Federal Ministry
Republic of Austria
Transport, Innovation
and Technology

Investigation Of SCR Tampering With Remote Sensing Device

Roadworthiness Committee June 24, 2019

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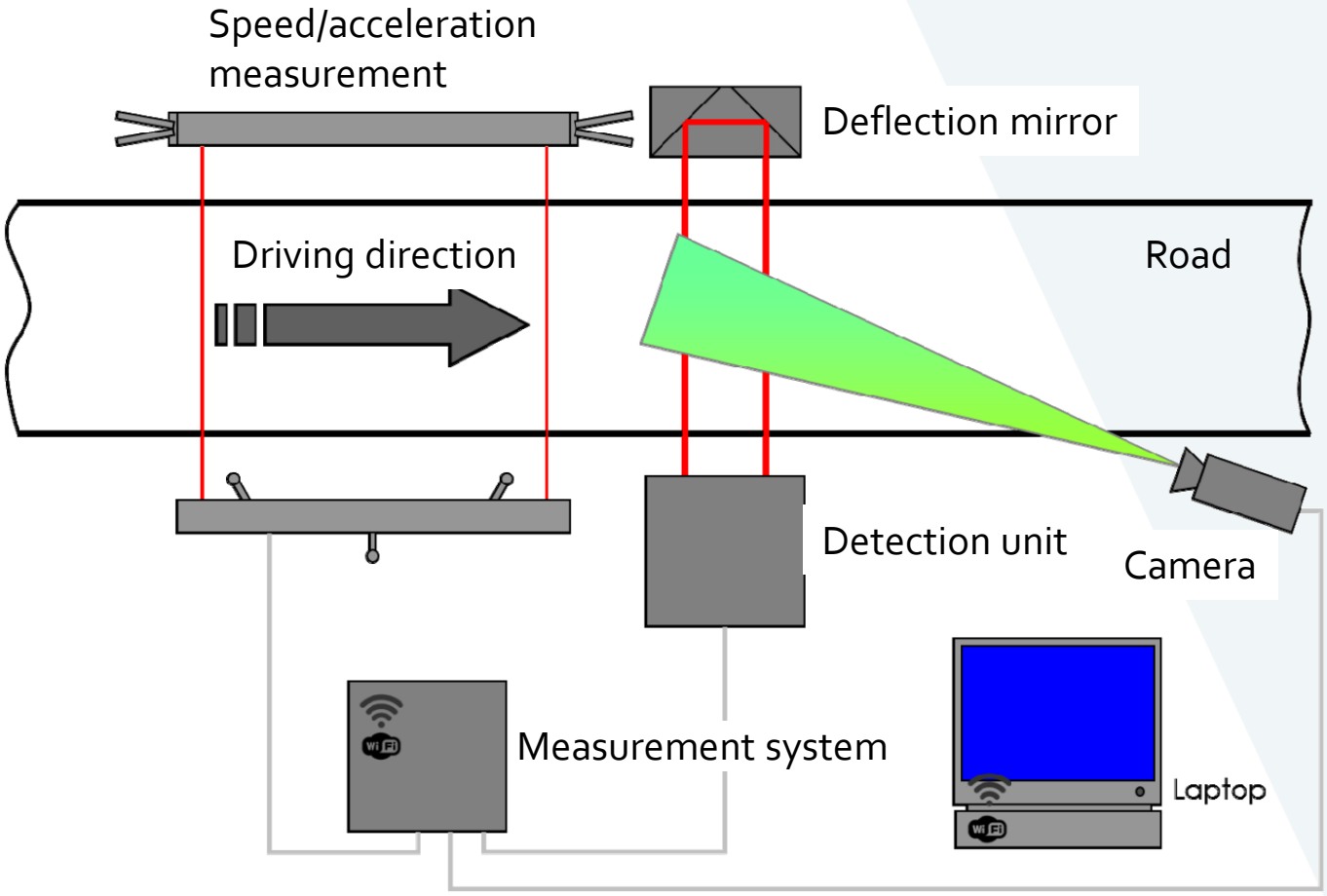
Brussels, 24. 6. 2019

Remote Sensing Device



Purpose of RSD Measurements

- Utility for preselection of vehicles for roadside inspections (RSI)
- Overview over the entire fleet emissions

Results RSD Measurements – Preselection for RSI

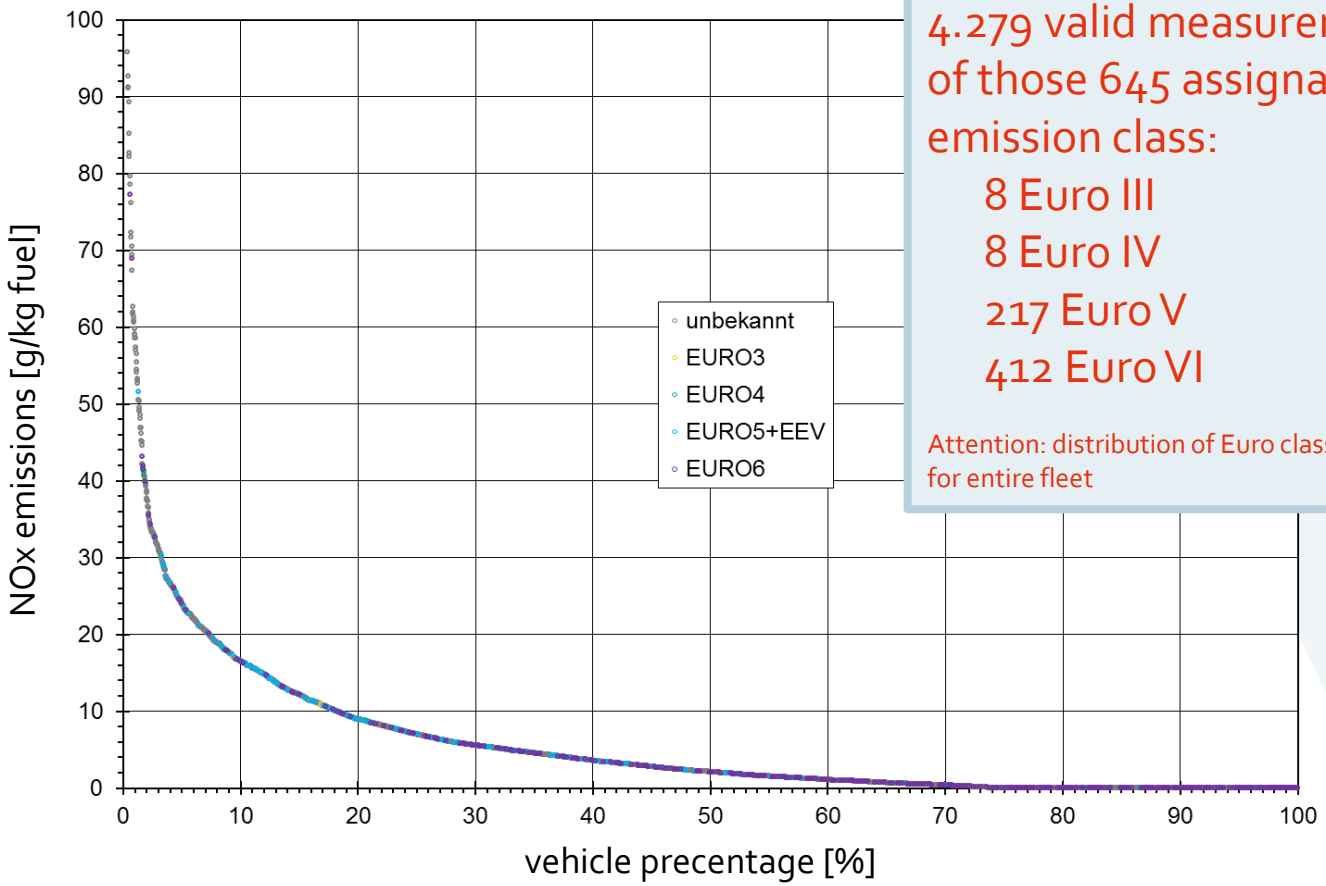
- **27.025 vehicles** measured by RSD
- **32 vehicles** were selected of those
  - **3 vehicles**: manipulations by emulators and missing fuses (only Euro V vehicles)
  - **5 vehicles**: defects in the emission aftertreatment system
  - **6 vehicles**: without SCR system
  - **18 vehicles:** no verifiable modification

Results RSD Measurements – Preselection for RSI

Findings

- Most efficient initial insepction by all-purpose OBD tester; favourably with automatic test procedure
- Open national legal issues
  - Competence for dismantling limited
  - Confiscation of emulators
  - ~~Consequences for vehicle owner/driver~~

Results RSD Measurements – Fleet Emissions

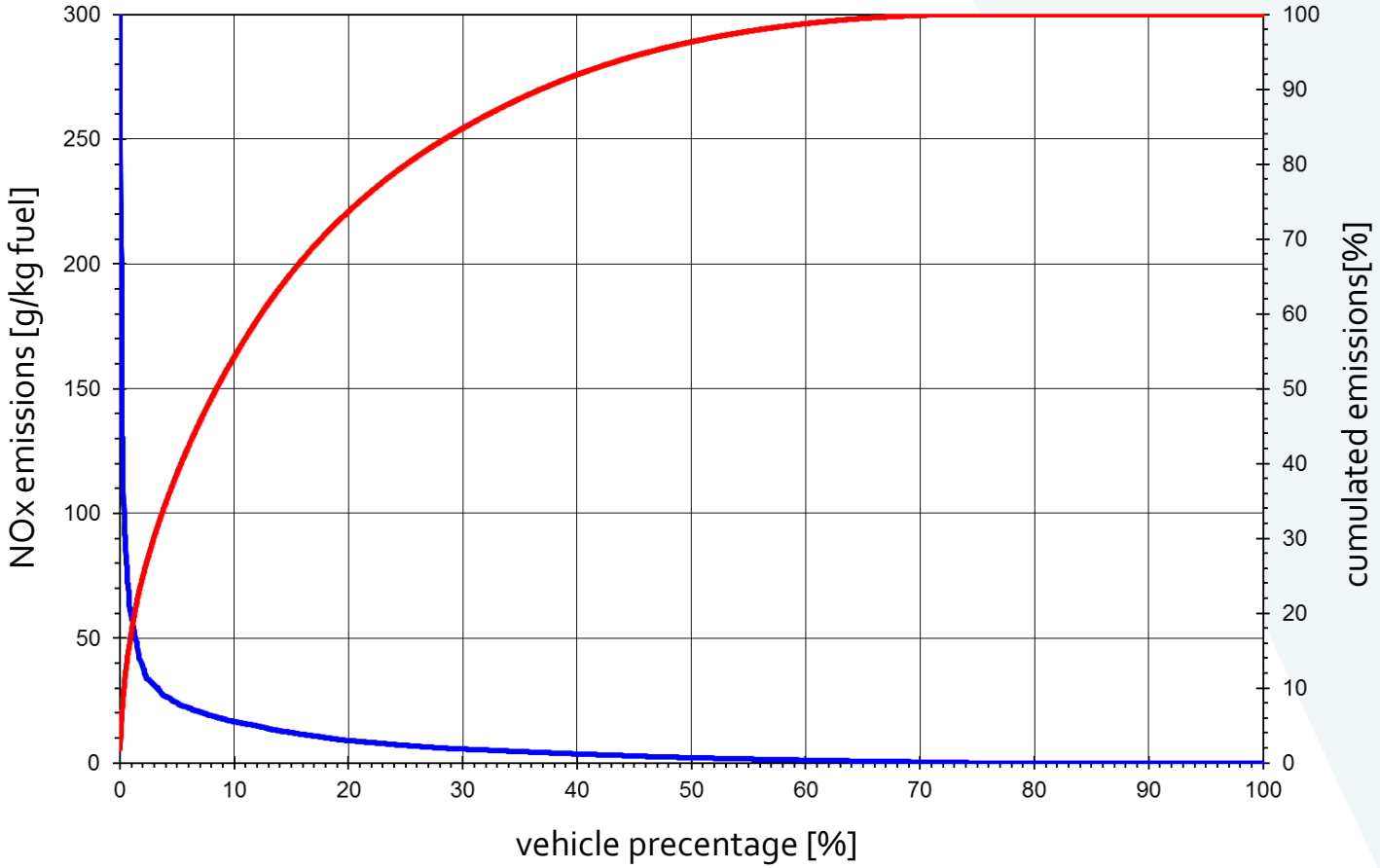


4.279 valid measurements of those 645 assignable to emission class:

- 8 Euro III
- 8 Euro IV
- 217 Euro V
- 412 Euro VI

Attention: distribution of Euro classes not representative for entire fleet

Results RSD Measurements – Fleet Emissions



Results RSD Measurements – Fleet Emissions

Objective of measurements:

Estimation of a manipulation rate: How many vehicles are potentially manipulated?

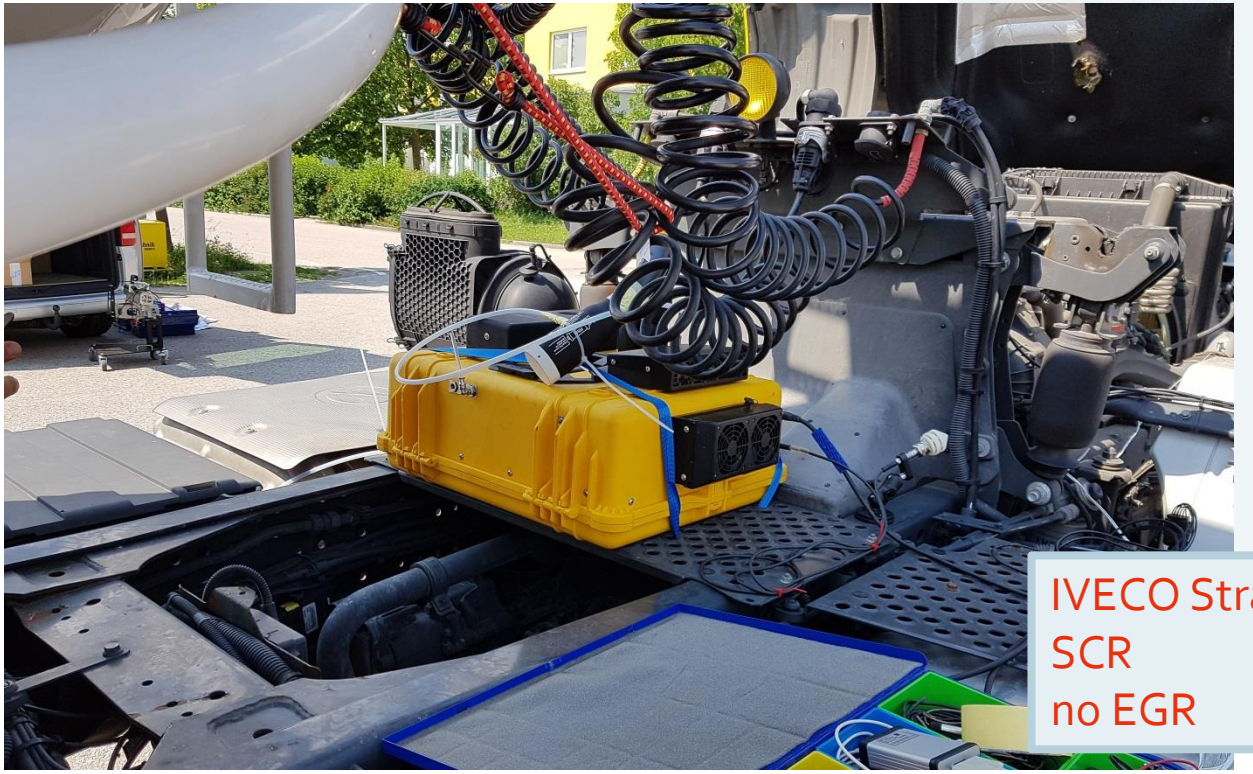
Interpretation of RSD Measurements

1. Reference measurements with manipulated Euro VI vehicle

   ⇨ Reference value for operation with and without SCR system

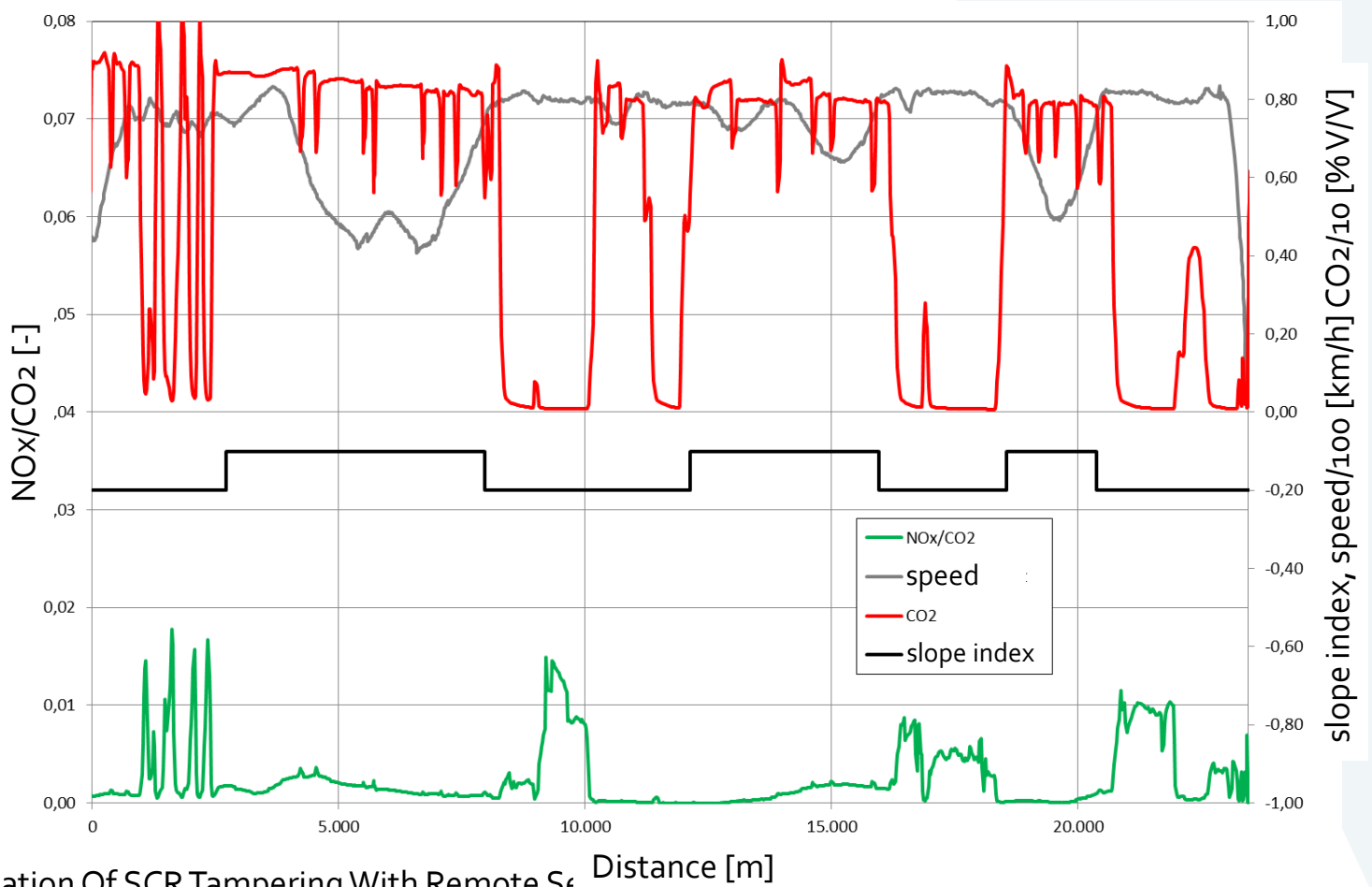
2. Comparison of the measured values with the limit values of the respective emission classes

Interpretation of RSD Measurements
Reference measurement with Euro VI vehicle



IVECO Stralis Euro VI
SCR
no EGR

Interpretation of RSD Measurements
Reference measurement WITHOUT emulator



Interpretation of RSD Measurements
Reference measurement WITH emulator

Interpretation of RSD Measurements
Reference measurement with Euro VI vehicle

- Without emulator (SCR system active)

3,0 g NO_x/kg fuel

- With emulator (SCR system inactive)

37,1 g NO_x/kg Kraftstoff

Interpretation of RSD Measurements
Comparison with Limit Values

Conversion of specific emission limits [g/kWh] in mass fraction [g/kg fuel]

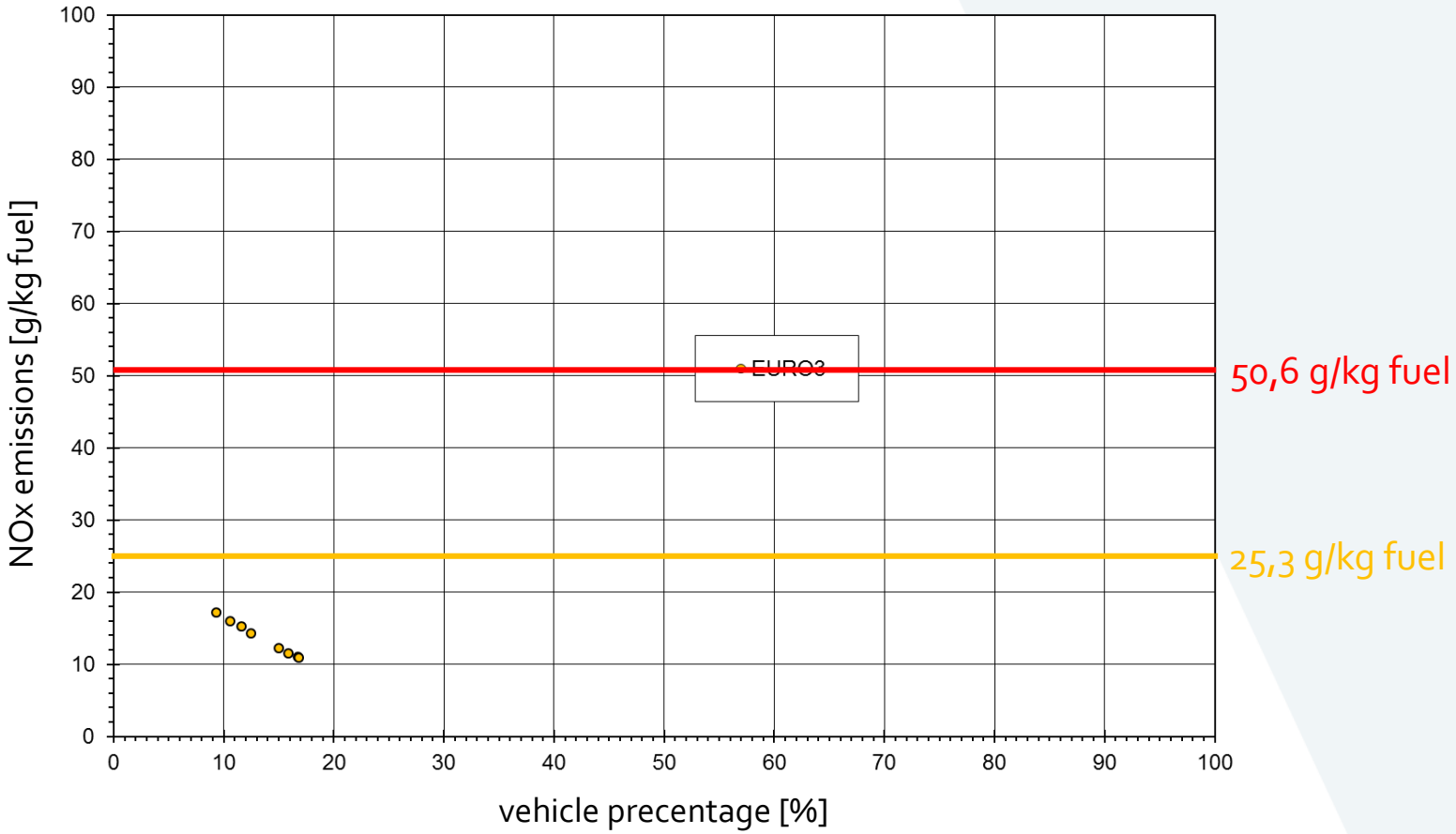
Emissions-klasse	Grenzwert [g/kWh]	Grenzwert [g/kg Kraftstoff]
Euro III	5,0	25,3
Euro IV	3,5	17,7
Euro V	2,0	10,1
Euro VI	0,4	2,0

Explanatory note: for the above conversion an assumption with a singificant uncertainty for the value for the thermodynamic efficiency in the particular operating points has to be made. In combination with the unfavourable conditions at the measurements (< 5 °C) a safety factor has been introduced.

⇨ „safety factor" 2

Results RSD Measurements

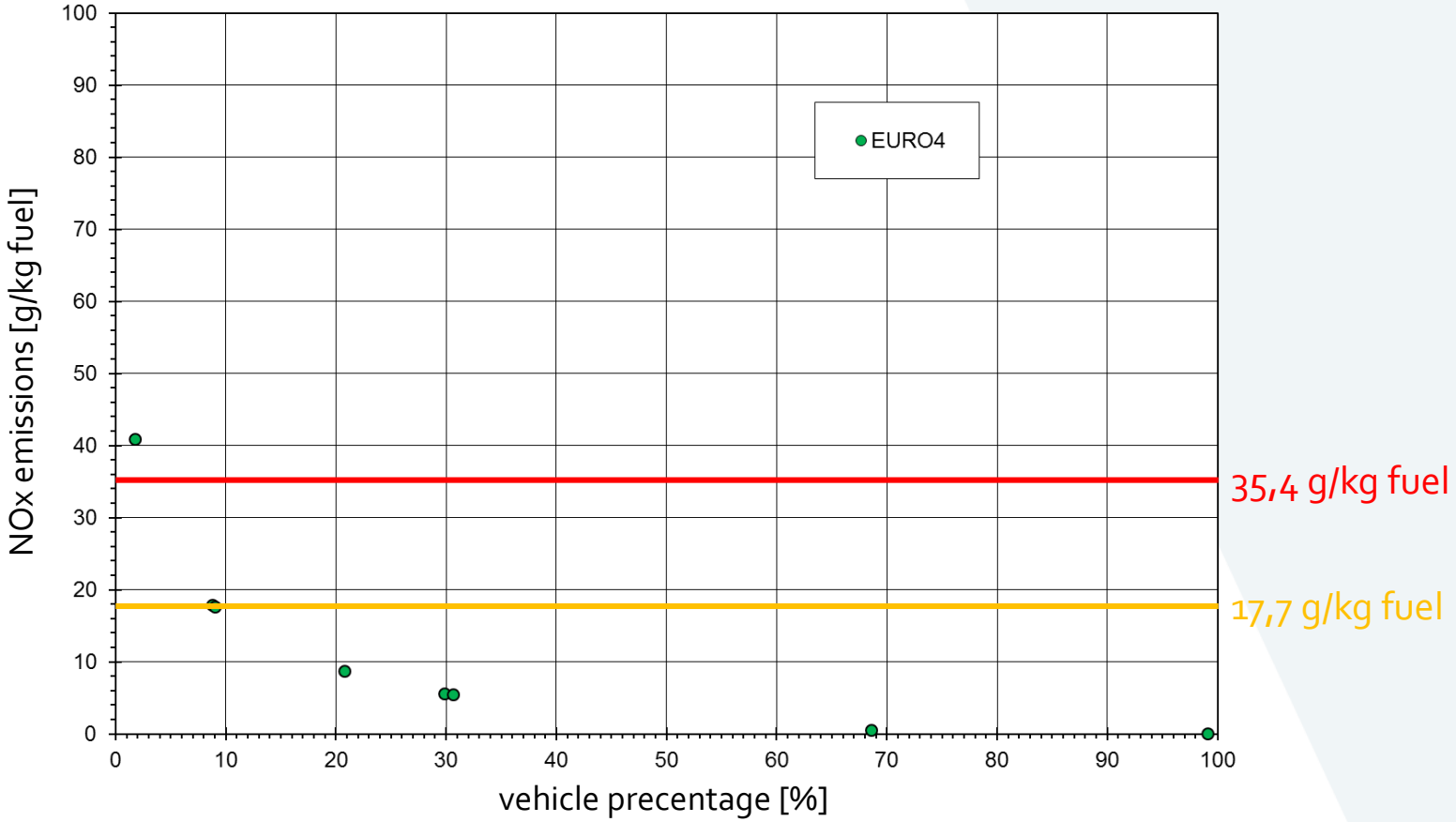
Vehicle Percentage Euro III Related to Total Fleet



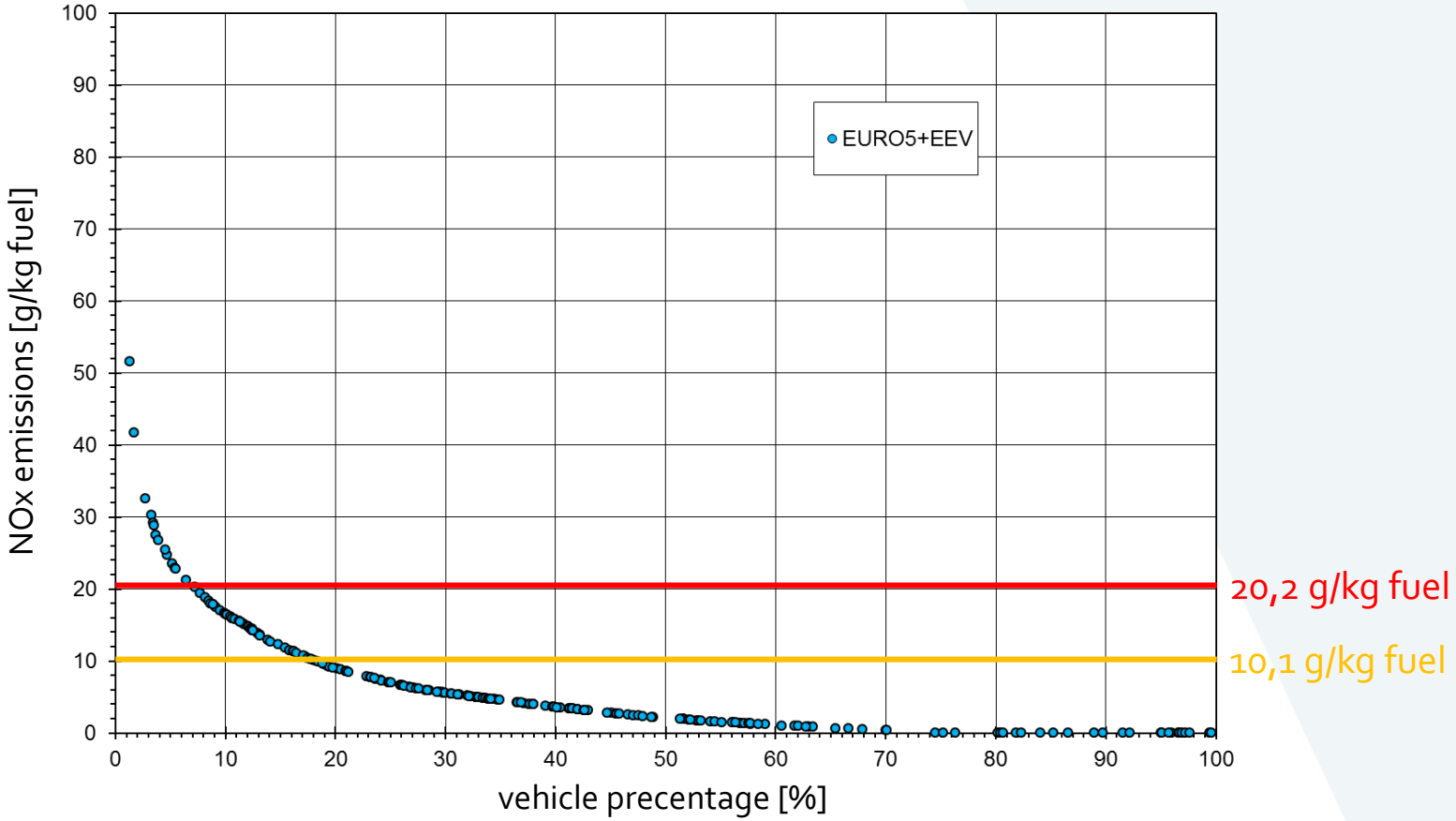
50,6 g/kg fuel

25,3 g/kg fuel

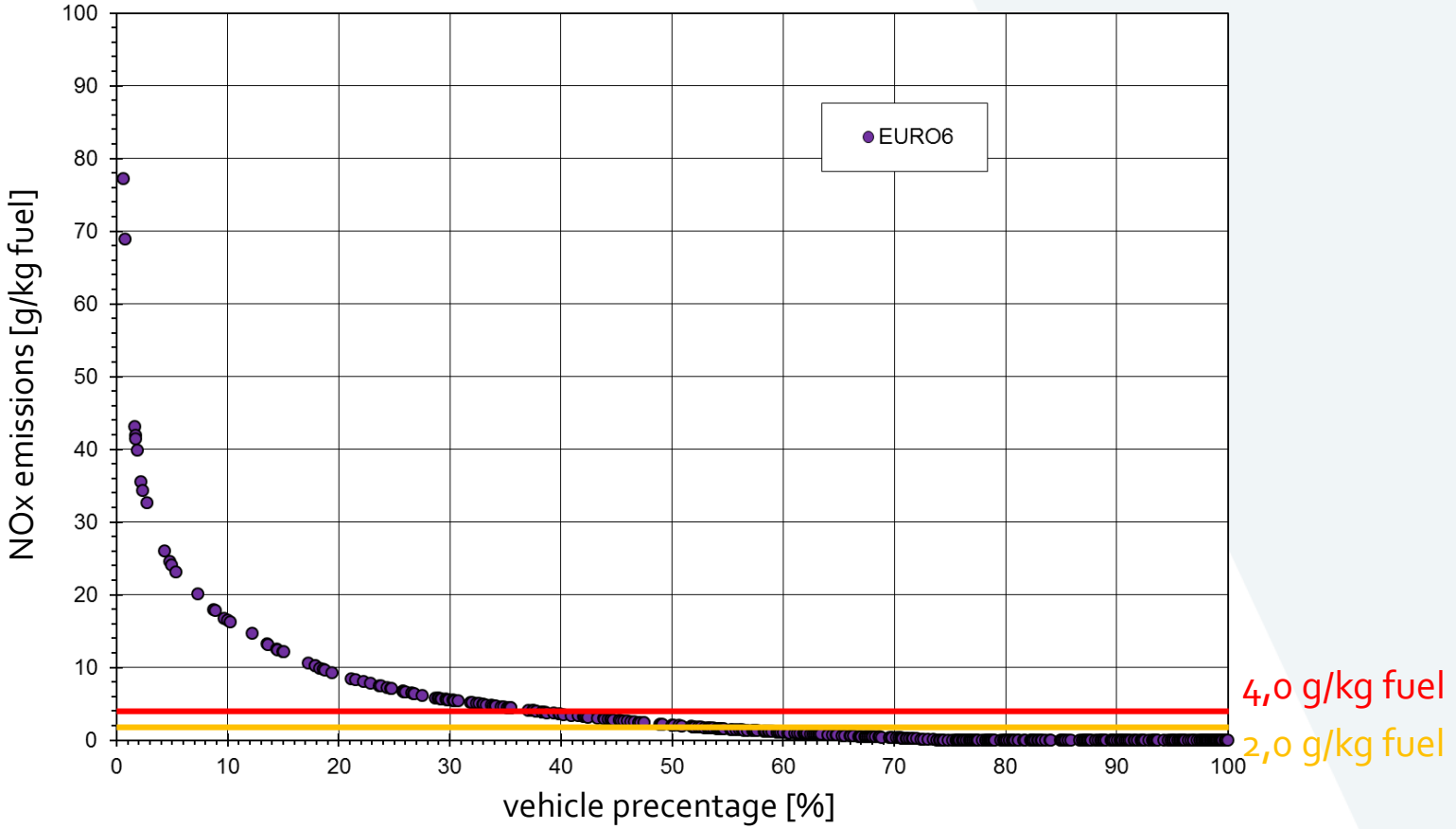
Results RSD Measurements
Vehicle Percentage Euro IV Related to Total Fleet



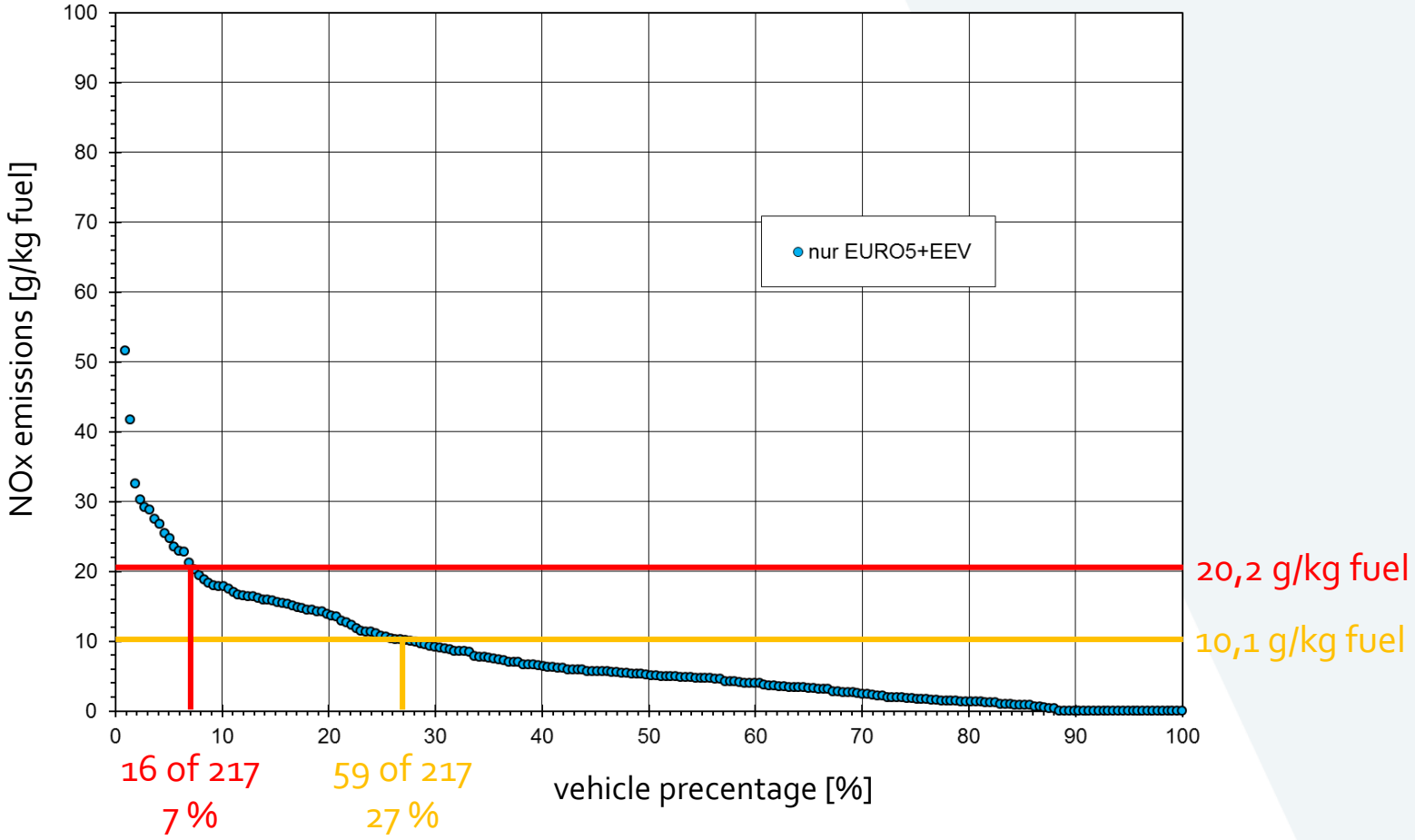
Results RSD Measurements
Vehicle Percentage Euro V Related to Total Fleet



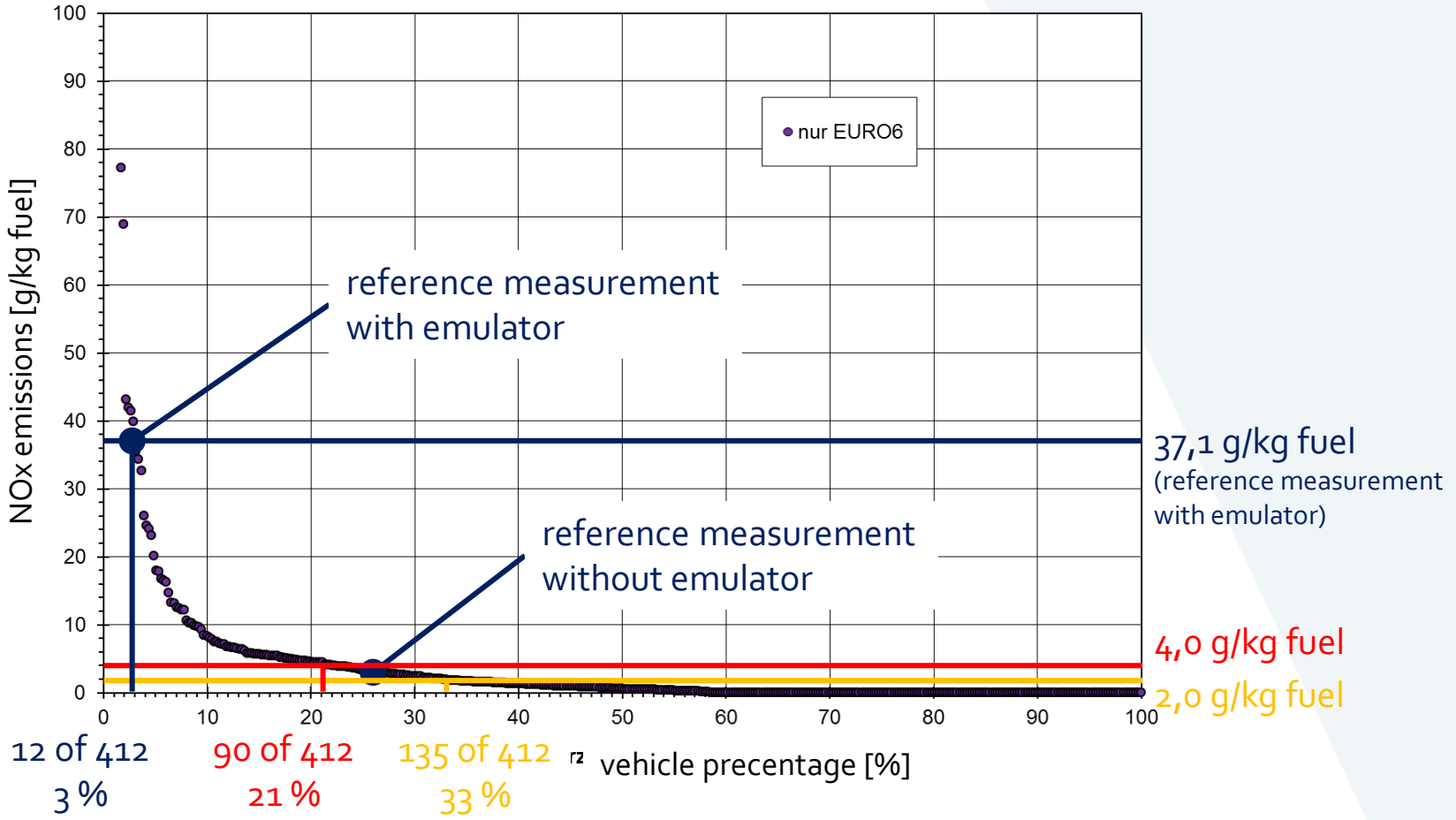
Results RSD Measurements
Vehicle Percentage Euro VI Related to Total Fleet



Results RSD Measurements – Euro V vehicles only



Results RSD Measurements – Euro VI vehicles only



Amendment of the Austrian Motor Vehicles Act

Paragraph on Modifications of Registered Vehicles

Old:

- Modifications of vehicles have to be notified to the Governor if they potentially influence the roadworthiness or the operational safety
- Governor has to approve the modifications if all relevant regulations are met

New:

- Modifications of vehicles have to be notified to the Governor if they potentially influence the roadworthiness or the operational safety **or the environmental performance**
- Governor has to approve the modifications if all relevant regulations are met

Amendment of the Austrian Motor Vehicles Act

Paragraph on Modifications of Registered Vehicles

- **Modifications on emission related parts** of the powertrain system**,** including engine**,** exhaust system and emission control system of vehicles which are able to **decrease their characteristics** or performance on emissions **are prohibited**.

- **Defeat devices** as defined in Regulations (EU) No 715/2007 or (EU) No 168/2013 or defeat strategies as defined in Regulations (EU) No 595/2009 or (EU) 2016/1628 as well as deactivation or removal of emission reducing devices or their modifications potentially decreasing the performance **are prohibited in particular**.

- Modifications of the engine control unit to change the engine power (**Chip-Tuning**) are permitted only and can be approved only if a **test report** issued by a technical service notified for the regulatory acts referred above demonstrates that **all relevant emission legislation is met**.

Amendment of the Austrian Motor Vehicles Act

Paragraph on Modifications of Registered Vehicles

- **Making available on the market** and placing on the market, offering and advertising of defeat devices, defeat strategies or items for deactivation or tampering of pollution control devices as well as for **deactivation or removal** or any other modification of pollution control devices decreasing their performance is prohibited.

- **Offering or advertising** of execution of such modifications, their making available on the market and placing on the market of such **illegal chip tuning** is **prohibited** too.

§ 33 Abs. 6a KFG 1967
(https://ris.bka.gv.at/Dokumente/Bundesnormen/NOR40213174/NOR40213174.pdf)

Thank you for your attention!

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