Taking Remote Sensing to the next level

Flanders deploys RS on highways and explores applications to act against unacceptable emissions

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Vlaanderen
is milieu

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Overview RS pilot June 2019

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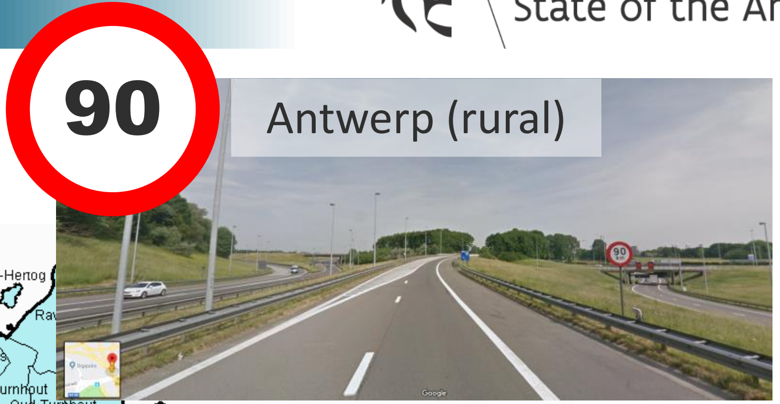

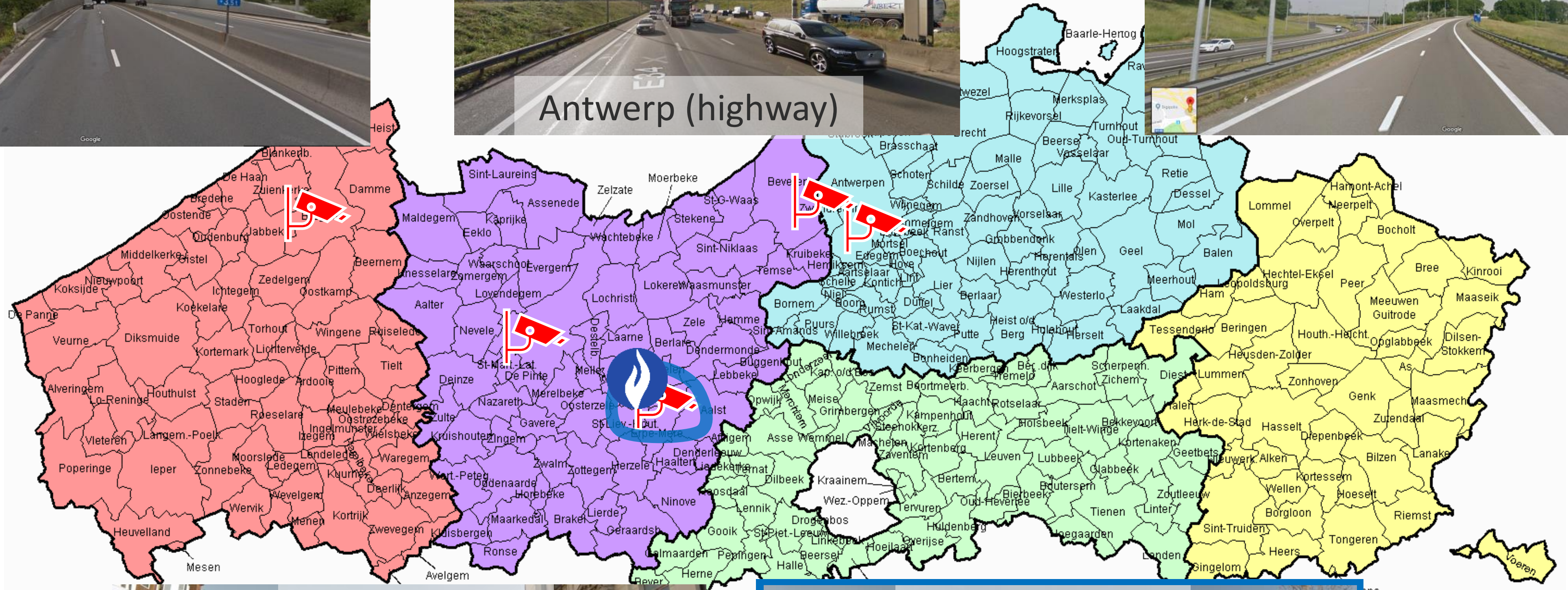

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Overview RS pilot June 2019

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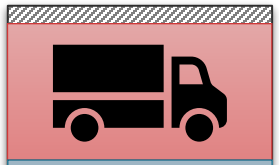
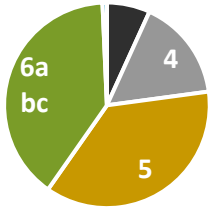
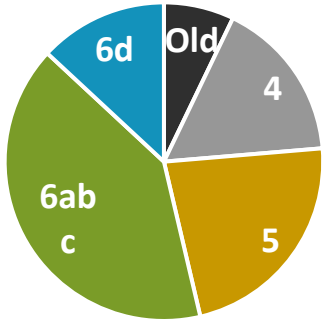
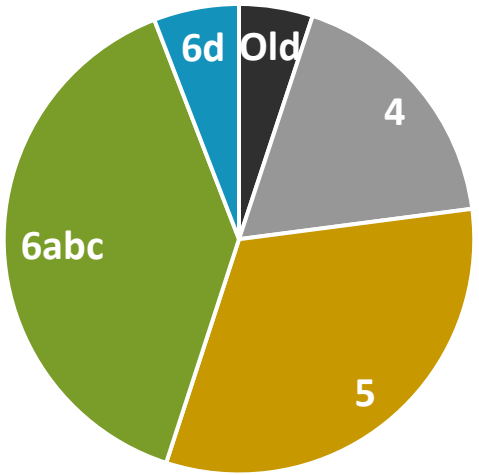
	21k
	29k
petrol 	52k
diesel 	84k







heat
Hager Environmental & Atmospheric Technologies

TNO

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emisia
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Remote sensing was part of a larger investigation to explore policy strategies to act against emission fraud by owner or by OEM

Average NOx emissions from cars

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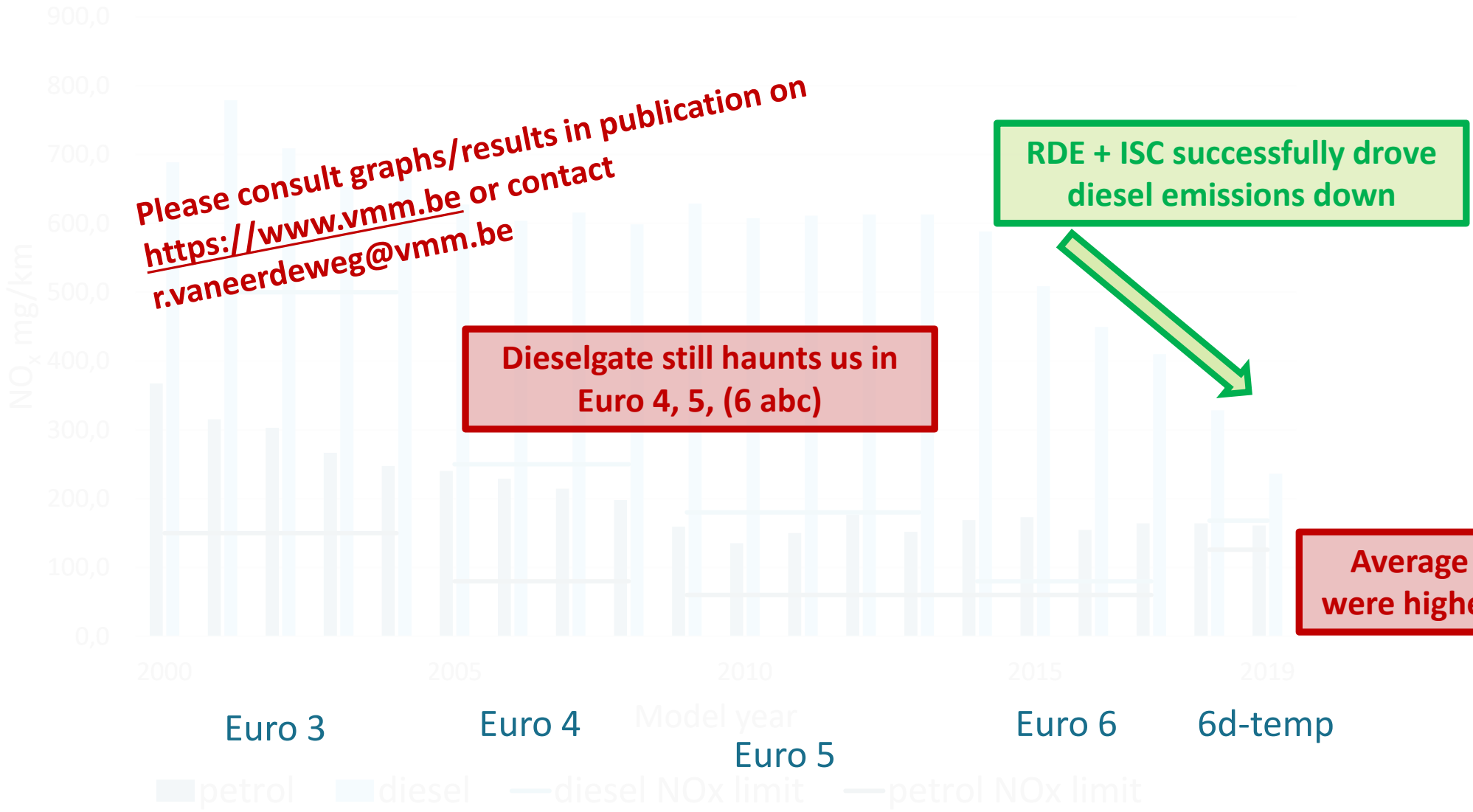

Please consult graphs/results in publication on https://www.vmm.be or contact r.vaneerdeweg@vmm.be

RDE + ISC successfully drove diesel emissions down

Dieselgate still haunts us in Euro 4, 5, (6 abc)

Average petrol emissions were higher than anticipated

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What lies behind the averages

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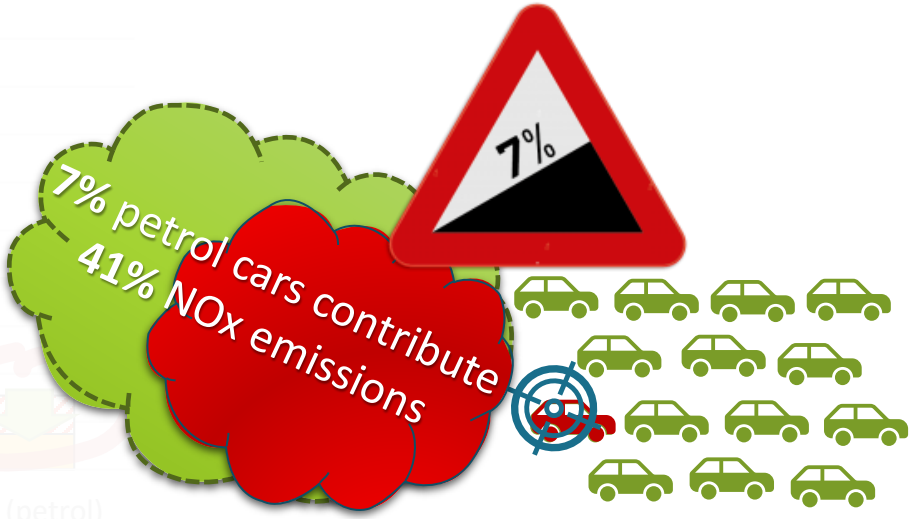
Please consult graphs/results in publication on https://www.vmm.be or contact r.vaneerdeweg@vmm.be

- Poor performance Euro VI in urban conditions → Flaw in ISC-PEMS legislation? (exclusion low engine load)
- Incresed NOx emissions from petrol PC in motorway conditions → high power demands require better representation in TA-tests
- Important to measure at variety different locations / driving conditions

Targeting small % high-emitters can yield tremendous gains!



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Typical | High-emitter contribution | 'dieselgate' fleet problem

Targeting tampering owners

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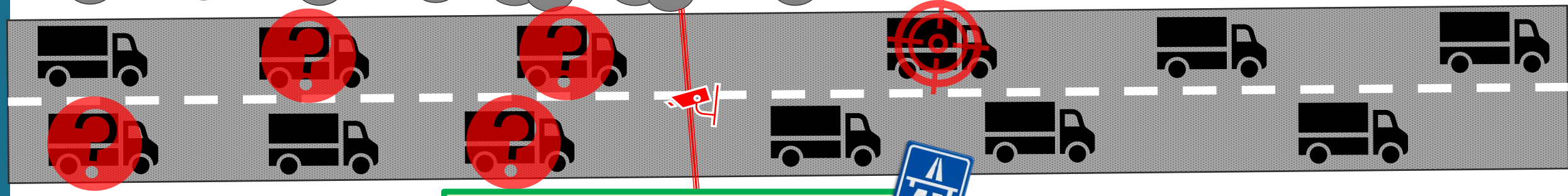
1 manipulated Euro VI truck emits **15x** NOx!

AdBlue tampering drastically increases NOx emissions



Highway locations are ideal for this type of roadside inspections

5-10% tampering/malfunctions

Inspections require **technical expertise + advanced software**

Targeted selection via RS increased inspection efficiency: **9% → 83% !**

AdBlue tampering in **LD-fleet:** increased inspection efficiency with RS required to deal with this

Targeting cheating manufacturers

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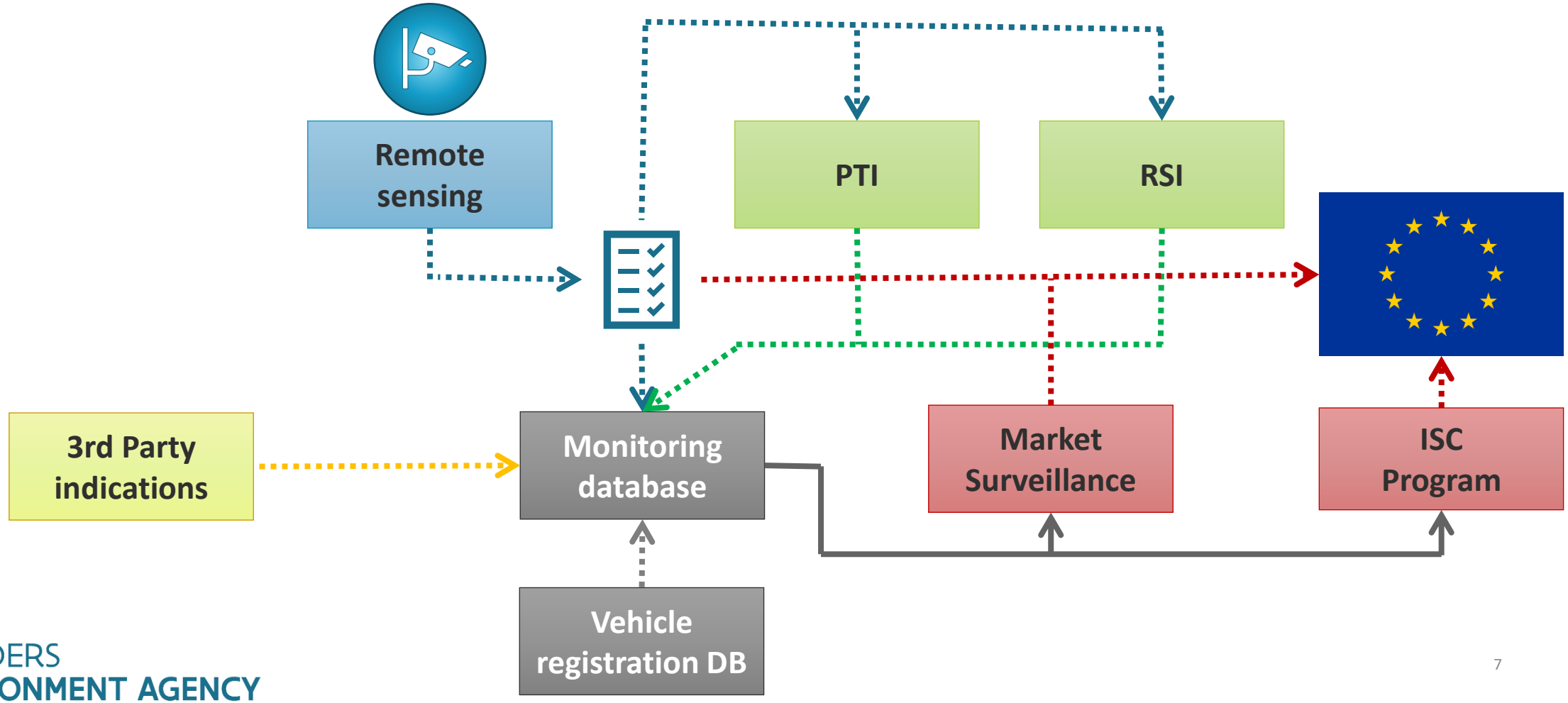
Market Surveillance and ISC monitoring are the only realistic instruments to ensure acceptable emission performance from recent and future vehicles



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Remote sensing applications

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1

Strengthening **Roadside Inspections** to detect **fraud and malfunctions**

Sufficient measurements required to allow **statistical methods** to determine accurate/tailored thresholds

2

Based on multiple readings on the same vehicle: detect emission issues and transmit problematic vehicles to **periodical technical inspection**

Further refine selection criteria using **statistical methods** on extensive dataset

3

ISC-testing programs en **Market Surveillance**

4

Research and investigations to improve **models**, **legislation** and **type-approval procedures/tests**

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European collaboration and policy

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1

Exchange data to shield single market from tampering / fraud and protect health, environment and consumer rights throughout Europe

- **Emission monitoring data**: protocol would facilitate this (CARES?)
- **Technical vehicle data:** GDPR proof approach applicable throughout EU
- **International enforcement:** Vehicles subjected to RSI

2

Collaborate: effective surveillance and harmonized enforcement

- **Finding cross-border solutions** with MSA's, (G)TAA's, 3rd parties
- Monitoring data provides input for **tailored PEMS-tests**

3

Use monitoring data to **improve (European) legislation and testing procedures**

- Real world emission data to **evaluate effectiveness of testing procedures** (e.g. RDE) and **type-approval framework** (**Euro 7/VII !**)
- Combining monitoring and inspection data provides insight into **durability of emission control systems**
- Improve **air quality and traffic emission modelling**

Thank you

for your attention