

FAIRMODE 8th plenary meeting: Baveno 12-13/02/2015

The meeting was attended by about 85 participants from 21 countries (see list in Annex 2) among which 18 Fairmode National Contact Points. The meeting aimed at 1) reviewing the status of work in the different Fairmode working groups and cross-cutting activities and 2) discussing possible options for future work related to specific topics.

The first presentation was given by Thomas Verheye (DG ENV) who provided an update on the air quality policy package in general, and issues that feature in the NEC Directive discussions in particular. He focused on exemplifying how model outcomes, for example as shown in the TSAP Report #12 (i.e. urban PM2.5 levels under the EU clean air policy package), can support the policy development."

A summary of the presentations and discussions is here below organized in terms of the various working groups. In addition, some actions are highlighted (in bold). Note that all presentations are available on the FAIRMODE web page.

WG1: Assessment

Guidance on Model Quality Objectives (MQO) and benchmarking

Initially planned for end 2016, a first version of the [guidance document on MQO and benchmarking](#) has been made available on the Fairmode web site for discussion. This guidance document which has currently been reviewed by 15 experts summarizes all previous works on the subject, lists key remaining issues (e.g. spatial representativeness, data assimilation...) and includes a "best practice" section to which 7 groups contributed so far. Stijn Janssen gave an overview of the guidance document and invited the community to review and comment it. This guidance is intended as a living document, with the expectation that remaining issues will progressively be solved during technical meetings and be promoted to the "mature" part of the guidance document, while new issues will emerge with time. Additional good practices examples will be added and comments received from the community will be integrated. An update version of the guidance will be available by beginning of April to allow sufficient time for review before the [next Fairmode technical meeting](#).

Action: S. Janssen to coordinate the review and update of the guidance document (April 2015)

Proposal for a EU Member states bottom-up composite Air Quality map.

Given the contrast between the weak response to the current e-reporting process for modelling (only 4 countries report) and the large availability of air quality maps at national levels (19 countries participated to the ETC pilot exercise on EU mapping in 2013), WG1 proposed to re-launch a similar mapping activity within Fairmode. The technical difficulties that will emerge from this activity (e.g. country border effects, model differences, input data inconsistencies, interpolation between different reporting grids...) are well known and have been clearly identified during the ETC Pilot study. Tackling these issues within Fairmode as part of its harmonization activity has been acknowledged as very relevant by the entire community, as it potentially will lead to improved national AQ mapping and to an increased consistency among MS national maps. However, some concerns were raised regarding the possible use of these maps outside the Fairmode context, especially with regard to their possible use and interpretation within the legal process of exceedance checking. The WG1 chairs will draft an updated proposal by April 2015. Herein the idea and overall objective will be further elaborated and clarified, taking into account the concerns raised during the plenary discussions. Further, a first request for participation will be sent out to NCP's and WG1. A roadmap describing the next steps can then be presented during the technical meeting in June.

Actions:

- 1) WG1 chairs to send EU Mapping proposal and request for participation to NCP and WG1 (April 2015)**
- 2) WG1 chairs to draft a roadmap for the initiative (June 2015)**

Delta benchmarking tool

As a result of the "wish list" coordinated by RIVM (detailing possible improvements to the [DELTA tool](#)) on the basis of the requests made during the technical meeting in Oslo, the JRC released version 4.0 after summer 2014 and will release version 5.0 in February 2015. Version 5.0 includes all improvements proposed in the "wish list" as well as a self-installing facility (no prior installation of IDL requested). This version will be available for Windows and Linux environments. Automatic robustness checks and format conversion utilities are also integrated in this new version. A training session will be organized at the JRC Ispra in autumn 2015.

Actions:

- 3) JRC to release DELTA version 5.0 (February 2015)**
- 4) JRC to announce details of benchmarking training meeting (June 2015)**

WG2: Emissions

Benchmarking activities

One of the main objectives of WG2 is to secure the consistency of detailed bottom-up emission inventories with those compiled for regulatory purposes at local, national and European scale. As part of its benchmarking activities WG2 has elaborated a methodological framework which needs now to be tested in practice on real datasets. To this end the JRC has released an [emission benchmarking tool](#) where top-down data sets from different sources (EC4MACS, TNO-MACC...) can be compared with local datasets originating from various cities, regions and countries. On the side of the plenary meeting, a training session on the emission benchmarking tool was held to present the Emission Benchmarking Tool and introduce the first ideas on how to interpret the results. During this training session the participants took the opportunity to give feedbacks about different features of the tool, which were compiled in a “wish-list” and will be considered in future versions of the tool. As a first step, L. Tarrason and M. Guevara will distribute to all participants a publication describing the current benchmarking methodology as well as a practical example of application. Participants will then be invited to perform similar analysis on other datasets and share their findings during the next technical meeting.

Actions:

- 1) WG2 Chairs to distribute to WG2 participants a publication describing the proposed benchmarking methodology as well as a practical example of application on one city/region (March 2015).**
- 2) WG2 chairs to collect feedbacks and coordinate efforts regarding the emission benchmarking tool. The JRC will follow-up on possible updates of the tool.**
- 3) WG2 participants to test the JRC tool, and report feedback on benchmarking in preparation of technical meeting (May 2015)**
- 4) JRC to update the emission benchmarking tool (June 2015)**

Guidance on best practices in urban traffic emission compilation

WG2 also focuses on the compilation of good practices for urban emission compilation, with focus on mobile sources. This includes the identification of best available data sources and methods, identification of methodologies to understand emission processes and the comparison of emission factors. NILU, together with a small group of developers, is currently drafting a document with best practices (potentially reaching TIER 4) for urban emissions. A first draft will be circulated before the technical meeting.

New co-chair

The current co-chair of WG2, Julio Lumbreras has been asked to contribute to the work in WG4. As a consequence, a new co-chair was selected for WG2. Marc Guevara (Barcelona Supercomputing Center) will act as co-chair of WG2.

Action: WG2 chairs to prepare guidance on urban emission best practices (June 2015)

WG3: Source apportionment

The analysis of needs and prioritization of tasks discussed during the technical meeting in Oslo was presented. The current work is in a transitional phase in which final products concerning receptor models have been finalized and are now in the phase of dissemination, while new technical work involving receptor-oriented and source-oriented methods is being implemented.

Harmonized Protocol on Receptor Models

The Common Protocol for Receptor Models was published in 2014 and feed-back from users has been asked. Even though the received answers so far are quite positive, more effort is needed to improve the response from the quantitative point of view.

SPECIEUROPE

In order to fill an important gap of input data and contribute to the harmonization of the definition of sources, the JRC with the support of WG3 has published the repository of European source profiles named [SPECIEUROPE](#). It contains more than 200 profiles, three quarters of which derive from measurements at the source, and the remaining are composite, theoretical or deriving from source apportionment studies. SPECIEUROPE provides information which is relevant for source apportionment with source-oriented, emission-oriented modes and for the validation of emission inventories.

CTM – RM model Inter-comparison exercise

In order to continue the evaluation of receptor-oriented models and expand the performance test to source-oriented models, the WG3 is organizing a joint inter-comparison exercise. The inter-comparison will rely on PM and gas measurements collected in a urban background site. This measurement data-set will be used as input values for the receptor-oriented models. For the teams applying source-oriented models, an enhanced emission inventory for Europe with fuel detail and meteorological fields will be provided for the European domain for a time window corresponding with the measurement dataset. The data evaluation will be then focused in the comparison between models belonging to the same approach and comparing the different approaches among each other for the sources which are compatible.

Actions:

- 1) C. Belis will launch a new consultation about the Common Protocol.**
- 2) G. Pirovano and M Pay will circulate in the following weeks a road map to achieve the inter-comparison exercise launch in the technical meeting of June.**

WG4: Planning

Planning is a new WG within FAIRMODE and is therefore not at the same level advancement as the other three working groups. The main aim of this WG is to propose a protocol to assess the performance of models used in scenario mode. A. Clappier reviewed the available methodologies (trends analysis, segregation periods, inter-comparison) with a special focus on the last one where most progress has been made in the last year. A [planning benchmarking tool](#) has been developed by the JRC and several datasets have been collected despite the challenging CPU demand (one test case indeed requires many scenario runs). The tool is available to all participants for analysis. A. Clappier called for a group of volunteers to review the advantages and disadvantages of each methodology and try to combine them into a protocol. This protocol should remain simple to apply and deliver an overview of the model performances in scenario mode, allowing for comparability in terms of models, regions or scenarios.

Given the high CPU demand of the current approach, participants also asked for the possibility of adapting the methodology so that standard runs already available could be used as well.

New co-chair

Some reorganization of the WG chairs/co-chairs has been decided (see other change in WG2 section). Julio Lumbreras (Technical University of Madrid) will act as co-chair of WG4.

Action: WG4 chairs to contact the group of volunteers and finalise a draft document to be sent to participants before the technical meeting

Cross-cutting activities (CCA)

The main objective of the CCAs is to foster interactions among WGs. F. Meleux, A. Miranda and O. Kracht gave an overview of the status of work in their respective CCA.

Spatial representativeness

One of the main outcomes of the technical meeting in Oslo was the conclusion that methodologies currently available to assess spatial representativeness were extremely diverse in their formulation although their scopes were similar. With a view of harmonization in this field it is proposed to conduct as a joined effort within FAIRMODE and AQUILA an intercomparison exercise of different spatial representativeness methods. The exercise shall be executed by different groups, but on the same shared dataset.

In preparation of this, JRC and CIEMAT launched a [survey to assess the feasibility](#) of performing such an inter-comparison exercise to which all relevant methodologies would be welcome. O. Kracht gave an overview of the background and work-plan while F. Martin provided information on the current status of the survey. The survey documents had been circulated a couple of weeks prior to the meeting and

received a limited amount of answers so far, but responses from the audience indicated a much larger participation to be expected in the coming weeks (deadline for returning the questionnaires: March 2nd, 2015).

The feasibility study shall be concluded by June 2015 and the outcomes will be presented at the next FAIRMODE technical meeting. The technical meeting shall also provide room for discussion, e.g. about the means and techniques to be used for comparing the different spatial representativeness methods in the course of the actual intercomparison study. Further preparations are then foreseen to be conducted until December 2015. It is envisioned to start the actual intercomparison exercise and to circulate the shared datasets by January 2016.

The participants of the plenary meeting agreed to the view of the organizers that the prospective intercomparison exercise should cover as much as possible the total variety and diversity of procedures which are in use today (ranging from methods with moderate complexity, used for pragmatic purposes, to those which involve higher levels of data requirements and computational efforts). It was discussed that this would probably imply the necessity to accept that the pool of investigated methods will not share a strictly unique definition of spatial representativeness. It should actually be one of the major aims of the feasibility study to evaluate if the intercomparison would rather be directed towards a comparison of methodologies, or towards an actual validation in the strict sense.

Actions:

- 1) Participants to fill and return the questionnaires by March 2nd 2015**
- 2) CIEMAT and JRC to provide a final report on the feasibility study by June 2015**
- 3) JRC and CIEMAT to present the outcomes of the feasibility study at the next technical meeting**
- 4) JRC (and possible other collaborators) to conduct necessary preparations for the intercomparison exercise until the end of 2015.**

Forecasting:

This cross-cutting activity currently aims at providing a specific assessment of air quality forecasts. Efforts have been put on the development of indicators dedicated to air quality forecasts. The goal of these indicators is to provide information about the capability of the forecasting system to detect/anticipate regulatory threshold exceedances and to check its ability to provide more accurate forecasts than a persistence model. A first version has been implemented within the delta_tools and a group of user has been formed to discuss the results and to test the relevance of the selected indicators. Further analyses should be conducted to test new approaches with the goal to select the most appropriate indicators to strengthen the forecast assessments. The way the uncertainty is taken into account to implement a margin of tolerance needs also to be discussed as well as the strategy to provide a complete representation of the forecasting system capabilities including the consistency of performances for all time lags.

Representations of the scores regarding the threshold exceedances within the delta tool needs to be developed to provide the most useful evaluations.

Additional tests are foreseen with the large European database of air quality forecasts from MACC projects. Teams who would like to join this initiative are welcome.

Actions:

- 1) Selection of the most appropriate indicators to implement within the delta tool by June 2015**
- 2) Proposal on the implementation of the margin of tolerance by June 2015**
- 3) Add to the delta tool further representations of the forecast capabilities to detect threshold exceedances by June 2015**
- 4) Evaluation process with the MACC database by end of 2015**

Modeling and Monitoring

This cross-cutting activity is a follow-up of work previously developed within FAIRMODE. One of the main purposes for the current period is to update the already delivered documents and to produce a first version of a document to be included in the WP1 Guidance Document. This first version will be presented and discussed at the next technical meeting.

During the technical meeting in Oslo it was clear that some guidance is needed on the independent validation of final results when model output and monitoring data are combined. A proposal based on a Monte Carlo approach was presented and circulated among the FAIRMODE community asking for volunteers to test it. Ana Miranda described this approach to the Plenary and re-enforced the call for volunteers. Four teams are available for testing this approach. The four available teams will coordinate actions and a summary of case studies and main results will be prepared to be presented and discussed at the technical meeting in Aveiro. Information on the data fusion used method and on the specificities of the case study will be provided. Focus should be on the practical feasibility of the proposed method. Another important aspect to assess is on its potential to be incorporated into the model quality objectives and model evaluation tool. Results will be presented at the next technical meeting and main recommendations discussed aiming to propose a method which could be directly included in the DELTA Tool.

This activity is mainly contributing to WG1. The strategy for the near future is to focus during 2016 on potential links with WG2 (e.g. the use of air quality monitored data from traffic stations to improve emissions), WG3 (e.g. the best use of monitored data to improve source apportionment results), and WG4 (e.g. the use of monitoring data to assess the planning capabilities of our modelling tools).

Actions:

- 1) UAVR to send an e-mail to the FAIRMODE's community with a couple of very simple questions about their current practice on combining modelling and monitoring data – mid March 2015**
- 2) UAVR to prepare a first draft of a document to be included in the WP1 Guidance document – mid May 2015**
- 3) UAVR to coordinate the test of the approach to validate results when combining monitored and modelled data – beginning April**

- 4) **UAVR, UNIBS and VITO to provide the outcomes of the testing study to be presented at the technical meeting – end May**

e-Reporting

EEA is responsible for providing guidance to member states concerning e-reporting. A Gsella presented an overview of the current state of progress regarding e-reporting for modelling data. FAIRMODE activities concerning e-reporting are listed here below:

General survey on e-reporting (responses from NCP)

The main outcomes of the e-reporting survey (questionnaire sent to all Fairmode NCP) have been presented by C. Belis. This survey had for main purpose to identify the main reasons explaining the weak responses of Member States in terms of e-reporting. While limited technical capacities and staff resources are identified as possible causes by a number of MS, modelling is generally perceived as sufficiently mature to complement monitoring and brings added value to the process. One of the main reasons identified to explain the weak response to e-reporting for modeling from this survey is however the lack of clear and common guidelines to report, the limitations of the reporting data formats when applied to modelling and the lack of clarity in the legislation.

Fairmode technical support to e-reporting

During the last technical meeting in Oslo, a working group (of 8) has been created to provide support to the EEA on the better definition of two e-reporting data-flows for modelling. This Fairmode working group provided recommendations on which type of common framework would be necessary to describe adequately modelling data (Meta-data and formatting). S. Janssen presented an overview of these recommendations.

Feedback on IPR and source apportionment

The identification of sources in the areas where there are exceedances of the limit values is a pre-requisite for the development of air quality plans and programs. The current IPR document fully relies on the “incremental” approach to define the contribution of sources in the areas where there are exceedances. WG3 has pointed out that this simplified approach is not applicable to all urban areas. It has been shown to be problematic in areas with stagnation, dominant sources outside the cities and high levels of secondary pollutants. A number of recommendations were proposed to overcome the problem.

Meeting discussions

The FAIRMODE meeting raised its concern with respect to the availability of modelling mapping information from member states through e-reporting. Although reporting modelling data is not mandatory, it is included under e-reporting, without the necessary harmonization requirements and

guidance. The meeting discussions highlighted the fact that lacking common guidelines currently prevent some MS to report modelling results as those might be used for exceedance checking in the medium or longer term. While the contribution of Fairmode to better specification in terms of modelling meta-data and formatting issues was seen as very valuable, several MS mentioned the need for clarifications at higher level to determine the possible use of these reported modelling data before proceeding further. In this context, Fairmode has a clear role to play to clarify guidelines in view of facilitating future e-reporting.

Actions:

- 1) FAIRMODE took note of the survey outcome and the technical recommendations on formatting for e-reporting modelling data.**
- 2) The FAIRMODE Steering Group will proceed to communicate the need to revise the source allocation guidance in the IPR as suggested by WG3**
- 3) The FAIRMODE Steering group will initiate the elaboration of a note on the need of common guidelines to report modelling data via e-reporting mechanisms.**

Standardization

The outcomes of the CEN TC264 ad-hoc meeting held in Ispra on 8/10/2014 were presented by P. Thunis. Two work items have been prepared by a working group composed of 7 MS representatives:

- Definition and use of model quality objectives for air quality model applications
- Methodology for the assessment of the performance of source apportionment model applications.

These topics are due to be voted by the CEN representatives in spring and upon positive outcome, two CEN working groups will be set-up. Their first task will consist in defining the work-plan and electing a chair person. Participation to these working groups is still possible and P. Thunis encouraged the participants to contact their national standardization offices if interested.

Action: Fairmode NCP who are interested to review and comment the current work items can contact the JRC (C. Belis or P. Thunis) and should send their feedback before 25/02. The JRC will send the final work items to CEN by end of February.

A.O.B

Aveiro technical meeting

The next technical meeting is organized by the University of Aveiro and will take place in Aveiro (Portugal) on 24-25/06/2015.

Harmonisation conference

The 17th international conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes will take place in Budapest (HU) on 9-12/05/2016. Similarly to the previous events, one of the topics of the conference will be "Use of modelling in support of EU air quality directives, including FAIRMODE". Participants were therefore encouraged to contribute to this topic. More information at the official conference web site: www.harmo.org