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Smoke & Mirrors

Flanders addressing elevated vehicle emissions in real driving conditions

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DEPARTEMENT
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POLIS
CITIES AND REGIONS FOR TRANSPORT INNOVATION
ANNUAL CONFERENCE 2019

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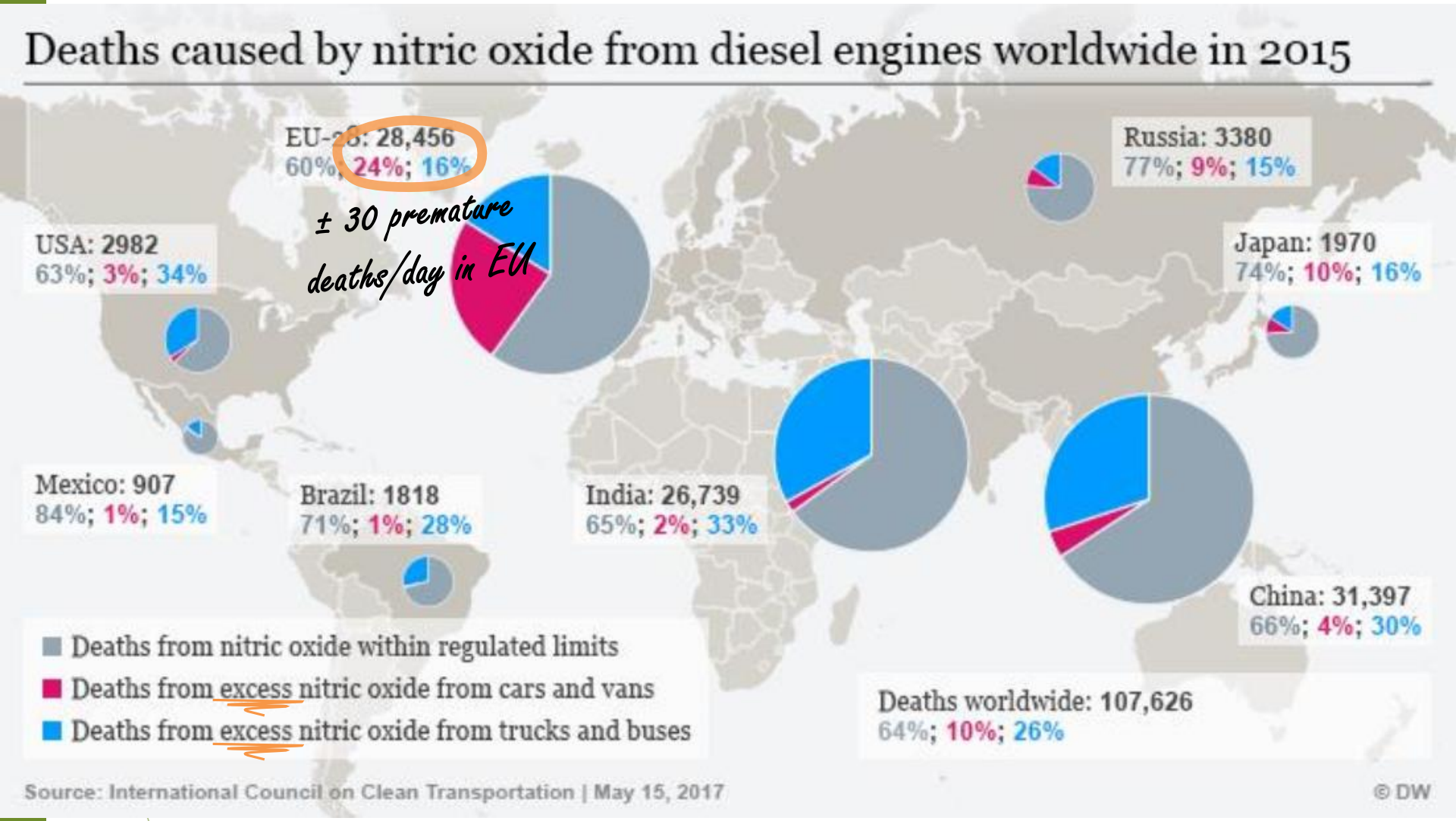
Elevated emissions in real driving conditions



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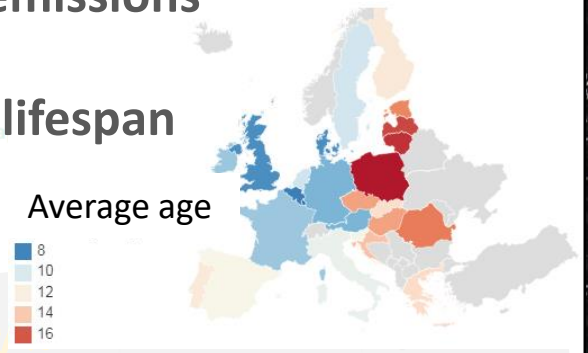
Type approval and emission standards

- **Limited liability of OEM**
  - → Both GTAA and OEM are responsible for emissions
  - → Useful lifecycle much shorter than actual lifespan

M1: 5 years or 100.000 km



  - → TA tests not representative for real driving conditions

TA-system mainly designed as a single ma... Rather than a system aimed at effective environmental performance...

  - → Little oversight, limited in service checks and enforcement
  - → OBD and post treatment systems prone to tampering

40 The RDE test aims at covering normal driving conditions. This means that, for example, driving in temperatures lower than minus 7 °C or driving in an aggressive manner is not covered by the test. Manufacturers may also attempt to employ emissions technologies and strategies to fit the RDE test parameters, i.e. optimising cars for RDE tests rather than attempting to reduce overall NO_x vehicle emissions. NGOs argue that the RDE test parameters are too narrow[41] and call for vehicle emissions to be tested beyond the RDE test parameters, in order to provide a better picture of the level of NO_x emitted[42].

Source: European court of Auditors

framework

...ures, accountability OEM slightly increased oversight and market surveillance

Policy study about elevated emissions

Part I: Legal support

- Order out of Chaos
- Identify legal 'bottlenecks'
- Specific challenges
  - ✓ call-backs for retrofits
  - ✓ Dealing with garage keepers
  - ✓ Analysis legal procedures in EU

Part II: policy strategy

- Active role in evaluation TA
- Investigations to collect evidence
- Strengthen PTI
- Fight illegal tampering
- Keep OEM accountable
- Reduce impact existing fleet

Part III: Data analysis

- Combine fleet info with real world emission info
- Develop methodology to prioritize vehicle models

Part IV: Remote Sensing

210.000 valid measurements

2 weeks, 2 RSD's, 5 locations

Incl Highways!

Analysis ageing effects

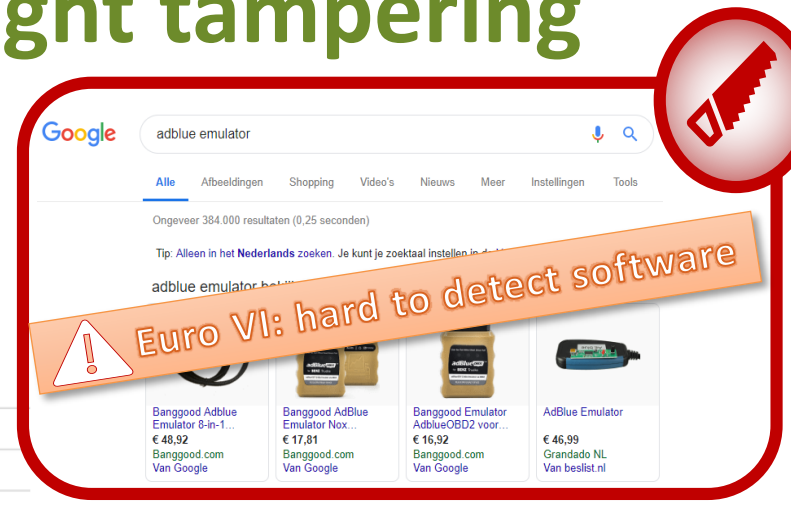
Analysis effect WLTP + RDE

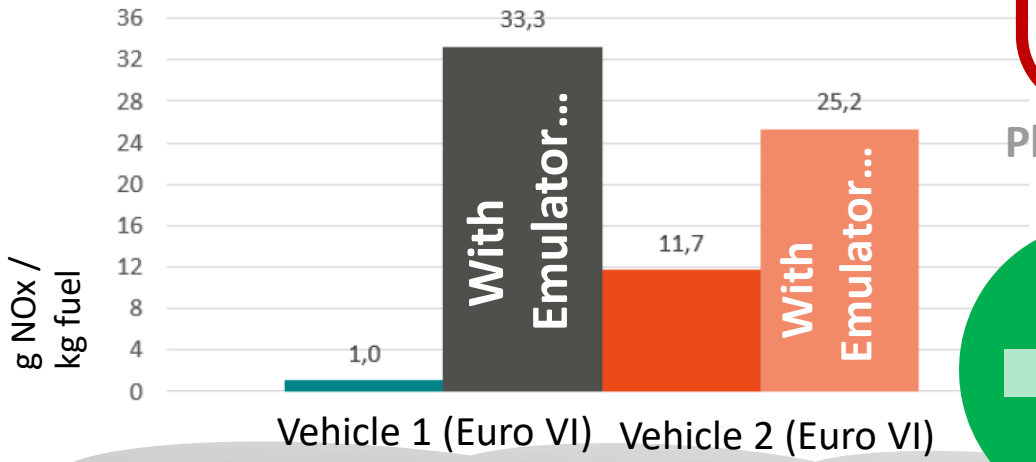
Assess and detect DPF and Ad Blue fraud

RS driven police campaign

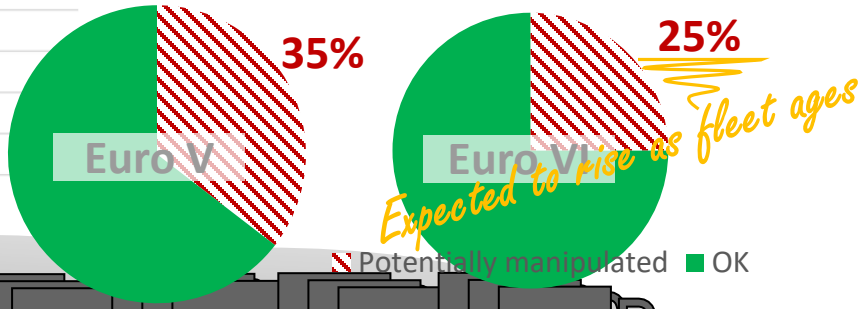
Remote Sensing to fight tampering

- AdBlue required by SCR to drastically decrease NO_X-emissions
- To save costs and avoid technical issues, owners disable system





Plume chasing 79 Euro V + 136 Euro VI trucks in Austria *



1 manipulated truck emits 2 – 32x as much!

In future: Also SCR-fraud in euro 6 passenger cars?

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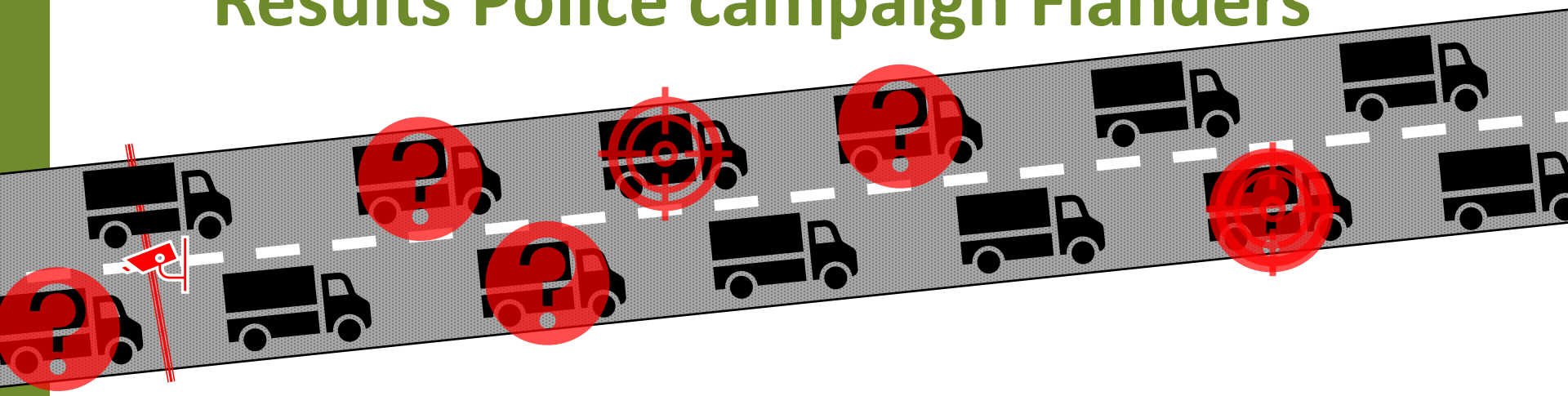
Source: RSD data Swedish Environmental Research Institute (IVL)

** Source: D. Pöhler et al. (2019): NOx RDE measurements with Plume Chasing - Validation, detection of high emitters and manipulated SCR systems - University of Heidelberg + Airyx GmbH*

Results Police campaign Flanders



Ad hoc selection

Ad hoc selection Euro V trucks

Detection rate: 9%

Based on field experience

With Inspection software

RS – based selection

37 g Nox / kg fuel (Euro V)

Detection rate: 83%

Eastern + Western EU trucks

Further investigation needed to fine-tune NOx cut-off for both euro V and euro VI

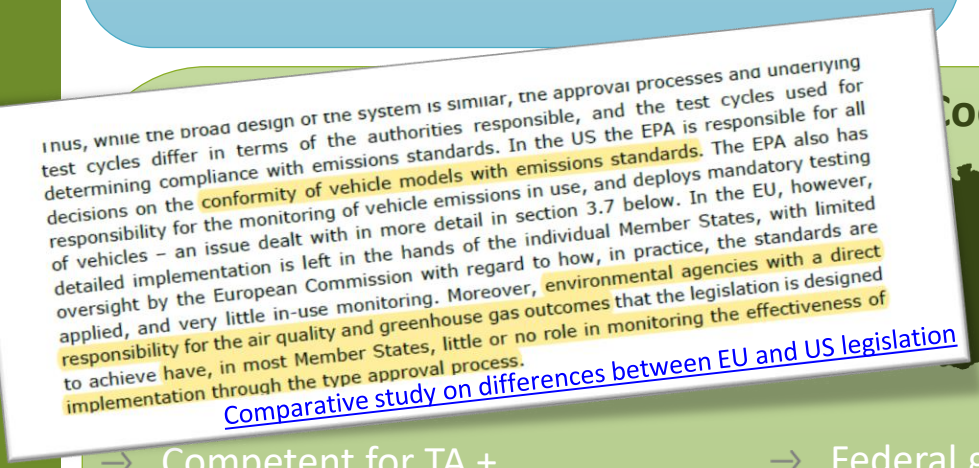
Challenges

Practical challenges

- → Obtaining vehicle data for research and monitoring
- → Limited means and know-how on national / regional level. A dedicated European authority on this would be a big asset.

Legal challenges

- → Complexity legislation
- → Accountability OEM is (and remains) limited
- → Limited influence MS <> GTAA
- → Conflict between single market principles and environmental protection
- → Scattered competence fields



Thus, while the broad design of the system is similar, the approval processes and underlying test cycles differ in terms of the authorities responsible, and the test cycles used for determining compliance with emissions standards. In the US the EPA is responsible for all decisions on the conformity of vehicle models with emissions standards. The EPA also has responsibility for the monitoring of vehicle emissions in use, and deploys mandatory testing of vehicles – an issue dealt with in more detail in section 3.7 below. In the EU, however, detailed implementation is left in the hands of the individual Member States, with limited oversight by the European Commission with regard to how, in practice, the standards are applied, and very little in-use monitoring. Moreover, environmental agencies with a direct responsibility for the air quality and greenhouse gas outcomes that the legislation is designed to achieve have, in most Member States, little or no role in monitoring the effectiveness of implementation through the type approval process.

Comparative study on differences between EU and US legislation

Cooperation

- → Competent for TA + vehicle inspection
- → Environmental goals
- → TAA = dMOW, but environmental goals are domain of dOMG

- → Federal government = market surveillance
- → Collaboration with DIV (vehicle data)

- → International exchange of vehicle data (RS, LEZ, …)?
- → More European oversight and coordination
- → More cooperation / exchange between MS
- → Post euro 6/VI = opportunity

Post Euro 6/VI

Ambitious emission limits

Complete set of pollutants

Testing representative for real world driving + in service conformity

Transparancy OBD vs Protection against Tampering

Reduce complexity where possible

Extended useful life-cycle

Stage	Date	CO	HC	HC+NOx	NOx	PM	PN
		g/km					#/km
Positive Ignition (Gasoline)							
Euro 6	2014.09	1.0	0.10[d]	-	0.06	0.005[e,f]	6.0×10[11] [e,g]
Compression Ignition (Diesel)							
Euro 6	2014.09	0.50	-	0.17	0.08	0.005[f]	6.0×10[11]

Stage	Category	Class	CO	HC	NMHC	NOx	N_2O	PM	PN
			g/km						#/km
China 6a	Type 1	I	0.700	0.100	0.068	0.060	0.020	0.0045	6×10[11]
	Type 2	I	0.700	0.100	0.068	0.060	0.020	0.0045	6×10[11]
		II	0.880	0.130	0.090	0.075	0.025	0.0045	6×10[11]
		III	1.000	0.160	0.108	0.082	0.030	0.0045	6×10[11]
	Type 1	I	0.500	0.050	0.035	0.035	0.020	0.0030	6×10[11]
		II	0.630	0.065	0.080	0.045	0.025	0.0030	6×10[11]
		III	0.740	0.080	0.095	0.055	0.030	0.0030	6×10[11]

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