



Urgent need to include 'lifetime compliance' in Euro 7 / VII proposal

Discussion paper - Version 29 October 2020

Purpose of this document:

This working document is meant to give input from The Netherlands to the EC & CLOVE consortium preparatory work, for the AGVES informal working group scheduled for 27 Oct. 2020.

In the current AGVES discussion and EC/CLOVE study, the emphasis seems to be on:

- extending the test conditions to include all driving conditions¹, and
- best available technology, as a starting point for proposals on stricter limit values.

We do support these directions.

However, The Netherlands requests to put equal emphasis on the introduction of requirements to control the lifetime emission performance of vehicles.

Background on Euro 7/VII context:

The Netherlands has ambitions as a front-runner in sustainable and clean mobility. We are internationally promoting the acceleration of uptake of zero emission vehicles² to enable carbon neutral transport at the latest in 2050. We also emphasize the need for cleaner air for the health of our citizens. The future Euro 7/VII legislation should support both objectives.

Vehicle emission standards for post Euro 6/VI should correspond to our needs to tackle air quality challenges and support the uptake of zero emission vehicles. This means that at least, enforcement requirements for these standards should ensure lifetime compliance in all driving conditions. These standards should also account for pollutants that are not yet regulated in Euro 6, such as ammonia.

This document does not represent a formal position of the Netherlands regarding Euro 7 / VII. It should be regarded as a means to put lifetime compliance clearly on the agenda.

Background on emissions in relation to air quality

The on-going introduction of Euro 6/VI shows to have a positive impact on air quality (via emission reduction). However, model outputs as presented by ACEA/CONCAWE during AGVES meeting (10 Sept. 2020) are likely too optimistic for several reasons:

- In the past 30 years, emission performance forecasts, in particular the assumptions of diesel NOx reductions, proved to be too optimistic.
- Higher emissions occur in specific circumstances that are not correctly modelled, such as idle functioning, driving with caravans, and fast acceleration.
- So far, the focus has been to comply with the limits for a selected range of average conditions. Therefore, the testing outside such conditions has been limited. The inclusion of other specific conditions could lead to higher emission outputs on the roads.
- Frequently, RDE test results are a factor 2-3 better than on-road use in practice. Therefore, RDE test results are too limited as a basis for the calculation of real world emission factors.

Moreover, ambitions for exhaust emission reduction (and air quality improvements) should go beyond complying with minimum (average) standards of air quality (and just eliminating air pollution hotspots), because there is no safe minimum level for air pollution below which there is no impact on human health. Focus should therefore be on reducing exhaust emissions as much as reasonably possible, as to minimize overall health risks, in line with WHO guidelines.

¹ All driving conditions refers to the full coverage of reasonably encountered on-road driving conditions including among others cold starting, idling, high acceleration. So *beyond* average conditions.

² As chair of the Transport Decarbonization Alliance and participant in iZEVA and EVI.



Need for lifetime compliance

With every new Euro-stage vehicle emission performance has become progressively dependent on the correct functioning of the emission reduction technology and as such modern vehicles become increasingly vulnerable to aging and tampering. Current Euro-standards insufficiently secure the emission performance of older vehicles. In addition to extending the test conditions to include all driving conditions, measures should be taken to control lifetime emissions for at least 2 reasons:

- Aging of after treatment technology is known to cause a significant increase in emissions;
- Intentional misuse (tampering) of after treatment technology by individual owners is increasing. Requirements for lifetime emissions, are required to ensure control on the after treatment, also in the later stages of a vehicles' life.

Both causes can result in extremely high emissions. For instance, removing a diesel particulate filter (DPF), that typically operates at efficiencies of above 99%, will result in a hundred-fold increase of emissions of ultrafine particles. In a substantial amount of older petrol vehicles, the three-way catalyst is defective, causing a tenfold increase in NOx emissions. This means that although it might occur in only a small number of vehicles, the total impact still significantly contributes to the total amount of vehicle emissions.

This conclusion is supported and confirmed by research data.

- o Remote sensing programs:
 - [In-use compliance and deterioration of vehicle emissions³](https://www.ivl.se/download/18.4447c37f16fa0999d1924d0/1580894080250/C387.pdf);
 - <https://www.ivl.se/download/18.4447c37f16fa0999d1924d0/1580894080250/C387.pdf>;
- o Dedicated vehicle test programs:
 - [Emissions of twelve petrol vehicles with high mileages⁴](#).
- o Synthesis from different programs:
 - [Emission compliance over the lifespan of a vehicle⁵](#).

This poses a serious risk on human health and air quality, enhanced by the ever-increasing lifetime of modern vehicles.

Therefore, The Netherlands requests the inclusion of lifetime compliance measures in the Euro 7/VII proposals.

Direction of possible solution to enable lifetime compliance:

A direct and continuous monitoring of emissions through OBD and OBM enables the lifetime compliance with emission norms, as it regularly provides feedback regarding the need for maintenance.

Another prerequisite for control of lifetime emission performance is a clear and unambiguous distribution of responsibility. A car manufacturer should never be made responsible for bad maintenance by the vehicle owner. Nevertheless, the manufacturer can be made responsible for detection of overdue maintenance or malfunction of the vehicle emission reduction system. The technology required to detect malfunctioning is already present in modern vehicles. If the responsibility is settled, this instrument can be used when emission performance requirements are extended to the full vehicle lifetime.

Life time compliance can be achieved by lifting the current lifetime and durability restrictions in the emission legislation, particularly if fair aging factors are introduced. If the vehicle indicates the adequate performance of the emission control system, enforcement of the Euro 7/VII can be performed through simplified tests under in-service conformity (ISC), market surveillance programs and periodic technical inspections (PTI).

The Netherlands is looking forward to proposals and further discussions including lifetime compliance measures in Euro 7/VII.

³ <https://repository.tudelft.nl/search/?q=title%3A%22In-use%20compliance%20and%20deterioration%20of%20vehicle%20emissions%22>

⁴ <https://repository.tudelft.nl/search/?q=title%3A%22Emissions%20of%20twelve%20petrol%20vehicles%20with%20high%20mileages%22>

⁵ <https://repository.tudelft.nl/search/?q=title%3A%22Emission%20compliance%20over%20the%20lifespan%20of%20a%20vehicle%22>