



Euro 7

New proposal for vehicle emissions type approval in Europe

Presentation at GRPE 87

12/01/2023

Context

Wider context of Air Pollutant Emissions



The need to act

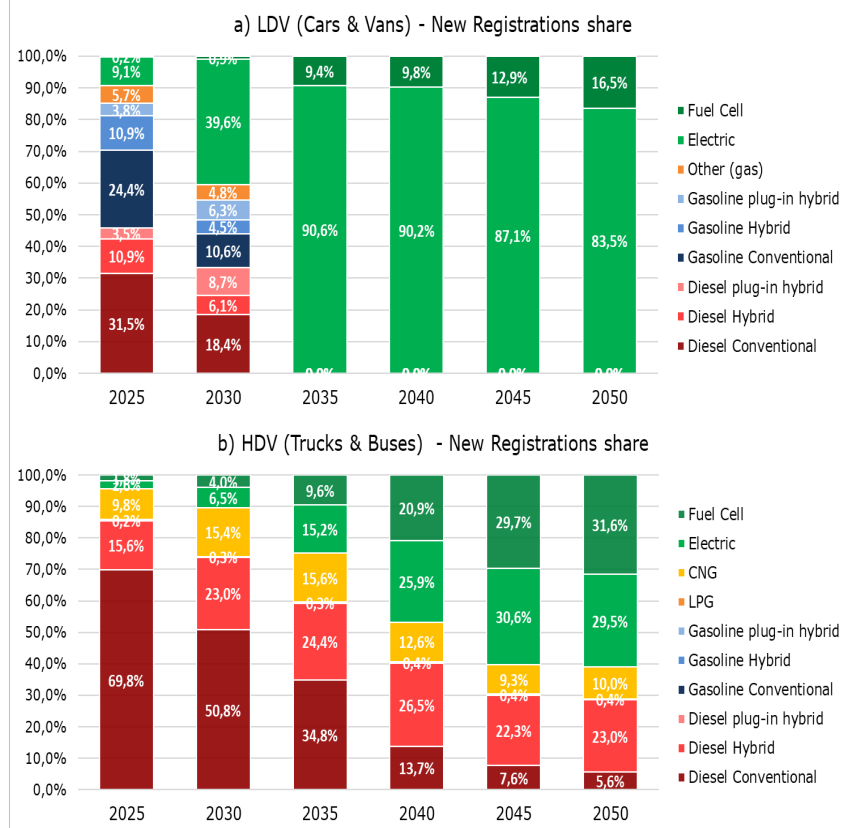
- **Important health and environmental concerns:** ~70.000 premature deaths due to road transport emissions (NO_x, particles...) in Europe each year
- **New Ambient Air Quality limits** proposed on 26 October
- Selective **Internal Combustion Engine (ICE) bans** from MS/cities and risk for single market
- Developments in key **world markets** (China, US)
- Only ZEV **sales** for cars/vans by 2035, but conventional vehicles will stay in circulation and brakes/tyres also emit
- Upcoming **CO₂ standards** for heavy-duty vehicles

A changing environment for the automotive industry

Sales of new vehicles:

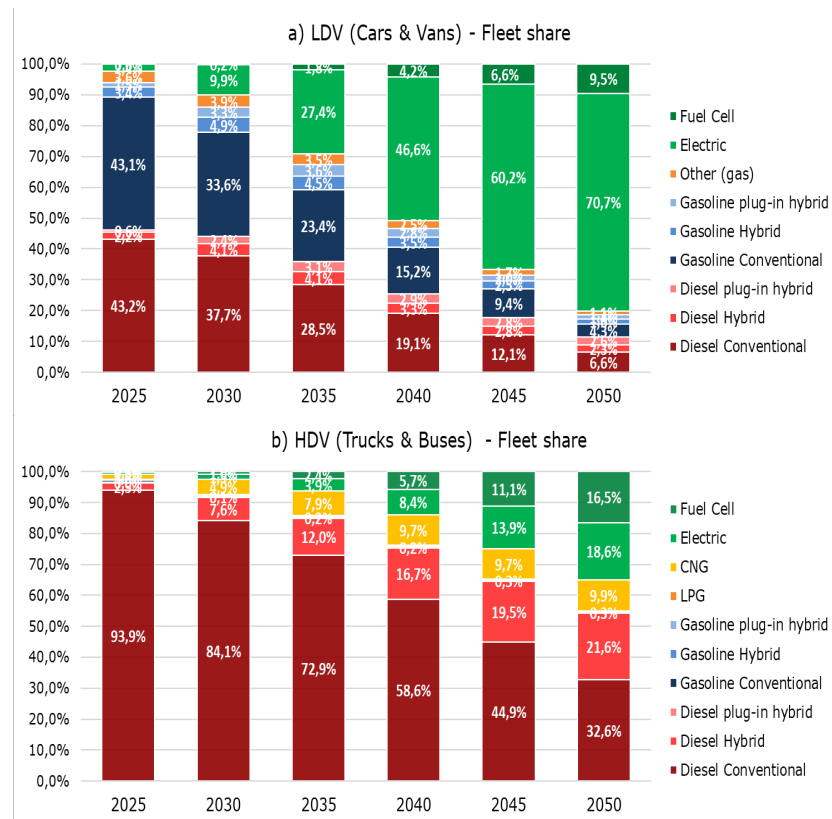
Vehicles on the roads:

LDV: 100% ZEV sold from 2035 on



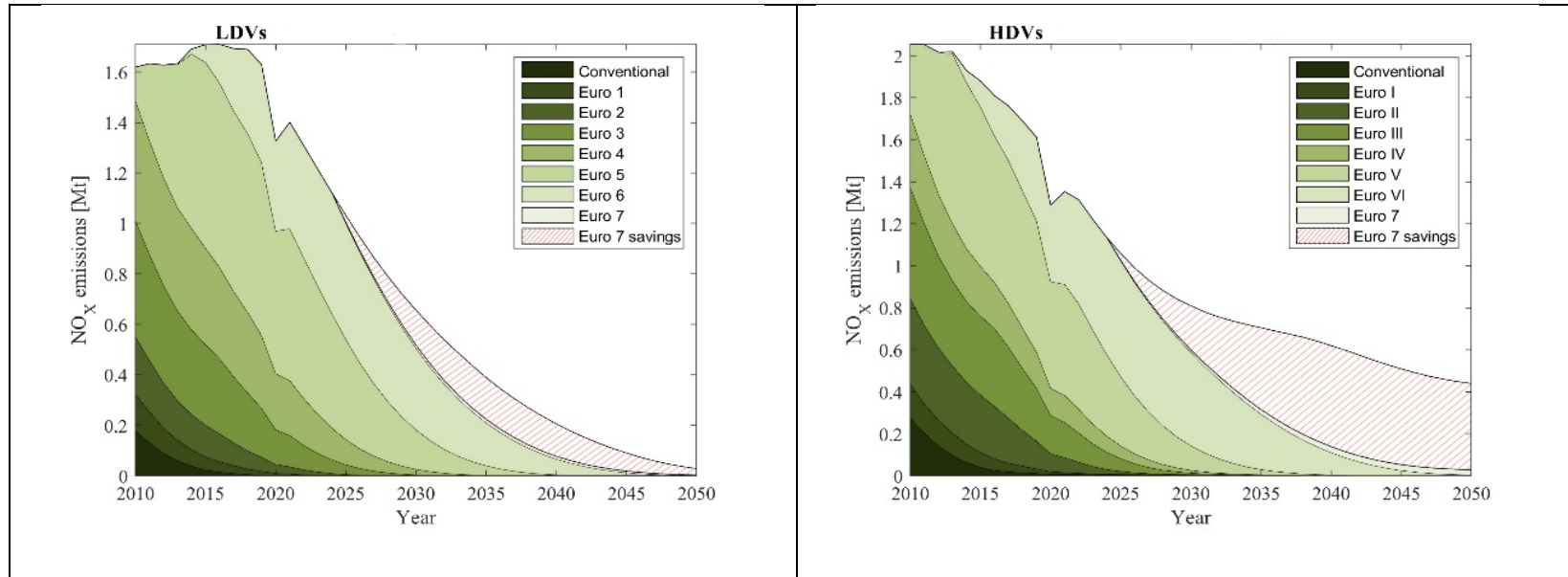
HDV: only 61% ZEV sold in 2050

LDV: 80% ZEV on the roads in 2050



HDV: 35% ZEV on the roads in 2050

Tapping the remaining potential for combustion engines



- Previous Euro emissions legislation has significant benefits
- All passenger cars sold in Europe after 1 September 2019 are Real-Driving-Emissions (RDE) compliant
- But potential remains to improve it further through Euro 7, in particular for heavy-duty vehicles

Euro 7 Objectives

- Improve **air quality**
 - Limit pollutants at the source, with particular emphasis in urban areas and wider conditions of use → ***make a difference where it matters most***
 - Take account of new developments (electrification, digitalisation, batteries, brakes and tyres) → ***future proof legislation***
- Ensure proper **functioning of internal market**
 - Avoid obstacles (incl. market imbalance across the EU) → ***affordability, access restrictions, etc.***
 - Reduce complexity and compliance costs; take account of investment potential → ***look for synergies where they exist***
 - Ensure compliance throughout more representative lifetime of vehicle → ***second-hand markets***

EURO 6 for cars, vans

EURO VI for buses, lorries

ICE vehicles



Electric and H2 vehicles



Euro 7

for cars, vans, buses, lorries

Significant simplification of legislation and testing

Longer lifetime coverage

Digital monitoring of compliance

Brake particles *and* Microplastics from tyres

Fuel- and technology-neutral emission limits:
NO_x, particles, hydrocarbons, CO, ammonia, ...
More representative on-road tests under wider
driving conditions

In-vehicle battery durability (*complementing
Battery Regulation*)

Detailed features in Euro 7 proposal

Text and accompanying documents and reports can be found at:

https://single-market-economy.ec.europa.eu/sectors/automotive-industry/environmental-protection/emissions-automotive-sector_en

Simplification

- Industry and Member States underline that Euro 6/VI is too complex and ask for simplification
- In 2005 Euro 4 with implementing rules was 180 pages long
- In 2021 Euro 6 with implementing rules is 860+ page long
- **Streamline and merge into 1 single main legislation for both LDV and HDV**
- Eliminate unnecessary tests and replace with declarations and checks if required (WLTP at 14°C, Crankcase, OBD)
- Reduce administrative burden where possible

Emission limits

LDV

- set at the lowest values in Euro 6 for all cars and vans
- Only underpowered vans get slightly higher limits
- **Proposed application date: 1 July 2025**

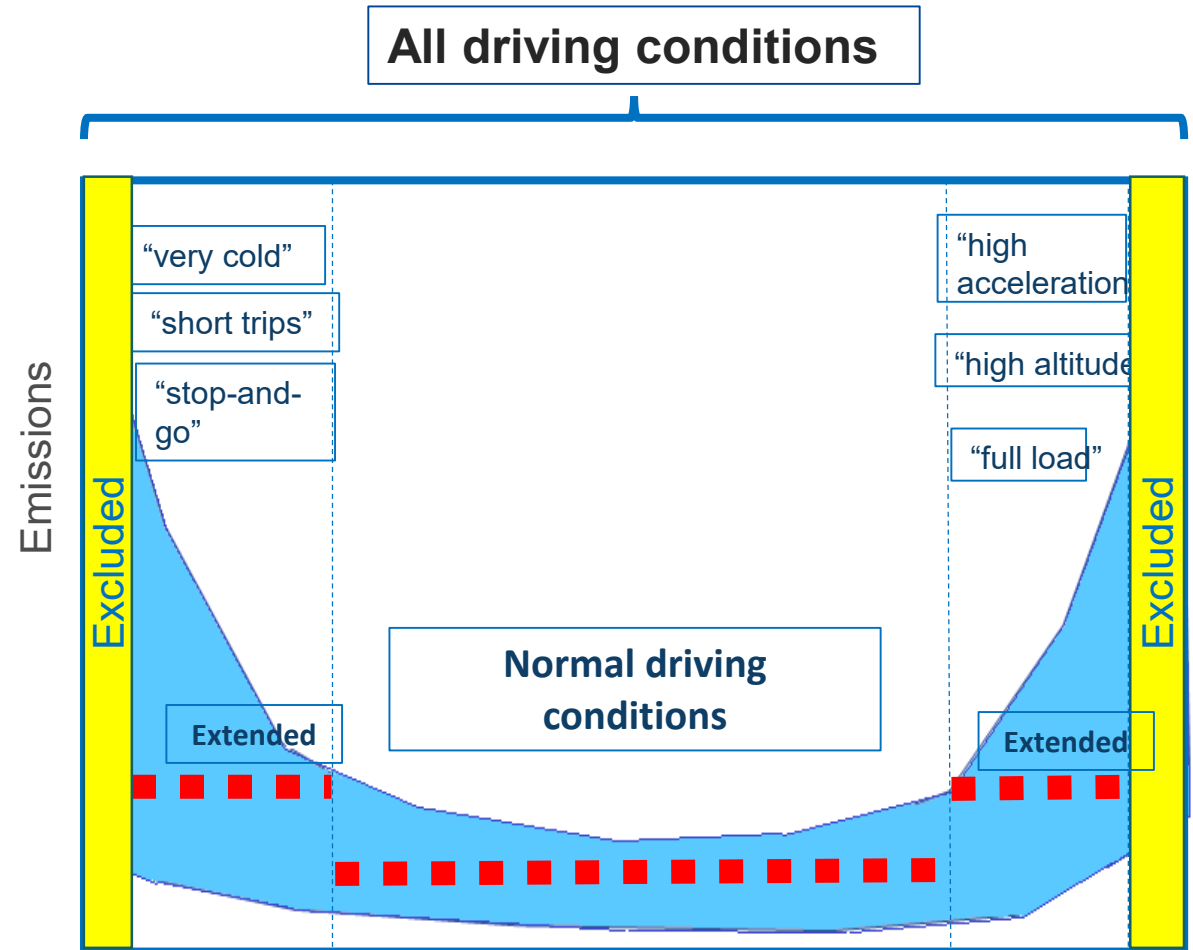
HDV

- Move away from engine testing to whole-vehicle testing
- Cold and hot emissions regulated separately to ensure good control of emissions
- **Proposed application date: 1 July 2027**

Emission limits (mg/km)	Cars/Vans	Underpowered Vans	Small trips (below 10 km)	Lorries and buses – Cold emissions	Lorries and buses – Hot emissions
NO _x	60	75	600	350	90
PM	4.5	4.5	45	12	8
PN (#/km)	6×10 ¹¹	6×10 ¹¹	6×10 ¹²	5×10 ¹¹	2×10 ¹¹
CO	500	630	5000	3500	200
NH ₃	20	20	200	65	65
Brake emissions	7 until 2035 / 3 after	7 until 2035 / 3 after		When method available	When method available
Tyre emissions	When method available	When method available		When method available	When method available

Better coverage of driving conditions in RDE

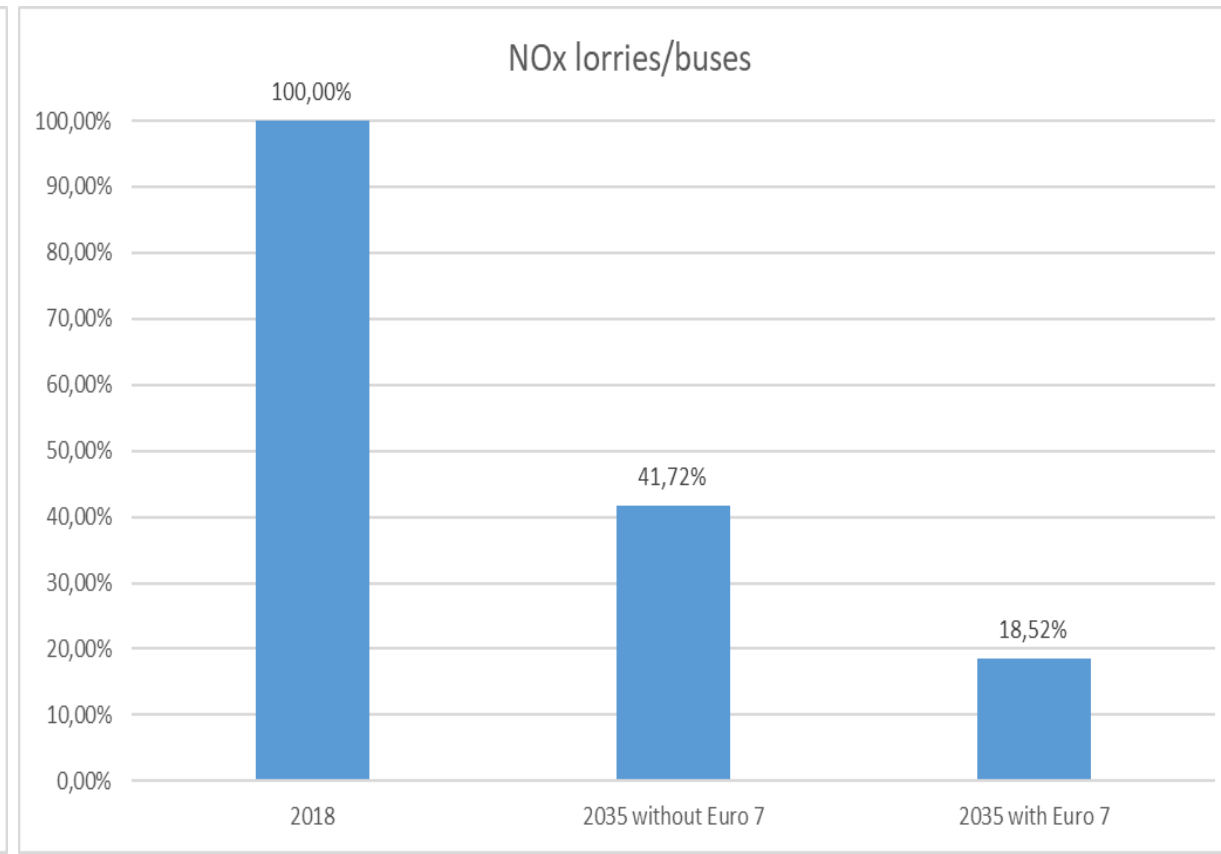
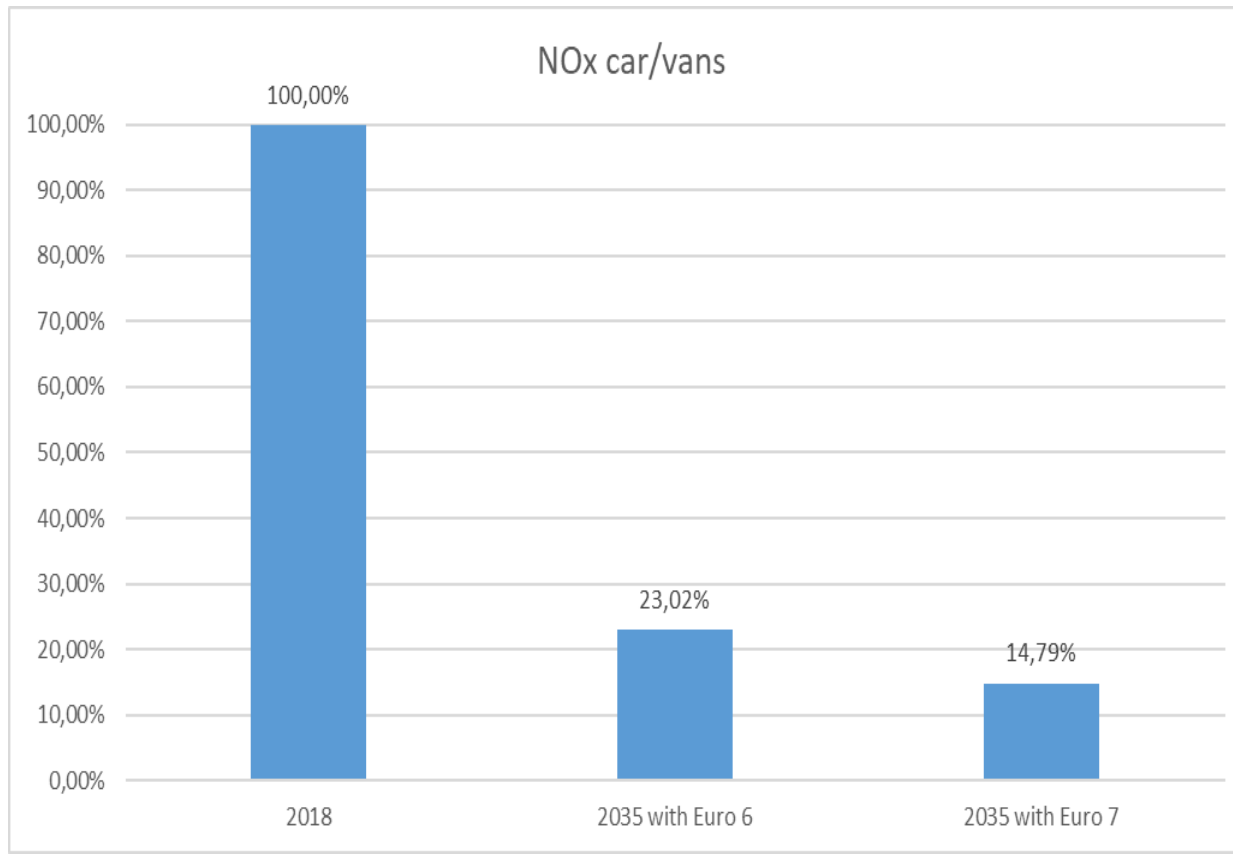
	Euro 6e		Euro 7	
Parameter	Normal	Extended	Normal	Extended
Ambient temperature	0 to 35°C	-7 to 0 or 35-38°C	0°C to 35°C	-10°C to 0°C or 35°C to 45°C
Maximum altitude	700	1300	700 m	1800 m
Maximum speed	145 km/h	up to 160 km/h for less than 3%	Up to 145 km/h	Between 145 and 160 km/h
Trip composition	33%urban, 33% rural, 33% highway	-	Any	-



Emissions in extended driving conditions are allowed to be higher (60% for LDV, 100% for HDV)

Emissions Saved

- Euro 7 will save more than 80% of NOx emissions for car/vans and lorries/buses by 2035 compared to 2018



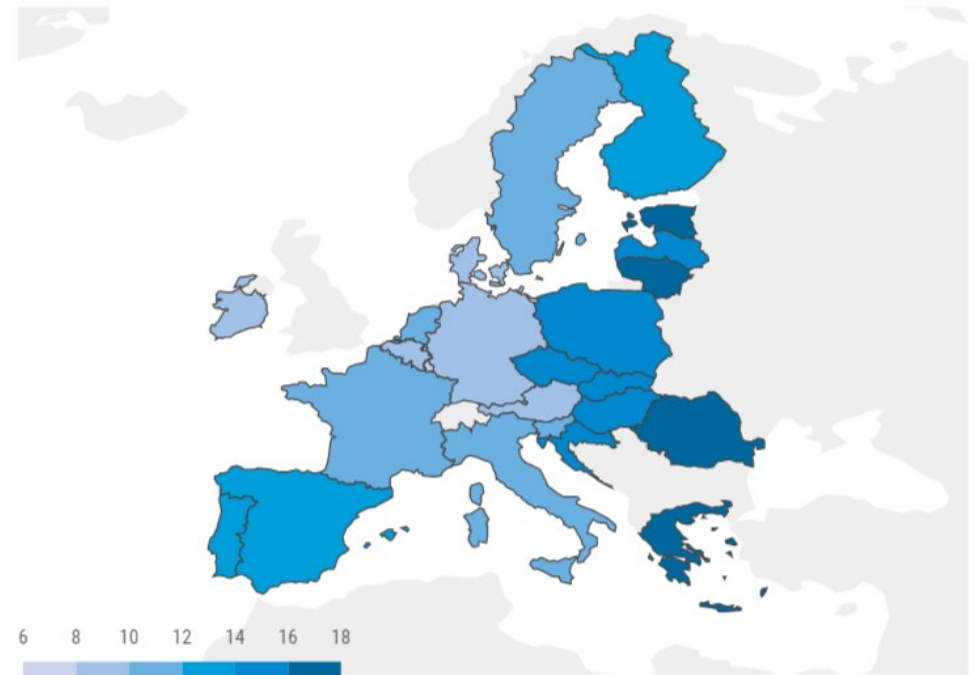
Durability

- Vehicles and emission control systems deteriorate as any mechanical or chemical system
- 200.000 km or 10 years for LDV and 375.000 to 875.000 km for HDV
- But durability multiplier to account for deterioration (20% higher emission limits for gaseous pollutants after 160.000 km or 8 years and up to 200.000 km or 10 years for LDV)

Average age of the EU vehicle fleet

BY COUNTRY, IN YEARS / 2020

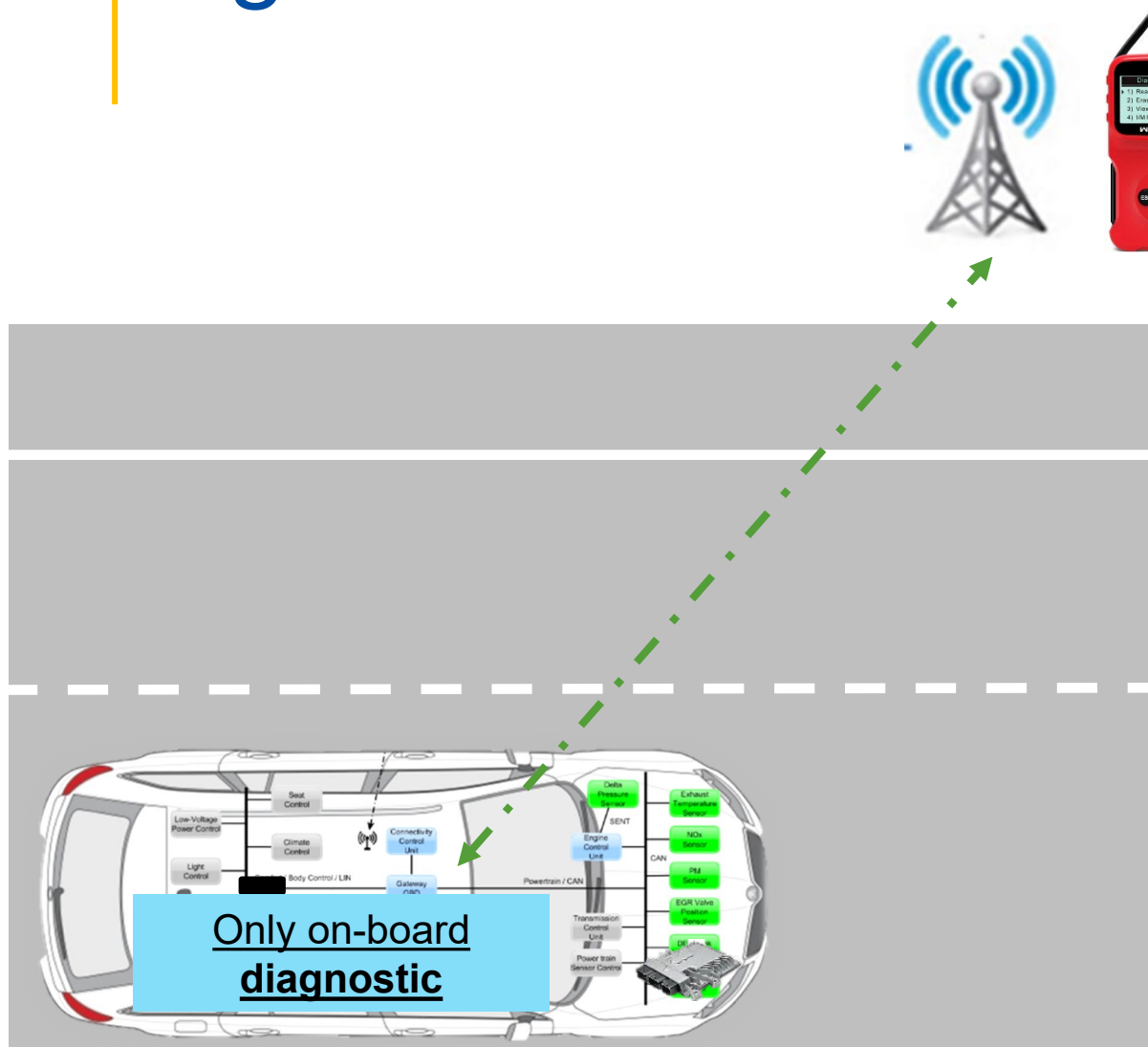
Passenger cars ▾



Created with LocalFocus

Source: ACEA VEHICLES IN USE REPORT 2022

Digital ambition for emissions

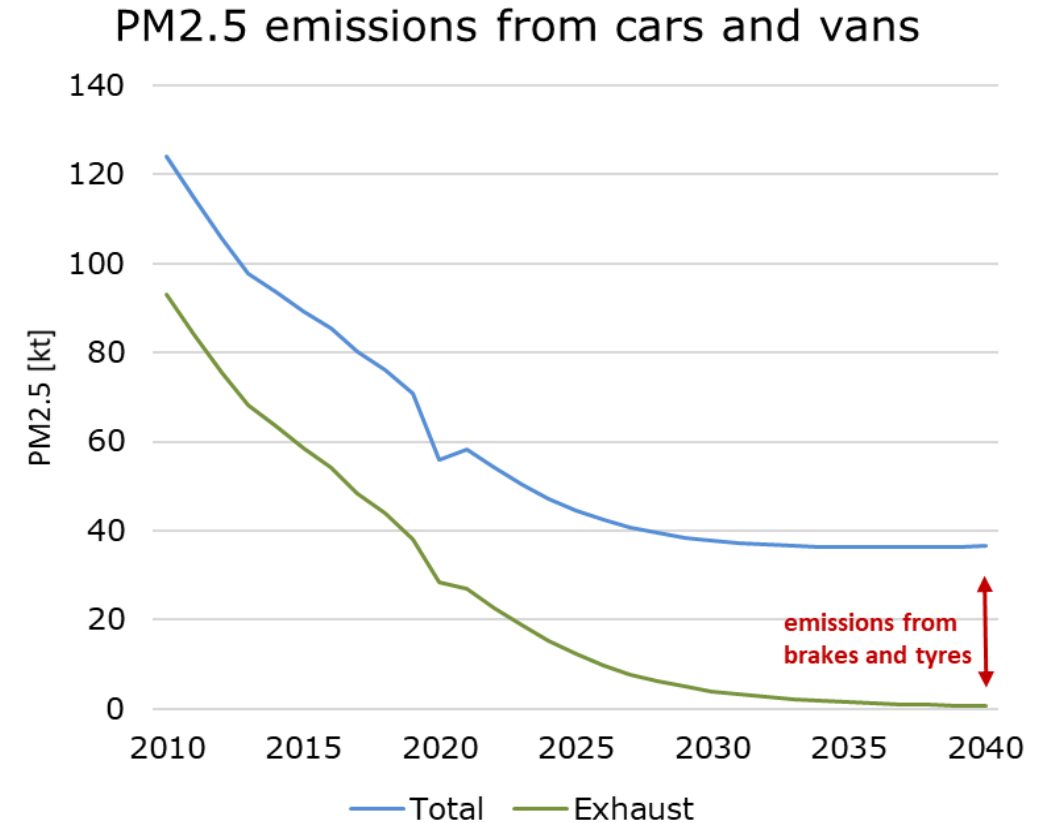


On-board **monitoring** so data can be transferred over the air and this will:

- Simplify checking compliance with type-approval rules
- Allow tampering protection
- Simplify periodic technical inspection
- Allow geo-fencing for Plugin Hybrids (PHEV)

Brake and Tyre wear particles

- Contribution of **brake** and **tyres** to PM2.5 will soon be higher than from exhaust sources
- Tyres are biggest source of unintentional release of **microplastics** in environment (heavier particles to water and soil)
- **Brake measurement method developed for cars and vans (GTR on brakes), under development on HDV**
- **Tyre abrasion method in development in GRBP/GRPE TF/TA**



Battery Durability



- Based on new **Global Technical Regulation 22**
- Introduces **monitors of state of health for batteries** installed in vehicles
- Minimum performance requirements for battery durability introduced for cars/vans reflecting current market situation

Vehicle age/usage	PHEV	BEV
Until 5 years/100.000 km	80%	80%
Up to 8 years/160.000 km	70%	70%

- Work ongoing for lorries/buses (less data available, more complex)

Estimated Impacts of Euro 7 proposal

Estimated impact of Euro 7 in 2035 (compared with Euro 6/VI)

Reduction of NOx emissions

➤ **35%** from cars and vans

➤ **56%** from buses and lorries

Reduction of particles from the tailpipe

➤ **13%** from cars and vans

➤ **39%** from buses and lorries

Reduction of particles from the brakes

➤ **27%** from the brakes of a car and vans

Low impact on consumers

These emission reductions are expected to be achieved with existing technologies. A moderate impact on the costs of cars - between €90 and €150 - and on the cost of buses and lorries - around €2600 - is expected.

Big benefit for health and environment

For each euro spent on technologies for Euro 7, more than 5 euros are saved on health and environment.

Conclusions

- The proposal is based on whole-vehicle testing on the road on typical use, including short trips, larger boundaries and larger durability resulting in significant emission savings
- The finally selected option is a balanced proposal which has **significant net benefits for the EU: €145,4 billion between 2025-2050**
- It requires minimal changes to cars and vans (mostly calibration of the engine, OBM for ICE and cleaner brakes for all)
- It requires technologies already used for buses and lorries (i.e. double SCR, slightly better particle filter, OBM for ICE)

Next Steps

- Co-decision means that the proposal is now discussed between Parliament and Council to reach an agreement
- Co-decision process may take time and final rules will only be known at the end
- Regular meetings of expert group AGVES to discuss implementing measures
- Aim to have most of the implementing measures ready by the time the co-decision ends (at least for light duty vehicles)
- Appropriate lead time will be built in the final rule

Thank you