

# Emissions

## CT7 - Compilation of high resolution emission inventories

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**FAIRMODE**

Forum for air quality modelling in Europe

# CT7 - Compilation of high resolution emission inventories

## Overview

- Main purpose of the CT7 sessions
- Summary of the break-out group discussions
- Next steps

# CT7 - Compilation of high resolution emission inventories

Plenary meeting in Berlin 18-19.02.2020: Presentation of the CT7 Road-map 2020-2022

Agreed actions:

- Initiate benchmarking activities for new sectors (off-road).
- Provide relevant feedback to EMEP, CAMS-REG.

**Session 1 (30/09 09:15 – 11:15h)**

- Draft final recommendations for the compilation of traffic and residential heating high resolution emission inventories.
- Elaborate recommendations on metadata to better understand the differences between inventories (use of the composite mapping platform).

**Technical meeting 30.09-02.10.2020**

**Session 2 (01/10 14:00 – 16:00h)**

# Session 1: Break-out questions

## Way forward on best practices for high resolution emissions

### 1. What are the "key challenges" for compiling emission from the off-road sector?

- Large diversity of emission categories (construction/agriculture/industrial machinery, recreational boats), which entails multiple challenges in terms of:
  - **Data compilation:** Multiple sources of activity data need to be collected and processed. There are no specific requirements that enable to get all the needed information (some time you do not even know who are the sources of information). Difficulties in collecting the data every year and getting them update (e.g. machinery fleet composition).
  - **Spatial distribution:** It is challenging to find the best proxy for the spatial distribution in each case (even more when considering future scenarios). In some cases, emissions from different types of machineries are reported under the same category, which make the disaggregation of emissions even more difficult. It is important to find a balance between the best proxy and the spatial distribution you need for modelling purposes
  - **Temporal distribution:** Similarly to the spatial distribution, each category requires a different temporal profile for the distribution of emissions. Certain emission processes (e.g. non-exhaust emissions from construction machinery) are driven by meteorological parameters, which makes the temporal disaggregation even more challenging.
  - **Emission factors:** Emission factors for "new" machinery (i.e. new technology layers) need to be more robust as they are starting to become more important in the total fleet.
  - **Characterization of emission processes:** Certain emission categories are composed of multiple processes, which need to be treated differently, e.g. shipping emissions at harbor versus cruising in open sea, exhaust versus non-exhaust emissions from construction machinery – An additional problem for shipping is to distinguish between national and international shipping emissions.

# Session 1: Break-out questions

## Way forward on best practices for high resolution emissions

### 2. How should guidance on the best practices on non-road emission sources be structured?

- Specific guidance for each subsector: The diversity of off-road transport makes it difficult to make a unified guidance
- Priority sub-sectors .
  - 1) Shipping
  - 2) Construction
  - 3) Agriculture – need a discussion whether this included only agricultural machinery or be extended to include also urban agriculture
- For each subsector,
  - we need guidance of potential data/information for activity data to represent emissions
  - we need to identify existing data sources for activity data at local level to promote comparable practiced in other regions/ countries
- The EMEP/EEA guidelines should be considered as a starting point for identifying which aspects need to be improved (with a focus on the data needs at local level)
- The quality of emission data for urban areas (i.e. urban off-road sources) should be high priority
- The best practice should be determined by the purpose of emissions, (AQ assessment, forecasting, planning)

# Session 1: Break-out questions

## Way forward on best practices for high resolution emissions

### 3. To which "key challenges/guidance" are you planning to contribute (specify name/contact of contributors)?

- Agriculture machinery: Stefan Feigenspan & Stephan Nordmann
- Construction machinery: Beth conlan & Tim Murrells and Susana López-Aparicio
- Shipping: Alexandra Monteiro, Bertrand Bessagnet, Jean Marc André
- Recreational boats: Marc Guevara, Susana López-Aparicio
- GIS spacialization : Robert Colas

# Session 2: Break-out questions

## Guidance, documentation and benchmarking of emissions

1. Do you agree with the general suggestions to improve the best practice guidance document for the transport sector?

General agreement with the suggestions and modification proposed

General agreement to not cover non-exhaust sources as it will increase a lot the complexity of the document. Nevertheless, it is important to specify in the title about “exhaust” and bear in mind the importance of non-exhaust, i.e. at the beginning of the document give indication of potential uncertainties if non-exhaust emissions are not included (e.g. underestimation of PM).

The air temperature dependence should be addressed for:

- Cold-start emissions (also comment on the assumption for length trip value and importance of NH<sub>3</sub> from gasoline vehicles)
- NO<sub>x</sub> emissions from diesel vehicles (inefficiency of the ERG system under low temperatures)

Good idea to separate the report by purpose and to include CT4 –microscale.

Special effort on the spatial distribution - downscaling methods review should be included

# Session 2: Break-out questions

## Guidance, documentation and benchmarking of emissions

### 2. How could documentation of high resolution emissions best be organized (metadata, reports, decision trees...)?

#### Metadata:

- Should be mandatory, as basic information, when uploading emission inventories into the platform
- Terminology: It is important to agree on a common definition for the different estimation approaches (BUP, TOD, downscaling)
- It is important to know who is the final user of the metadata
- How can we give an idea of the uncertainty of the emissions through the metadata? (uncertainty should be shown)

#### Advantages about presenting documentation as a decision tree:

- Decision tree secures comparability of metadata and can be useful as guidance too
- It offers an homogeneous way of producing metadata associated to emission inventories
- The questions proposed in the decision tree may help to improve documentation of the emission inventories

#### Concerns about presenting documentation as a decision tree:

- The decision tree may not fit some inventories, contemplate all the options for estimating emissions or be flexible enough. Perhaps some questions should be formulated as open questions instead of limited amount of choice
- The decision tree may guide/direct too much



# Session 2: Break-out questions

## Guidance, documentation and benchmarking of emissions

### 3. Where do you plan to contribute (specify name/contact of contributors)?

- Sandy (decision tree & guidance)
- Bruce (contribute to the non-exhaust part when we get there + temperature dependence on diesel NOx emissions)
- Beth Colan (review on cold-start NH3 emission and temperature dependence)
- Oxana (review fitness-for-purpose approach)
- Stephan (contribute with decision tree & support development of the trees)
- Stijn (CT4 links for the guidance document)
- Monica and Stig (review the guidance document)
- Colas Robert (contribute to the downscaling chapter in the non-exhaust guidance)

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## Next steps

- Best practice document on exhaust traffic emissions:
  - Apply the new structure + comments received and distribute the document to the whole FAIRMODE community for feedbacks, including those who explicitly volunteered for review.
- On-line metadata decision tree:
  - Agree on a common definition for the different estimation approaches
  - Distribute the proposed version of decision tree for road transport sector and residential combustion to the whole FAIRMODE community for feedbacks
  - Work with JRC and VITO to develop a first version
- Off-road sector:
  - Go from "off-road" to "specific subsectors"
  - Working on the compilation and evaluation of existing methods for specific subsectors within off-road (NRMM in agriculture; in construction; households; recreational boats)
  - Identify what metadata needs to be submitted