



European Parliament's Committee on the Environment, Public Health and Food Safety

Public Hearing Real-Driving Emissions Test

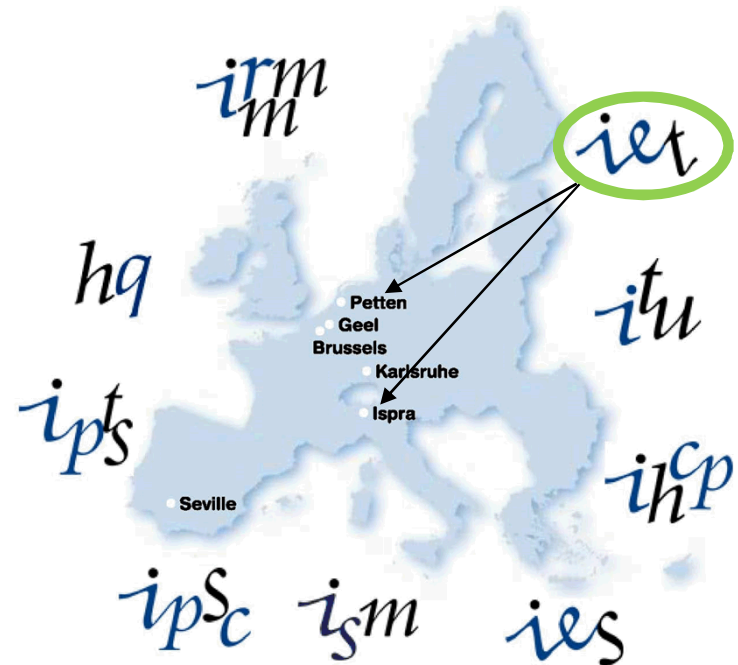
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- JRC is the European Commission's in-house science service
- 7 Institutes - Institute for Energy and Transport operates 9 vehicle test facilities (VeLA labs)

How do we work?

- Own scientific and technical initiative
- Request from policy DGs in Brussels
- Technical co-operation with academia, industry and technical services



- **JRC is key contributor to the development of the European vehicle emissions legislation**
 - Testing of 2-wheelers, cars, heavy-duty vehicles, non-road machinery, EMC/Interoperability of e-vehicles
 - Development of test procedures
 - Supporting the development of instrumentation
 - Disseminating best practices
- **JRC scientists are recognized worldwide and maintain international collaborations**





VELA 1 & 2



VELA 3



VELA 4, 5, 6 & 7



Passenger cars and Light Duty Vehicles →

- EURO 5 /6
 - New limit values
 - PMP programme
 - New driving cycle
 - Real-world emissions
 - Evap. emissions
 - Low temperature emis.
 - CO2, FC, Eco-Innov.

Outside EU UN-ECE (GRPE)

- Worldwide test procedure for LD vehicles (WLTP)
 - New driving cycle
 - Test procedures
 - Additional pollutants

Motorcycles →

- EURO 3
 - New limits
- Beyond EURO 3
 - Durability
 - Anti-tampering
 - Mini-PEMS

- WMTC - Worldwide Harmonised Test Cycle

Heavy Duty Vehicles (On/Off-road) →

- EURO VI
 - PMP programme
 - PEMS programme
- NRMM Directive Review (Dir.2004/26/EC)
- CO2 - VECTO

- NRMM GTR
- PMP Programme

Fuels →

Joint Research Centre

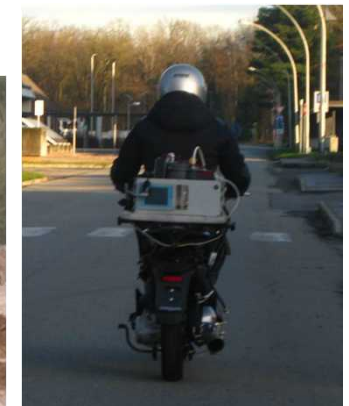
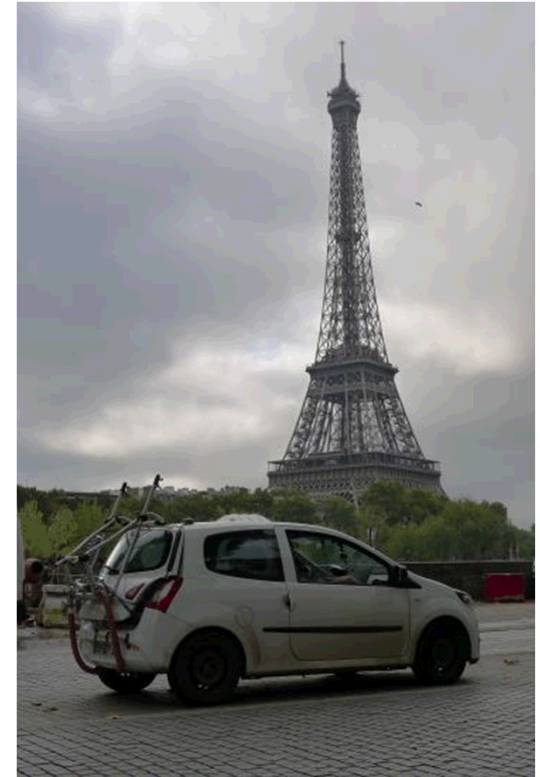
- Fuel Directive Review
 - Impact of ethanol
 - Metallic additives
- Alternative fuels
 - Well to Wheels analysis
 - Impact on emissions/energy efficiency

- H2 Fuel Cell GTR

History of JRC testing of real-world emissions

- Since 2004: Heavy-duty vehicles
EURO VI implementing measures adopted
Under Regulation 582/2011)
- Since 2007: Passenger cars
- Since 2008: Non-road mobile machinery
- Since 2015: Motorbikes with mini-PEMS

In-use emissions testing with Portable Emissions
Measurement Systems (PEMS) as
key technique to ensure robust emissions legislation





History of the Real-Driving Emissions (RDE) Test Procedure

2007: JRC starts testing passenger cars' emissions on road

2010 November: JRC presentation diesel-NOx emissions on the road

2011 January: Kick-off RDE working group

2011 and 2012: Evaluation of 4 candidate procedures

- (i) complementary fixed test cycles, (ii) random test cycles,
- (iii) PEMS on-road testing, (iv) emissions modelling

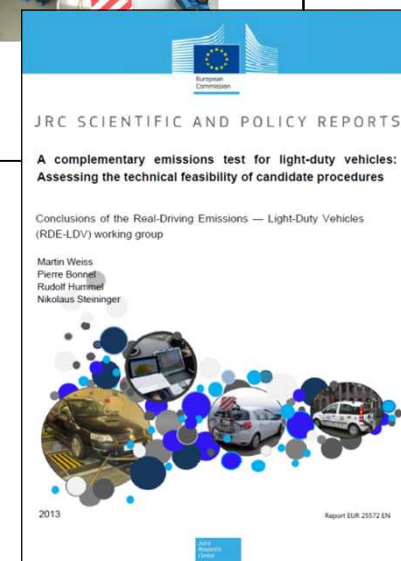
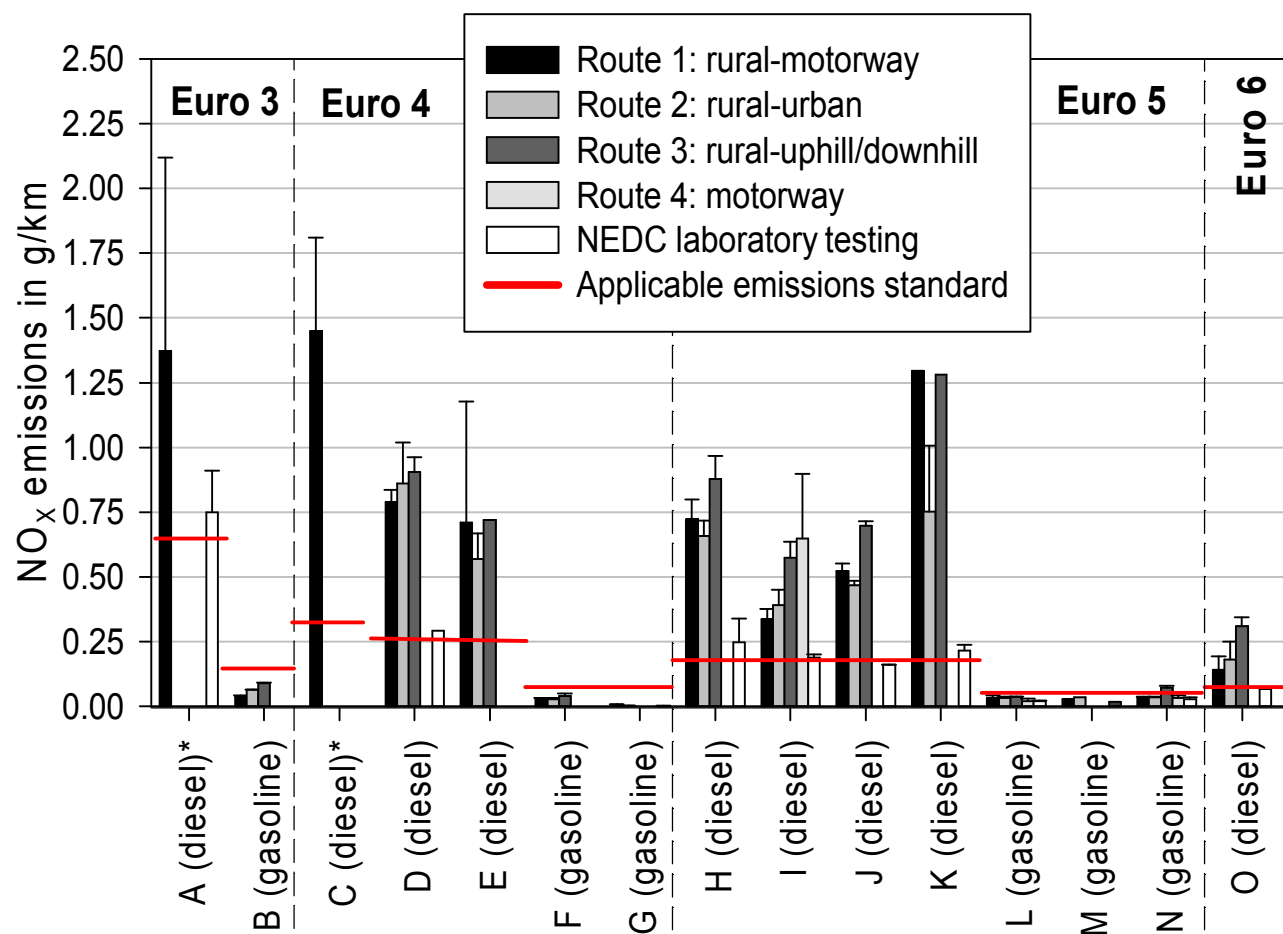
➤ In-depth evaluation of options (ii) and (iii)

2013-2014: Development of an PEMS on-road test procedure

- Boundary conditions and data evaluation

Outcome of JRC real-drive emissions tests 2007-2010

building evidence of the Diesel NO_x problem



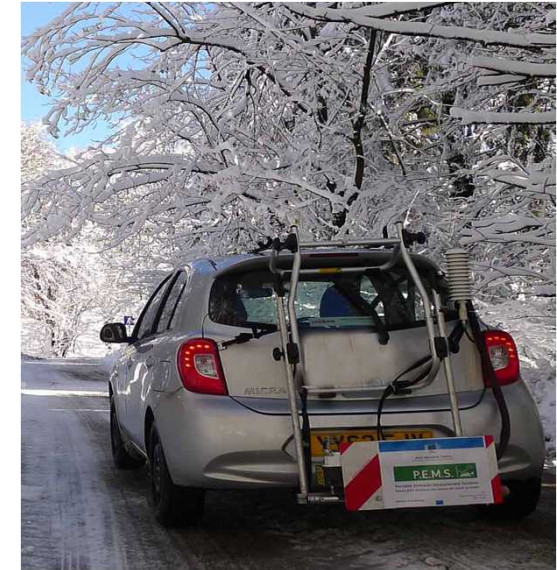
Where are we now?

May 2015: RDE 1st package

- Setting boundary conditions for testing and equipment specifications

October 2015: RDE 2nd package

- Further testing conditions, data analysis and conformity factors





What will come?

On-going and future RDE activities at JRC

2016 (3rd RDE package)

- Developing a dedicated cold-start test procedure
- Adapting the data evaluation to accommodate hybrid vehicles
- Measurement of Particle Number emissions (PN)

2016 (4th RDE package)

- Defining the provisions for in-service conformity and market surveillance testing

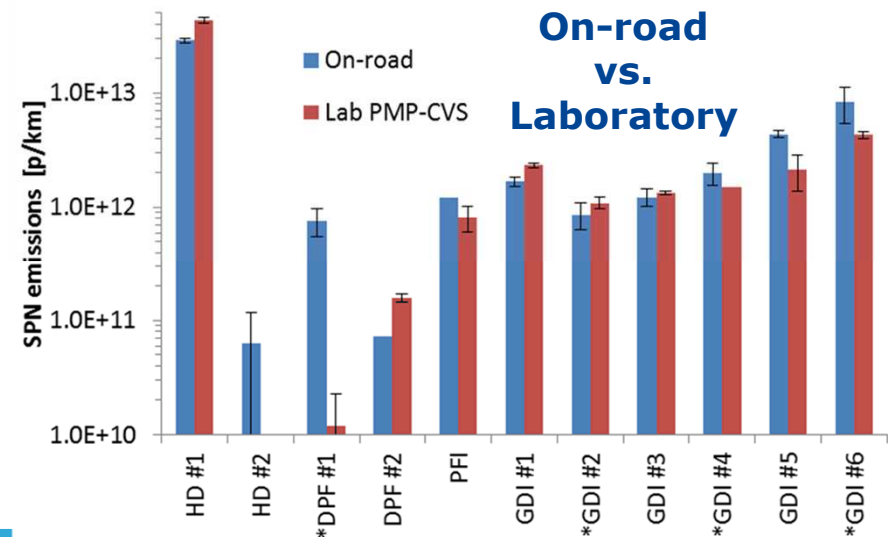
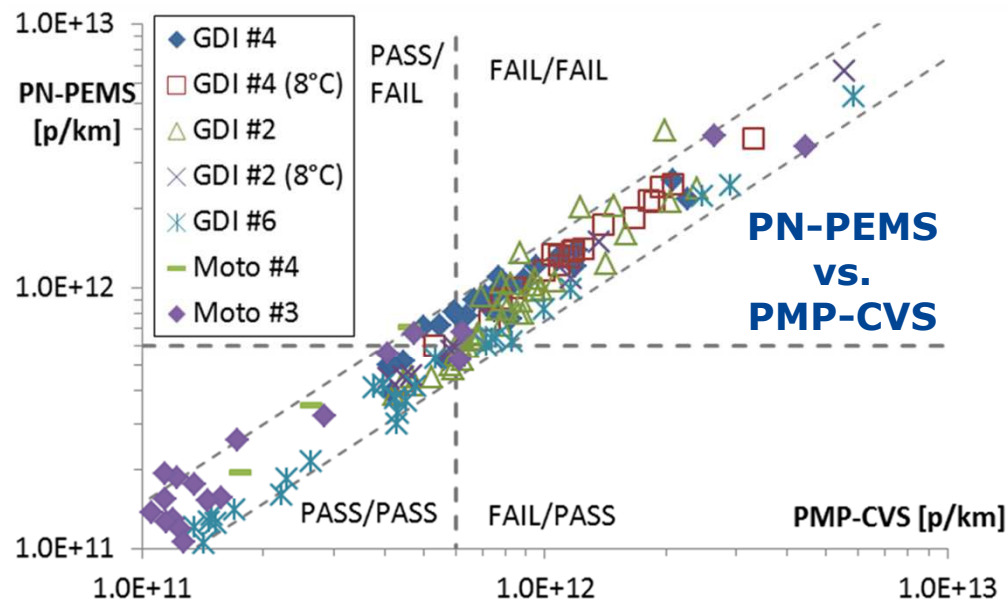
2016-2017

- Reviewing RDE procedure and adapting provisions to ensure practicality and effective emissions testing

Example of on-going work at JRC

2016 in support to the 3rd RDE package

- Completing experimental activities/feasibility studies on mobile particle number counters (PN-PEMS)
- Defining performance requirements for PN-PEMS equipment





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**Thank You
for
your attention!**