FAIRMODE 10th plenary meeting: Utrecht 14-15/02/2017

The FAIRMODE plenary meeting was attended by about 80 participants from 24 countries among which 18 Fairmode National Contact Points. The meeting aimed at 1) reviewing the status of current work and 2) discussing options for future work, including the strategy roadmap for 2017-2019.

The FAIRMODE plenary meeting was organised back-to-back with an RIVM meeting entitled "Status of Air Quality Sensors and their use in (official) monitoring strategies" and with the EMEP Task Force on Integrated Assessment Modelling (TFIAM) meeting on the specific issue of "On modelling urban and regional measures for improved air quality". Reports on these other meetings are given under cooperation with other projects.

The meeting included sessions dedicated to discuss 1) the status and roadmap of the Fairmode Working Groups; 2) connections to other projects and activities and 3) the new cross cutting activity on air quality management practices.

A summary of the presentations and discussions is given below. Note that all presentations are available on the FAIRMODE web page.

P. Thunis presented the main orientations of the FAIRMODE roadmap for 2017-2019. This new roadmap naturally follows-up the activities performed so far. The main change is the creation of a cross-cutting activity aiming at promoting better air quality management practices, with the support of pilot cities and regions. The roadmap was well accepted by the participants, in particular the strengthening of the links between the local, regional and national scales and the increased focus on air quality management practices. It was reminded that National Contact Persons remain the main link regarding modelling activities in the Member States, even though modelling is frequently done at the sub-national scale. Although e-reporting is not a cross-cutting activity anymore, it remains an important activity with specific work being addressed on this issue in each of the FAIRMODE working groups.

F. Wakenhut (DG ENV) provided an update of the Clean Air for Europe programme, including an overview of the recently signed legislation on national emission ceilings. Among others, this new legislation will require a greater involvement of all levels of decision-making in air quality planning, an area in which FAIRMODE is foreseen to provide support. Potential FAIRMODE support to policy will be related to the Air Quality directive related plans & programmes and/or to their fitness-check that is expected to initiate in the coming months, with a finalization foreseen by end 2019. F. Wakenhut also gave information on the on-going preparation of the clean air forum and clean air dialogue to start later this year.

WG1-Assessment: status and roadmap

Guidance on Model Quality Objectives

S. Janssen (VITO) presented the updated version of [the guidance document on MQO and benchmarking](), available on the FAIRMODE web site. Version 2.1 includes the latest updates derived from the work performed in TC264/WG43 on Model quality objectives: clarified definitions, improved readability, executive summary, definition of the main assumptions... A section dealing with forecast indicators is included as annex. This new section requires further fine tuning in terms of methodology and has to be tested with more real world cases. The best practice section has been removed and turned into a publication to be submitted in Spring 2017.

Inter-comparison exercise on spatial representativeness

M. Gerboles (JRC) presented the preliminary results of the inter-comparison exercise (IE) of the area of representativeness of Air Quality Monitoring Station in Antwerp (B). The results show a large scattering of the extent and position of the area of representativeness and triggered of lot of interest from the participants. These discrepancies require further quantitative definition of the concept of "area of representativeness", that was requested by the DG ENV representative in view of the harmonization of all used estimation methods. Participants requested that further to the IE, guidelines and guidance for determining of the area of representativeness according to available information are prepared by JRC, that the IE is repeated in other cities in the future both for yearly averages and shorter time average defined in the Air Quality European Directive. **A workshop will be organized to discuss the definition, methodologies and results, possibly at the next technical meeting in Athens. JRC will distribute all results to participants before the workshop and will give the possibility to resubmitting their results**.

Composite mapping

S. Janssen (VITO) provided an overview of the composite mapping exercise stressing out the high level of responses (54 deliveries including 19 national contact points). Improvements with respect to the previous release include 1) the possibility to compare model results to the airbase measurements and 2) the availability of a QA/QC software to facilitate the maps uploading process. A second version of the map is proposed with deliveries foreseen by May 2017 to feed discussion during the technical meeting in June. **S. Janssen will distribute a note to announce the compilation of this second version, including some concrete information about the requested maps (NO$_2$ and PM$_{10}$ annual averages for 2012 and/or 2015) and the expected time line.**

Exceedance modelling and model's fitness for purpose

Reporting of an exceedance situation according to the implementing decision 2011/850/EC requires information (e.g. estimating the population exposed to pollution levels) that highly depends on the methodology used and of its spatial resolution. S. Janssen illustrated this point with city-scale modelling results obtained at different spatial resolutions but also with spatially highly detailed experimental campaigns (2000 passive samplers in Antwerp) pointing out to the very large concentration spatial gradients found in urban environments. Harmonization of methodologies is therefore required to

support Member States in their reporting and FAIRMODE intends to provide guidelines to support this process, especially regarding resolution (spatial and temporal). This topic will be further discussed during the next Technical Meeting. It was agreed to focus on NO_2 and $PM_{2.5}$ annual averages in a first stage. M. Ross-Jones (SE), C. Guerreiro (N), S. Nordmann (DE), D. Brooks (UK), B. Maiheu (B), H. Elbern (DE) and A. Monteiro (P) volunteered to contribute to a draft proposal as a basis for discussion.

Roadmap 2017-2019

The work on Modelling Quality Objective will include a continued support to the ongoing CEN work, propose modifications in the MQO & participate in testing (e.g. high percentiles, limited number of stations available for evaluation...) as well as further develop the MQO for forecasting.

The composite Mapping exercise will be used as a trigger for discussions about the quality of AQ assessment, to support the drafting of guidelines for fit-for-purpose modelling criteria and to support the e-reporting process.

The Spatial Representativeness intercomparison exercise will be consolidated.

WG2-Emissions: status and roadmap

L. Tarrason gave an overview of the on-going WG 2 activities, with a special emphasis on the outcome of the benchmarking exercises in selected cities. She presented the main updates regarding the benchmarking methodology developed to secure the consistency of detailed bottom-up (BUP) emission inventories with those compiled for regulatory purposes at local, national and European scale (TOD). The main purpose is to improve TOD national and BUP local emission inventories and reduce the gap between them.

WG2 will continue its work at the urban scale but with an extension of the current activities on transport to other key sectors. Foci for WG2 best practices will include resuspension, residential combustion-wood burning, small combustion, industry, and agriculture, emission sectors that showed the highest uncertainties during the benchmarking process.

One important point of discussion was the foreseen extension of the composite mapping exercise to emissions. The proposed platform will in a first stage focus on a few key sectors (residential, transport, agriculture) and pollutants but will allow checking data consistency across all scales (from EU to local scale). The purpose of the emission composite mapping is not to generate a new emission inventory but rather to facilitate comparisons in view of a better understanding of the reason behind observed differences. It was highlighted by German and Swedish colleagues that in order to promote environmental solutions in urban areas, good understanding of the emissions in these areas is necessary. Currently there is a large gap (both in terms of methods and results) between the official reported national and regional emissions and emissions compiled at urban level. Therefore, the first analysis of the emission composite map exercise will focus on the differences between urban scale inventories and those reported by national authorities under EMEP 01.x0.1. This emission composite mapping will also support the analysis performed in WG1 on the assessment of air quality maps and the

urban AQ assessment work performed in the frame of the Urban partnership and help in the future with collaboration with EMEP/TFEIP. **Participants interested to contribute to this exercise should send their gridded data to WG2 by May 1ˢᵗ 2017 to feed discussions during the June technical meeting in Athens**.

WG3-Source apportionment: status and roadmap

C. Belis (JRC) reported on the WG3 activities performed during the 2014-2016 period, the lessons learned from the intercomparison exercise (IE) and the roadmap 2017-2019. He highlighted the benefits of the IE for both source- and receptor-oriented models (40 participants) in providing insight on the model behavior and the uncertainty of the source apportionment (SA) output. The IE results were used to refine the evaluation methodology and associated performance criteria. The testing datasets generated in this and previous IEs are integrated into the new online tool DeltaSA to test model SA applications. The analysis of the IE results also revealed the need to investigate further the differences between model approaches, between source- and receptor-oriented models but also between chemistry-transport model approaches: tagged (e.g. PSAT) vs. brute force. Some participants discussed the possibility of including SHERPA at a later stage of the IE.

The WG3 Road Map 2017-2019 focuses on developing guidelines for SA with source oriented models, testing the identification of the geographical origin of pollutants, extending SA tests to a wider range of pollutants and supporting the e-reporting of sound SA data.

A SHERPA additional interface, resulting from the collaboration between WG3 and WG4, has been presented and discussed. This interface has been developed to provide information on source apportionment in the context of e-reporting. Although SHERPA is limited to urban background scales (not applicable to traffic stations), the added value of this new module was appreciated as a mean to provide first guess information, especially for locations where this information is not readily available.

WG4-Planning: status and roadmap

A. Clappier (Univ. Strasbourg) provided an overview of the past and on-going WG4 activities. He reviewed the different benchmarking activities (now linked to peer-reviewed articles) and stressed the need to further benchmark model approaches, as these will determine the accuracy and robustness of the policy responses in terms of source apportionment and air quality planning. This is the case in particular for the SHERPA simplified modelling approach. He also stressed the need to better connect the WG4 activities to WG2 (emissions) and WG3 (Source apportionment) in the frame of this benchmarking process. A. Monteiro (U. Aveiro) recalled the work that initiated in WG4 regarding the harmonization in terms of abatement measures.

The discussion revealed substantial interest in the SHERPA results of which the added value of providing first guess results was acknowledged. Some of the SHERPA limitations were recalled and discussed (e.g. not applicable to traffic hot spots, only applicable to annual mean concentrations, meteorological inter-annual variability…) and the participants also called for additional testing of its simplifying assumptions

(linearity, isotropy…). Its further testing in the on-going source apportionment IE was also recommended.

The 2017-2019 roadmap will consist in continuing the benchmarking activities (with support of SHERPA) and in supporting the e-reporting process. Collaboration with WG3 will strengthen to develop methodologies to assess the quality of the source apportionment results in terms of the spatial dimension (local vs. regional and national contributions). WG4 will also contribute to the harmonization of the specifications used to classify abatement measures that are available to policymakers at the regional/local scales

Air quality management practices: A new CCA/WG

P. Thunis introduced the new cross-cutting activities aiming at improving air quality management practices at the local and regional scales. The objective of this activity is to ensure that the methodologies and guidance's developed in Fairmode and shared with the National Contact Points (NCP) are applied in practice at all levels (national to regional to urban). In particular, it aims at:

- strengthening the links between FAIRMODE and the local and regional Authorities;
- making sure these Authorities make use of most of the available FAIRMODE tools and methodologies in order to ensure that the whole modelling chain (including input data) is robust;
- improving the Fairmode support thanks to the Authorities feedback.

The foreseen process (time frame, FAIRMODE-Pilot interactions…) was discussed during the meeting and on that basis the FAIRMODE Steering Committee will elaborate a plan for the pilot. The following cities/regions/countries volunteered: Stockholm/Sweden, Emilia Romagna, Krakow, Milan (TBC) Zagreb/Croatia, One Portugal region and Dublin/Ireland. **By the end of March the steering group will circulate detailed information regarding the practical implementation of this pilot exercise. Cities/regions or countries can still volunteer until March 31st.**

Connections to other projects & activities

C. Guerreiro (NILU) and C. Belis (JRC) presented the status of CEN-TC264/WG43 and WG44 on model quality objectives and source apportionment, respectively. Both working groups are currently drafting their technical specification and preparing a list of tasks (associated to testing needs) to apply for funds from EC/EFTA. The main decisions taken so far were recalled by the two WG convenors.

L. Rouil (INERIS) presented an overview of the current CAMS activities and products, especially those potentially connected to FAIRMODE. These connections reside mostly in the quality assessment of the CAMS regional products (AQ forecast, AQ assessment, emissions) with respect to the FAIRMODE performance indicators. But the exchange of experience on the lessons learnt from the usage of these products were seen as beneficial to the FAIRMODE community as well.

The Fairmode meeting was organised back-to-back with the Task Force on Integrated Assessment Modelling (TFIAM) on the specific issue of "On modelling urban and regional measures for improved air quality". Rob Maas (RIVM) highlighted the main objectives of this meeting and pointed out to the potential links between the task force and the FAIRMODE network. Presentations of this meeting are available here.

J. Wesseling (RIVM) summarized the outcome of the sensors workshop held at RIVM on 13/02/2017. The meeting had an informal character and aimed at exploring EU wide activities on air quality sensors and its state of the art. The large attendance (about 60 participants) was a clear sign of the interest on potential applications of this new technology. One of the main points arising from the discussion was the need to increase interactions with AQUILA regarding the standardization/comparison with official measurement stations and with FAIRMODE regarding guidance on the use of low cost sensors in combination with modelling. Work on how these activities are to be coordinated will continue in the next few months.

A.O.B

Next FAIRMODE technical meeting: Athens – June 2017
The next technical meeting will be organized in Athens (19-21/06/2017) by the Technical University of Athens (Greece). Contact: Vassiliki Assimakopoulos.

Harmonisation conference
The 18th international conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes will take place in Bologna (IT) on 9-12/10/2017. Similarly to previous events, one of the topics of the conference is on the "Use of modelling in support of EU air quality directives, including FAIRMODE"