

- Full electrification guarantees zero emissions at the tailpipe. Especially when taking particulate matter created by brakes and tyres into account, battery electric vehicles are equally performant as latest generation combustion engines. Studies[3] have shown that new EURO 6d temp diesel passenger cars will be as effective as zero exhaust emissions vehicles in helping cities become compliant with air quality standards.
- Hybridisation, specifically 48 Volt, will also play an important role in reducing pollutant emissions, especially in urban areas, providing several kilometres of pure electric propulsion before taking recourse to the combustion engine.
- Increasing availability of charging infrastructure combined with limited mileage in urban areas will facilitate market uptake of such technologies.
- Specifically, electric vehicles may further benefit from integration into IT-based operating systems such as connected, automated and managed fleets. Research has shown the need for additional effort in research and innovation for Europe to catch up to economies which are more advanced.
- Uptake may, therefore, be further facilitated by incentives which may be directed specifically to the modernisation of predominantly urban fleets, e.g. taxis or providers of shared mobility. The potential for emission reduction through connected and automated driving may benefit from R&I support, e.g. information exchange on R&I programs and projects, standardisation of components and protocols.

[3] Concawe report 8/18 prepared by AERIS Europe: "A comparison of real driving emissions from Euro 6 diesel passenger cars with zero emission vehicles and their impact on urban air quality compliance", available online: http://www.concawe.eu/wp-content/uploads/2018/04/Rpt_18_8.pdf

Solutions

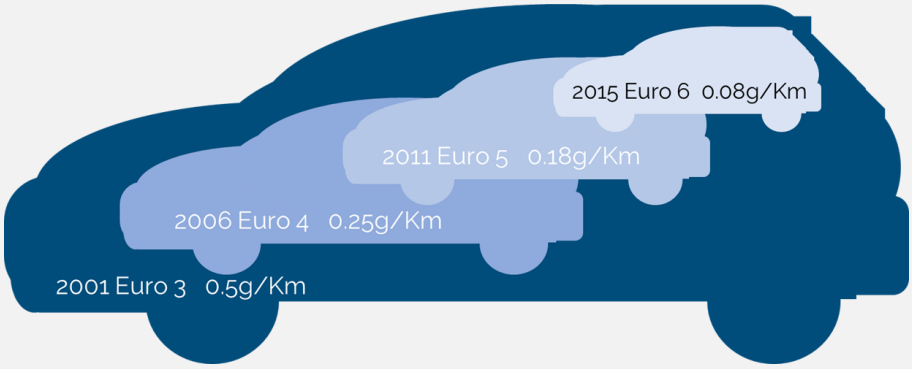
Traffic management

- Traffic management primarily aims at reducing congestion but can also be beneficial for reducing air pollution and CO_2 emissions. A broad variety of measures can be subsumed under traffic management, starting from low-cost option such as traffic light optimisation and better enforcement of road traffic laws to improving infrastructure and public transport to road pricing or limitations on the access to certain roads for certain vehicles.

- The optimisation of traffic flow via planning and incentivisation is preferable to restrictive measures such as access limitations for certain vehicles, e.g. a driving ban, which impairs the mobility of citizens and by further eroding trust of consumers in certain technologies conflict with other options, such as retrofitting and fleet renewal, which can be as effective to reduce pollutants.
- Traffic management would benefit from the exchange of information on effective strategies and incentivisation in the context of public funding of projects.

NO_x reductions 2001-2015

Emissions of NO_x from diesel cars have fallen by 84% since the millennium



Source: The Society of Motor Manufacturers & Traders (SMMT)

Conclusions

- There are various options to reduce pollutant emissions in an urban environment and corresponding policy measures for their promotion.
- These options differ in cost impact and duration to implement, consumer acceptance etc. and on the level of policy implementation, from international to local.
- Such options would ideally be weighted according to chosen priorities as parts of a comprehensive, integrated and pragmatic political strategy.

CLEPA, the European Association of Automotive Suppliers, represents over 3.000 companies supplying state-of-the-art components and innovative technology for safe, smart and sustainable mobility, investing over 20 billion euros yearly in research and development. Automotive suppliers in Europe employ nearly five million people across the continent.

- Some **12 million** people are employed in the European automotive industry
- European automotive suppliers directly employ 5 million people
- European automotive suppliers invest over **€22bn** in RDI per year. They are the biggest private investor into research and innovation
- Per year, **18 million** vehicles are manufactured in Europe, contributing to the stability and growth of the European economy

Imprint

Status	September 2018
Image licenses	Bosch, Delphi, Gestamp, Mahle, Valeo
Copyright	European Association of Automotive Suppliers (CLEPA)

CLEPA
Cours Saint-Michel 30G, 1040 Brussels
www.clepa.eu
Twitter @CLEPA_eu
For more information, please contact: info@clepa.be