European vehicle emissions standards
Euro 7 for cars, vans, lorries and buses
EPHA feedback

Summary

The **European Public Health Alliance welcomes the European Commission's initiative to develop stricter emissions standards** for all petrol and diesel cars, vans, lorries, and buses.

Especially in light of the **consequences of the COVID-19 pandemic**, the European Union needs a public health driven, green recovery to help fight the climate crisis. To this end, **the *European Green Deal* shall be strengthened** in order to lead the European transition to **sustainable mobility, including zero-emission vehicles**.

The new European vehicle emissions standards "Euro 7/VII" will be vital in this strategy. **The last EU vehicle emission standard must be implemented as soon as possible**, to make sure that vehicles on European roads no longer endanger any lives due to their emissions.

EPHA believes that the **new Euro 7/VII standards shall contribute to a modal shift from car-based cities to walking, cycling, and public transport**, wherever possible. These are the healthiest, the less polluting and most efficient transport options. Non-internal combustion engines should be preferred over conventional fossil fuel-powered vehicles because they are non-exhaust emission sources.

For health, climate protection and environmental reasons, the vehicle emissions of air pollutants should be drastically reduced. Many pollutants emitted from automotive engines are dangerous to human health. Yet, they are poorly regulated or not regulated at all under the current Euro regulation nor the EU Air Quality Standards: all must be regulated. **EPHA demands the EU air quality standards to be aligned with the latest WHO guidelines**. Consequently, the Euro emissions standards and their enforcement should be strengthened.

EPHA urges the European Union to **end the sale of new diesel and petrol cars by 2028 (2032 for heavy duty vehicles larger than 26 tonnes), while progressively phasing out existing polluting vehicles from urban areas.**

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It is important to strengthen the emissions regulation, especially the removal of the conformity factor for all pollutants, to ensure that vehicles meet the emission limits on the road, for all pollutants, under all possible driving conditions. Effective implementation is as important as the limits themselves.

EPHA policy recommendations

EPHA stresses the importance of more stringent Euro 7/VII standards as strict and as possible as soon as possible, and more crucially, alternative to combustion engines. That overarching principle should be mainstreamed and implemented in the technical regulation.

The new standards must be aligned with the "*zero pollution*" ambition of the *European Green Deal* and with the goal of net zero greenhouse emissions by 2050. Limits must apply under all conditions all the time, including during DPF regeneration and throughout the vehicles' lifetime. Particle pollution from brakes and tyres should be regulated as part of Euro 7/VII. The new standards must also introduce a roadmap to achieving 100% zero emission vehicles by 2028 (2032 for heavy duty vehicles larger than 26 tonnes).

The **European Public Health Alliance** (EPHA) is the largest European public health NGO advocating for better health. Our 82 member organisations encompasses public health NGOs, patient groups, health professionals, disease groups, academia and population group representatives working together to improve health and strengthen the voice of public health in Europe.

EPHA welcomes the European Commission's initiative to develop stricter emissions standards for all petrol and diesel cars, vans, lorries, and buses.

Especially in light of the consequences of the COVID-19 pandemic, the European Union needs a public health driven, green recovery to help fight the climate crisis. To this end, the *European Green Deal* shall be strengthened in order to lead the European transition to sustainable mobility, including zero-emission vehicles. The new European vehicle emissions standards "Euro 7/VII" will be vital in this strategy. **The last EU vehicle emission standard must be implemented as soon as possible**, to make sure that vehicles on European roads no longer endanger any lives due to their emissions.

Vehicles emissions still have a **serious negative impact on air quality in Europe**. "**Ambient air pollution is currently the greatest environmental risk to health**", according to the World Health Organization (WHO). In 2016, air pollution was responsible for 4.2 million deaths worldwide, mainly from noncommunicable diseases. There is a clear link between air pollution and pandemics, the magnitude of which is still to be determined in light of science . Air pollution increases the risk of heart disease, stroke, cancers, dementia, and diabetes, causes new asthma cases in children, and damages nearly every organ in the human body. It is estimated to cause about 16% of lung cancer deaths, 25% of chronic obstructive pulmonary disease (COPD) deaths, about 17% of heart disease and stroke, and about 26% of respiratory infection deaths.

Researchers have recently demonstrated that there is **no "safe" level of air pollution for human health**. **Air pollution "is the single largest environmental health risk in Europe"** according to the European Environmental Agency (EEA). In

its 2019 report, the EEA wrote that the health impacts attributable to exposure to air pollution indicate that PM concentrations in 2016 were responsible for about 412 000 premature deaths in Europe, of which around 374 000 were in the EU-28. In 2016, the estimated impact of exposure to NO_2 was around 71 000 in Europe, including around 68 000 from the EU-28 and O_3 concentrations on the population in 2016 was respectively 15 100 and 14 000 premature deaths per year.

Road transport is the largest contributor to NOx pollution in Europe (28,12% of total emissions). In cities like Brussels, **road traffic is the major source of air pollution** and emits 30% of $PM_{2.5}$ and 69% of NO_2. The latest EEA's data confirm large decreases in air pollutant concentrations (especially NO_2) largely due to reduced traffic in major cities under lockdown measures. These types of measures are temporary.

EPHA believes that the **new Euro 7/VII standards shall contribute to a modal shift from car-based cities to walking, cycling, and public transport**, wherever possible. These are the healthiest, the less polluting and most efficient transport options. Non-internal combustion engines should be preferred over conventional fossil fuel-powered vehicles because they are non-exhaust emission sources.

For health, climate protection and environmental reasons, the vehicle emissions of air pollutants should be drastically reduced. Regulating emissions from the traffic sector by setting emissions standards, e.g. Euro emissions standards, have decreased emissions of air pollutants from road transport in Europe since 1990. Nevertheless, there are still ongoing air pollution issues, e.g. reductions in pollution from road transport have slowed down since 2014. Moreover, **many pollutants emitted from automotive engines are dangerous to human health. Yet, they are poorly regulated or not regulated at all** under the current Euro regulation nor the EU Air Quality Standards: ultrafine particles smaller than 23 nanometres (not regulated, carcinogenic), ammonia (NH_3) (partially regulated, toxic), volatile and semivolatile particles (not regulated, toxic), non-methane volatile organic compounds (NMVOCs), formaldehyde (not regulated, carcinogenic) and acetaldehyde (not regulated, possibly carcinogenic), etc. **All must be regulated**. The emissions of these pollutants from road transport could be easily reduced, e.g. formaldehyde from vehicle emissions is regulated in the USA.

WHO sets recommended limits for health-harmful concentrations of key air pollutants based on the latest scientific evidence. The WHO Air Quality Guidelines cover annual and daily concentrations of fine particulates, nitrogen dioxide, sulfur dioxide, carbon monoxide, and ozone. The European Union has established objectives for a number of pollutants present in the air but are still much higher than the WHO Air Quality Guidelines. **EPHA demands the EU air quality standards to be aligned with the latest WHO guidelines** bearing in mind that new standards can be expected by 2021. Consequently, the Euro emissions standards and their enforcement should be strengthened.

EPHA highlights the importance to **align the new Euro standards with the current *Europe's beating cancer plan***. Given that diesel exhaust is considered a carcinogenic substance by IARC the proposal should include an impact assessment about reducing cancer and should include appropriate indicators. To facilitate that, the Commission shall ensure coordination with the relevant Unit of the Directorate-General for Health (DG SANTÉ)

EPHA urges the European Union to **end the sale of new diesel and petrol cars by 2028, while progressively phasing out existing polluting vehicles from urban areas.** The EU needs to phase out the sale of diesel and petrol cars by 2028 if it wants to meet its commitments to the Paris climate agreement. State parties have resolved to limit the rise in global average temperatures to 1.5°C. In order to have a high (66%) chance of achieving this, the EU will need to end all sales of conventional fossil fuel-powered cars by 2028 and phase out all petrol and diesel cars by 2045.

It is important to strengthen the emissions regulation, especially the removal of the conformity factor for all pollutants, to ensure that vehicles meet the emission limits on the road, for all pollutants, under all possible driving conditions. Looking at the development of EU legislation, the Euro standard shows that market players and the industry are unlikely to introduce stricter standards unless there is a market demand or a binding regulation. The recent CE Delft

publication on different policy scenarios for 2030 clearly demonstrates how the fleet of different Euro categories in the given Member States (and in the EU as a whole) is likely to decrease (NEEDS model) which is unlikely to happen without enforceable Euro standards. Having now better data coming from the TRUE initiative makes it possible to better assess the differences among the various Euro categories. Therefore, it is highly unlikely that technological developments addressing pollutant emissions would have taken place without Euro 6/VI or would take place without Euro 7/VII.

Since the first legislative introduction of the Euro 6/VI emission standard in 2007, **the emissions of light-duty vehicles (LDV) have decreased but not fast enough**. In fact, the on-road emissions performance of LDVs has improved thanks to the introduction of real driving emissions (RDE), implemented in 2018 with Euro 6d-temp. Unfortunately, the World Harmonized Transient Cycle (WHTC) test has not been an effective procedure for reducing the gap between type-approval and real-world pollutant emissions. The test cycles are more representative of the on-road driving than the former New European Driving Cycle (NEDC) test. Yet, the WHTC has the same problems as NEDC. Both are fixed and predictable tests, i.e. it is easier to circumvent the process. Moreover, they do not test the real emission performance of vehicles under the extensive range of conditions experienced during on-road driving. For instance, they do not take into account the use of auxiliary services (heating, cooling, radio, etc.), nor the temperature and load variabilities. However, these real-world conditions affect the vehicles' emissions.

The introduction of real-driving emissions (RDE) test procedures, which came into force in March 2016, has been important to reduce the gap between type-approval and real-world pollutant emissions. RDE tests cover more situations than usual laboratory-based tests. The automotive industry must now check that its vehicles comply with the emission limits under a wider range of driving conditions (low and high altitudes, more realistic temperatures, additional load, low, medium and high speed, etc.).

Nevertheless, RDE tests do not ensure that vehicles respect the emission limits under all driving conditions for all pollutants. The automotive industry has

an inexplicable 1.6 conformity factor to comply with emission limits. (Debate: *the Bumpy Ride towards Real Driving Emissions* - 3/03/2020) All vehicles must comply with the emission limits under all driving conditions, using only raw emissions without any corrections, and include tests during *Diesel particulate filter* (DPF) regeneration.

Establishing emission limits was a key development to protect public health but effective implementation is as important as the limits themselves. Therefore, introducing Real Drive Emissions was a step in the right direction. In fact, Euro 6 cars preceding RDE surpassed the emission limits during on-road driving, and in particular for NOx. Emission limits could have been more ambitious and wider, including more pollutants. It could also have been possible to achieve better results by using all the best technology already available at the time. The particle number (PN) emission limit for diesel and Gasoline Direct Injection (GDI) vehicles forced the implementation of particle filters on these cars. Nevertheless, there are too many exemptions, e.g. the *Diesel particulate filter* (DPF) regeneration is still excluded from the tests. National implementation is key as *Dieselgate*-like cheating methods, non-compliance can be very effective. That would require national wide strategies and consequent control of respecting emission limits and compliance. However, there is a variety in Europe on this as not all member states have introduced programmes covering that aspect. This is also the legacy of *Dieselgate*. People are discriminated against because in some wealthier member states action and implementation are better. Therefore, there are more benefits to public health.

Transport is one of the four key sources of air pollution. Although the fitness check of the Ambient Air Quality regulation demonstrated a decrease of many pollutants (except ammonia, where the least progress was made), the decrease of road transport-related pollutants (carbon, CO, PM_{10}, $PM_{2.5}$, NVMOC) was moderate after 2014. The EEA data confirm that trend. Quite telling that many European cities still breach WHO air pollution limits and cities are the places where transport-related pollution materialises the most. **EPHA would like to point out that compared to other international regulations (e.g. USA) the European rules are not the strictest**.

For public health, the low or zero-emission transport would be much beneficial: it would decrease the pollution-related deaths and related healthcare costs. However, the emission regulation did not provide the right

incentives for the industry. On the markets, the share of Low and Zero-emission vehicles is really low, and far below the potential of the European car industry.

EPHA would like to stress that the moderate impact of emission reduction also resulted in air pollution-related healthcare costs. Based on the latest scientific evidence, the costs of air pollution have been estimated. **The health costs of transport-related air pollution are heavily underreported and underestimated**. Despite the media coverage the *Dieselgate* scandal has received, very few actions have been taken in Europe in order to rectify the damage caused by the emission exceedances. While the impact of diesel emissions on the environment is well known, there is little attention paid to its health impacts. The CE Delft study examined the health costs but did not take into account all potential health damage which indicates significant health benefits which should be into account considering the impact of Euro 6/VI 2016 with COPERT emission factors When calculating with the COPERT emission factors, the total costs of road traffic-related air pollution in the EU28 in 2016 was € 66.7 billion. The share of diesel vehicles in these costs amounts to 83%. Also in each of the nine Member States that have been assessed in more detail, the share of diesel is high (67% up to 92%) and mainly depends on the share of diesel vehicles in the fleet. NOx emissions have the largest share in the total costs (both health and non-health related) of air pollutants (65%), followed by PM2.5 (32%). PM10 (non-exhaust), SO2 and NMVOC emissions have only a minor share of about 1%, 0.1%, and 2% respectively. In the nine Member States that have been assessed in detail, about three-quarters of the total health costs of air pollution are borne by governments and compulsory insurances. When assuming that this is representative of the EU28 as a whole, the total cost of road emission air pollution in the EU amounts to about € 45.4 billion a year. 2016 with adjusted emission factors based on TRUE, the COPERT emission factors are a respected and widely used set. However, recent work in the TRUE Initiative has revealed that real-world NOx emission factors for cars are higher than expected and reported by COPERT (and also by other sources). Therefore a sensitivity analysis has been carried out with a set of adjusted emission factors which take account of these latest findings by TRUE and assume higher NOx emission factors for both cars and LCVs. In addition, PM2.5 emission factors have been adjusted to take account of malfunctioning of diesel particulate filters in part of 4% of the diesel vehicle fleet. When calculating with these adjusted emission factors, the total costs of road traffic-related air pollution (both health and non-health related) in the EU28 in 2016 was € 79.8 billion, so 20% higher than when using COPERT, 75% of these costs caused by diesel. Both NOx and

PM2.5 emissions are expected to decrease significantly between 2016 and 2030 for each of the nine Member States and the EU28 as a whole. When calculating with COPERT emission factors, NMVOC emissions decrease Evaluation of the Euro 6/VI Vehicle Emission Standards by 50%, NOx and SO2 emissions decrease by 69% and PM2.5 emissions decrease by 80%. Unlike NOx and PM2.5, PM10 emissions from wear and tear of tires and brakes are expected to increase (on average by 29%), as the emissions per vehicle-km are expected to remain more or less constant and the number of kilometres driven in EU28 is expected to increase. With COPERT emission factors, the sum of the health and non-health related costs of road traffic-related air pollution in the EU28 in 2030 is estimated at € 19.5 billion; of which € 18.3 billion are health-related. This is a decrease compared to 2016 of € 47.2 billion (or 71%). The health costs borne by governments and compulsory insurances are estimated at € 13.0 billion for the EU28 in 2030, which is a reduction of 71% compared to 2016. (Health impacts and costs of diesel emissions in the EU – November 2018) When using the adjusted emission factors (TRUE), the reductions are slightly smaller. In that case, the sum of the 2030 health and non-health related costs amount € 25.6 billion (of which € 23.3 billion are health-related), 68% lower than in 2016. The health costs borne by governments and compulsory insurances are with these emission factors € 17.4 billion, 67% lower than in 2016.

Therefore, **OPTION 1 from the *Advisory Group on Vehicle Emission Standards* (AGVES) is not a plausible scenario**. As regards simplification, EPHA has doubts if the regulation achieved its objectives due to the high number of exceptions which can ultimately undermine the effective reduction of emissions. Yet, a narrow revision of Euro 6/VI is not enough. It could not decrease the health cost of transport pollution, so “the Option 1 is expected to have a positive economic impact” is based on a wrong hypothesis. Only stricter and new air pollutant limits would reduce health and environmental costs “OPTION 2 and OPTION 3”. However, stricter rules are not efficient without proper inspections. Real-world emission monitoring collected through *on-board monitoring* (OBM) over the entire lifetime of a vehicle are crucial to ensure in-service conformity testing. **As a result, EPHA much prefers OPTION 3.**

EPHA policy recommendations

EPHA stresses the importance of more stringent Euro 7/VII standards as strict and as possible as soon as possible, and more crucially, alternative to combustion engines. That overarching principle should be mainstreamed and implemented in the technical regulation.

The new standards must be aligned with the "*zero pollution*" ambition of the *European Green Deal* and with the goal of net zero greenhouse emissions by 2050. Limits must apply under all conditions all the time, including during DPF regeneration and throughout the vehicles' lifetime. Particle pollution from brakes and tyres should be regulated as part of Euro 7/VII. The new standards must also introduce a roadmap to achieving 100% zero emission vehicles by 2028 (2032 for heavy duty vehicles larger than 26 tonnes).

Future limits for concentrations of pollutants harmful to human health and the environment ($PM_{2.5}$, PM_{10}, O_3, NO_2 and other NO_X, SO_2, PN, CO, THC, NMHC, CH4, NH3, etc.) should be based on the latest scientific evidence and comply with the WHO *Air Quality Guidelines*.