

# Transport Expert Panel

Summary Report  
Thessaloniki, 2019-05-13

# Agenda

<b>13:45</b>	<b>Welcome and progress since last year</b>	<b>Chairs</b>
<b>14:00</b>	ECAMED: A Technical Feasibility Study for the Implementation of an Emission Control Area (ECA) in the Mediterranean Sea	<b>Jean-Marc Andre (CITEPA)</b>
<b>14:20</b>	POP and heavy metal emissions from marine engines, Nordic programme	<b>Paivi Aakko-Saksa (VTT)</b>
<b>14:40</b>	The Contribution of Brake Wear Emissions to Particulate Matter in Ambient Air	<b>Daniel Wakeling (Ricardo)</b>
<b>15:00</b>	JRC's Activities in Road Vehicle Testing and Emission Factors Development	<b>Georgios Fontaras (JRC)</b>
<b>15:20</b>	Experiences of semivolatile (SVOC) and particulate matter (PM) emission measurements	<b>Paivi Aakko-Saksa (VTT)</b>
<b>15:40</b>	Coffee break	
<b>16:00</b>	New developments on road transport chapter	<b>Giorgos Mellios (ETC)</b>
<b>16:20</b>	Non-exhaust traffic emissions in the UK's inventory	<b>Daniel Wakeling (Ricardo)</b>
<b>16:40</b>	Consideration of rail abrasive emissions	<b>M. Kotzulla (UBA)</b>
<b>17:00</b>	2019-2020 workplan	<b>Chairs/all</b>
<b>17:20</b>	<b>Meeting end</b>	

# Progress since last year

Item	Reporter
Review and uptake of Nordic study -Update of NMVOC emissions profile -PAH and HM	Paivi Aakko-Saksa (VTT)
New exhaust emission factors for motorcycles Conversion of Tier 1 and Tier 2 EFs to kg/MJ	EMISIA /Done
New emission factors for electrified vehicles (diesel hybrids, plug-in hybrids, battery electric vehicles) Review of non-exhaust PM EFs (PM <sub>2.5</sub> over PM <sub>10</sub> )	EMISIA / Next year
Consideration of rail abrasive emissions	UBA

# An Emission Control Area in the Mediterranean Sea

- ECAMED project results
- Reference period 2015
- Pollutants SO<sub>2</sub> , NO<sub>2</sub> , O<sub>3</sub> , PM
- All the Mediterranean sea
- Most impacted countries Italy, Greece,
- In the worst-case scenario, health benefits of implementing a SECA/NECA are 3 times higher than costs,
- France hopes that the French study, the EU study and the REMPEC one will lead to a rise of awareness about the important need for an ECA in the Mediterranean Sea.
- Report available: [https://www.ecologique-solidaire.gouv.fr/sites/default/files/R\\_DRC-19-168862-00408A\\_ECAMED\\_final\\_Report\\_V5.pdf](https://www.ecologique-solidaire.gouv.fr/sites/default/files/R_DRC-19-168862-00408A_ECAMED_final_Report_V5.pdf)
- The problem was to find activity data available for compiling the model

# The Nordic programme about the POP and heavy metal emissions from marine engines

- Nordic program PoP (persistent organic pollutant emissions ) and heavy metal emissions from ships
- Emissions limits expected for ships, PM, PN and black carbon, and methane for LNG ships.
- Little data for BC
  
- Guidebook emissions confirmed, new data produced – guidebook data based on data derived from older fuels.
- PAH EFs were evaluated from recent marine engine measurements
  - bunker “residual” fuel
  - distillate fuels
  - ships equipped with emission control devices using residual fuels
- PAH EFs for marine engines are not in the Guidebook.
- The HM EFs evaluated from recent programs were in most cases well in-line with the Guidebook. However, slightly lower EFs for As, Cu and Se than in Guidebook.

# The Contribution of Brake Wear emissions to Particulate Matter in Ambient Air

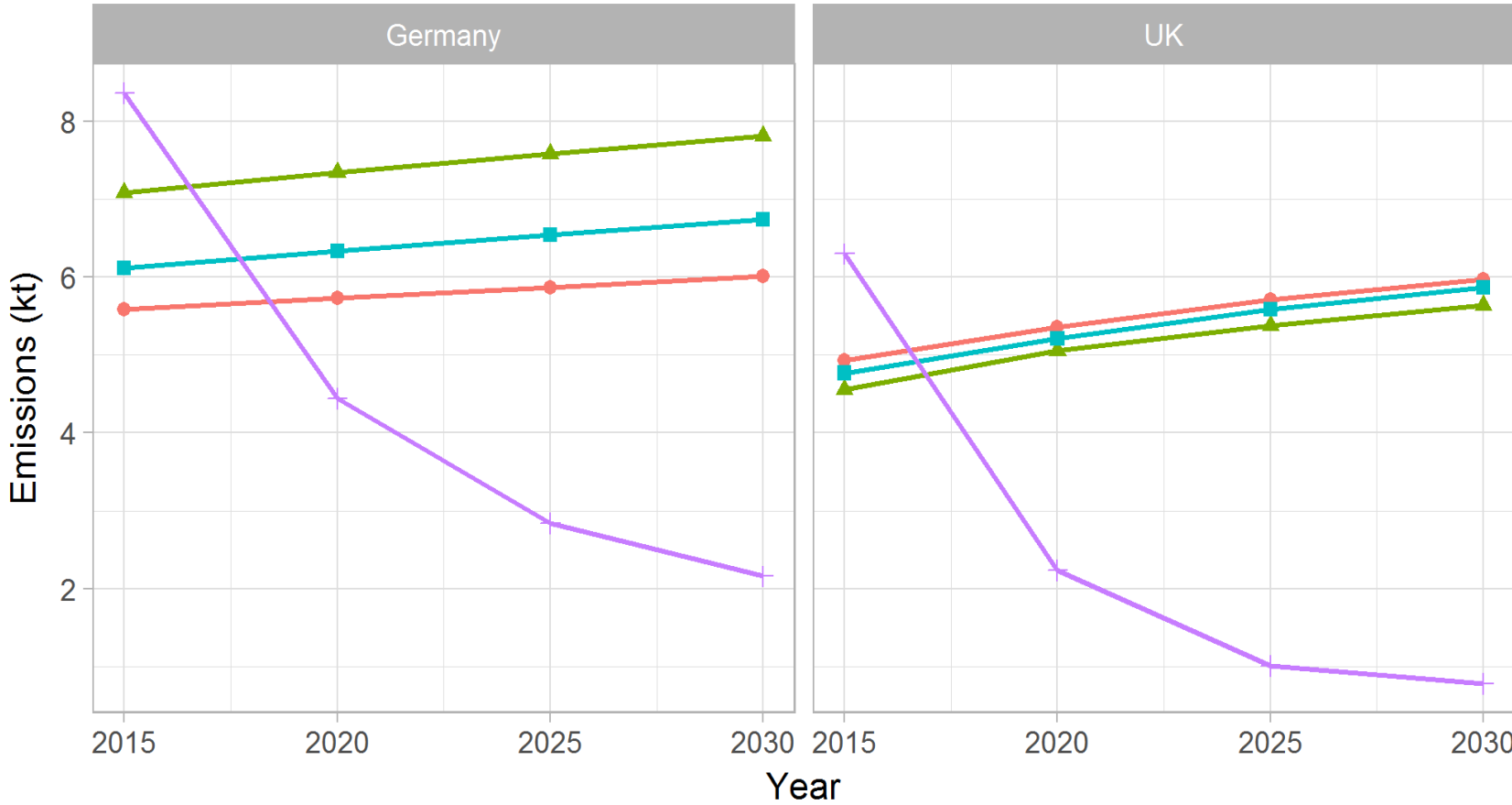
- Scientific literature, brake wear contributions, scoping study, current work
- Existing uncertainties in brake wear emissions and how they can be calculated
- FAT → VDA + suppliers
- Lack of data and considerable uncertainties
- PM10 from road transport, brake, tyre road abrasion, way higher than tailpipe.
- Used VSP (kW/t) in real highway junctions to understand how vehicles brake intensively and what the results are
- Modeling Riccardo Rapid Air Model. for and testing
- 2018 draft report, waiting for feedback to be published soon – developing

# Non-exhaust traffic emissions in the UK's inventory

- Methodology use, emission factors, uncertainties, Guidebook 2016 method, Tier2 approach,
- Uncertainty range 2.5 for pass cars and lcv, 4 for hdv
- Metal emissions – no metal emissions from road abrasion
- Conclusions:
  - important emissions,
  - outdated data available,
  - additional feedback necessary.
- The guidebook can be successfully used for spatial estimates of non-exhaust emissions

# Emissions trends - PM<sub>10</sub> emissions from road transport sources

Activity ● Road abrasion ▲ Brake wear ■ Tyre wear + Road transport - exhaust



Source: German data: German Environment Agency  
UK data: Ricardo Energy & Environment

The scale on the y-axis applies to both countries.

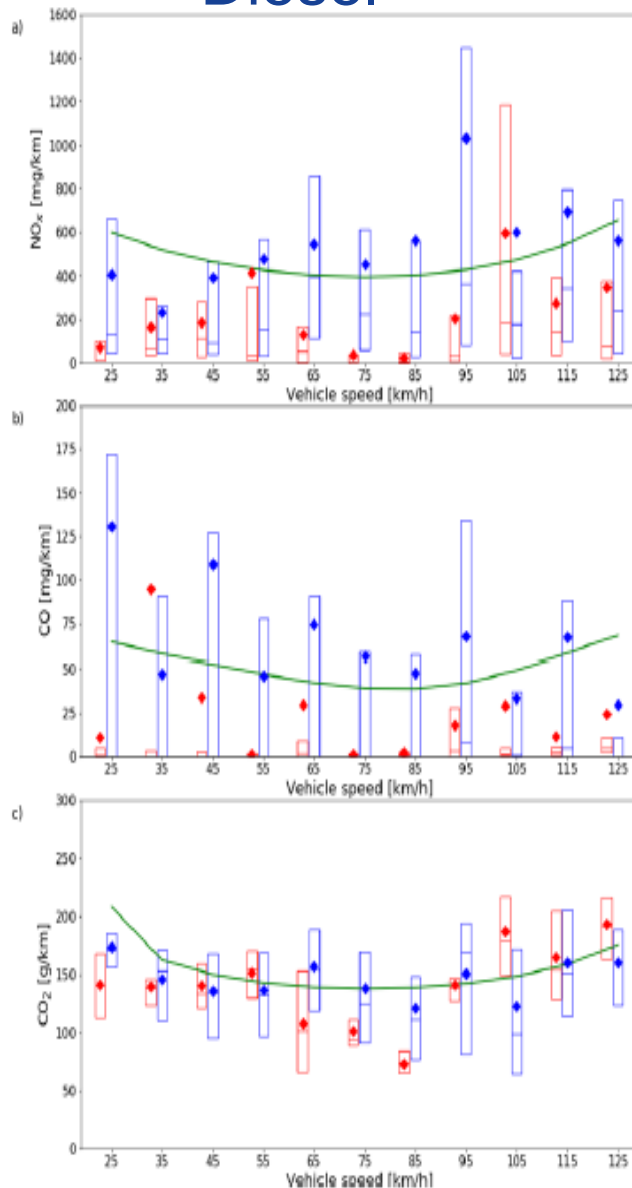


# JRC's Activities in Road Vehicle Testing and Emission Factors Development

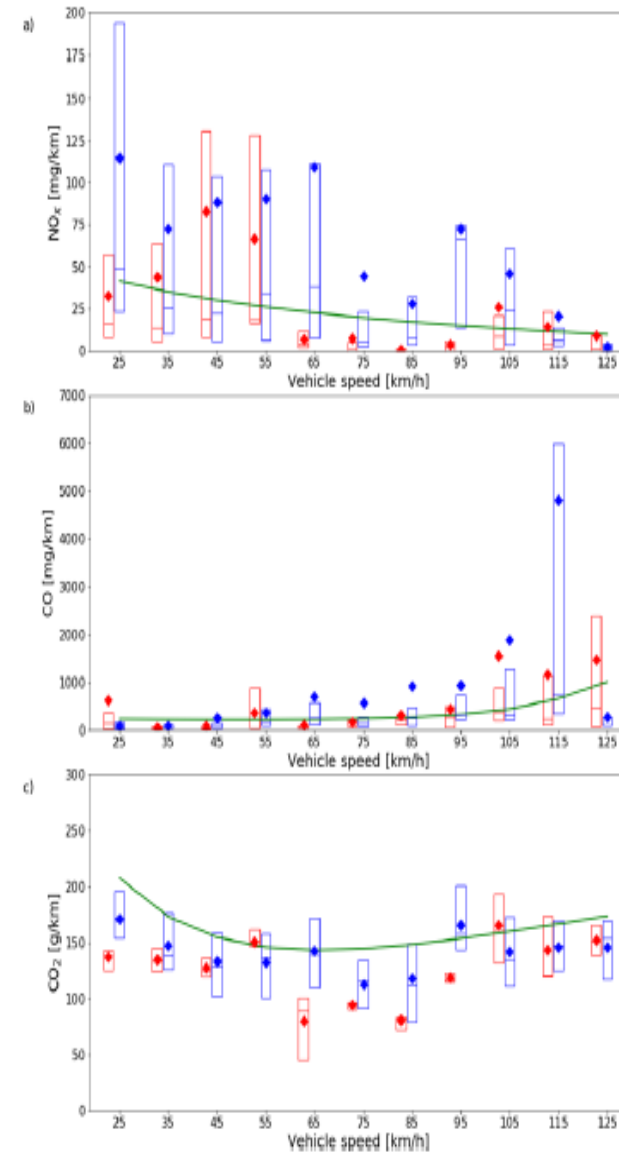
- Testing numerous vehicles as part of market surveillance campaigns and other projects
- Effort to produce updated EFs for modelling purposes – feedback provided as part of ERMES activities for 13 Euro 6 vehicles
- Studies on HDV vehicles confirming existing Efs
- Emphasis on CO<sub>2</sub> and GhG emissions due to recent regulations
- New elements in CO<sub>2</sub> emissions monitoring and reporting, real world vehicle CO<sub>2</sub> operation

# Emission factors from LDVs Diesel & Gasoline

## Diesel

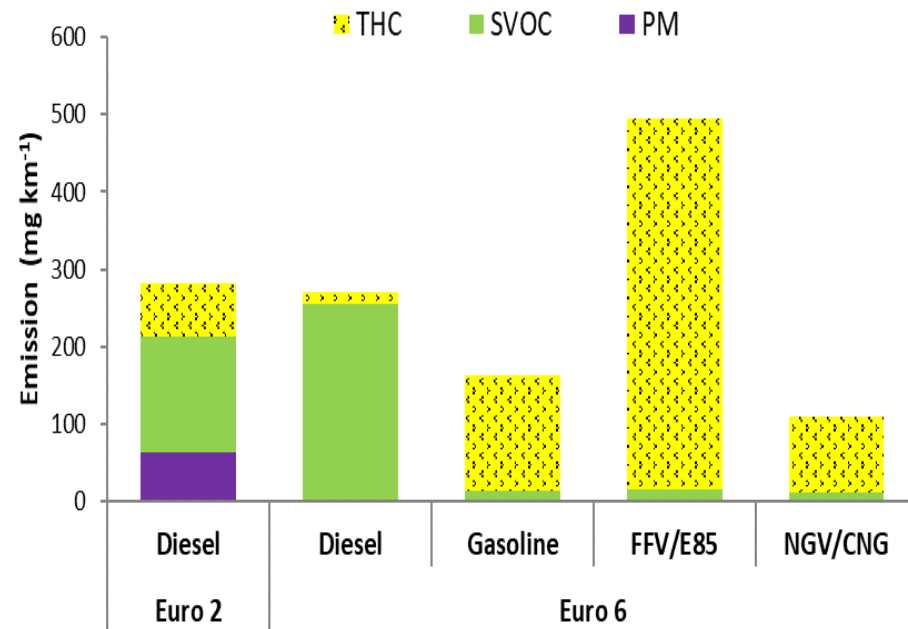


## Gasoline



# Experiences from semi-volatile (SVOC) and particulate matter (PM) emission measurements

- SVOC are sufficiently volatile to be in vapor form at the temperature of engine out exhaust but condensable under atmospheric conditions
- Review of reveals new classification of SVOC
- Higher SVOC than PM emissions for all cars tested.  
**Very high SVOC emission for Euro 6 diesel car.** Chemical composition was not analysed (except PAHs).



Sum of PM, SVOC and THC mass emissions are surprisingly similar for different cars.

# New developments on road transport chapter

- Implemented updates and new elements
  - Revision of emission factors for mopeds and motorcycles
  - Calculation of the fossil fuel fraction in biodiesel
  - Revision of Euro 6 evaporation emission factors
  - Revision of Euro 6 LCVs emission factors
  - Review of exhaust NMVOC speciation profile

# Abrasive rail emissions

- Germany first country to handle rail abrasive emissions
- Material available on-line
- Tier 0.5 approach with a lot of assumption
- Abrasion of contact line, tyres, brakes,
- Copper emissions from contact lines quite high,
- Proxy gap-filling
- Further study necessary to come up with a more comprehensive quantification approach

# Workplan 2019-2020

- New emission factors for electrified vehicles (diesel hybrids, plug-in hybrids, battery electric vehicles)
- Revision of non-exhaust PM EFs (PM2.5 over PM10) from tyre wear
- Review of emission degradation functions light duty vehicles
- Review of Euro 6d EFs in light of new RDE measurements
- Revision of PM characteristics (PN & Surface area) as a result of H2020 projects
- Additional feedback stemming from on going work on ship emissions, rail and non exhaust emissions