Transport Expert Panel

Summary Report
Thessaloniki, 2019-05-13
<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter/Institution</th>
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<tbody>
<tr>
<td>13:45</td>
<td>Welcome and progress since last year</td>
<td>Chairs</td>
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<tr>
<td>14:00</td>
<td>ECAMED: A Technical Feasibility Study for the Implementation of an Emission Control Area (ECA) in the Mediterranean Sea</td>
<td>Jean-Marc Andre (CITEPA)</td>
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<td>14:20</td>
<td>POP and heavy metal emissions from marine engines, Nordic programme</td>
<td>Paivi Aakko-Saksa (VTT)</td>
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<td>14:40</td>
<td>The Contribution of Brake Wear Emissions to Particulate Matter in Ambient Air</td>
<td>Daniel Wakeling (Ricardo)</td>
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<td>15:00</td>
<td>JRC’s Activities in Road Vehicle Testing and Emission Factors Development</td>
<td>Georgios Fontaras (JRC)</td>
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<td>15:20</td>
<td>Experiences of semivolatile (SVOC) and particulate matter (PM) emission measurements</td>
<td>Paivi Aakko-Saksa (VTT)</td>
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<td>15:40</td>
<td>Coffee break</td>
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<td>16:00</td>
<td>New developments on road transport chapter</td>
<td>Giorgos Mellios (ETC)</td>
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<td>16:20</td>
<td>Non-exhaust traffic emissions in the UK’s inventory</td>
<td>Daniel Wakeling (Ricardo)</td>
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<td>16:40</td>
<td>Consideration of rail abrasive emissions</td>
<td>M. Kotzulla (UBA)</td>
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<td>17:00</td>
<td>2019-2020 workplan</td>
<td>Chairs/all</td>
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<td>17:20</td>
<td>Meeting end</td>
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## Progress since last year

<table>
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<th>Item</th>
<th>Reporter</th>
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<tr>
<td>Review and uptake of Nordic study</td>
<td>Paivi Aakko-Saksa (VTT)</td>
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<tr>
<td>- Update of NMVOC emissions profile</td>
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<td>- PAH and HM</td>
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<td>New exhaust emission factors for motorcycles</td>
<td>EMISIA /Done</td>
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<td>Conversion of Tier 1 and Tier 2 EFs to kg/MJ</td>
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<td>New emission factors for electrified vehicles (diesel hybrids,</td>
<td>EMISIA / Next year</td>
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<td>plug-in hybrids, battery electric vehicles)</td>
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<tr>
<td>Review of non-exhaust PM EFs (PM$<em>{2.5}$ over PM$</em>{10}$)</td>
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<td>Consideration of rail abrasive emissions</td>
<td>UBA</td>
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An Emission Control Area in the Mediterranean Sea

- ECAMED project results
- Reference period 2015
- Pollutants $\text{SO}_2$, $\text{NO}_2$, $\text{O}_3$, 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.
- 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, break wear contributions, scoping study, current work
- Existing uncertainties in break 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$_{10}$ emissions from road transport sources

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$_2$ and GhG emissions due to recent regulations
- New elements in CO$_2$ emissions monitoring and reporting, real world vehicle CO$_2$ operation
Emission factors from LDVs Diesel & Gasoline

**Diesel**

- NOx emission factors vs. vehicle speed (km/h)
- CO emission factors vs. vehicle speed (km/h)
- CO2 emission factors vs. vehicle speed (g/km)

**Gasoline**

- NOx emission factors vs. vehicle speed (km/h)
- CO emission factors vs. vehicle speed (km/h)
- CO2 emission factors vs. vehicle speed (g/km)
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